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THEORY AND PRACTICE FOR STUDENTS AND NURSES

by

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PREFACE

It appears to the author that many text-books on mental disorder written for nurses endeavour to compress within a small compass the whole of anatomy, physiology, general medicine, neurology, psychology and psychiatry. This must inevitably fall far short of the ideal in many respects. So many important subjects can thus hardly be dealt with other than in sketchy outline. In the hand-book presented here, the subject matter has been restricted to the essentials of nervous structure and function related as far as possible to the mind in health and disease. It has been written to assist the nurse about to embark on her last year of study at the end of which she must negotiate the final examination in mental medicine. The assumption is made that those who read this little volume will have become familiar with simple anatomy, physiology, hygiene, general medicine and the principles of nursing.

Recent years have seen much more research and interest in the subject of nervous disorders. Much physical distress is now known to be based upon, or complicated by, psychological factors. Gradually, doctors have come to look on their patients from a psychophysical angle instead of regarding them as cases of this or that disease. They have at last alighted on the fact, after twenty-five hundred years of psychiatric history, that behind an illness, physical or mental, is a living, pulsating human being. So much the better. After all, motives are at least as important as measles, and conduct of more significance than cancer. No longer is the study of behaviour restricted to detached and dignified armchair philosophers totally divorced from the realities of life. Those concerned with the nursing and treatment of nervous illness and behaviour disorders have at last assumed an independent status.

Every disease has psychological repercussions which are reflected in behaviour alterations of some kind. It is therefore important that the general as well as the specialist nurse should know something of the forces which inspire human conduct. To this end, much space has been devoted to the consideration of mental mechanisms, normal and morbid, for there is hardly any field of medicine or surgery into which motives and psychological methods of 'escape' from difficult circumstances do not intrude.

It is abundantly clear that we have not yet learned the lessons of 1914–18 as regards the effects of stress on the less well integrated nervous system. True, we have discarded the term 'shell-shock' and substituted the word 'neurosis', but there still exists crass and unpardonable ignorance of the nature of psychological illness. In point of fact, there are still too few humanists in psychological medicine. To quote, 'We have

learned to accept the fact that everything in the body is determined by the sum total of physiochemical forces. . . . But, tormented by an invisible anxiety, we seem to be unwilling and unable to admit to ourselves that our thoughts, our fantasies, our mental pains, our joys are also subject to determining biological forces, that they are not merely results of our wilful making or of our faint-hearted lack of courage. . . . We shall learn that our instincts and unconscious emotions are as effective in making us act when they are left outside the field of awareness.' And again, more significantly still, 'Every time humanism has diminished or degenerated into mere philanthropic sentimentality, psychiatry has entered a new ebb. Every time the spirit of humanism has arisen, a new contribution to psychiatry has been made.'

Psychological awareness is also very necessary to ascertain the causes of periodic and increasingly disastrous wars with a view to their abolition as a mode of settling human disputes. This ideal can best be attained by the universal dissemination of authoritative psychological information so that the knowledgeable folk can control therewith the baser passions of the ignorant and unteachable. As an intermediate goal it is at any rate desirable to spread knowledge which might induce deliberate and intelligent conduct and prevent impulsive, emotionally inspired and therefore irrational behaviour.

This war, like the last, is already producing a harvest of men (and women for that matter), broken in health and spirit. Those who were precariously adjusted in civilian life and moderately contented with their lot, have had their lives disrupted, their homes broken and their security shattered. They have in consequence broken down and can only view their future with increasing anxiety, feelings of frustration and an acute sense of failure. These unfortunate people will require rehabilitation. It is therefore of paramount importance that nurses should understand the principles of psychopathology and of psychiatric nursing; for they will be called upon to play no small part in the scheme of restoration.

The author is neither sufficiently optimistic nor presumptuous enough to imagine that he has supplied anything but an elementary answer to the nurse's problems. However, if she is interested in the theoretical aspects of psychiatry in addition to the practical side of her work she may find a modicum of information and perhaps something of service to her in this book.

Finally, the author wishes to express his grateful thanks, acknowledgements and indebtedness to all the authorities he has consulted, and particularly does he wish to thank Miss B. Reynolds for her unfailing and ever-ready assistance with the labour involved in typing the manuscript.

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PREFACE TO FOURTH EDITION

This book apparently continues to be of service to students in all branches of psychological medicine and it has therefore become essential to consider a fourth edition.

Although psychiatry is far from static, advances are of necessity slow and the newer approaches numerically few; for it is a truism to state that many and bewildering are the theories, physical and psychological, put forth to explain the recondite nature of the human psychic organism, its vagaries and its multiplicity of reactions. Consequently the additions to this volume although significant are small in number.

This is the age of 'tranquillizers' and we are daily inundated with a vast mass of literature describing in glowing and optimistic terms the effects of many new drugs guaranteed, so it is claimed, to relieve agitation and anxiety, the commonest symptoms of our present civilization. Some are of value and of these chlorpromazine and rauwolfia derivatives are outstanding but need to be prescribed with discrimination.

The matter of pharmacological treatment by these newer drugs has been discussed as succinctly as possible in the light of the available information derived from clinical research.

Minor refinements which have been elaborated in the known physical treatments have also been described, particularly in connection with modified electroplexy and neurosurgery. Furthermore, recent research, carefully controlled, has thrown some fresh light on the value or otherwise of deep insulin therapy.

Thus, a thorough and complete revision of this book has been undertaken to include also some extensions in the fields of occupational therapy and recent alterations in the methods of admission to hospital.

As regards the laws relating to mental treatment, nothing can be said except that these have been reviewed by a Royal Commission with a view to modernization and elimination of some of the more cumbrous legal processes. A report has been published and the implementation of any or all the recommendations must be awaited.

The author therefore hopes that this book will continue to subserve a useful purpose.

H. C. BECCLE

1957

PREFACE TO FIFTH EDITION

Phenomenal advances in the practice of psychological medicine together with new legislation have compelled the preparation of a fifth edition of this book.

Both research and treatment have gained impetus during the last decade. Consequently, the face of psychiatry is changing rapidly under the influence of new drugs and new methods of treatment. Mental illness is being much more effectively treated than it ever was in the past. Thousands of patients otherwise condemned to spend their lives in hospital are now returning to their homes and to rewarding employment.

Revolutionary changes are contemplated in the hospitals themselves, although it will be a number of years before the new pattern of psychiatry is established.

As to the new legislation, a uniformity of procedure is in being which simplifies the law as it affects patients who have to be detained compulsorily. At the same time, it is clinically rather than legally orientated although many legal safeguards exist for the prevention of possible abuse. Moreover, the trends expressed in the new laws are in the direction of community care, day hospitals, therapeutic social clubs and similar organizations, and away from the orthodox large mental hospital with its inherent defects.

As far then as is possible, the text has been brought up to date, always in the knowledge that the rapidity of advancement far exceeds the capacity of any writer to maintain textual parity with progress.

The author therefore hopes that this book will still continue to be of value to those who wish to survey the territory of psychiatry in its present state of development.

H. C. BECCLE

1962

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INTRODUCTION

The study and practice of psychiatry is only of recent origin and development. Historically, there seem to have been three distinct phases in the evolution of mental medicine as a science. The ancients were sympathetic towards disorders of the mind and Hippocrates is recorded as having made some shrewd comments on the subject. During the Middle Ages, however, the crudities of medicine and medical men were extended to insanity. The times were those of religious wars, superstition, gullibility and ignorance. Sorcerers, necromancers, astrologers and charlatans guided the lives of the populace and were sometimes entrusted with the care of the deranged, with results that can well be imagined. Some of these unfortunates also came under the care of priests on the supposition that witchcraft and 'possession' by demons was at the root of all conduct disturbance. Madness was regarded with horror and mad people were subjected to exorcisms and every kind of ingenious barbarity. Burning, flogging, torture, chains and drowning were the lot of these unhappy creatures. 'Canst thou minister to a mind diseased?' was the rhetorical question of the day.

Even in later years the insane were still being segregated in prisons and primitive madhouses where they were allowed to rot, starve or die in circumstances of the utmost filth and squalor. Wealthier individuals or persons of note such as George III were bled, purged and restrained. It is strange to contemplate that whilst physical disease was being studied earnestly, anomalies of the mind were avoided like the plague. Consequently, no advances were made in the matter of psychological medicine although armchair philosophers and scholars argued about the mind and discussed at their gracious ease some of the phenomena of normal thinking.

At length it occurred to the humanitarians of the eighteenth century that perhaps the insane were sick people and might be treated on medical principles. After a further short period, during which chains, padded rooms, cold showers, mechanical restraint, purging and bleeding persisted as the treatments of choice, the first lunatic asylums came into being. Even with their inception, however, there were still incidents such as brutality, rape, murder and other crimes. Eventually, after Royal Commissions had sat upon the weighty problem of insanity, laws were promulgated, mechanical restraint was abolished and the older barbarities were finally discarded.

The third phase, which might be called the hospital era, dawned; for

it was noticed that certain patients recovered in spite of the treatment meted out to them. Gradually, legal safeguards were tightened up and a regular system of hospital inspection instituted. Psychological medicine became an examination subject. Doctors were encouraged to specialize in mental diseases. The special training of nurses commenced. A great step forward was the nursing of male patients by women. Furthermore, the 'dynamic' school of psychologists and psychotherapists such as Freud, Jung and Adler entered the lists in opposition to ignorance and sterile academic psychology. They won a total victory over the forces of uninformed prejudice and ignorant hostility. Research commenced and has since been pursued intensively.

And so a new age has been ushered in. Most institutions for the mentally sick structurally resemble, in part at least, general hospitals. The doctors are trained and are now required to take a diploma in psychological medicine. Modern laboratories and other diagnostic facilities have been installed and modern methods of treatment, physical and psychological, have been established. Occupational, recreational and social facilities are now provided. The general hospitals have set up psychiatric out-patient departments which work in close liaison with the other clinics. A number of progressive county councils have accepted the fact that much psychological disorder begins in infancy. They have therefore established Child Guidance Clinics.

Another feature of modern psychiatry is the growing interrelationship between the police courts, adult and juvenile, and psychiatric clinics. Enlightened magistrates are making increasing use of the facilities offered for the investigation of delinquents, first offenders and abnormal law-breakers. The psychiatric social worker has come into being. She is a highly trained person of sound character and judgment whose task it is to investigate home surroundings, obtain school reports and to provide information for the doctor. She has, as a rule, an encyclopaedic knowledge of convalescent homes, clinics, schools special and general, and is thus of immeasurable service to the psychiatrist. Further, she conducts 'follow-ups' on patients discharged from hospital, assists to place them in homes, jobs, and, in general, supervizes their welfare. In other directions, she maintains contact with various hospitals and with the organization known as the Mental After-Care Association whose assistance in the rehabilitation of convalescent psychotics is invaluable. There remains much to be done. The training of medical students, for example, is still perfunctory. In fact, the teaching of psychological medicine leaves much to be desired. It consists as a rule of about eight to twelve lecture demonstrations the value of which is almost negligible. Newly qualified doctors are therefore wellnigh at a complete loss when confronted with the vast amount of psychological distress which greets them in their practices.

Further, mental hospitals still retain some of their more primitive characteristics. Many of them lack facilities for the proper classification

of patients. The villa system has not yet been universally adopted so that voluntary patients are unsatisfactorily accommodated. Wards still consist of long cheerless galleries, terminating in dreary day-rooms and punctuated by cold and bare side-rooms which resemble prison cells. The walls of these wards are more often than not adorned (or more accurately, defaced) by hideous fly-blown prints or lithographs depicting such novelties as scenes from the Crimean War! Nearly all hospitals are desperately overcrowded and are thus ideal breeding-grounds for typhoid fever, dysentery and tuberculosis. All these features must be swept away into the limbo of forgotten things. Instead, proper villas exuding a cheerful and curative atmosphere must be substituted.

Apart from the question of treatment many more facilities for research must be provided. As in all disease, prophylaxis is of paramount importance. Sterilization of the mentally unfit is a much vaunted but comparatively useless remedy. The prevention of mental disease cannot be dismissed as lightly as this, so that a still more intensive inquiry into hereditary, constitutional and causative factors must be pursued.

Research must begin with the infant. The populace will have to be taught the art of child management. It is then for the schools to provide proper instruction in sexual hygiene and biology. 'Storks', 'gooseberry bushes' and other foolish old wives' tales should be dismissed with the contempt they deserve. The various secondary sexual epochs must be explained beforehand so that their arrival should not be attended by shock. Intelligent anticipation should be substituted for stealthy and often inaccurate knowledge of an obscene kind. It is well worth pruning sex of pornography, bawdy stories and furtive sniggers. After school, vocational adjustments are best determined on a basis of discovered aptitudes so as to avoid occupational misfits. Still later, marriage must be depicted as a process of intricate and delicate adaptations and not as a licensed and exciting incident launched in an atmosphere of alcohol. In this respect, there is tremendous scope for the 'ante-marriage' clinic, a bureau which would have the authority to advise prospective partners and, if necessary, prevent unions between unsuitable people. Surely, ante-marital advice is at least as important as ante-natal supervision. Moreover, a bureau of this kind would also provide instruction in the art of marriage; for so many folk, particularly those encountered in psychiatric out-patient departments, are totally unfitted for the responsibilities entailed in marriage and parenthood.

It is also well worth while disseminating knowledge about middle age and the climacteric which have peculiar problems of their own. Then again, there is still not enough information available as to negotiation of the later years with their prospects of retirement from active occupation. There is nothing to prevent people from growing old with dignity and grace instead of having to labour on against an increasing handicap of failing efficiency with its alternative, dependency and municipal support. The newer social security legislation testifies to the fact that the

problems of this phase of life have always loomed large and are now receiving belated attention.

Finally, the propagation of authoritative information on psychological subjects has a great bearing on the political future. At the present time, the world is in a state of flux. It is impossible to forecast what will emerge from this reversion to primitive savagery. But one thing is certain, the more enlightened the various populations, the less the likelihood of recourse to barbarism as a way of settling disputes. So that doctors and nurses alike can add their quota to the education of peoples. The ideal to be aimed at is the certainty that conduct based on intelligent and dispassionate deliberation is far superior to that inspired by unconscious motives.

And so throughout life instruction should proceed hand in hand with growth and development; for none is so omniscient that he need no longer learn.

CHAPTER I

ELEMENTARY ANATOMY AND PHYSIOLOGY OF THE NERVOUS SYSTEM

The nervous system is a complicated structure composed of highly specialized cells linked together to form a system of pathways along which travel impulses. Its function is to receive stimuli from surroundings which change at every moment, and to respond to such alterations with adequate muscular and secretory processes. Stimuli arise within as well as outside the body. Sensations pour into the brain from all directions. They pass through a great many paths called association areas, strengthening each other or cancelling each other out until they finally pass from the brain to effect changes in the working organs. From the moment of birth, such interplay of sensation and movement comes into existence so that experience is being continually gained. Previous experience leaves its mark on the nervous system so that the infant's clumsy movements become more and more accurate until the normal degree of skill is developed.

In more detail, nerve cells possess the property of extreme irritability, i.e., they respond rapidly to minute stimuli. Some of them have been especially modified to receive sensation from the skin and mucous membranes. Sensations therefore flow in constantly from all parts of the body, thus maintaining constant contact with the outer world, supplying information as to the state of the bodily organs and giving warning of dangers and commencing illness. Whatever their nature, sensations are conveyed in nerves to the spinal cord and to the brain. There they relay and are passed on through chains of nerve cells or tracts to specialized areas of the brain which analyse the impulses and pass them on again to the parts of the brain which control such movements or other actions as are appropriate. For example, the act of selection of a coin puts into action touch corpuscles in the finger-tips. The feel and shape of the piece of metal is conveyed from the fingers through the nerves of the arm to the spinal cord and thence to the sensation receiving centre of the brain. Here, the sensations are interpreted as regards the exact size and shape of the coin so that one knows its appearance, its value and its purchasing power. Impulses then pass across to the movement section of the brain which sets into motion the necessary muscular activity for the disposal of the coin. This whole series of elaborate mental processes takes place in a trice, in fact, in a fraction of the time necessary to describe it. Similarly, the sight of an object causes changes in the back part of the eyes. These changes are transmitted along the nerves of the eyes to the

occipital portion of the brain. Such visual sensations are analysed, their meaning deduced, and again, stimuli pass to the areas of action so that suitable movements can be brought about if necessary.

The nervous system is often regarded as a highly complicated system of communications comparable with an elaborate telephone exchange. Let it be said at the outset that there is nothing in the mechanical world, however ingenious, to compare for one moment with the intricacies of the simplest of nervous structures. Even in the lowliest of living creatures nature far surpasses still all that has so far been constructed by man's comparatively clumsy hands.

The basic nervous principles remain the same in all animals. By dissection and experiment it is possible to trace the evolution of the human nervous mechanism right throughout the animal world, commencing with the simplest of living organisms and proceeding by way of the earthworm, dog-fish, frog, rabbit, sheep and ape. The eventual development of man and his dominance over all other creatures are all traceable back to the fundamental fact that his brain is the most complex and the most recent in evolutionary history. Thus, its very nature makes its study difficult. Regarded from the physiological point of view man's activities can be thought of as intricate and variable combinations of reflex actions initiated in the mind, controlled by the brain and carried out by the muscles and organs to which the brain and its subdivisions send messages by means of nerves.

The nervous apparatus consists of:

1. The Central Nervous System which comprises:

(i) The brain and its parts which first initiate and control movements; and secondly which receive sensations from all parts of the body.

(ii) The spinal cord which carries strands of nerve fibres called tracts. These tracts convey nervous impulses to and from the brain.

2. The Peripheral Nervous System which consists of nerve fibres acting as conducting material. These nerves are sent out from the brain and spinal cord to all parts of the body. To economize in valuable space such nerves also carry back sensations from all the tissues to the central nervous system.

3. The Vegetative Nervous System. The nerves of this system arise from highly specialized portions of the central nervous system and are entirely concerned with functions which are quite independent of conscious desires. They control the activities of the viscera both hollow and solid, the genitalia, the glands and the blood vessels. To illustrate this independence one may take such functions as the heart-beat, respiratory activity and digestion. The vegetative nervous system is closely linked with the emotions and is very much influenced by the emotional state as will be detailed later.

The brain and spinal cord are enclosed in protective membranes within the cranial cavity and vertebral column, collectively called the meninges.

The outermost membrane is called the *dura mater* because of its tough and fibrous consistency. Within it is situated a double membrane, the *pia-arachnoid mater* which is closely attached to the nervous substance, the pial layer following the outline of the nervous system very intimately, covering the ridges and dipping into its grooves.

In certain districts, particularly at the base of the brain, the pia-arachnoid becomes detached to form spaces.

Thus there are two spaces: one under the dura—the subdural space, and the other beneath the arachnoid—the subarachnoid space.

The central nervous system, having been fashioned during the course of evolution out of a hollow tube, retains its central cavity which in the brain is subdivided into ventricles. Proceeding downwards from the brain the ventricles gradually narrow finally to become the central canal of the spinal cord. These hollows are lined by an epithelial layer called the *ependyma.* In the brain the ependymal linings are closely connected with certain blood vessels derived from the internal carotid arteries. The unions so formed are called *choroid plexuses* and one of their functions is to manufacture cerebrospinal fluid. This fluid, produced in the ventricles, passes into the subarachnoid space to be finally absorbed into the veins of the central nervous system. There is thus a continuous secretion, circulation and absorption of cerebrospinal fluid. Its functions are:

1. *Protective*: it acts as a water-cushion and shock-absorber. For example, a blow on the head is first transmitted through the skull bones to the cerebrospinal fluid which absorbs the shock in part, thus lessening the severity of its effects upon the brain tissue.

2. *Nutritive*: it carries food substances derived from the blood to all parts of the nervous system.

In appearance cerebrospinal fluid is a clear watery fluid containing the same substances as are contained in blood but in very much greater dilution. Microscopic examination shows it to be free normally from any kind of cell, at the most one white corpuscle per cubic millimetre. On analysis it contains small quantities of globulin, albumin, sugar and chlorides. In diseased conditions of the brain or cord, the cells increase markedly in number as does also the protein content. Injury or burst blood vessels cause red blood cells to appear in the fluid, whilst such diseases as meningitis cause the sugar to disappear. Syphilitic diseases produce changes in the protein content of a characteristic kind. These changes are detected by special tests. It will be apparent that an examination of the cerebrospinal fluid withdrawn by lumbar puncture can give very valuable information as to the state of the nervous system.

STRUCTURE OF THE NERVOUS SYSTEM

Like all other bodily tissues the nervous system is composed of cells and supporting tissue. It contains: highly specialized cells—the neurons;

and supporting cells arranged with their processes to form a network comparable to fibrous tissue—called collectively—neuroglia.

Neurons are limited in number and once destroyed cannot be replaced. The dead cells are digested, removed and replaced by neuroglial scar tissue. Destruction of nerve cells is therefore always a serious matter which may result in disturbances of sensation, paralyses of various kinds and conduct disorders, the type of disorder depending upon the site of the lesion.

The Neuron. The nerve cell is a complex structure generally pyramidal in shape, made up of a cell membrane, cytoplasm, nucleus and central nucleolus. In the substance of the cytoplasm are embedded granules which stain deeply with certain dyes and which are called Nissl's bodies. These vary in number and staining capacity with the health of the neuron, being fewer in disease or exhaustion. They are in all probability food reserves. (Diagram 1.)

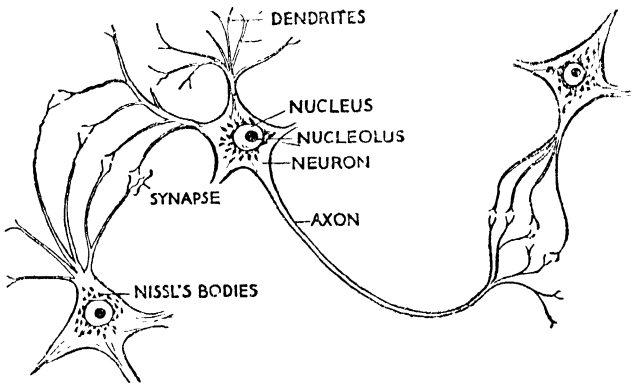

DIAGRAM 1

NERVE CELLS AND PROCESSES

The cell is always in touch with its fellows by means of two sorts of off-shoots from its substance, the axon or axis cylinder and the dendrites. In fact, it may make contact with a large number of similar neurons so that one stimulus may excite many cells. The junctions thus made are called synapses.

The dendrites are branching tree-like formations. Within the cell delicate fibres run between the dendrites and the axon which is situated as a rule directly opposite the dendritic formation. The axon may be of any length depending upon its function. For example, in the sciatic nerve which runs practically the whole length of the leg, the axons are very long indeed. What passes along the axon is in the nature of an electric current. Any nerve contains a large number of axons insulated from each other. Diagram 2 represents a typical nerve cell with its dendrites and axon. It will be seen that the latter is enclosed in a fatty (myelin)

sheath, constricted at intervals by the Nodes of Ranvier. This sheath prevents, so to speak, the leakage of current. Thus, impulses can be transmitted in either direction in the same nerve without risk of short-circuits. Should the cell die and degenerate the axon dies simultaneously.

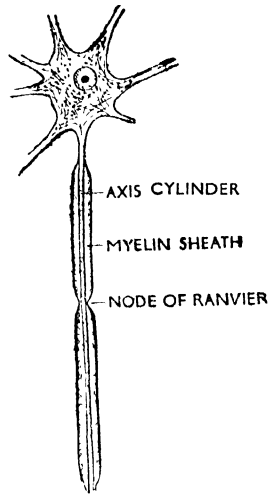

DIAGRAM 2
NERVE CELL AND AXIS CYLINDER

Nerve cells then have been devised during the course of evolution for:

1. The reception of sensation from the outer world.
2. The interpretation of such sensations.
3. The production of muscular movements and other activities appropriate to the sensations.
4. In man—the production of thought, the exercise of imagination, wisdom, judgment and in general the adjustment of the individual to his surroundings. In other words, the performance of all that is implied in thinking, feeling and doing.

Support is afforded the nervous tissue by the neuroglial cells and their processes which are arranged in a complicated basket-like manner to enmesh and sustain it. The complete nervous system is thus a neat and compact structure. Neuroglial material takes no part in the actual conduction of impulses.

Types of Neuron. For the sake of simplicity nerve cells can be divided into three types:

1. *Sensory*—i.e. concerned with the reception of such sensations as:
(a) Special: smell, taste, sight, hearing, touch.
(b) Common: pain, heat, cold.
(c) Distension, as in the stomach, intestines and bladder, which sensations in the end become extremely painful.
(d) Kinaesthetic, which tell how much movement has taken place in joints, or how much contraction has occurred in muscles.

2. *Motor*—i.e. engaged in the transmission of impulses from the nervous system to muscles, organs and glands, thus bringing about muscular contraction and glandular secretion. Impulses are either stimulatory or inhibitory.

3. *Association*—i.e. small nerve cells which act as 'go-betweens' amongst the important motor and sensory cells. They act as convenient agents for relaying impulses.

General appearance. On inspection the central nervous system seems to be composed of grey and white material. The grey matter is a dense collection of nerve cells, whilst the white substance is made up of the axons and dendrites of the neurons. Throughout the grey matter of the

brain can be found clumps of neurons whose function it is to take on subsidiary duties. There is one notable difference between the brain and the spinal cord. In the brain the grey matter is externally placed. The axons of the brain cells run downwards to form the white matter of the external part of the cord, so that the grey substance of the cord is internally placed.

The central nervous system then consists of:

(i) *The brain or cerebrum* which receives all sensations and which initiates all movement. It is the seat of all the intellectual functions such as reasoning, judgment, memory and intelligence.

(ii) *The cerebellum or small brain*, the chief function of which is the proper control of all movements.

(iii) *The mid-brain* which contains nerve fibres running between the spinal cord and the brain.

(iv) *The basal ganglia* (*nuclei*) which are part of the interbrain, and which function as lesser motor and sensory areas.

(v) *The pons Varolii* which bridges across the two halves of the cerebellum.

(vi) *The medulla oblongata* which contains vital centres controlling such functions as respiration and the heart beat.

(vii) *The spinal cord* which commences at the level of the foramen magnum of the occipital bone and proceeds down the neural canal of the vertebral column.

These structures will be dealt with in greater detail.

THE SPINAL CORD

The spinal cord is relatively simple to understand and will be described first. In man it commences where the medulla finishes, i.e. at its exit from the skull. Throughout most of its length it is about the thickness of the little finger but terminates in a slender thread, the filum

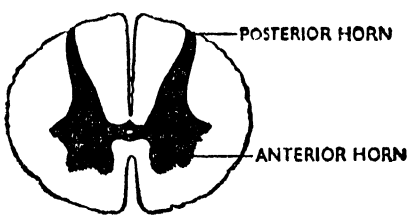

DIAGRAM 3

REPRESENTING THE SPINAL CORD IN CROSS SECTION

terminale, at the lower border of the first lumbar vertebra. In cross-section, the grey matter is internally situated and is roughly 'H' shaped. The cord is hollow and its central canal opens up in the brain to form

cavities known as ventricles. The limbs of the 'H' are called 'horns'. Reference to Diagram 3 makes it clear that the slender horns are posterior and receive sensory nerves or roots, whilst the anterior thick horns contain many motor neurons from which proceed motor nerves (motor roots).

The external white matter is composed of strands of axons arranged in compact bundles called tracts. Some ascend to the brain as afferent columns and others descend from the brain as efferent paths. The ascending bundles carry sensory impulses whilst the efferent tracts convey motor impulses. The brain is thus linked to every part of the body. In addition to the anterior and posterior horns the thoracic part of the spinal cord possesses a third or lateral horn on either side which gives rise to the nerves of the sympathetic or involuntary nervous system. These special nerves are concerned with visceral functions to be described later (see Diagram 4).

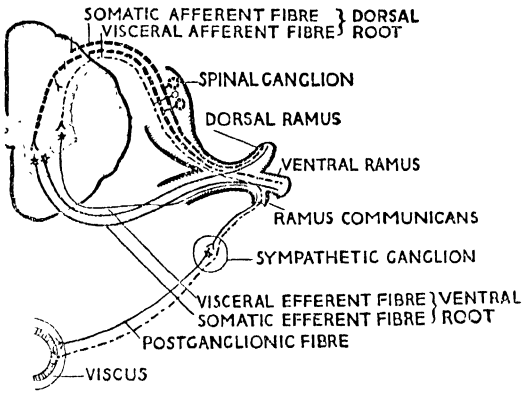

DIAGRAM 4

TO SHOW THE SPINAL CORD, REFLEX ARC, AND ORIGIN OF SYMPATHETIC NERVES

In the cervical and lumbar districts the cord presents enlargements associated with the intricate blendings of the nerves of the arms and legs called the brachial and lumbar plexuses. Finally, the cord provides attachment for thirty-one pairs of peripheral nerves.

The spinal cord constitutes a protected pathway for the transmission of incoming and outgoing impulses. It deals with many routine activities of an automatic and habitual kind thus relieving the brain of much work. It can supply the appropriate answers in the way of movements and secretions to a large number of sensations. Reflex action is seen in its purest and simplest form in the cord. In fact, reflexes form the basis of much of the cord's activities. Such important reflex functions as micturition, defaecation and sexual activity are partially controlled by

centres which are clustered together in the lumbar division of the cord. Injury or disease in this region invariably results in disturbances of the sphincters and of the sexual apparatus.

Reflex action. By definition, reflex action describes the immediate response by movement or other organic activity to a sensation. For example, the accidental touching of a hot object produces an instantaneous movement of withdrawal. A sharp noise causes an immediate turning of the head and eyes in the direction from which the sound proceeded. An acid substance placed in the mouth, or even the sight of an object such as a lemon, causes 'watering of the mouth', i.e. a profuse secretion of saliva. Diagram 5 illustrates the path of the impulses involved in such simple reflex actions. It will be seen that at least two processes are involved.

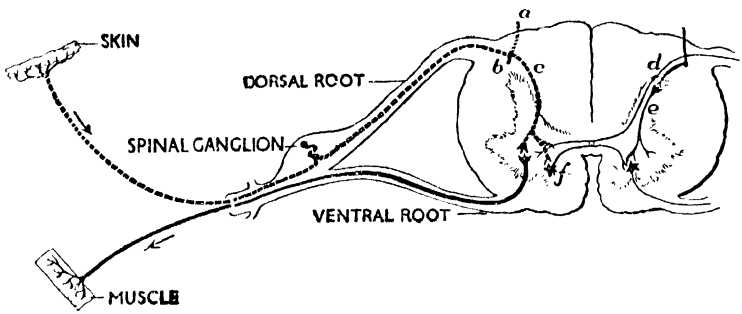

DIAGRAM 5

TO ILLUSTRATE A SIMPLE REFLEX ARC

1. Afferent. A sense organ, e.g. a touch corpuscle, is stimulated. The sensation passes along the sensory nerve (axon) to the cell body, and from the cell body via its dendrites into the spinal cord where the dendrite ends in a junction (synapse) with a motor neuron.

2. Efferent. The motor neuron thus excited, sends an impulse through its axon to a muscle (or gland). The axon terminates in an 'end-plate' embedded in the muscle, and it is instrumental in causing the muscle to contract.

Sensory paths. Many of the incoming nerves which pass in through the posterior roots do not make immediate contact with anterior horn cells but proceed up the cord as the 'white matter' arranged in bundles or tracts. Others relay in the posterior horns. So that for clearness of description, sensory nerves may be described as terminating in three ways:

1. By passing straight to anterior horn cells.
2. By relaying in the posterior horns.
3. By ascending the cord.

The chief sensory tracts are as follows:

1. The tracts of Goll and Burdach which compose the posterior

columns of white substance. These carry sensations from the muscles, joints, sensations of pressure, touch and vibration. The axons are derived from incoming posterior roots which ascend the cord to relay in the nuclei of the medulla (nucleus gracilis and cuneatus). Fibres from these nuclei cross each other and pass up to a sensory nucleus, the thalamus, deeply embedded in the brain. A final relay carries the sensations to the post-central convolution of the brain. Because of the crossing, the left side of the brain receives sensations from the right side of the body and vice versa.

2. Two spinothalamic tracts derived from posterior roots which relay in the posterior horns of grey matter. They convey sensations of touch, pain and temperature. The axons cross each other in the cord almost at once and proceed partly in the lateral and partly in the anterior parts of the cord to the thalamus where they are relayed on to the post-central convolution.

3. Two spinocerebellar tracts (anterior and posterior or dorsal and ventral) which again are formed from a relay which commences in a part of the posterior horn called Clarke's column. Some cross each other, others ascend directly and all reach the cerebellum whose function it is to supervise balancing, posture and smooth working of muscles and joints. The impulses carried come from muscles or tendons.

Motor paths. Motor horn cells in the spinal cord are excited either by impulses arriving direct from the posterior roots or by stimuli arising in the brain which travel from the brain to the cord along special channels. The chief channels or descending tracts are:

1. The pyramidal or corticospinal tract. This is the most important of all and the most recently developed during the course of evolution. It begins in the large pyramidal cells of Betz situated in the motor cortex of the brain on either side. The axons travel down through the brain, cross in the medulla and run down the lateral columns of the cord to end round anterior horn cells.

2. The rubrospinal tract commences in neurons grouped to form the red nuclei placed one on either side of the central canal of the mid-brain. The axons end round anterior horn cells.

3. The vestibulospinal tract arises in the vestibular nucleus in the medulla, descends into the cord and conveys impulses to the anterior horn cells which are necessary for the maintenance of muscle tone.

4. The tectospinal tract is derived from nuclei present in the roof of the mid-brain. Like the vestibulospinal tract it is located in the anterior part of the cord. It is concerned with reflex movements brought about by visual and auditory impulses.

Involuntary functions. The lateral horn, restricted to the thoracic part of the spinal cord, contains cells which give rise to special nerves of supply for the viscera. These nerves are under the direct control of a special area of the brain and function involuntarily. They belong to the

sympathetic or vegetative nervous system and are sufficiently important to warrant detailed and separate description.

PERIPHERAL NERVES

It will be noted that the diagrammatic representation of the reflex arc is over-simplified. Actually, the sensory nerves contain a large number of fibres which are grouped together and contained in a sheath. The cells of origin are collected together in swellings known as the posterior root ganglia. These ganglia are situated on either side of the vertebral column and their axons are called sensory roots. The sensory roots enter the posterior horns of the spinal cord through spaces formed by the laminae of the vertebrae. Each sensory nerve collects sensory impulses from its own area of skin so that leg sensations enter the lumbar part of the cord, body sensations are conveyed to the thoracic cord, and so on.

Similarly, each motor nerve consists of collections of axons derived from motor horn cells and each supplies its own particular set of muscles.

The sensory root joins the motor root for economy in space and the 'mixed' nerve thus formed is distributed to its defined areas. In the thoracic region, each mixed nerve accompanied by an artery and a vein, runs in a groove on the lower part of the rib thus being protected as far as possible from injury.

Because of the development of complicated structures like the limbs special arrangements of nerves exist in the cervical and lumbar areas. In relation to the arm the fifth, sixth, seventh and eighth cervical together with the first thoracic unite in a complex network to form the brachial plexus. In the same way, the lumbar and sacral nerves join to form the lumbar plexus. In this connection it must be noted that as the spinal cord is much shorter than the vertebral column the lumbo-sacral roots must take a more or less vertical course downwards. These roots resemble a horse's tail and receive the collective name, 'cauda equina'.

The peripheral nerves can thus be classified under three headings:

1. Sensory or afferent, conveying to the central nervous system impressions derived from many sources.
2. Motor or efferent, terminating in end-plates in the muscles.
3. Mixed nerves. As already mentioned, mixed nerves are formed by the combining of sensory and motor nerves in the one sheath for economy in space.

Some important nerves. The following peripheral nerves are important enough to warrant special notice:

1. The phrenic nerve arises in the neck and runs down to supply the diaphragm with motor fibres.
2. The musculospiral is a mixed nerve which, arising in the brachial plexus, supplies motor nerves to many arm muscles and certain portions of the skin of the arm. It is liable to become involved in fractures of the middle of the humerus around which it winds.

3. The ulnar nerve comes from the brachial plexus and supplies various forearm muscles including those of the ring and little fingers. It provides a sensory path for the skin of the same area. Behind the internal epicondyle of the humerus it becomes superficial and often receives minor blows.

4. The sciatic nerve comes from the lumbar plexus and pursues a very long course through the sciatic notch into the buttock, down the back of the thigh into the popliteal space supplying the hamstring muscles in its course. Behind the knee it divides, one of its branches curling round the head of the fibula to reach the outer side of the leg and foot.

SENSATION

The sensory system needs some special explanation because the surface of the body is a vast receptive area for many types of stimuli. A variety of end-organs have been elaborated to cope with the multitude of impressions which fall on the organism throughout life, and in particular, waking life. End-organs are very specialized modifications of dendrites.

The Skin. The skin responds to:

1. Pain—by means of free nerve endings profusely distributed in most areas of the body.

2. Touch—by means of 'end-bulbs' which are very numerous in such sensitive districts as the finger-tips, nose and lips.

3. Heat—the exact nature of the 'heat-spot' has not been identified but it is known that certain defined and limited areas can detect warmth above that of the body temperature.

4. Cold—'cold spots' are likewise distributed over the skin surface.

Muscles and tendons. These are supplied with nerve endings called muscle spindles which convey information to the brain as to the amount of muscular contraction. Such knowledge is very necessary for the proper control of movement. A fact of medical importance is that light blows on the tendons of partially stretched muscles produce reflex contractions. For example, a tap on the patellar tendon will cause a sharp extension of the anterior thigh muscles. This reflex is called the knee jerk. There are many such reflex mechanisms in connection with the muscles of the arms, legs and elsewhere, which provide valuable information as to the state of health or otherwise of the nervous system.

The Viscera. Visceral pain does not exist as such. Organs like the stomach and bladder give rise to a sensation of fullness when distended. Irregular contractions of hollow organs produce colicky pain as the result of stretching of their peritoneal coverings. When an internal organ is diseased what is actually experienced is 'referred pain', i.e. the pain is felt in that portion of the skin which is supplied from the same segment of the cord as the unhealthy organ. For example, the tenth spinal segment supplies both the testis and the kidney; consequently kidney disease refers its pain to the testis. Again, gall-bladder pain is felt in the right

shoulder, cardiac pain often extends down the left arm. Further, the stomach and forehead are supplied by the tenth cranial nerve so that a hurried swallowing of ice-cold food often produces a sudden and intense frontal headache. A knowledge of the nature and distribution of referred pain is, therefore, of importance in medical diagnosis.

Peritoneum, pleura, pericardium and skull membranes. These are extremely sensitive and plentifully endowed with nerve endings. They respond with pain to stretching, pulling, tearing and inflammation, the pain being referred to the corresponding skin surface.

The Ear, Eye, Tongue and Nose. Hearing, vision, taste and smell are so highly specialized as to require separate and detailed description. As these functions are associated with the brain they will be dealt with in the section relating to the cranial nerves.

THE BRAIN

The brain is a complex structure composed of extremely specialized nerve cells. Unlike the spinal cord the 'grey matter' (neurons) is external and the 'white matter' (axons) internal. The neurons are supported by non-conducting neuroglial cells and their processes. The whole of the brain is contained in the cranial cavity under the protection of the skull bones and brain membranes (the meninges).

It consists of a large anterior cerebrum or fore-brain and a small posterior cerebellum or hind-brain. Attached to the cerebrum and emerging from its under-surface are the legs or *crura* of the cerebrum. These are chiefly composed of the axons of cerebral cells and make up the front of the mid-brain, the posterior part being made up of four hemispherical masses, the *quadrigeminal bodies*. The crura proceed downwards and enter the *pons Varolii* which is a mass of nerve fibres bridging the two halves of the cerebellum which lies behind and below the cerebrum. The pons gives place to the medulla oblongata, a part of the brain which contains many vital regulating centres. The latter terminates at the foramen magnum to become the spinal cord, which enters the vertebral canal and which continues downwards to its termination.

The interior of the cerebrum is hollow, the cavities or ventricles merging with each other eventually narrowing to become the central canal of the spinal cord.

The cerebrum. On inspection the cerebrum is seen to be patterned by a complicated system of ridges (convolutions) and grooves (sulci) which make it easily distinguishable from the brains of large animals. Viewed from above it is seen to be divided into two exactly similar halves or hemispheres. These are connected together by a thick horizontal band of nerve fibres, the corpus callosum. The space between the two hemispheres is called the superior longitudinal fissure. Of the grooves or sulci the two most important are the fissure of Rolando (central sulcus), which runs upwards and slightly backwards, and the fissure of Sylvius

which, commencing in front, proceeds backwards more or less horizontally, turning upwards slightly at its hinder end. Reference to Diagram 6 will give their positions.

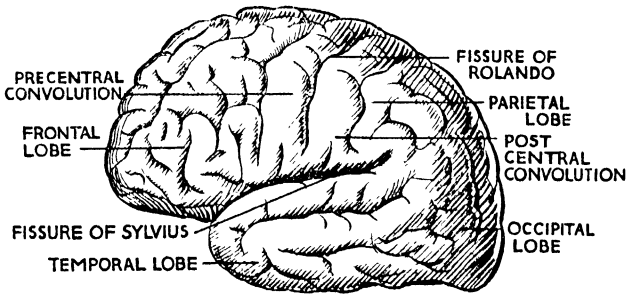

DIAGRAM 6

SIDE VIEW OF BRAIN, CHIEF LOBES AND FISSURES

Thus each hemisphere is roughly divided into subdivisions or lobes each of which takes the name of the overlying skull-bone.

The lobes may be thus described:

1. *In front of the Rolandic fissure.* The frontal lobe, very well marked in man, is the seat of all the intellectual functions such as thought, memory, imagination, foresight and wisdom. All movement, conduct and purposive behaviour originate here.

2. *The pre-central convolution.* Immediately anterior to the fissure of Rolando is the easily recognizable and important pre-central gyrus. It is made up of large pyramidal cells, the cells of Betz, which serve to initiate and control movements of all parts of the body. Within the convolution

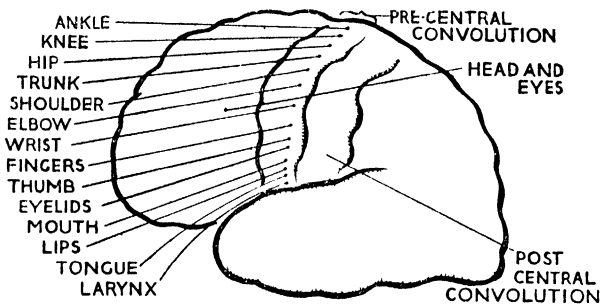

DIAGRAM 7

TO SHOW THE REPRESENTATION OF THE BODY IN THE MOTION CONTEXT

every part of the body is represented so that the toes are controlled from its highest point and the face from its lowest portion. There is also a special centre which ensures that the eyes shall move simultaneously in the same direction. (Diagram 7.)

The axons of the Betz cells extend for both short and long distances throughout the brain and spinal cord. They come together from all parts of the pre-central gyrus to form a fan-shaped structure called the *corona radiata*. The fibres thus come more closely together in part of the brain called the *internal capsule* which lies between two large nuclear masses called the *basal ganglia*. Proceeding downwards the pyramidal tracts pass into, and form part of, the mid-brain, occupying three-fifths of the crura cerebri (cerebral peduncles). During their passage they give off axons to the various nuclei from which the cranial nerves originate. The tracts continue down through the pons and pass into the medulla on the front of which they become visible strands. At the lower border of the medulla the tracts cross each other (decussation of the pyramids), and take up their final positions in the lateral part of the white matter of the cord. A few fibres continue without crossing and take up a situation in the anterior part of the spinal cord. Thus, there are two pyramidal tracts on either side, crossed and direct. In the cord axons leave the main tract at intervals to form synapses with anterior horn cells. (Diagram 8.)

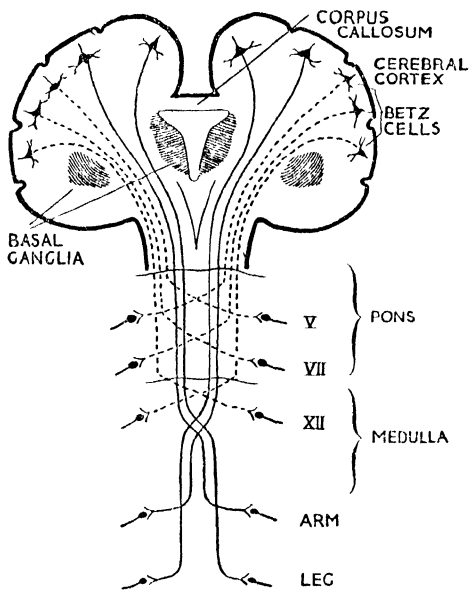

DIAGRAM 8

THE PYRAMIDAL TRACTS

The arrangement described makes the right side of the brain responsible for the left half of the body and vice versa. In right-handed people the left cerebral hemisphere is the dominant one, and also controls speech by way of a special centre situated low down and just in front of the pre-central convolution. Therefore, disease or injury affecting this

district and the adjoining pre-central gyrus causes right-sided partial paralysis and speech defects.

The pyramidal tract is sometimes called the *upper motor neuron* extending as it does from the brain to the anterior horn cells. In contrast, the *lower motor neuron* is represented by the anterior horn cell and its axon of supply to a muscle or organ. The upper motor neuron initiates and controls movement, whereas the lower carries it out. In practice, the desire to move arises in the frontal lobes and is immediately communicated to the pre-central gyrus. The impulse then passes down the appropriate set of pyramidal fibres and, arriving at anterior horn cells, stimulates them to produce impulses which are finally conveyed to the muscles appropriate to the desired movement. All kinds of delicate, intricate and skilled actions can thus be carried out and accurately supervised. When the pyramidal system is damaged this delicate mechanism is severely impaired, and all that remains is a limited capacity to carry out coarse movements at the large joints.

3. *Behind the fissure of Rolando.* Immediately posterior to the Rolandic fissure lies the post-central gyrus in which all parts of the body are represented in a similar manner to the arrangement in the pre-central convolution. The post-central gyrus receives sensation as follows:

(i) Touch, pressure, vibration, muscle and joint sense reach the posterior horns of the spinal cord via the posterior or sensory roots. The next relay carries these impulses in the tracts of Goll and Burdach situated in the posterior white columns of the cord. These tracts relay again in the two nuclei, Gracilis and Cuneatus in the medulla. The fibres arising from these nuclei then cross and pass to the thalamus of the opposite side. Finally, fibres from the thalamus carry the sensations to the post-central gyrus.

(ii) Pain, heat, cold and touch sensations are conveyed from the posterior horns of the spinal cord via the spinothalamic tracts situated in the lateral white columns. The crossings take place almost immediately in the cord and in close proximity to the central canal. The tracts proceed directly to the thalamus, relay therein and then ascend to the post-central convolution.

In this important gyrus all sensations are critically analysed. Surfaces and textures can be appreciated, all shades of touch and pain sensation can be accurately assessed, and every variety of movement can be supervized and controlled.

The parietal lobe of which the post-central gyrus forms the anterior border, lies behind the Rolandic sulcus and between it and the upturned end of the Sylvian fissure. The latter also forms the lower border. Its function is to receive and analyze all incoming sensations other than those of smell, taste, hearing and vision.

4. *Below the fissure of Sylvius* lies the temporal lobe which blends imperceptibly with the rearward part of the brain. Its function is the

reception and interpretation of sounds, i.e. it is composed of a sensory district which receives the sounds and a psychic area which determines what the sounds mean.

On the inner and forward side of the lobe, a special gyrus, the hippocampus, deals similarly with sensations of smell and taste.

5. *The most posterior part of the brain, the occipital lobe,* is equipped with a visuo-sensory and a visuo-psychic area to receive and interpret visual impressions.

In passing from the front of the brain to the rear it becomes evident that there is a gradual transition of function from motor to sensory. Nevertheless, no one part of the brain acts independently of any other. All sections are closely linked up by association cells and their fibres making the whole a comprehensive system of inter-communication. It follows therefore that damage to any one part of the brain must result in serious consequences. For example, injury to the auditory psychic area is followed by word-deafness, i.e. words are heard but not understood. This leads to impairment of all intellectual functions and is obviously a very serious condition as compared with the deafness of ear disease where the brain and therefore the mind remain intact.

THE BASAL GANGLIA

These are collections of nerve cells deeply embedded in the substance of the cerebral hemispheres on either side of the third ventricle of the brain. They belong to the earliest history of man's development.

1. The corpus striatum is a mass of cells, once a primitive motor centre, well developed in the fish and other lowly creatures. In man, it has been superseded by the pyramidal system and now only subserves a secondary function. By way of its connections with the cerebral cortex, red nucleus and thalamus it controls muscular tone. When diseased, muscular rigidity and tremors develop.

2. The thalamus like the corpus striatum is a primitive mass of neurons, but concerned with sensory functions. It receives impulses of pain, heat, cold and touch and in fact acts as a relay station for all sensations including sensations of sound and sight. These impressions are passed on to the post-central gyrus; parietal and occipital lobes. Pain actually becomes conscious in the thalamus but only in a crude sort of way. Thalamic estimations of sensations are very coarse, the finer shades of feeling not being detected. The thalamus can only appreciate pain of a certain intensity, and extremes of temperature.

There are then two sets of higher motor mechanisms and two sets of reception areas:

Motor: (a) the pyramidal system for all skilled movements; (b) the corpus striatum for the control of cruder movements.

Sensory: (a) the post-central gyrus and the posterior part of the cerebrum; (b) the primitive thalamus. (Diagram 9.)

Note. The epithalamus which lies above the thalamus includes a number of structures of which the pineal body is the best known. This is a

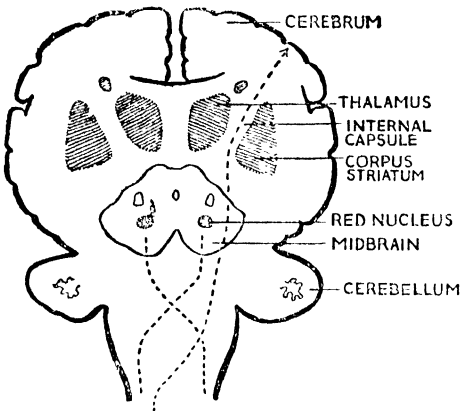

DIAGRAM 9

BASAL GLANGLIA AND RED NUCLEI

small mass which lies in the roof of the third ventricle between the two thalami. It contains no nervous tissue but is related to the endocrine system. Its origin has been traced back to certain types of lizard in which it is a kind of third eye.

The hypothalamic portion of the brain is of importance because of the pituitary gland which emerges from its ventral surface and which is attached to it by a stalk. The pituitary gland rests in the sella turcica of the sphenoid bone in close relationship to the optic chiasma and the cavernous sinus.

The rest of the inter-brain consists of a complex system of nuclei which are concerned with temperature regulation, water, sugar and fat metabolism and possibly with sleep. It has also been suggested that this district also controls the sympathetic system and is therefore concerned with the emotions.

THE MID-BRAIN

The mid-brain may be regarded as the upper and expanded end of the medulla. It is largely made up of the pyramidal tracts which act as a double support to the cerebrum and which are contained in the crura cerebri. It contains the nuclei of origin of several cranial nerves particularly those supplying the muscles of the eyeball.

On either side of the central canal or aqueduct of Sylvius are situated masses of neurons of a pinkish hue, each mass being called the red nucleus. A tract, the rubrospinal tract, arises from each red nucleus, crosses its fellow and runs down the opposite white column of the cord to end round the anterior horn cells. In man the rubrospinal apparatus

is concerned with automatic movements and the maintenance of posture. It is connected with the opposite cerebellar hemisphere and to the corpus striatum of the same side. Hence, by this means, the cerebellum can

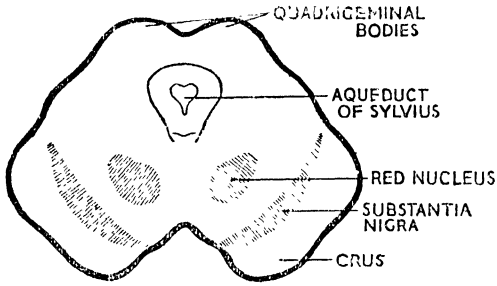

DIAGRAM 10

THE MID-BRAIN

exert influence over the spinal and other reflexes. Behind the peduncles are nuclear bodies, the four corpora quadrigemina or colliculi of which the upper pair are related to eye reflexes and the lower pair to auditory reflex action. They give rise to tracts which terminate round anterior horn cells, so as to link up the eyes and ears with spinal reflexes. (Diag. 10.)

THE CEREBELLUM

The cerebellum is sometimes called the small brain and is situated behind and under the mass of the cerebrum in the posterior fossa of the skull. It is separated from the large brain by a strong membranous fold of dura mater called the tentorium cerebelli. Like the cerebrum it is composed of two hemispheres joined to a central narrow worm-like lobe, the vermis. On section each hemisphere reveals a tree-like striation and a number of nuclei. The connections of the cerebellum are as follows: (Diagram 11).

1. To the red nucleus and thalamus of the opposite side. It thus establishes control over the muscles of the same side.
2. With the pontine nuclei of the opposite side.
3. With the spinal cord by way of the two spinocerebellar tracts which carry incoming fibres from the posterior roots.

The functions of the cerebellum are still obscure but it undoubtedly exercises a profound influence on posture, muscular tone and equilibrium. It has a special relationship with the balancing apparatus of the ear which if disordered produces giddiness, sickness and instability. Disease of one or other cerebellar hemispheres gives rise to weakness (asthenia), loss of muscle tone (atonia), staggering gait (ataxia), loss of measuring capacity of movements (dysmetria), all on the same side of the body. In short then, the small brain is the master organ of equilibrium.

The pons Varolii bridges between the two cerebellar hemispheres. It contains a number of cranial nerve nuclei, which are connected to the cerebellum on the one hand and with anterior horn cells on the other.

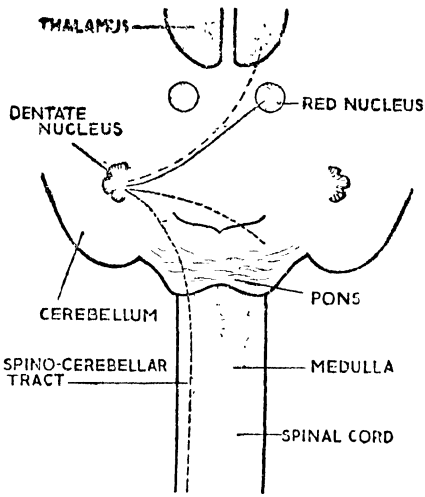

DIAGRAM 11

CONNECTIONS OF CEREBELLUM AND RED NUCLEUS

The medulla oblongata lies between the mid-brain and the spinal cord. It is hollow and its cavity is called the fourth ventricle. From it arise the rest of the cranial nerves. (Diagram 12.)

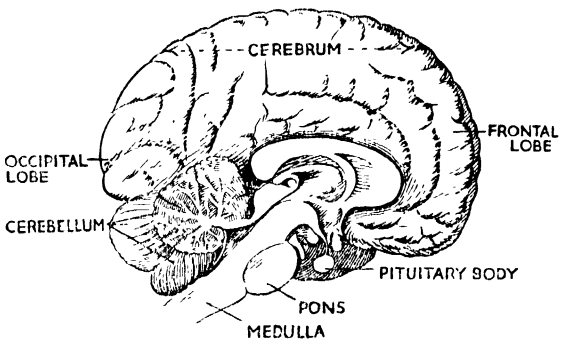

DIAGRAM 12

LONGITUDINAL SECTION OF CEREBRUM AND CEREBELLUM

The medulla contains a number of vital centres. Special nuclei regulate respiration, the strength, rate and force of the heart-beat, and the size of the arterioles and therefore of the blood pressure. In addition centres exist for the production of such reflexes as sneezing, vomiting,

swallowing, sucking and salivation. Injury to the medulla causes instantaneous death because of damage to the vital centres.

The cavities of the brain and spinal cord. The central nervous system is hollow having been originally elaborated from a simple tube of nervous material. Each cerebral hemisphere contains a cavity, the lateral ventricle, which penetrates deeply into the frontal and occipital lobes. The two lateral ventricles join to form the third ventricle situated between the two thalami. Posteriorly, the third ventricle narrows to become the iter or aqueduct of Sylvius which courses through the midbrain to expand behind as the fourth ventricle of the medulla. A further narrowing then takes place as the cavity blends imperceptibly with the central canal of the spinal cord.

The cavities throughout are lined by a special epithelial layer of cells called the ependyma, which, together with the blood vessels form the choroid plexuses and manufacture cerebrospinal fluid.

THE CRANIAL NERVES

The cranial nerves are described separately because of their specialized functions and because they all arise from specific parts of the brain.

It has already been noted that the spinal nerves arise in an orderly sequence from the cervical, dorsal, lumbar and sacral segments and are distributed to the various muscles and other organs of the neck, trunk and limbs. The cranial nerves, except for the fact that they are paired, have however lost the appearance of orderly and segmental origin. There are twelve pairs which may be described as follows:

The olfactory nerve. Sensations of smell are detected by nerve filaments situated in the upper part of the nasal mucosa. The filaments pass through the cribriform plate of the ethmoid bone to the olfactory bulb which lies more or less under the tip of the frontal lobe of the brain. From the bulb the olfactory tract passes back to the hippocampus where smells are analysed. The olfactory sense is easily fatigued, a fact which explains the ability of human beings to herd together and live on occasions in vitiated atmospheres without discomfort.

The optic nerve arises as the grouped axons of special cells, situated in the retina at the back of the eye. It conveys photographic impressions received via the lens and retina and passes through the sphenoidal fissure into the cranial cavity beneath the frontal lobes. The optic nerves meet in the region of the sella turcica in a junction, the optic chiasma. The inner halves of each nerve cross, and behind the chiasma, the optic tracts now contain axons from both eyes. They continue backwards and relay in the posterior part of each thalamus and upper quadrigeminal body. The last relay sweeps round the lateral ventricles to end in the occipital lobes. The optic chiasma may sometimes be pressed upon by tumours growing in the neighbouring pituitary body causing varying

degrees of blindness together with symptoms of increased intracranial pressure.

STRUCTURE OF THE EYE

The eye is a globular organ covered in front by a delicate membrane, the conjunctiva, which also lines the inner surface of the eyelids. The coats of the eyeball consist of:

An outermost tough membrane, the sclerotic, which becomes transparent in front and is then called the cornea.

A middle layer, the choroid which, anteriorly, gives place to the ciliary muscle and iris. The ciliary body provides attachment for a capsule containing the lens. The iris is pigmented and its colour varies from person to person. Being muscular it can contract or expand according to the amount of light falling on its central aperture, the pupil.

An innermost layer, the retina, is a sensitive membrane composed of special cells called rods and cones. The rods are employed in night vision whilst the cones are adapted for keen central vision. The axons of all these cells are gathered at the posterior part of the eye in the 'blind spot' to form the visual path which has already been traced back to the occipital lobes of the brain.

Thus, the lens capsule divides the interior of the eye into two parts, a small anterior division containing a watery fluid, the aqueous humour, and a large posterior compartment filled with a gelatinous, viscid substance, the vitreous (glass-like) humour. (Diagram 13.)

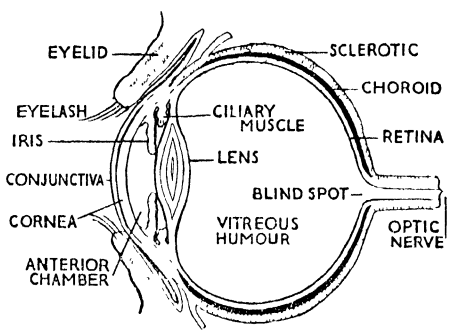

DIAGRAM 13

THE EYE

As far as the physics of the eye is concerned, the principle is that of the camera. Instead of the 'stop', the iris is capable of dilating to receive more light or contracting to diminish glare. Focusing or accommodation is carried out by contraction or relaxation of the ciliary muscle which, by tightening or loosening the lens capsule, causes the lens to become flatter for distant vision, or more convex for near vision as required. Light thus falls on the retina producing an inverted retinal image

of the same nature as that which results from exposure of a film or plate. The picture is carried back to occipital lobes of the brain and therein analyzed. For near vision, not only does the lens expand but the eyes are made to converge upon the object viewed by means of the internal rectus muscles of each eyeball acting together.

The fronts of the eyes are kept clean and moist by means of tears which are secreted by the lachrymal glands situated in the upper and outer parts of each orbit. Excess of tears is carried away by the lachrymal ducts in the inner and lower part of each orbit which drain into the nasal cavities. Eyelashes and rapid flickering movements of the eyelids give some protection from foreign bodies.

The third (oculomotor), fourth (trochlear) and sixth (abducent) cranial nerves arise from nuclei in the mid-brain and innervate the muscles which move the eyeball.

The fifth cranial nerve (trigeminal) is a mixed nerve and arises by three roots from the medulla. It provides sensation for the face, tongue, jaws and teeth, and also motor nerves for all the muscles of mastication. This nerve is of special interest because of the ganglion situated on its sensory root, the Gasserian ganglion. It is liable to a very painful and distressing inflammation.

The facial nerve originates in the medulla and emerging from the stylomastoid foramen, pierces the parotid gland to fan out on the face and supply all the muscles of facial expression. It also carries sensations derived from special taste buds in the anterior two-thirds of the tongue which eventually reach the hippocampus by a complicated route. The seventh nerve is liable to injury during mastoid operations, and during confinements necessitating a difficult forceps delivery.

The eighth or auditory nerve consists of two distinct parts. One is derived from the actual organ of hearing, the cochlea, and the other from the balancing or vestibular apparatus of the ear. The first section enters the skull through the internal auditory meatus to end in the temporal lobe. The second part is directed to the cerebellum to which it gives information as to the position of the head and body in space.

THE STRUCTURE OF THE EAR

The ear is a compact organ embedded deeply in the temporal bone. Its function is of two kinds, one to transmit auditory impulses, and the other to convey to the brain detailed information as to the position of the body in space. The external ear shows a sound collector or pinna. It leads to a passage, the external auditory meatus, closed at its inner end by the tympanic membrane or eardrum. This passage is kept lubricated and moist by a waxy secretion. Beyond the eardrum lies the cavity of the middle ear which is separated from the inner ear by yet another membrane. The two membranes are connected by a chain of bones called ossicles. Within the inner ear are arranged the cochlea which is the actual

hearing apparatus, and three fluid-containing semi-circular canals which are so disposed as to respond to movements of the head according to the direction taken. Below the canals lies the labyrinth which contains other types of balancing organs. Finally, to maintain an equality of atmospheric pressure on either side of the tympanic membrane, a passage, the Eustachian or pharyngotympanic tube, runs from the middle ear to the post-nasal space. This arrangement prevents bursting of the eardrum under the influence of sudden changes of atmospheric pressure such as would be met with in descending rapidly from heights.

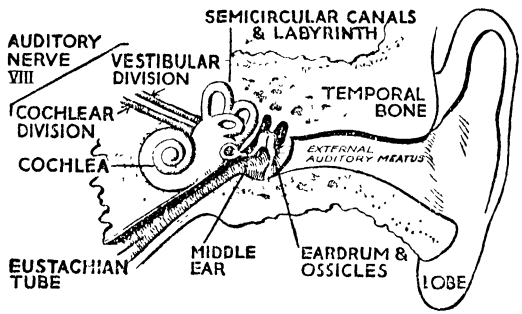

DIAGRAM 14

THE EAR

Sounds are collected by the pinna, and passed on to the eardrum which then vibrates and sets the ossicles in motion. This motion is communicated to the inner membrane which disturbs the fluid in the cochlea and labyrinth. Thus, the nerve filaments in the cochlea are stimulated, the impulses passing along the auditory division of the eighth nerve finally to reach the lower colliculi and the temporal lobe of the brain. The lower colliculi are in this respect concerned with reflex movements of the body in response to sounds. (Diagram 14.)

The vestibular division passes in to end eventually in the cerebellum.

The ninth or glossopharyngeal nerve is made up of nerve endings from taste-buds of the posterior third of the tongue and from the pharynx. It also carries motor nerves to the laryngeal and pharyngeal muscles. It terminates in a medullary nucleus, a further relay carrying the sensations to the brain. The tastes are classified as sweet, salt, sour and bitter.

The tenth or vagus nerve has a very extensive distribution. Apart from minor sensory functions in respect of the skin of the ear and back of the scalp, it supplies motor nerves to the pharynx, larynx, oesophagus, stomach and intestines as far as the ileocaecal valve. It also supplies nerves to the lungs and bronchi causing contraction or spasm of the bronchial musculature. This latter effect is important in the causation of asthma. The vagus also supplies the heart muscle and causes slowing of

the heart with consequent fall of blood pressure. In point of fact the vagus is a very important nerve and will be discussed at greater length during a consideration of the vegetative nervous system.

The eleventh or accessory nerve is purely motor and supplies the sternomastoid and trapezius muscles.

The twelfth or hypoglossal nerve is again purely motor to the tongue muscles.

The seventh, eighth, ninth, tenth, eleventh and twelfth cranial nerves all arise from medullary nuclei. Note that all these nuclei receive communications from the pyramidal tract on its way down from the cerebral cortex.

THE VEGETATIVE NERVOUS SYSTEM

Many of the bodily functions are quite beyond voluntary control. For example, the introduction of acid into the mouth evokes an immediate secretion of saliva. Flashing a light into the eye causes an instantaneous contraction of the pupil. These are examples of involuntary reflex activity. The heart-beat, alterations in blood pressure, digestion and bowel movements proceed unaltered by conscious effort.

Such alimentary and glandular functions are controlled by the vegetative or autonomic nervous system. Its functions can only be disturbed by disease, emotion or certain drugs. Briefly, it consists of two separate sets of nervous mechanisms with approximately equal and opposite functions. These are known as the sympathetic and parasympathetic systems. Together they are widely distributed over the body, especially in the head, neck, thorax and abdomen. Through these systems the viscera, heart, blood vessels, glands and smooth muscle elsewhere, receive their nerve supply. There is a close relationship between the vegetative and cerebrospinal nervous systems.

The sympathetic system. The cells of origin lie in the lateral horns of the thoracic and upper lumbar portions of the spinal cord. They supply slender nerves called white rami communicantes to the sympathetic tracts which are two nerve strands extending vertically through the neck, thorax and abdomen, one on either side of the cerebral column. Each strand is composed of a chain of sympathetic ganglia which receive white rami from every spinal segment. The white rami relay in the ganglia whose nerve cells give off grey rami communicantes which either proceed to involuntary muscles and glands or link up with each other to form plexuses. The latter are associated with the larger arteries and from them all the viscera receive their nerve supply.

Afferent or sensory visceral nerves travel to the spinal cord via the peripheral spinal nerves. The sensations conveyed are vague. Touch, pain and warmth are not felt.

The grey rami communicantes are unmyelinated and are distributed to the smooth muscle of the arterioles, the eye, to the viscera, glands, heart muscle and hair follicles. (Diagram 15).

Distribution. *Cervical.* The cervical sympathetic ganglia supply nerve some of which reach the cranium and face by coursing upwards aroun the internal carotid artery. Others run down to the cardiac plexus.

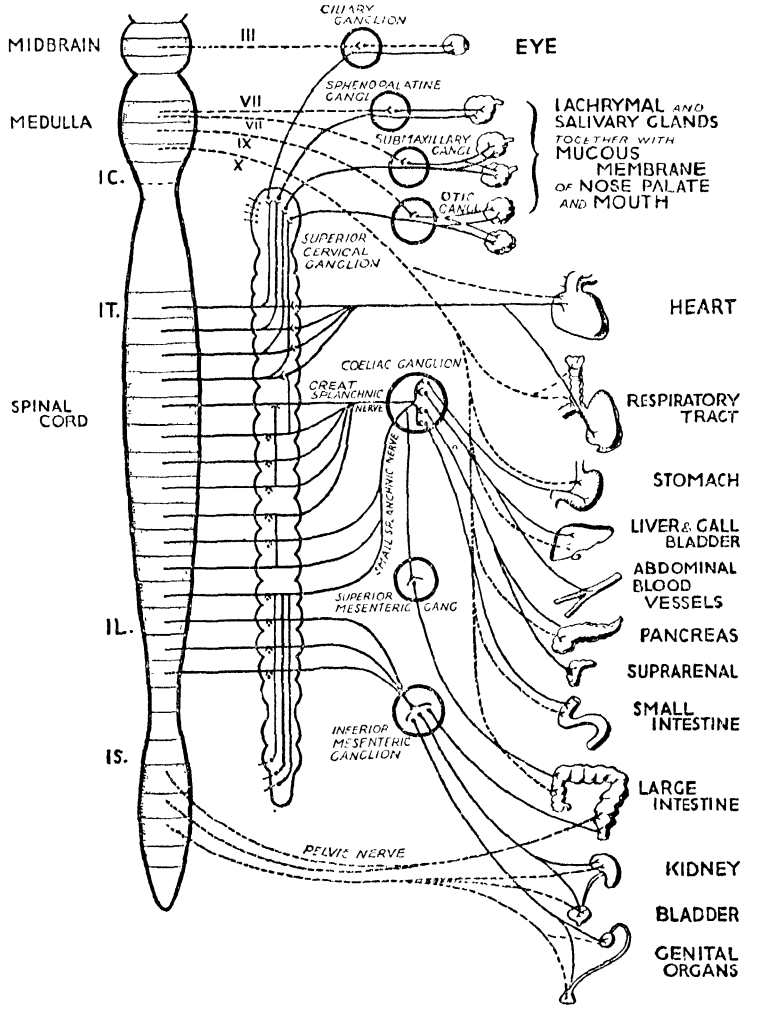

DIAGRAM 15

THE VEGETATIVE NERVOUS SYSTEM

Amongst other functions they supply:

a. fibres which dilate the pupils;

b. nerves to the salivary glands which increase secretion.

Thoracolumbar. a. Through thoracic ganglia and the cardiac plexus the sympathetic causes:

1. Increase in rate and force of the heart-beat.
2. Rise of blood-pressure by contraction of the arterioles.
3. Increase in respiration rate.
4. Inhibition of unstriped muscle of the bronchi. Thus, stimulation of the sympathetic directly or by means of adrenaline injections brings about relief in asthma.

b. Through the coeliac (solar) plexus, the abdominal viscera and the gastro-intestinal tract are supplied with nerves which when stimulated cause digestion and intestinal movements to cease. At the same time the sphincters are contracted, the liver is stimulated to break down the stored glycogen into glucose, whilst the suprarenals are provoked to increase the quantity of adrenaline in the blood stream.

c. The hypogastric plexus innervates the lowest portions of the intestine, the rectum and the pelvic organs, including the bladder and the genital organs. With regard to the bladder, sympathetic function causes contraction of the external sphincter with consequent retention of urine.

In general, sympathetic stimulation prepares the organism for fight or flight. The effects described belong to an emergency mechanism which prepares for strenuous action whether it be for rapid retreat from danger or for vigorous combat. This system comes into operation under the influence of strong emotions such as fear or anger. In certain neurotic disorders sustained fear keeps the sympathetic in a constant state of stimulation, hence the symptoms complained of such as indigestion, palpitation and constipation. At times paradoxical effects occur, i.e. inhibition of the bladder and intestine with closure of the sphincters, diarrhoea and frequency of micturition.

The parasympathetic system. The functions of the parasympathetic are directly antagonistic to those of the sympathetic. Its nerve fibres are derived from the third, seventh, ninth, tenth and eleventh cranial nerves and from the second, third and fourth sacral nerves.

Cranial stream. 1. The third nerve contracts the pupil and carries out the function of accommodation of the eyes.

2. The seventh nerve carries fibres which stimulate the salivary glands to secrete. It also acts as a pathway for the passage of a special nerve which carries sensations of taste from the taste-buds in the anterior two-thirds of the tongue.

3. The ninth nerve carries taste fibres coming from the posterior third of the tongue. Other fibres stimulate the parotid glands.

4. The vagus, although a cranial nerve, has a very extensive distribution. It supplies the involuntary muscle of the heart, respiratory passages, oesophagus, stomach, small intestines, pancreas, liver and other glands. Amongst other effects it causes the following results when stimulated:

Slowing of the heart-rate.

Lowering of the blood pressure by dilating the arterioles.

Stimulation of gastric and intestinal secretion, digestion and peristaltic movements as far down as the ileo-caecal junction.

Contraction of the bronchial unstriped muscle and, in extreme cases, producing asthma.

Sacral outflow. The sacral parasympathetic through the pelvic nerve stimulates the bladder muscle and inhibits the sphincter during the act of micturition. The nervi erigentes stimulate the genital organs preparatory to sexual intercourse.

Thus, the parasympathetic differs from the sympathetic in several respects. Its nerves arise from a very limited area, namely from the brain and from the sacral cord; the nerves instead of relaying in a chain of ganglia, continue as white rami relaying only in the actual organ which they innervate. Normally, there is always a delicate balance maintained between the opposing forces represented by the sympathetic and parasympathetic. This state of equilibrium can only be disturbed by disease or strong emotions.

The action of drugs on the vegetative nervous system.

a. On the sympathetic: Drugs such as adrenaline, ephedrine, cocaine and caffeine are stimulatory. In particular, ephedrine and adrenaline are used to raise blood pressure, relieve asthma, hay-fever, urticaria and other allergic conditions characterized by spasm of involuntary muscle or engorgement of mucous membranes.

On the other hand, ergotoxine and nicotine first depress and then paralyze the nerve endings of the sympathetic.

b. On the parasympathetic: Pilocarpine, choline and eserine stimulate the parasympathetic causing sweating, contraction of the pupils and increased intestinal peristalsis. Atropine and hyoscine paralyze the nerve endings. This effect is made use of in asthma which may be relieved by atropine given by injection, by the mouth or by inhalation in the form of asthma cigarettes. It will be noted that in this instance atropine and adrenaline produce similar results, for paralysis of the parasympathetic is equivalent to stimulation of the sympathetic.

BLOOD SUPPLY OF THE BRAIN

The brain derives its blood supply from the internal carotid and vertebral arteries. (Diagram 16.)

The vertebral arteries enter the skull through the foramen magnum. At the lower border of the pons they join to form the basilar artery which runs forward and then divides into the two posterior cerebral vessels.

The internal carotids pass into the cranial cavity through two foramina in the base of the skull. Each artery runs forward in the walls of a venous sinus and then divides into its terminal branches, the anterior and middle cerebral arteries. The anterior cerebrals are joined to each other by a short anterior communicating artery. An additional branch, the posterior communicating, springs from the internal carotid and passes backwards to join the posterior cerebral artery.

Thus, an anastomosis is formed at the base of the brain which is roughly circular and which is called the circle of Willis. It surrounds the stalk of the pituitary body and the optic chiasma. From this circle,

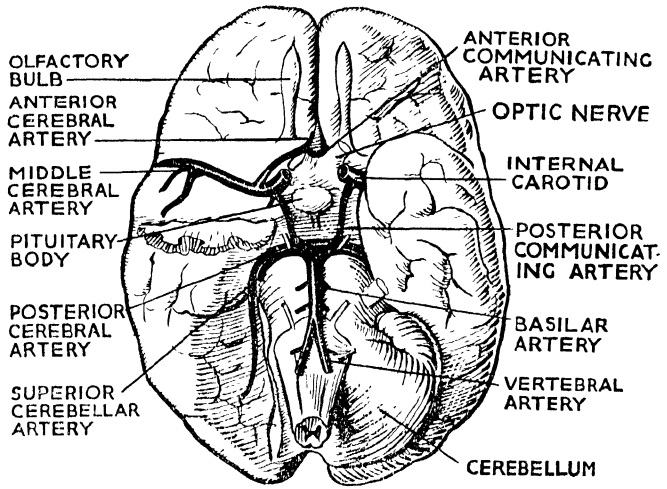

DIAGRAM 16

THE CEREBRAL ARTERIES AND CIRCLE OF WILLIS

vessels proceed to all parts of the brain including the choroid plexuses which manufacture cerebrospinal fluid. The cortical branches, i.e. those on the surface of the brain, anastomoze with each other to some extent, but the central vessels, i.e. those which penetrate deeply into the brain, are end arteries. Blocking of these deep vessels always leads to serious degeneration of the parts of the brain which they feed because of this absence of alternative routes of blood supply. Furthermore, because of this anatomical peculiarity the scope of drugs given by intravenous injection is very limited.

The artery which serves the internal capsule with its closely packed pyramidal fibres, is of special importance. Should this vessel be affected by clotting or embolism, widespread paralysis of the opposite side of the body may result.

Venous return. In the case of the brain venous return takes place through large sinuses constructed in folds of dura mater. They all eventually drain into the internal jugular veins. The most important sinuses are:

The superior longitudinal which runs from before backward throughout the length of the superior longitudinal fissure.

The lateral sinuses running through the mastoid bones. They are of surgical importance because of their liability to thrombosis during the course of spreading infection of the middle ear, or to injury during the operation of mastoidectomy.

The cavernous sinuses in the region of the sella turcica which carry in their walls the internal carotid artery and important nerves to the eyes and surrounding districts.

The spinal cord. The spinal cord is fed by arterial branches derived from the intercostal arteries and from the anterior and posterior spinal arteries which run the length of the cord.

The venous return takes place through a complex network of veins which closely surround the cord.

MECHANISM OF REFLEX ACTION

It is now possible to sum up the mechanism of reflex action which is worth repeating because of its importance.

To arouse reflexes the following anatomical equipment is required:

1. The appropriate stimulus to the particular sense organ. The impulse travels from the sense organ along a sensory or afferent nerve, through its cell body usually situated in a posterior root ganglia, to the central nervous system, i.e. spinal cord or brain. There the impulse relays in the posterior horn or its equivalent.

2. A connector neuron transmits the impulse from the posterior horn to the next junction or synapse, an anterior horn cell.

3. The anterior horn cell then passes an impulse through its axon in a motor or efferent nerve to the effector organ be it viscus, muscle or gland.

Behaviour therefore has its physical basis in a complicated system of reflexes which are all directly or indirectly controlled by the brain.

Some important reflexes

1. The pupil.

A beam of light thrown into the eye causes the pupil to contract in order to diminish glare and to lessen the amount of light falling on the retina.

Convergence of the eyes for near vision causes contraction of the pupil.

2. The arm.

The biceps jerk is obtained by striking the biceps tendon in front of the elbow with the arm partially extended. The reflex obtained is one of flexion of the forearm.

The triceps muscle extends the arm when its tendon is tapped behind the elbow.

3. The supinator longus tendon is tapped on the radial side of the wrist to produce extension of the wrist.

4. The abdomen.

Stroking the skin of the abdomen causes contraction of the abdominal muscles. The test is usually carried out in each of the four quadrants and contraction is evidenced by movement of the umbilicus in the direction of the muscle pull.

5. The leg.

The knee jerk is obtained by striking the patellar tendon to produce extension of the leg.

A blow on the tendo achilles causes plantar flexion of the foot, i.e. the ankle jerk.

The plantar response. Normally, stroking the outer edge of the sole of the foot causes the great toe to turn downwards. The rest of the toes tend to curl inwards towards the sole. This response is known as the flexor plantar reflex.

Some commoner reflex abnormalities. In many nervous disorders the reflex responses alter in certain ways which can be detected and which are of great value in establishing the correct diagnosis.

Pyramidal disease. The pyramidal tract may be affected in any part of its course. A lesion of the precentral gyrus if small, may not cause very extensive paralysis. Below the cortex, the axons of the Betz cells are closely packed so that even a small injury, haemorrhage or other disease process may cause a widespread and extensive paralysis of the opposite side of the body. Further down, the tract may be damaged in the mid-brain, pons, medulla or cord. Thus, in the cortex paresis of a single limb or a group of muscles may occur. In the internal capsule the paresis is extensive and other tracts may be caught up in the damage to give rise to loss of feeling as well as paresis. In the mid-brain paralysis and anaesthesia may also be associated with paralysis of eye muscles because of the presence there of the third, fourth and sixth cranial nerve nuclei. In the pons and medulla other cranial nerves may be involved in addition to the pyramidal tracts whereas in the cord the cranial nerves and arms may escape. If the lesion is in the cervical cord an arm may become involved.

The signs of pyramidal tract disturbance are those of loss of control of the lower reflex apparatus (lower motor neuron), so that complete paralysis never occurs. Coarse movements remain possible so that paresis (partial paralysis) is the correct description. All tendon reflexes on the opposite side of the body are grossly exaggerated whilst all skin reflexes on that side are lost. Therefore the arm jerks are increased, the abdominal reflexes lost, the knee and ankle jerks are exaggerated and the plantar response becomes extensor (Babinski's sign). This sign is evoked by stroking the sole of the foot. The great toe turns up and the other toes fan out in a slow and deliberate way. Clonus denotes rapid alternate contraction and relaxation. At the knee it is produced by pushing the patella down firmly. The pull on the extensors of the thigh causes a rapid vertical oscillation of the patella. Similarly, pressing the foot up sharply will cause it to move up and down quickly. Clonus continues as long as the pressure is maintained.

Cerebellar disease. Affections of the cerebellum or any of its connections causes lack of proper control and co-ordination of reflexes. It becomes impossible to measure distances accurately as for example in

reaching for an object. Instead of brisk accurate movements the reflexes when elicited resemble the movements of a clock pendulum.

Absent reflexes. Tendon jerks disappear when the lower motor neuron is diseased. Reference to the diagram of the reflex arc makes it clear that the reflexes may be abolished in two distinct sets of circumstances:

Any disease of the posterior root, as for example in syphilitic disease of the nervous system, will interrupt the reflex circuit. The disease generally affects the lumbar district so that the knee and ankle jerks cannot be obtained.

Disease of the anterior horn cells as in infantile paralysis, or inflammation of the motor nerves as in neuritis or polyneuritis, will disturb the reflex arc on the motor side, thus causing the tendon reflexes to disappear.

The pupil reflex. The commonest cause of disturbance of the pupillary light reflex is cerebrospinal syphilis. The pupil no longer contracts when exposed to bright light but the contraction on convergence of the eyes (accommodation) remains intact.

Functional nervous disorder (neurosis). The reflexes may be exaggerated in states of emotional excitement where there is much and prolonged nervous tension. There are, however, no other abnormalities so that when the excitement subsides the tendon jerks likewise diminish.

NEUROLOGICAL LEVELS

It can now be seen that the chief difference between man and the lower animals is the vast growth of the cerebrum during the course of evolution. It is with the aid of the fore-brain that every variety of human activity is carried out. Upon its well-being depend the three great attributes of conduct, namely accurate thinking, feeling and action.

At the cerebral level then, the highest types of behaviour are devised, set into motion and controlled. Wisdom, virtue, foresight, memory, ideation, acquisition of knowledge, interpretation of experience—these are only a few of the functions belonging therein. On the motor side, the cerebrum controls all muscular action from the coarsest movements to the most delicate manipulations. This control is exercised by the precentral convolution with its large Betz cells, the long axons of which sweep down through the brain and spinal cord giving off branches to all the cranial nerve nuclei and anterior horn cells.

Speech is a special function governed by a centre in the lower part of the pre-rolandic area and the posterior end of the lowermost frontal convolution. This centre is present on the left side of the brain in right-handed people and vice versa.

On the sensory side, the post-central gyrus receives all sensations via the thalamus from the spinal sensory tracts such as the spinothalamic and the tracts of Goll and Burdach. By this means it is possible to appreciate textures, surfaces and light touch, to detect varying degrees of pain

and temperature, to separate pin-points, and in fact all that is implied in the terms 'tactile discrimination' and 'stereognosis'. In addition, large cerebral areas linked together by association cells and fibres receive, identify and interpret sensations of smell, taste, hearing and sight.

These large newer motor and sensory areas have come, in time, to dominate and largely replace the primitive centres represented by the corpus striatum and thalamus. The corpus striatum is now chiefly concerned with the supervision of associated movements such as swinging the arms when walking. The thalamus can detect crude sensations but passes them all to the post-central gyrus for accurate analysis.

The cerebellum receives information from the spinocerebellar tracts, and because of its connections with the rubrospinal tract, it can exercise control over posture, balance and muscle tone.

The mid-brain level serves to associate sights and sounds with body movements. It contains nuclei and nerve origins for eye muscles and eye reflexes. Through the agency of its red nucleus and rubrospinal tract it links the cerebellum with the spinal cord and reinforces the control over muscle tone and associated movements.

The pons contains a number of nuclei of origin of important cranial nerves and it also unites one cerebellar hemisphere with the other.

At the medullary level many vital functions are centred. These include respiration, digestion, coughing, vomiting and blood pressure control. The remainder of the cranial nerves arise from this region.

Finally, the spinal cord acts as a centre for simpler reflex actions and automatic movements. It is also a large conducting path for the transmission of impulses to and from the brain.

CONDITIONED REFLEXES

Pavlov, a Russian scientist, drew attention to what he called conditioned reflexes on the basis of the following experiment. Food was presented to a dog and a bell rung at the same time. The food naturally aroused the secretion of saliva reflexly. The process was repeated on many occasions until at length the bell alone caused salivation to occur. By the end of the experiment the bell sound had become firmly associated with the presentation of food. This principle is capable of general application. It is probable that the more intelligent the animal the easier it is to set up conditioned reflexes or responses. An infant presented with a toy and frightened at the same time may forever be afraid of that particular toy or in fact of any toy resembling it. A child having nearly drowned will entertain fears of water for many years if not for a lifetime. It is common to find too that certain older children having accomplished a 'belly-flop' during a first attempt to dive will avoid diving afterwards. Similarly, a motorist having experienced a crash or two may come to fear traffic, traffic noises, or being driven by someone else.

Conditioned responses may thus be the basis of habit formation both

in animals and in man. It is quite possible that childish experiences of a terrifying kind may manifest themselves in later years as neurotic symptoms and therefore this subject will be referred to again in the psychiatric section. It may be that many forms of timidity and neurotic fear are based on the possibility that they are 'conditioned' morbid responses to any form of threat to the security.

Behaviour Therapy

The principle underlying conditioned reflexes has been employed in recent times in the treatment of severe neuroses mainly of the anxiety type wherein phobic trends are prominent and disabling. Amongst the fears encountered are those of open spaces, closed spaces, of travelling in lifts, tube trains, buses and other vehicles. Indeed, occasionally apprehensiveness is so severe as to prevent the sufferer from leaving the felt security of his or her own home to carry out such comparatively simple tasks as shopping or visiting a friend or relative.

It is claimed that orthodox psychotherapeutic methods, in particular, psychoanalysis, with or without the aid of sedative or tranquillizing drugs, have failed in the large majority of such patients. Manifestly, a more vigorous approach is required. The chief exponents of behaviour therapy in this new form of treatment are Professors Wolpe and Eysenck and their followers. They maintain that the principle of conditioned reflexes or responses, hitherto a physiological curiosity, can be applied practically to retrain patients to face and finally come to disregard the circumstances arousing phobic anxiety. To this end, patients are exposed on a gradually increasing time basis to fear-arousing conditions until they can encounter and at length overcome their apprehensions.

The same principle underlies 'aversion therapy' in the treatment of alcoholism, and sexual perversion such as transvestism and fetishism. An emetic is given at the same time that the object, usually an article of female underclothing, is exposed to the patient. This procedure is repeated as often as is necessary, having due regard to the physical state of the patient, until he comes to feel revulsion, disgust and nausea at the sight of the object.

Good results are claimed for behaviour and aversion therapy involving, as they do at times, what is called reciprocal inhibition. At any rate, this treatment promises the possibilities of improvement in hitherto intractable phobic anxiety states.

CHAPTER II

DISEASES OF THE NERVOUS SYSTEM

Neurological disorders may be classified under the following headings:

1. Traumatic—resulting from injury.
2. Inflammatory—due to infection.
3. Neoplastic—due to new growths both innocent and malignant.
4. Hereditary and degenerative.
5. Vascular.

1. TRAUMATIC

A. HEAD INJURY

a. Concussion may occur after a blow on the head of varying severity. A slight injury may be followed by a dazed condition during which the patient acts automatically subsequently remembering nothing of these events. A more severe blow may cause unconsciousness varying from a few seconds to several hours or even more. The memory loss may not only involve the whole episode (anterograde amnesia), but may also extend back to incidents which occurred before the injury (retrograde amnesia). After recovery of consciousness, restlessness, irritability and headache are almost invariable symptoms.

Occasionally, a trivial head injury will provoke a neurosis in certain individuals of neurotic make-up particularly if compensation is involved.

Treatment of simple concussion consists of rest in bed in a darkened room for at least a week. Mild sedatives such as aspirin may bring about complete recovery in most cases. Cold compresses to the head and occasional saline purges are also of value.

b. Cerebral contusion or actual bruising of the brain is a very serious condition which, although rarely, may prove fatal. Unconsciousness is prolonged and at its termination the patient remains drowsy, confused and delirious for long periods. Irritability, resentment of attention and headache are well marked giving place at times to noisy excitement and violence. Because of the exudation of blood other signs of cerebral damage may be observed. For instance, should the pyramidal system be injured, hemiplegia results. At the base of the brain, the cranial nerves are likely to become involved so that squints, facial and other paralyses sometimes occur. Convulsive seizures occasionally complicate the picture. If generalized they indicate increased pressure within the skull; or if localized they denote injury to the pyramidal cortex.

Recovery and convalescence are prolonged whilst both anterograde

and retrograde amnesia are quite common. Subsequently, a post-concussional state may develop having as its chief symptoms headache, giddiness and impairment of memory and concentration. Testing by special methods may reveal a general lowering of mental efficiency.

c. Cerebral compression occurs when the injury causes haemorrhage to occur in the spaces surrounding the brain internal or external to the dura mater (subdural or extradural haemorrhage). These conditions may be brought about by tearing of the meninges or fracture of the skull. With regard to fractured skull, breaks in the vault are less serious than those of the base, and both types are more of medico-legal than of clinical importance. Haemorrhage outside the dura is more often than not caused by tearing of the middle meningeal artery, giving rise to an easily recognized set of symptoms. There is a history of a blow on the head with loss of consciousness. Recovery is followed by a further lapse into unconsciousness which may proceed to coma and death. The pupil on the injured side becomes dilated whilst there is progressive weakness of the opposite side of the body.

Where the skull has been fractured unconsciousness is profound, respirations at first are slow and deep but later become rapid. The pulse is slow, full and bounding. Fracture of the base may cause bleeding from the ears, nose and mouth, and may result in oozing of cerebrospinal fluid from the ears, and from the skull down the nasal passages. Owing to the proximity of the cranial nerves to the site of fracture they may be torn with resulting cranial nerve palsies. Inflammation of the meninges may occur as a fatal complication.

Whatever the cause of the intracranial bleeding the pressure inside the skull rises and the patient passes into coma. Later, the coma may pass off for a while. A so-called 'lucid' interval follows which is again succeeded by deepening coma. This is of grave significance. Focal convulsions may occur indicating irritation of the motor cortex. Paralysis of the side of the body opposite to the injury is nearly always present. During the later stages of compression the respiration rate takes on a Cheyne-Stokes character whilst the pulse becomes rapid, weak and thready. Cerebrospinal fluid withdrawn carefully and in small quantity after the initial shock has passed off will be found to contain blood. An X-ray of the skull may reveal a fracture.

Treatment of severe head injuries. Absolute rest in bed should be enforced for a minimum of three weeks. Treatment commences locally if the scalp has been lacerated and the treatment of shock takes precedence over every other immediate measure and follows the usual lines. Cardiac and respiratory stimulants may be required. Caffeine, adrenaline and lobeline are those customarily employed. Sedatives may be required in the early stages to control restlessness and noisy confusion. Sedative drugs such as paraldehyde (℥ i–ii) are of value. Medinal, luminal or sodium amytal may be used. Morphine must not be given during the shock period because of its depressant effect upon the respiratory centre

but may be employed afterwards with benefit. Blood or cerebrospinal fluid should be gently removed with swabs of sterile gauze. Particular attention should be paid to the hygiene of the mouth. It is best to empty the bowels by means of simple enemata. The bladder may require catheterization. As regards feeding, small quantities of liquid nourishment should be given frequently. Rectal administration of 8 oz. of 25 per cent Epsom salt solution helps considerably to reduce intracranial tension. Glucose given intravenously in quantities of 100 c.c. of a 50 per cent solution at the rate of 3 c.c. per minute is also of value.

Limbs must be examined for signs of paralysis. If convulsions occur they should be recorded under the following headings:

1. In which part of the body they began.
2. Which parts of the body were involved.
3. Direction of spread of the fit.
4. The time taken by the whole episode.
5. After effects if any.

Following the appearance of convulsions nurses should thereafter have at hand a rubber-covered metal spatula for insertion between the teeth the moment it becomes evident that another fit is about to occur. This measure prevents the tongue from being bitten.

If surgical interference becomes necessary it will not be considered until the phase of shock has vanished. Operation will be performed to elevate a depressed fracture of the skull or to evacuate blood clot and so relieve increased intracranial pressure.

After the acute phase has subsided convalescence must be slow with a gradual return to work. If there are any post-concussional symptoms a mixture containing potassium bromide (gr. x) and Epsom salts (gr. xxx) may help to diminish their intensity.

Mention must be made of penicillin which has altered the outlook in penetrating wounds of the brain and meninges. Penicillin in the form of penicillin methazine powder is a most valuable dressing which can be applied directly to scalp wounds or to the brain substance. By this means, together with adequate surgical methods, the death rate in such grave disasters has been greatly lessened.

After-effects of head injury. Whilst rapid recovery from the immediate effects of head injury is common yet disabling symptoms persist in a good many cases. The chief post-concussional symptoms are:

The post-concussional syndrome which comprises:

1. Headache which is severe and persistent. It is increased by sneezing, bending, physical work and emotion.

2. Giddiness which is largely a feeling of instability and not a sense of rotation.

3. Mental symptoms of which anxiety, depression, impairment of memory and concentration, lack of energy and insomnia, are the most prominent. The mental picture presented depends a great deal upon the underlying temperament.

This type of disability needs to be distinguished from neuroses presenting similar features.

Sometimes the mental symptoms are even more severe and are therefore detailed in a special chapter (q.v.).

Cranial nerve paralyses are usually the result of fracture of the base of the skull and are usually permanent.

Chronic subdural haemorrhage. In this condition blood slowly accumulates in the subdural space following a head injury. There may be an interval, sometimes very prolonged, during which there are no particular symptoms. Then there is a gradual onset of headache, drowsiness and confusion which vary in intensity. Still later there may be signs resembling those produced by tumours of the brain including hemiplegia, swelling of the optic discs and other signs. The outlook is excellent if the condition is diagnosed early enough and the blood evacuated from the cranium by surgical operation.

Traumatic epilepsy. Epileptiform fits develop as an after-effect in about 5 per cent of cases of head injury. In some there is an inherited predisposition to epilepsy. In others fits result from adhesions between the brain and the dura mater. They may be localized, depending upon which part of the brain is affected, or they may be general, as in 'idiopathic' epilepsy. If scar tissue is the cause operation may give relief. Otherwise the treatment is as in epilepsy.

Other sequelae of head injury are meningitis, abscess of the brain and Parkinsonism. These are described under their respective headings.

B. INJURIES TO THE SPINE

Injuries to the spine may be caused by all kinds of accidents, blows and gunshot wounds. Shock is profound and the outlook in all cases is serious. Haemorrhage may occur into the central canal of the cord. The nervous tissue may be bruised, lacerated, crushed or compressed by bony fragments or by kinking of the vertebral column.

The usual signs in addition to those of shock are as follows:

1. Paralysis of the parts of the body below the level of the injury, i.e. paraplegia. Owing to the damage, temporary or permanent, to the spinal cord all impulses ascending and descending are cut off. If the break in the cord is complete, the ensuing paralysis is of a flaccid type, i.e. the muscles lose their tone and all reflexes are absent. If the break is incomplete and the vestibulospinal tracts are uninjured, the paralysis is at first flaccid, later becoming spastic after the shock has passed off. Muscles not only recover their tone but become excessively rigid. With the cutting off of the pyramidal tracts, the reflexes become exaggerated and the plantar response, extensor.

2. Loss of sensation below the level of the damage because of severance of the sensory tracts.

3. Double incontinence, i.e. loss of control of bladder and rectum.

4. Wasting of the muscles supplied by the anterior horn cells at the site of injury.

5. The loss of sensation interferes with the nutrition of the skin directly because abrasions are not felt. Bed-sores develop with great rapidity if treatment is not applied early.

Treatment of spinal injuries.

Treatment is directed towards:

1. Prevention of bed-sores.

2. Correction of dislocated vertebrae.

3. Surgical treatment to remove bony fragments if a comminuted fracture has occurred.

4. Restoration of muscular power by means of massage, exercises and electricity, i.e. physiotherapy.

A fractured spine necessitates the use of a special bed, the principle of which is to use the patient's weight in obtaining hyperextension of the spine. For this purpose a blanket roll is placed under the site of the fracture. Hyperextension must be maintained whenever the patient has to be moved for any purpose. In other cases, nursing is carried out on an air- or water-bed to minimize the risk of bed-sores.

The patient's strength must be maintained by means of adequate nourishment. Fluids should be administered generously. Simple enemata or saline washouts may be used for opening the bowels which should, however, be encouraged to act daily at a regular hour with the assistance of liquid paraffin if necessary. In the acute stages enemata of hypertonic saline or saline and glucose solution are given to reduce oedema of the spinal cord.

Various methods of inducing emptying of the bladder may be employed. A hot enema is sometimes useful. A bedpan filled with warm water may succeed. The sound of running water is of psychological value in encouraging micturition. Warmth applied to the genitalia may occasionally assist the patient to accomplish the act. If all these methods fail resort must be had to catheterization which must be carried out with the strictest aseptic precautions. If it is likely that catheterization will be required for some days, the method of tidal drainage is to be preferred in order to minimize the risk of infection.

The skin and bony prominences require careful and repeated attention, for unless this is carried out with scrupulous care the necessarily prolonged stay in bed is liable to produce intractable bed-sores and chronic sepsis. Frequent alterations of position are essential too to avoid congestion of the lungs.

Double incontinence necessitates frequent washing, drying, powdering and changes of bed linen.

Every effort should be made to encourage, interest, occupy and amuse such sufferers who, if they do not succumb to the effects of the injury, or from spreading infection of the bladder, are likely to be bed-ridden for very long periods.

2. INFLAMMATORY DISEASES

A. MENINGITIS

Meningitis is an inflammation of the coverings of the brain brought about by a variety of causes. The typical form of it is due to a germ called the meningococcus and the disease is known as cerebrospinal or spotted fever. It is an acute and very infectious illness occurring for the most part in epidemics. It is therefore common where masses of people foregather as in camps, schools and barracks. The germ is present in the nasopharynx of carriers and is distributed to others by droplet dispersal of saliva.

Other acute forms of meningitis are secondary to infections elsewhere in the body. Pneumonia, typhoid, influenza, streptococcal diseases, spreading mastoiditis, fractured skull, scalp infections and burst cerebral abscesses are all liable to involve the meninges.

The tubercle bacillus may give rise to a subacute form of meningitis which takes a more prolonged course than other forms of meningeal inflammation.

The organism of syphilis can produce a chronic meningitis which, if untreated lasts for considerable periods. If treatment is commenced quickly good results may be expected.

Cerebrospinal fever (acute meningococcal meningitis). The onset is sudden with malaise, restlessness, severe headache, nausea and vomiting. Temperature, pulse and respiration rates are all raised. The patient lies curled up in bed, is resentful of interference and dislikes the light intensely (photophobia). Rigidity of the neck is marked and pain is caused when the thigh is flexed to a right angle and attempts are made to straighten the leg (Kernig's sign). Paralyses of cranial nerves may be present, e.g. facial palsy, squint, and double vision. Convulsions sometimes occur particularly in infancy. The blood white cell count is raised above 20,000 cells per c.mm. Cerebrospinal fluid withdrawn by lumbar puncture is always under pressure, contains many leucocytes, and the organisms causing the disease are invariably present often within the bodies of the white corpuscles. Occasionally, minute haemorrhages occur in the skin hence the older name of the disease, namely spotted fever.

Treatment. A quiet, darkened room should be selected and visitors should be excluded during the acute stages. Ice bags to the head help to relieve headache. Feeding obeys the general principle of light easily digested fluids 'little and often'.

Temperature, pulse and respiration rates are charted four-hourly. A lumbar puncture tray should be made available together with the requisite number of sterile towels, gauze and test tubes in which to receive the fluid. Some physicians use anti-meningococcal serum which is given intrathecally. In such event the nurse must have several 30–40 c.c.

sterile syringes in readiness. The serum should be warmed to body temperature before being injected through the lumbar puncture needle into the spinal canal.

Any discharges from the nose and mouth should be gathered in paper handkerchiefs and destroyed by burning. After attending to the patients' needs and before leaving the room the nurse should wash her hands in a weak antiseptic solution.

The modern treatment of meningitis has been revolutionized by the introduction of sulphanilamide preparations. With the aid of these new chemicals the death rate and liability to after-effects have been very greatly reduced. Previously, in addition to a high mortality rate, such sequelae as hydrocephalus, blindness, squints and mental changes occurred with some frequency. Sulphanilamides act by removing the capsule of the invading bacteria, thus allowing the anti-bodies formed in the blood to attack and annihilate them. Dosage usually commences with 15 grains per 20 lb. of bodyweight given every four hours until definite improvement has set in. The night dose is then omitted, after which the drug can be gradually withdrawn.

Treatment continues for several days, a careful watch being maintained for toxic effects of the drug such as nausea, vomiting and rashes. At times oral administration has to be replaced by intramuscular or intravenous injection in cases which show gastric intolerance manifested in nausea and vomiting.

The discovery of the truly miraculous antibacterial properties of penicillin has added another very powerful weapon with which to attack the invading organisms. Unfortunately, when given by intramuscular injection it fails to penetrate into the cerebrospinal fluid in sufficient amount to be of any value. It is therefore necessary in all cases to employ the sulphonamide drugs. But penicillin is a most valuable addition when given by lumbar puncture, i.e. intrathecally in doses of 20,000 units every twelve hours. If the patient can be removed to a properly equipped neurosurgical unit, penicillin can also be given locally, i.e. through burr holes made in the skull.

Other forms of meningitis. Sulphapyridine is used to combat pneumococcal meningitis whilst the staphylococcal type of infection is best treated with sulphathiazole. Good results have been obtained in most cases which contrast with the almost invariably fatal issue in these diseases before the introduction of chemical therapy.

In all cases convalescence should be prolonged with a gradual return to those activities which require concentration and mental effort.

Tuberculous meningitis commences as a feverish illness which lasts about a week before the onset of typical meningitic symptoms. There are one or two recognizable differences however. The first is the peculiar crying sound made by sufferers. Again, the abdominal muscles tend to retract giving a boat-shaped appearance to the abdomen. The antibiotic streptomycin has altered the prognosis in this disease considerably

for the better. Once invariably fatal, the death rate has been reduced by at least half. For adults the dose is 1–2 grammes once daily for at least six months. In addition, 25–100 milligrams daily by the intrathecal route is also currently used in practice.

If the bacillus becomes resistant during the course of treatment, P.A.S. (para-aminosalicylic acid) may help to combat the organism. Yet another substance, Isoniazid, is of use as it is non-toxic and can be given by mouth. A combined attack on tubercular meningitis might nowadays consist of streptomycin 1 gramme together with 200 milligrams of Isoniazid daily, or streptomycin with P.A.S. 20 grains daily.

It has to be borne in mind that streptomycin itself can be very toxic bringing in its train rashes, headache, nausea and, most importantly and commonly, deafness especially in children.

Syphilitic meningitis will be especially described under the heading of neurosyphilis.

B. ENCEPHALITIS

Encephalitis signifies inflammation of the brain substance itself. The cause is usually a minute organism which cannot be detected microscopically and which passes through porcelain filters which hold back most other bacteria. Most parts of the brain being involved the symptoms are very widespread. The organisms find their way into the spaces surrounding the blood vessels causing engorgement and local leucocytosis.

Encephalitis may occur during the course of mumps, measles, whooping cough, chickenpox, vaccinia, and in a great many other acute infections. Sometimes, and more especially in the acute specific fevers, the spinal cord is also affected so that the clinical picture is one of acute encephalomyelitis.

Inflammation of the brain can also result from poisoning by lead, mercury, arsenic, alcohol and carbon monoxide.

As a rule the symptoms of acute encephalitis are drowsiness, cranial nerve paralyses and in particular, double vision and facial weakness. There may be mental confusion or excitement. If the spinal cord is also involved (myelitis), there may be paralysis of the lower limbs, double incontinence of the sphincters and double Babinski's sign.

Encephalomyelitis due to infectious fevers, whilst alarming, clears up completely as a rule. Occasionally, especially in children, mental changes of a more or less permanent nature may ensue.

Of the metallic poisons lead is the commonest. Proper industrial precautions have greatly lessened the incidence of lead poisoning amongst painters and workers with lead. Recently there has been a recurrence of lead encephalitis due to intoxication by lead 'dope' used in petrol. The condition may be ushered in by epileptiform convulsions and may proceed to a serious mental disorder characterized by violence, hallucinations, delusions and failure of memory. Eventually, the patient lapses into weak-mindedness.

Carbon monoxide intoxication is commonly the result of attempted suicide by coal-gas poisoning. It produces an encephalitis which may affect the corpus striatum to produce Parkinsonism, *q.v.*

C. ENCEPHALITIS LETHARGICA

Encephalitis lethargica. This is indeed the gravest form of encephalitis and is also thought to be a virus disease. It first came under observation as a clinical entity in 1917 at the same time as influenza was scourging the world. What brought it under sharp scrutiny was the fact that most sufferers lapsed into profound drowsiness after an initial phase of fever and malaise resembling influenza. This tendency to drowsiness and lethargy gave the name to the disease.

Onset. Encephalitis lethargica is ushered in with influenza-like symptoms but with only a moderate pyrexia. Respirations and pulse rate are similarly slightly increased. Sometimes, however, the temperature may rise steeply to hyperpyrexial levels. Convulsions may occur and paralysis down one side of the body is not unknown. At other times the disease may be installed with great excitement, confusion and delirium similar to that seen in states of acute manic excitement. Occasionally the gravity of the illness may be overlooked. A mild feverish attack with transitory diplopia (double vision) may pass for a chill and perhaps settle down altogether. Gradually and almost imperceptibly after-effects appear, i.e. the Parkinsonian syndrome develops, possibly over a period of years.

Whatsoever the type of onset, excluding the chronic insidious form, the characteristic lethargy soon appears. The patient becomes very somnolent but can be roused to take food and even to converse rationally. However, as soon as feeding or questioning ceases, he falls back into profound drowsiness. On examination, paralysis of eye muscles is discovered. The eyelids may droop (ptosis), double vision (diplopia) is common, and the pupils may be irregular in outline. As far as the pupillary light reflex is concerned, the pupil may contract when illuminated but may not react on convergence of the eyes. The facial expression is typically mask-like or Parkinsonian. All wrinkles and folds are obliterated and the face becomes expressionless. Saliva drools unchecked from the angles of the mouth. Neck rigidity may be present, whilst the tongue and hands sometimes show a peculiar tremor. Occasionally, groups of muscles here and there contract suddenly as if impelled by electric shocks. The term myoclonus is applied to these irregular twitchings. Speech becomes dull and monotonous. There are no significant changes in the reflexes and lumbar puncture reveals a cerebrospinal fluid virtually unchanged. The sleep rhythm is often inverted, drowsiness by day giving place to insomnia.

Pathology. The virus obtains lodgement in the brain substance itself, and microscopic examination shows a characteristic 'cuffing' of the blood vessels, i.e. an accumulation of white corpuscles around the vessels in

the shape of a muff. On inspection the brain tissue shows clearly all the signs of inflammation and vascular engorgement.

Treatment. So far no specific treatment has been discovered. It was once considered that colloidal iodine was of value and that salicylates brought about beneficial results. Recently, sulphonamides have been tried, but no treatment seems to modify the course of the disease. The fact remains that about one-third of all cases die during the acute phase, another third or so survive but develop Parkinsonian after-effects, and a third or fewer seem to recover fully. Treatment then is symptomatic and resolves itself into careful nursing.

At the outset strict confinement to bed is absolutely essential. Tepid sponging is of value. The mouth should be cleaned frequently with glycerine and borax solution or with some mild antiseptic fluid. Mild acids such as lemon juice stimulate salivary secretion and thereby prevent parotid infection.

Attention to the bowels is of primary importance and free action must be promoted by the use of simple laxatives. An occasional enema may be required. The diet should be liberal, farinaceous, easily digested and given in small quantities frequently. If it is decided to give any drugs by intravenous injection a tray with the requisite dressings and instruments must be made available. Any untoward circumstances such as convulsions, irregular or myoclonic movements should be carefully noted.

Post-encephalitis lethargica. Post-encephalitic states are very common indeed and are perhaps the most troublesome, difficult and disheartening after-effects with which the nurse has to cope. They may appear within a few months of the onset of the acute disease or may evolve over a period of years. Residual symptoms are both physical and mental. As the disease attacks the brain, and in particular the corpus striatum, it is evident that sequelae are likely to be of a severe and intractable character.

Physical. The most noticeable feature is the mask-like and expressionless face. Except for some flickering of the eyelids the face is immobile and the gaze staring. Speech is dull, monotonous and is accompanied by much drooling of saliva. Pupil changes are common. The general musculature is rigid and when the limbs are moved a cogwheel-like sensation is experienced by the observer. The body is held rigid, leans slightly forward and there is a tendency to run forward or backwards, i.e. festination or retropulsion. One witness has described these movements in terms of the patient chasing his own centre of gravity. At times there is a tremor of the lower jaw and similar tremors of the hands, arms and legs which cease upon voluntary movement but which recommence when this stops. Some patients exhibit distressing oculogyric crises in which the eyes turn upwards and outwards and are held in spasm. Involuntary movements and tics are very common. Head-nodding, spasm of the neck muscles (torticollis) and attacks of over-breathing with tetanic seizures have all been observed. Some patients become liable to

attacks of pathological sleep (narcolepsy), or the inverted sleep rhythm previously described may persist.

Mental disorders. Depression not uncommonly follows a realization of the disabilities, and suicide is not infrequent. The necessity for careful observation of such patients must therefore be stressed.

Encephalitis lethargica may result in subsequent organic dementia or weak-mindedness which renders patients extremely childish, helpless and dependent.

In children and young adults the disease is often followed by complete alteration of the personality. A young person, previously docile and well conducted, may become vicious, impulsive, emotionally unstable, violent, excitable and uncontrollable. Stealing, irregular sexual practices and all kinds of anti-social conduct may be indulged in. Again, the sleep rhythm may be reversed.

Treatment. Whilst most post-encephalitics can be supervized in their homes, a fair number find their way into neurological and mental hospitals. Extracts of Bulgarian belladonna, increasing doses of atropine, sulphate or hyoscine hydrobromide sometimes relieve the more distressing symptoms such as salivation, tremor and oculogyric crises. In hospital, massage, electricity and above all proper occupational interests are of considerable value in making life tolerable for such sufferers. In recent times numerous antispasmodic drugs have been manufactured and good results have been claimed for them all. They comprise Parpanil, Artane, Phenergan, Diparcol, Lysivane and Myanesin. Each has been designed to reduce tremor, salivation and oculogyric crises. The most useful are Lysivane and Artane, the former being given in doses of 50–200 milligrams per day. Of the remainder, Parpanil and Myanesin are worth mentioning as being helpful occasionally to reduce rigidity. Nevertheless, the illness remains a discouraging one to treat.

Depression and suicidal tendencies sometimes require certification and removal to a mental hospital. Benzedrine helps in the treatment of narcolepsy. Delinquent children require special hospitals and even then are extremely difficult to supervize, being a constant source of anxiety both to the doctors and to the nurses. All cases of post-encephalitis reveal diminished resistance to intercurrent disease, and a chill or an attack of pneumonia often ends fatally.

D. ACUTE POLIOMYELITIS (INFANTILE PARALYSIS)

Infantile paralysis is an acute infection which usually occurs in epidemic form. It is caused by a filter-passing virus which obtains access to the nervous system via the nasopharynx. The disease manifests itself during the summer months as a rule. Although called infantile paralysis, it spares no age and affects all races with the exception of the negro. The disease attacks the pyramidal cells of Betz in the motor cortex (polio-encephalitis) or the anterior motor horn cells of the spinal cord

(poliomyelitis). If the motor cortex is affected a resulting paralysis ensues which is of the upper motor neuron or pyramidal type, i.e. hemiplegia with increased tendon reflexes, speech defects, absent skin reflexes and Babinski's sign on the hemiplegic side.

Damage to the anterior horn cells causes a flaccid paralysis of muscles because of the loss of the corresponding motor nerve supply. The muscles become slack and toneless, wasting commences at once and tendon reflexes are lost, i.e. a typical lower motor neuron form of paralysis.

Any part of the nervous system may be affected so that cerebral (encephalitic), meningeal, medullary (bulbar) and other special types of this disorder have been described.

The onset is sudden with fever, malaise and headache. Kernig's sign may be present together with other symptoms of meningeal irritation. After a day or so characteristic flaccid paralysis appears in odd groups of muscles. Thus, cranial nerves may be involved causing squint, facial paralysis, difficulty in swallowing and weakness in neck muscles. Lower down, various sets of muscles belonging to the arms, chest, abdomen and legs may become the seat of tenderness, paralysis and wasting. The most serious symptom is diaphragmatic and intercostal muscle paralysis necessitating the use of a Paul Bragg or Drinker machine to produce artificial respiration.

Later, with the absorption of oedema a certain amount of muscular recovery takes place. But owing to the complete destruction of anterior horn cells some permanent paralysis inevitably remains.

During the acute stage of the illness the cerebrospinal fluid shows an increased number of cells. Later, the fluid becomes perfectly normal.

Whilst recovery often takes place the death-rate in epidemics is about 10–15 per cent so that infantile paralysis is still a serious scourge.

Treatment. Absolute rest in bed is essential. Glucose solution intravenously coupled with lumbar puncture may be used to reduce cerebral and spinal oedema. Paralysed limbs should be supported by splints and relieved of the weight of bedclothes by means of a cradle. Artificial respiration in a Drinker machine must be commenced at once if there is any respiratory embarrassment. 'Convalescent serum' is sometimes given by intravenous and intraspinal routes. It is obtained from the blood of patients who have recovered from an attack of anterior poliomyelitis and who are therefore presumably immune from further infection, i.e. they have manufactured sufficient blood antibodies to ward off the disease. However, the results are indifferent and further observation has not justified an expressed earlier optimism.

When all acute symptoms have subsided massage and electrical treatment must be applied, at first gently and then with increasing vigour. Muscle training and exercises can then be added. Eventually, orthopaedic appliances and surgical procedures will be required to correct deformities which result from the paralyses and defective nutrition of the affected limbs. 'Withered' limbs and 'club-foot' are examples of residual

deformities following a sharp attack of infantile paralysis; for the unaffected and therefore stronger muscles cause contractures.

E. BRAIN ABSCESS

Under certain circumstances the brain may become the seat of localized collections of pus. The commonest causes are:

1. Head injury with or without fracture of the skull.
2. Infections of the scalp.
3. Thrombosis of veins of the scalp.
4. Infection of the nose, middle ear, sinuses and mastoid air-cells.
5. Thrombosis of the venous sinuses in the brain.
6. Secondary to lung abscess or bronchiectasis.

The common symptoms are headache, vomiting, giddiness, swelling of the optic disc, i.e. papilloedema, tenderness over the site of the abscess, local symptoms depending upon the situation of the abscess. Such symptoms reveal the site of pressure and aid in the diagnosis.

Briefly, the additional signs are as follows:

Frontal area. Mental changes, poverty of judgment, tendency to the making of silly jokes, particularly puns. Convulsions may occur.

Parietal. Signs of hemiplegia, hemi-anaesthesia and speech defects (dysarthria), increasing with the passage of time. The expanding abscess presses upon the precentral gyrus, the post-central convolution and adjacent parts.

Temporal. Hippocampal pressure causes hallucinations of taste and smell. Visual defects of all kinds particularly if there is pressure upon the optic chiasma.

Occipital. Visual defects and in particular visual field disturbances.

Cerebellar. Pressure on one or other cerebellar hemisphere causes nystagmus (regular jerky lateral movements of the eyeballs), loss of co-ordination of the limbs of one side, speech disturbances, giddiness during which the patient experiences a sense of rotation, falling to one side and loss of tone of the muscles of that side.

Cerebral abscesses if untreated cause the patient to go into coma. Death results eventually because the abscess ruptures into one of the ventricles, or it bursts to cause meningitis, or the markedly increased intracranial tension produces paralysis of the medullary vital centres.

Treatment and nursing. The primary focus must receive immediate attention. If aspiration is possible, this should be carried out and penicillin instilled into the cavity if the causative organism is penicillin-sensitive. Subsequently it is necessary to drain the abscess and finally to excise it if and when it has become sufficiently encapsulated. The capsule is designed by nature to shut off the infection from the rest of the brain so that in the end the abscess behaves like a solid tumour and can be removed as such.

Nursing consists of complete rest, accurate observation and recording

of vomiting, headaches and muscular twitching. Particular attention must be paid to the pulse rate which tends to diminish as the pressure inside the skull rises. After surgery, post-operative nursing follows the usual lines.

F. POLYNEURITIS (MULTIPLE OR PERIPHERAL NEURITIS)

Actually, true inflammation of the nerves themselves is very rare. When it does occur it is an inflammatory condition of the internal substance of the nerves. Most conditions known as neuritis are degenerations of nerve tissue brought about by pressure, injury or by poisonous substances including bacterial toxins.

Polyneuritis is therefore a disturbance in a number of peripheral nerves, those of the lower limbs being more commonly affected than the upper. The causes fall into several groups:

1. Infections such as diphtheria, enteric fever, syphilis, tuberculosis and virus diseases.
2. Metabolic diseases such as gout and diabetes.
3. General debilitating disorders such as pregnancy, severe anaemia and malignant diseases.
4. Metallic and gaseous poisons including arsenic, lead, alcohol, mercury, bismuth and carbon monoxide.
5. Deficiency diseases, i.e. vitamin deficiency including beri-beri and pellagra. Chronic alcoholism is thought to play a part in provoking avitaminosis because it engenders chronic gastro-enteritis which hinders proper absorption of vitamin B.

Whereas the metallic poisons tend to affect the motor nerves other forms of polyneuritis also involve the sensory nerves. In addition, the cranial nerves may be attacked (polyneuritis cranialis), and the brain quite often shares in the disease process. In the latter case a set of mental symptoms known as Korsakoff's psychosis is aroused. It is characterized by failure of memory together with the substitution of false reminiscences for the amnesic gaps.

The onset of polyneuritis may be acute or insidious. In the acute form, the temperature rises steeply, the pulse quickens and there is a feeling of malaise. The muscles are tender and ache, particularly in the alcoholic form where the tenderness is exquisite. If cranial nerves are involved, the patient may squint, show facial paralysis and complain of difficulty in swallowing (dysphagia). Cranial nerve palsies are commonest in diphtheria.

As regards the peripheral nerves the extensors of the wrist and foot are affected so that 'dropped foot' and 'dropped wrist' are observed. Sensory changes consist of loss of feeling in the so-called 'glove' and 'stocking' areas. In other words the distal parts of the body are more liable to sensory disturbances than the proximal. The skin of the affected limbs becomes smooth and glossy, whilst the fingers tend to taper.

Walking is impossible in the very acute forms of polyneuritis but in less severe cases it is accomplished by means of the 'steppage' gait, i.e. the dropped feet are lifted high enough to clear the ground. The wrist, knee and ankle jerks are diminished and then lost. Where the onset is slower the symptoms already described occur but are preceded by cramps in the muscles, feelings of heaviness in the limbs and tingling (pins and needles) in the extremities.

Special types of polyneuritis

Acute infective polyneuritis of unknown origin is a serious and sometimes fatal disorder. Both the cranial and peripheral nerves may be affected.

Coal-gas poisoning may produce in addition to neuritis such mental changes as depression and signs of permanent nervous damage resembling Parkinsonism.

Lead. This metal is likely to give rise to a myopathy, that is to say a disease of the muscles especially affecting the neuromuscular junction. Lead poisoning may also be accompanied by a serious and intractable mental disorder characterized by fits, delusions and hallucinations which later give place to weak-mindedness (dementia).

Alcohol and arsenic. These substances may produce mental disease of the Korsakoff type. Originally the name Korsakoff syndrome was applied to the well-known alcoholic nervous disease consisting of a special type of psychosis with polyneuritis.

Deficiency diseases. Beri-beri is, as a rule, confined to the Far East and is due to avitaminosis (deficiency of vitamin B). Cardiac failure and dropsy are common accompaniments.

Pellagra is brought about by deficiency of various components of vitamin B, in particular, riboflavin and nicotinic acid. It is not altogether uncommon in mental hospitals and more especially in patients who have required tube-feeding for long periods. The features of this disease are dermatitis, diarrhoea, inflammation of the tongue (glossitis), stomatitis and mental symptoms. The dermatitis takes the form of a 'butterfly' pattern around the nose and mouth and a pigmented rash on the trunk.

Note. It is of interest to record that polyneuritis has occurred during the treatment of schizophrenia with large doses of insulin. Whether this is a direct toxic effect of the hormone or whether it is an intercurrent disorder is not yet known.

Treatment. Absolute rest must be enforced. A cradle is required to take the weight of the bedclothes. The affected limbs should be wrapped in cotton wool, kept warm and any tendency to deformities and contractures must be counteracted by correct splinting. The cause, if known, must receive active attention. For example, the appropriate doses of insulin should be administered in diabetes, antiserum in diphtheria and

large doses of vitamin B and nicotinic acid in avitaminosis. Where metallic poisoning is the causal factor intravenous injections of sodium thiosulphate are of value. If the cause is not obvious search should be instituted for septic foci in the teeth, tonsils, sinuses and elsewhere. If found, they should be eradicated.

The diet should contain milk, cream, liver extract, wholemeal cereals, vegetables and raw fruit. Brewers' yeast is sometimes of benefit. If there is difficulty in swallowing with regurgitation of food through the nostrils as in the cranial forms of polyneuritis (e.g. diphtheria), ample quantities of liquid nourishment must be given by oesophageal or nasal tube.

When the acute stage of the disease has subsided and there is no longer any tenderness along the course of the nerves or in the muscles, massage and electrical treatment may be commenced. Recovery is the rule but the knee jerks do not return until after a considerable period has elapsed.

Other forms of neuritis

Neuritis may affect isolated motor nerves and it may attack the brachial plexus. It is often a painful, intractable and disabling disorder not to be mistaken for muscular fibrositis which is exceedingly common and which responds readily to ordinary forms of physiotherapy. The treatment of neuritis follows the same lines as those described for polyneuritis.

Neuralgia. In many ways akin to neuritis, neuralgia however is a very disturbing complaint due to inflammation of the posterior or sensory root ganglia any of which may be affected.

Trigeminal neuralgia (tic douloureux). Trigeminal neuralgia is characterized by attacks of stabbing burning pain in the face. If all three roots of the ganglion are affected the pain affects the whole of one side of the face. The roots may be involved singly so that pain may be limited to one side of the head, the maxillary area including the teeth, or the lower jaw and teeth. During the spasms which occur irregularly there is much anxiety, the eyes water and the patient is afraid to move for fear of increasing the pain. The affected skin areas are often very tender.

Treatment. The condition varies greatly in its response to treatment. Sometimes it may be relieved or even cured by attention to septic foci, improving the general health, and by such remedies as aspirin and vitamin B (thiamine chloride) given in large doses over a long period. Liver extracts are occasionally useful. Tincture of gelsemium has a reputation when combined with mild sedatives. Inhalations of trichlorethylene 20 minims distributed on gauze, t.i.d., sometimes produces brilliant results. The patient must always be recumbent when inhaling this drug because of its anaesthetic effects. Additionally, it is an irritant and must therefore not be allowed to touch any mucous membrane.

The more severe cases may require alcoholic injection of the Gasserian ganglion via a needle passed through the cheek to the base of the skull.

In its most violent form the condition can only be relieved by opening the skull and cutting the sensory roots of the fifth nerve.

Herpes zoster (shingles). Shingles is due to a virus infection of the posterior root ganglia generally those of the intercostal nerves so that the characteristic 'rash' is commonly seen in the thoracic and abdominal districts.

Herpes zoster is usually ushered in by slight fever with malaise. A burning pain is then experienced in the path of one or more of the intercostal nerve roots, extending from the vertebral column and proceeding round the side of the chest to the sternal area. A day or so later a crop of vesicles appears along the same course following which the pain subsides to some extent. As a rule the vesicles dry up and eventually disappear leaving small scars. They may however become secondarily infected.

Treatment. The patient should remain in bed for the first few days. Aspirin should be prescribed in full doses. As far as the local condition is concerned nothing more is required than application of an antiseptic dusting powder or collodion to keep the vesicles dry and clean. Sometimes the pain is very intense and may continue long after the rash has cleared up. It may therefore be necessary to prescribe morphine. This should however be avoided because of the danger of establishing a craving for opiates. Good results have been claimed for pituitary extracts given by injection. Deep X-ray treatment, alcohol and Novocain injections may be required for persistent pain (post-herpetic neuralgia). In the most intractable cases surgical division of the affected posterior roots or even section of the spino-thalamic tract may be required. At times, and especially in elderly neurotic patients, a fairly severe state of depression may arise in response to the prolonged pain, and psychological treatment may be necessary. On the whole, herpes zoster recovers spontaneously and fairly quickly.

Bell's paralysis (facial paralysis). Facial paralysis may be a symptom of grave intracranial trouble or what is much more common, it may be due to a simple inflammation of the sheath of the seventh nerve.

It is sudden in onset and is often caused by exposure to draughts. The patient is unable to wrinkle the forehead on one side, close the eye or move the muscles of the face on that side. Tears fall unchecked from the eye (epiphora), and there is some difficulty in chewing. Food tends to collect in the affected cheek, and saliva drools from the depressed angle of the mouth.

Treatment. Most cases recover spontaneously. Fomentations to the face and counter-irritation with tincture of iodine to the mastoid processes are sometimes helpful. Some authorities prescribe a rubber-covered wire hook which extends from the ear to the angle of the mouth. This helps to abolish the dribbling of saliva and minimizes the disfigurement. After ten to fourteen days, massage and galvanic current may be used to hasten recovery. On the whole the prognosis is good, but in

rare cases no improvement takes place at all, whilst in others it only does so after a prolonged period of treatment which may, if necessary, include surgical opening of the facial (Fallopian) canal and incision of the nerve sheath, autog afts and plastic surgery.

Brachial Neuralgia. One condition often diagnosed in the past as brachial neuritis must be selected for special consideration. Strictly speaking, it must be called neuralgia and not neuritis. It is due in fact to prolapse of a cervical intervertebral disc. The commonest site is between the 4th and 5th or 5th and 6th vertebrae. Extrusion or degeneration of the disc tissue causes pressure on the roots of the brachial plexus which results in pain in the root of the neck, in the shoulder and possibly in the scapular region. In addition, there is often wasting of the deltoid, biceps and other forearm muscles, the loss of flesh extending to the small muscles of the hand. Shooting pains, numbness and tinglings are often experienced along the course of the ulnar nerve affecting particularly the ring and little fingers.

Treatment is directed towards immobilizing the neck by means of a plastic collar, or alternatively, neck traction may be employed in the hope that the disc will slip back into place. Gentle physiotherapy helps to relieve muscle spasm. In most cases recovery takes place but some cervical disc lesions require surgical treatment to relieve what can be quite severe pain and suffering.

For some as yet unknown reason, cervical and for that matter lumbar disc protrusions are much more common nowadays.

Sciatica. Sciatica is a painful disorder affecting the sciatic nerve which, arising from the lumbosacral plexus, pursues an extensive course in front of the sacro-iliac joint, through the sciatic notch and down the back of the thigh to its eventual distribution. The causes of sciatica are manifold. Some types are definitely inflammatory in origin. Other causes can be traced to vitamin deficiency, gluteal fibrositis, osteo-arthritis of the lumbar spine with pressure on the nerve roots as they emerge from the vertebral canal, and pelvic tumours causing pressure in a similar manner. Recently, it has been shown that some sciaticas are due to prolapse of an intervertebral disc, generally that between the third and fourth or fourth and fifth lumbar vertebrae. The condition is referred to as a nucleus pulposus herniatum or disc syndrome. The prolapse is usually brought about by strain or injury. Lastly, there are a number of cases resembling sciatica which are undoubtedly hysterical in origin.

The symptoms are pain and tenderness along the course of the sciatic nerve, the chief sites being over the sciatic notch, i.e. deep in the buttock, in the popliteal space, over the head of the fibula, and on the outer side of the ankle. The pain is increased by stooping, coughing and sneezing, and is particularly well marked where there is pressure on nerve roots. With the patient in a recumbent position very intense pain is caused by attempts to raise the affected leg when extended (Lasègue's sign). The limb feels heavy and lifeless. In some cases the only relief from pain is

obtained by getting up and walking around. Another cause of distress is the pain experienced during the act of defaecation. The ankle jerk may be diminished or lost, and there may be an area of partial numbness on the outer side of the foot.

Treatment. The general consensus of opinion nowadays is that treatment must commence with complete rest in bed for some weeks preferably on fracture boards. This in itself may encourage a spontaneous remission, the criteria of which are freedom from pain and full straight leg raising. Should this fail then complete immobilization of the lumbar spine by means of a plaster jacket is the next treatment of choice. This method ensures that the lumbar curve is maintained in a forward position and that movement of the vertebrae is reduced to the very minimum.

Should immobilization prove unsuccessful, the surgeon may have recourse to manipulation of the spine or alternatively traction may be applied to the vertebral column to widen the intervertebral space so that the disc might slip back into place.

All else having failed, the last resort is surgery which nowadays is entirely restricted to intractable cases with persistent pain and disability. The operation consists in the removal of the approximate neural arches of the lumbar vertebrae, i.e. laminectomy, with surgical excision of the offending disc. Occasionally, the surgeon will operate through a 'window' made in the arch or arches instead of cutting the bone away completely.

Generally, conservative methods yield good results with complete relief after a period varying from six weeks to as long as twelve months. Occasionally, the symptoms unfortunately persist in spite of every form of treatment.

In all other cases where pressure on nerve roots is involved the cause must be sought in the pelvis and removed if practicable.

Inflammatory or fibrositic types of sciatica are treated by means of rest, analgesics, heat, infra-red rays, diathermy and massage. Other remedies consist of alcoholic injections into the sciatic nerve, injections or epidural infiltrations of Novocain and saline through the sacro-coccygeal opening at the base of the spine. Cures are claimed here and there but sciatica still remains a difficult and unpleasantly painful complaint.

Where pain which approximates to the distribution of the sciatic nerve is of hysterical origin, a psychological approach is necessary to evaluate the meaning of the symptom.

Syphilis of the nervous system. Syphilis of the nervous system presents its own peculiar problems and is perhaps the most tragic of all the end-results of syphilitic infection. Although there are exceptional cases in which neurosyphilis makes itself manifest within a year or so following the original infection, the usual period of latency is about five years. In some cases the onset is delayed for as long as twenty years. Apart from

congenital syphilis it is therefore rare to find the disease in young people.

Unfortunately, a large number of victims have no reason to believe that infection has ever taken place; for the primary sore may never become evident, and the secondary stage if not pronounced, may be dismissed as of no consequence. Thus, patients remain in blissful ignorance of their fate. For some unknown reason the organism lies dormant in the nervous system for years before wreaking its dire effects. This phenomenon has suggested the theory that a special kind of spirochaete exists which affects nervous tissue only and which requires time to elaborate its toxins. The theory has also been propounded that neurosyphilis occurs only in those who possess susceptible nervous systems. Be that as it may, the disease is a very serious condition with an uncertain response to treatment.

The disorders produced are:

Meningitis. Whilst an acute form of meningitis is known to occur during the secondary stage of syphilis it is usual for it to take a chronic course. The disease is characterized by headache especially severe at night, cranial nerve paralyses such as ptosis of the eyelids and squint, and pupils which are irregular in shape and whose reaction to light is absent or sluggish. The blood and cerebrospinal fluid give a positive Wassermann reaction.

Treatment. Treatment consists in administering salvarsan or other organic preparation of arsenic, bismuth and mercury in courses extending over months and at intervals for up to five years.

Cerebral syphilis (meningovascular syphilis). Cerebral syphilis is a severe infection involving not only the meninges but also the blood vessels of the brain. The symptoms accordingly vary depending upon which arteries have been affected. Nocturnal headache is a feature of the disease. Because of chronic meningitis affecting the base of the brain, cranial nerve paralyses such as squints are very common. Argyll Robertson pupils are often present. Occasionally, the disorder is ushered in by an epileptiform convulsion which leaves a hemiplegia with speech defects as after-effects. This is the result of thrombosis of the artery supplying the internal capsule. On account of increased intracranial tension the optic discs may swell (papilloedema) and the mentality may become sluggish, the whole condition resembling that produced by a cerebral tumour. Sometimes the mind is sufficiently disturbed to manifest hallucinations and delusions. The blood Wassermann reaction is always positive but the cerebrospinal fluid may be, and often is, negative.

Treatment. For a full account of the treatment of this disorder see page 215 *et seq.*

Tabes dorsalis (locomotor ataxia). Tabes usually appears between five and fifteen years after infection. It is a disease of the sensory roots of the spinal nerves. It affects particularly that portion of the sensory nerve which lies between the posterior root ganglion and the spinal cord. In consequence, it causes degeneration of the posterior columns of the cord

which carry impulses of touch and joint-sense to the brain. Additionally, the cranial nerves are nearly always involved in the disease process. Thus, optic atrophy is not uncommon. Ptosis and squint due to paralysis of the third and sixth nerves frequently occur. The pupils are irregular in outline, unequal, sometimes fixed, and at other times of the Argyll-Robertson type, i.e. they contract on convergence but remain unresponsive to light. There may be patches of anaesthesia on the face.

In the spinal cord the district chiefly affected is the lumbar zone. Because of interference with the sensory side of the reflex arc the knee and ankle-jerks are lost. There is an area of diminished sensation to touch and pin-prick from about the umbilical level downwards. The muscles of the lower limb are hypotonic and flabby so that hyperextension at the joints becomes possible. Furthermore, because of lack of sensation from the skin and joints in the affected districts, slight injuries and burns pass unnoticed and untreated. They may develop into painless whitlows, perforating ulcers of the feet, and large, swollen and disorganized joints (Charcot joints). Sexual impotence is usual. Because the knowledge of bladder distension does not reach consciousness urinary incontinence (distension with overflow) is the rule.

Other features of the disease are severe stabbing pains in the calves ('lightning' pains), and sharp encircling pains around the abdomen known as 'girdle pains'. The patient may experience 'crises' of severe pain and spasm in the pharynx, stomach and the rectum. In the abdomen the paroxysms of a gastric crisis have to be differentiated from other gastric disorders and abdominal emergencies such as perforation, a matter of some difficulty at times.

There are yet other important features of the disease which depend upon the loss of sensory experiences. The patient has no idea where his limbs are without the aid of vision. Consequently, if asked to stand with his heels together and his eyes closed he staggers and may even fall (Romberg's sign). He often feels as if he is walking on cotton wool and his gait is ataxic, i.e. he raises his feet too high off the ground and stamps them down vigorously.

The blood Wassermann reaction is positive in the large majority of cases. The cerebrospinal fluid also gives a positive reaction and in addition, contains a large excess of protein together with many lymphocytes. The special Lange (gold solution) test gives a characteristic result known as the tabetic curve.

Treatment. Treatment follows the usual anti-syphilitic lines. Analgesics will be required for the severe shooting pains. Supervision of bladder and rectal functions is necessary. The ataxia is best overcome by means of re-education of the limbs together with walking exercises. The tabetic has to re-learn how to use his muscles. Massage and electrical treatment are of benefit in increasing muscular tone and nutrition.

Myelitis. Syphilis is one of the causes of inflammation of the spinal cord and is described in the appropriate section.

General paralysis (dementia paralytica). This is a very serious and severe infection of the brain by the spirochaete, which like tabes, may only come to light many years (five to fifteen) after the disease has been first acquired. Both the meninges and the brain substance are invaded with disastrous effects on the mind. This disease will be described in more detail in the psychiatric section.

Congenital neurosyphilis. Syphilis is one of the diseases where, regrettably, the sins of the fathers fall upon the children. There are congenital forms of both tabes and general paralysis which are very refractory to the usual forms of treatment. There is also a form of mental deficiency due to syphilitic inheritance.

In this connection it is safe to say that energetic treatment of primary and secondary syphilis would prevent the onset of neurosyphilis in later life. However, the uncertainty of cure is such that all treated cases must be supervized for years, such after care including an annual blood Wassermann examination. Marriage should be forbidden for at least five years.

The best treatment of all if exposure to infection has taken place is prophylactic, i.e. immediate washing of the genitalia in weak permanganate of potash solution followed by the instillation of a preparation of calomel cream into the genital orifices. Unfortunately as alcohol is also a factor inasmuch as it diminishes wisdom and foresight, such prophylaxis is often neglected.

Wars always bring about a significant rise in the number of cases of venereal disease and the recent war is no exception. So that in years to come, the usual crop of tabetics and general paralytics will have to be faced.

The scourge of syphilis can only be combated by recognition of the sexual needs of mankind, a general overhaul of the socio-economic factors preventing early marriage, proper instruction in sexual hygiene and forceful propaganda illustrating the dire consequences of ill-regulated and promiscuous intercourse.

As far as the nursing of neurosyphilis is concerned, the nurse should be familiar with all the antisyphilitic drugs which are still in use, such as the organic arsenicals, preparations of mercury and bismuth, tryparsamide and the antibiotics such as aureomycin and penicillin. Finally, neurosyphilis is neither contagious nor infectious and can be nursed without risk.

Myelitis. Myelitis is an inflammation of the spinal cord resulting from injury, vertebral disease such as tuberculosis (Pott's disease of the spine), meningitis or infection of the cord itself. Syphilis is a frequent cause of this disease. The symptoms are limited to those parts of the body below the site of the lesion except where infection is present. In the latter case the signs of a general toxaemia are superadded.

There is a flaccid paralysis at first. If the damage to the cord is incomplete the paraplegia later becomes spastic because of uncontrolled

action of the vestibulospinal tracts. These markedly increase muscular tone. The knee and ankle jerks are lost at the outset but later become exaggerated. The plantar responses become extensor in type. Sphincter disorders are always present and impotence is the rule. There is a zone of hypersensitivity at the site of the lesion but below this point sensation is diminished or lost. On account of vasomotor disturbance in the cord the limbs become blue and cold. Loss of skin sensation may result in bed-sores over the bony prominences unless careful nursing is instituted at once.

As the usual site of infection or injury is the lower dorsal area, the symptoms and signs are to be found below the level of the umbilicus. Where myelitis is part of a general infection such as measles, the outlook is good and a complete recovery may be expected. The traumatic and syphilitic types do very badly, however, and proceed to a fatal issue.

Treatment. Treatment resolves itself into careful nursing on a water- or air-bed. All pressure points require careful attention, and in all cases other than the traumatic variety, frequent changes of position are desirable. Until automatic regulation of the sphincters is established, it is best to empty the rectum by means of saline washouts. The bladder will require catheterization or regular voiding by means of tidal drainage. In other directions, treatment depends on the cause discovered. The illness is a very prolonged one and ultimately terminates fatally as a result of ascending infection from the bladder.

Disseminated sclerosis. This disease is classified with the infections but actually its cause is still unknown. Some authorities allege that it is a virus infection, others that it is due to avitaminosis. In a number of cases fractional test meals have revealed a complete absence of hydrochloric acid in the stomach similar to that found in pernicious anaemia.

Whatever the cause, it is a chronic and intractable disorder. It has a selective effect on the nervous system, causing destruction of myelin sheaths of the pyramidal tract anywhere in its course. The optic nerve is also affected. Thus, there are a great variety of symptoms; for patches of degeneration may occur anywhere in the brain or spinal cord. These patches are sclerotic in nature and take the form of plaques, some of which may reach a considerable size. The disease is characterized by frequent remissions; consequently all sorts of treatments have been given credit for cures which have occurred spontaneously. As time passes so the disease proceeds remorselessly to a fatal issue.

It commences in early adult life and the first symptom may be an attack of blindness which soon passes off. Other early signs are tinglings in the hands and attacks of double vision. After some years the picture is one of spastic paralysis, violent tremor of the limbs on movement (intention tremor), dysarthria, nystagmus, and all the usual signs of pyramidal damage, i.e. absent abdominal reflexes, increased tendon jerks, knee and ankle clonus, and double extensor plantar responses.

Precipitancy and frequency of micturition are usual. Mental changes are common and consist of alternating phases of hilarity and tearful depression together with other features which resemble hysteria at one time and schizophrenia at another.

Treatment. There is no treatment of any real value. It would seem that quinine and silver salvarsan have sometimes given good results. Vitamins have been tried in large doses without effect. Towards the end sufferers become bed-ridden and dependent. Sooner or later all cases terminate fatally.

3. NERVOUS DISEASES DUE TO NEW GROWTH

A. CEREBRAL TUMOUR

For the sake of simplicity only three types of brain tumour are described:

1. Gliomata which spring from neuroglial tissue and which invade the brain substance. The outlook is very poor and operation postpones but does not avert a fatal issue.

2. Meningiomata which grow from any part of the meninges and produce pressure symptoms inside the cranium. When located they are fairly easily removed and the survival rate is reasonably satisfactory.

3. Secondary deposits from malignant growths elsewhere in the body. Cysts of worms, e.g. cysticercosis.

The classical symptoms are as follows:

i. Choked disc or papilloedema. The retinal veins which leave with the optic nerve through the back of the eyeball become varicose because of the back pressure exerted by raised intracranial tension. They can be detected as swollen vessels with the aid of an ophthalmoscope.

ii. Persistent and distressing headache worse at night.

iii. Slowing up of the pulse rate.

iv. Vomiting which has no relationship to food and which may be forcible or projectile in character.

v. Giddiness in all positions of the head.

vi. Epileptiform convulsions.

vii. Focal signs depending upon which area of the brain is being subjected to pressure. Briefly the additional or focal signs are as follows:

Frontal. Mental changes, drowsiness, childishness, memory defects, punning and making of silly jokes, dreamy states and emotional instability. All these symptoms are the result of disturbance of the intellectual centres of the brain.

Pituitary. Eye changes occur early on. Papilloedema, or papilloedema in one eye and optic atrophy in the other, are not uncommon. In children, premature senility (progeria) or gigantism may be observed. Other glandular anomalies such as acromegaly, adiposity, infantilism and impotence have been described.

Precentral. Pressure in the Rolandic area causes Jacksonian epilepsy, i.e. as the result of an orderly spread of impulses from the part of the precentral convolution pressed upon, there is a comparatively orderly march of spasms in the limbs represented in the gyrus. For example, if the tumour is situated in the thumb area, the spasm commences in the thumb, spreads up the arm to the face and down the side of the body and leg. This regular sequence of spread finally ends in a generalized convulsion which may be followed by temporary paralysis (Todd's paralysis). As the tumour expands and the pressure increases, the temporary hemiplegia, instead of passing away, becomes permanent.

Post-central. Disturbances of sensation and hemi-anaesthesia of the opposite side of the body occur.

Parietal. Severe interference with receptive functions of the brain of a complex type. Loss of ability to retain names, loss of capacity to use ordinary grammar ('jargon' aphasia) are the usual signs. The patient's conversation becomes gibberish.

Temporal. i. Hippocampal. Dreamy states, hallucinations of taste and smell ('uncinate' fits).

ii. Lateral part of the lobe. Word-deafness and hallucinations of hearing.

Occipital. Word blindness. Disturbances or blindness in various parts of the fields of vision as ascertained by retinoscopy.

Cerebellar. Nystagmus, clumsy movements of the same side of the body, falling to the same side, inco-ordination of muscles and speech disturbances. A type of tumour growing from the auditory nerve (acoustic neuroma), gives rise, in addition, to gradually increasing deafness and tinnitus (noises in the head).

The diagnosis of cerebral tumour is often difficult because of the close resemblance of many of its symptoms to those of neuroses, and depends on:

i. General signs and symptoms as already described.

ii. Where there is a pituitary tumour x-ray may show enlargement of the sella turcica and atrophy of the clinoid processes. It may also show atrophy of the inner table of the skull ('finger-printing') which is the result of prolonged increased intracranial tension.

iii. Ventriculography is the term applied to a procedure during which air is injected into the cerebral ventricles through trephine holes in the skull, and an x-ray picture taken subsequently. The photograph may show displacement of a ventricle by the injected air. If air is introduced through a lumbar puncture opening, the method is called encephalography.

iv. A recent development, electro-encephalography, assists diagnosis by electrical means. Electrodes placed on the skull detect minute quantities of electricity produced by brain action. These tiny currents are then magnified by valves and photographed. The picture obtained takes the form of waves, and abnormally slow waves are indicative of cerebral

damage. Thus, by shifting the electrodes about over the skull, it may be possible to discover areas of diseased brain.

v. Lumbar puncture may show that the cerebrospinal fluid is under pressure. The fluid may contain an excess of protein. The operation must be carried out with great care as sudden release of fluid may compress the medulla into the foramen magnum in the form of a cone, causing instantaneous death. However, with suitable precautions some cerebrospinal fluid can be withdrawn for analysis.

Treatment. Treatment is surgical.

Before operation. Abnormalities of any kind should be recorded, especially convulsions, twitchings of limbs or alterations in speech. The quality of the pulse should be noted. With regard to the mental state personality changes frequently occur and should be reported. Intravenous injections of hypertonic saline produce temporary shrinking of the brain with some relief of symptoms.

Operative. Operation consists of removing a flap of bone from the skull, a procedure known as decompression. The relief of pressure thus produced permits the brain to expand bringing about a cessation of headache and sickness. This measure also spares the eyesight; for papilloedema eventually leads to optic atrophy and blindness if unrelieved.

If the tumour is accessible and operable it is then removed. However, where operation is not possible or the growth cannot be located, or if it is a secondary deposit from a malignant growth elsewhere which has invaded the skull, decompression is all that can be done.

After operation. The cerebral swelling must be protected from injury. Dressings should be inspected frequently for oozing of blood. The bowels must be kept active by means of saline washouts or Epsom salts. 'Salts' not only act as an aperient but help to relieve headache because they withdraw water from all tissues including the brain. Food is given in small quantities frequently. Above all, the maintenance of a cheerful attitude and atmosphere is important, for the death rate is very high owing to the nature of the complaint and the present limitations of surgery.

B. NEW GROWTHS OF THE SPINAL CORD

These may be classified as follows:

a. Extramedullary. Those which grow from the meninges of the cord.

b. Intramedullary. These are tumours which arise from the cord substance itself.

c. Secondary deposits. Although not strictly new growths, lymphadenomatous (Hodgkin's) tissue, cysts of worms (cysticercosis) and secondary carcinomatous tumours are deposited in the spine.

The symptoms presented are those due to pressure on the cord and its tracts and vary with the site of the tumour. As a general rule extramedullary tumours cause more pain than those in the body of the cord. At the level of the tumour there are often 'root' or 'girdle' pains. Below

the level the signs are those of incomplete severence of the cord; hence the pyramidal and long sensory tracts are affected early. The symptoms are those of a gradually deepening spastic paraplegia with exaggerated plantar responses. Sphincter disturbances occur and sensation is diminished in the districts below the level of the lesion. A tumour growing in the lowest parts of the spinal cord may completely paralyse bladder, rectal and sexual functions.

The diagnosis is made by:

i. Clinical methods which estimate the highest level of sensory loss taken in conjunction with the other signs present.

ii. Radiography after lipiodol injection. Lipiodol (iodine-containing oil) is injected into the spinal theca well above the approximate site of the tumour. This substance is opaque to x-rays so that a picture will clearly show the point at which it is held up.

iii. Lumbar puncture, which obtains a yellowish cerebrospinal fluid containing an excess of protein but no cells.

Treatment. Most spinal tumours other than secondary deposits lend themselves readily to surgical removal and the results are very often good. Nursing must be carried out on an air- or water-bed. The bowels and bladder require supervision as following operation, incontinence of the sphincters is likely to be present for some weeks. Catheterization may be necessary, and if so, strict asepsis must be observed. Careful note should be kept of any of the patient's comments as to loss of power, sensory disturbances or twitchings of the limbs.

At a later stage, gentle massage, movements, heat and constant current may be applied to maintain the tone of limb muscles. To facilitate complete recovery, the patient should be encouraged to exercise his limbs actively.

4. HEREDITARY AND OTHER DISEASES OF OBSCURE CAUSATION

Chorea. Although chorea should strictly be classified with the acute inflammatory diseases of the brain its causation is still obscure. It is a disease of children and has a definite association with acute rheumatic fever. In fact the disease has been called 'acute rheumatism of the brain'.

The illness emerges insidiously and the child is first noticed to lack proper muscular co-ordination. It tends to drop objects from its hands and spends most of its waking life in making irregular movements of the face, body and limbs, such as smacking noises with the lips, shrugging of the shoulders, involuntary movements of the hands and twitchings in other parts. General restlessness, irritability and emotional instability combined with the movements tend to exhaustion if unchecked. Often there is an associated rheumatic involvement of the heart and murmurs

at the mitral valve are very common. The disease process may continue for periods up to three months before it subsides but the death-rate is very low. Another peculiarity of this illness is that it often selects intelligent children as its victims.

Treatment. All children suffering from chorea should be kept in bed for a minimum of four weeks and much longer—up to three months—if there are cardiac complications. Excitement should be avoided by the use of a single room if possible, or with the aid of screens round the bed. When the movements are very severe it may be necessary to erect padded side pieces on the bed. It may even be more convenient to nurse the patient on a mattress placed upon the floor. The skin and pressure points require frequent attention.

Warm packs are useful to allay restlessness and in mild cases may be so effective as to render sedatives unnecessary. Salicylates are the drugs of choice, the most useful being aspirin which should be given in doses of from 5–15 grains t.d.s. In more severe cases showing marked excitement phenobarbitone gr. ½–1 may be given in addition at night. Nirvanol has been used in very severe cases. It is given twice daily in 2 grain doses until it produces toxic symptoms consisting of a rash and fever. This reaction occurs after about ten days. The use of this drug is restricted to those cases which do not respond to milder methods of treatment. The diet must be ample and easily digestible. Fluids may be given in any quantity.

As the disease subsides occupational therapy is necessary to re-educate the limbs. It should consist of drawing, painting, knitting and sewing. Convalescence must be slow with careful supervision of the heart and a gradual return to full activity.

Huntington's chorea is an hereditary disorder passed directly from parent to offspring. It is a disease of middle age characterized by the gradual emergence of uncontrollable, writhing and irregular movements (choreo-athetotic movements), which cannot be arrested by any known means. The disease is chronic, progressive and beyond remedy. In the later stages mental changes consisting of hallucinations and delusions, supervene. The end result is a profound dementia necessitating mental hospital care.

Paralysis agitans. This disease is one which afflicts elderly people and closely resembles post-encephalitic Parkinsonism. This similarity is due to the fact that the same portions of the brain, the basal ganglia, are damaged in both diseases.

The symptoms comprise a mask-like face, staring gaze, rhythmic tremors of the head, jaws, arms and legs, monotonous voice and generalized muscular rigidity. The gait is peculiar or festinant and is described as though the patient 'were chasing his own centre of gravity'. When walking he tends to run forward with increasing speed (propulsion). Similarly, if pushed backwards he continues in that direction (retropulsion). The tremors cease temporarily on voluntary movement.

Treatment. There is no known remedy. Some measure of relief from tremor is obtained by the administration of hyoscine hydrobromide in increasing doses. Vitamin B6 is said to be of value. Constant current electrical baths occasionally afford some diminution of the rigidity. In the later stages patients are very dependent and need assistance in dressing and performing every bodily function. Such sufferers should be kept as fully occupied as possible with such handwork as they are able to carry out. Full employment in interesting tasks serves to alleviate to some extent the querulous depression invariably associated with this ailment.

Subacute combined degeneration of the spinal cord. This disease is part of a complex metabolic disorder involving both the blood and the nervous system. Essentially, it consists of pernicious anaemia, sclerosis of the posterior and lateral columns of the cord and in some cases, mental changes. On account of degeneration of the pyramidal tract (lateral white column) and the sensory tracts of Goll and Burdach (posterior white column), the symptoms presented are a mixture of upper motor neuron and sensory disturbances. The gait may be both spastic and ataxic, sensations of pins and needles in the hands and feet are common, and there may be diminished sensation to touch and pin-prick of the 'glove and stocking' type in the arms and legs.

The blood changes are those of a primary or pernicious anaemia so that pallor of the mucous membranes, inflammation of the tongue and a lemon-yellow skin colouration are the usual accompaniments. Gastric analysis demonstrates a complete absence of hydrochloric acid in the gastric juice.

Mental disturbances take the form of querulous depression or delusional and hypochondriacal trends. The disease tends to be progressive and the outlook is always doubtful although intensive treatment with modern remedies does appear to arrest the trouble at times.

Treatment. Treatment is primarily directed towards the basic blood disorder and is best carried out by means of regular intramuscular injections of liver extract. The exact dosage of this substance is controlled by repeated blood counts. Large doses of iron preparations up to 75 grains t.d.s. are said to be beneficial. In addition, a generous diet is called for, its digestion being assisted by the administration of weak hydrochloric acid solution (m.X—XV. t.d.s. p.c.). Simple mouth-washes are of assistance in clearing up glossitis if present. Local treatment consists of radiant heat and gentle massage to the limbs.

Migraine. Migraine is a curious episodic disorder with definite hereditary tendencies. In its classical form it is characterized by attacks of one-sided headache (hemicrania) with visual disturbances and vomiting.

It usually commences during adolescence and persists for many years although, as a rule, attacks tend to diminish both in frequency and intensity in later life. Its victims are nearly always intelligent people of

the professional classes, and investigation often reveals a nervous temperamental background. Migraine is consequently often associated with neurosis, a statement borne out by the fact that attacks are often precipitated or aggravated by worry and anxiety.

The cause is as yet unknown but it is thought to be due to spasm of the cerebral vessels. Some believe that migraine is allied to epilepsy and others hold that it is an allergic disease.

A typical attack is often preceded by an unusual feeling of well-being. It commences with the appearance of a dark spot before the eyes which then breaks into wavy lines tinged with all the colours of the spectrum. The lines zig-zag across the field of vision. Sometimes the colours are absent but one-half of the visual field is blacked out. The sight becomes blurred and there is difficulty in reading or examining instruments. At the same time severe one-sided headache sets in which is associated with a marked dislike of light (photophobia). Then follows a period of nausea and vomiting. This condition may persist for several hours, finally passing off completely if the patient can get to sleep.

Other types of migraine may be associated with temporary cranial nerve paralyses. In the ophthalmoplegic variety, each attack is accompanied by drooping of an eyelid (ptosis) and contraction of the pupil. Yet another variety is characterized by attacks of speechlessness or dysarthria. Weakness on one side of the body may occur or tinglings in an arm may be experienced.

Migraine must be carefully distinguished from intracerebral growths and from neurosis both of which may present similar symptoms.

Treatment. Migraine is an intractable disorder and treatment is therefore difficult and uncertain. Occasionally, a hypodermic injection of ergotamine tartrate (½ mg.) brings about sudden and dramatic relief and should be tried in all severe cases. During the attack the patient should retire to bed in a darkened room. Ordinary analgesics such as aspirin sometimes help. A dose of brandy is occasionally of value. Inhalations of pure oxygen have cut short a particularly stubborn attack. Gower's mixture containing bromide, strychnine and gelsemium has for long borne a reputation as a useful form of treatment. Some authorities prescribe small doses of phenobarbitone or phenytoin sodium for regular use in minimizing or warding off attacks. Other treatments include magnesium sulphate, 2–4 drachms of a 50 per cent solution, carbachol 2–6 tablets daily and even antihistamine drugs such as Phenergan 10 mg., t.d.s., where an allergic element is suspected.

As regards general measures, the sufferer should modify his life so as to avoid physical and mental stress as far as possible. Septic foci should be eliminated. Benefit may result from the correction of refractive errors by means of suitable spectacles. Finally, psychotherapy aimed at the removal of worries, anxieties and preoccupations is very valuable. It might remove sources of irritation hereby lengthening the intervals between attacks and perhaps lessening their severity.

Epilepsy. Epilepsy is another episodic disorder but as it has so many psychological implications it will be dealt with in the psychiatric section. One form of it, namely, Jacksonian epilepsy, has already been encountered as it is often caused by injuries or tumours affecting some part of the pre-central convolution and hence the pyramidal tract. However, idiopathic (causeless, of unknown origin) Jacksonian epilepsy does occur and is treated in the same way as the more usual variety.

Narcolepsy. Narcolepsy describes a condition in which attacks of irresistible sleep occur. It is caused by cerebral tumours and other intracranial diseases, it may be hysterical in origin, or it may be a symptom of the post-encephalitic syndrome. The sleep is described by patients, particularly those suffering from Parkinsonism, as unrefreshing, and it may last from several minutes to as many as thirty-six hours.

Treatment. Treatment depends upon the cause. Intracranial disease must receive attention. Hysterical narcolepsy yields to psychotherapy, and some improvement can be obtained in the post-encephalitic types with benzedrine, ephedrine and belladonna.

Cataplexy. Cataplexy is a condition marked by attacks of absolute powerlessness. Attacks may be brought on by any strong emotion especially laughter. The victim falls to the ground in a state of total muscular paralysis which may last for a variable time. Ephedrine is sometimes of value in this condition.

Pyknolepsy. Pyknolepsy is a disorder of children in which attacks resembling minor epilepsy occur. In fact the distinction between the two diseases is extremely difficult. The attacks are very slight and literally scores may be recorded in any one day. Each attack consists of a sudden momentary loss of consciousness, rigid immobility and fixation of the gaze. The eyes sometimes deviate to one side or another. The cause is unknown but it is possible that electro-encephalography may throw some light thereon in the near future. There is no treatment whatever, all the usual analeptic drugs such as bromide and phenobarbitone leaving the condition quite unaffected. If correctly diagnosed the promise of a complete cure at the age of puberty can safely be held out.

5. VASCULAR DISORDERS

I. ARTERIOSCLEROSIS OF THE BRAIN

Cerebral arteriosclerosis may exist by itself or may be part of a generalized arteriosclerotic process (hyperpiesia). As regards causation, hereditary factors play some part but it is more than likely that worry and anxiety lie in the background of many cases. Anxious tension is often responsible for emotional rises in blood pressure with consequent extra strain upon the cardiovascular system. The extra work thus imposed upon the arteries leads eventually to hardening of the vessels, narrowing of their channels and permanent elevation of the blood pres-

sure. There are, however, exceptional cases wherein arterial rigidity exists together with a normal or subnormal blood pressure.

A large number of the smaller arteries of the brain are end arteries, which signifies that anastomoses in the cerebrum are neither so rich nor so profuse as those elsewhere, if they exist at all. The consequence is that arterial disease in cerebral tissue produces more serious effects than in other situations. A portion of brain insufficiently nourished because of a poor blood supply tends to degenerate as there are no means of establishing a collateral circulation. It is on this account too that intravenous antisyphilitic drugs fail in their purpose when given in general paralysis; for in this disorder the spirochaete actually obtains lodgement in the substance of the brain.

Cerebral arteriosclerosis then leads to failure of nutrition of the brain cells. It arises usually in the late fifties at a time of life when the powers of recovery are diminishing in vigour. The onset is insidious and commences with headache, giddiness, tinnitus, irritability, and impairment of memory and concentration. Personality changes gradually develop, the prominent symptoms of which are periods of confusion, aimless wandering, childishness and emotional instability. The patient may retain vivid memories of the remote past but readily forgets recent happenings. He makes errors of recognition, misplaces articles and may in consequence accuse those around him of stealing. His personal habits may become faulty. There is also a liability to fainting attacks, epileptiform seizures and strokes.

Actually the outlook is not quite so gloomy as was once considered. Nevertheless, a number of such patients continue to deteriorate and eventually lapse into a state of profound mindlessness.

Treatment. Patients must be withdrawn from their occupation and rested. Attention should be paid to their general health. Dietetic restrictions as regards meat, heavy foods and alcohol must be imposed. It is necessary to exercise tact in the care and management of irascible arteriosclerotics. They should be provided with interesting tasks which make no severe demands on thought and concentration. Sedatives such as bromide and barbitone will allay irritable restlessness and promote sound sleep. Under such conditions confusion may clear up and quite a number of patients may be restored to gainful work of a non-strenuous kind.

The more severe forms of cerebral arteriosclerosis demonstrating gross mental changes and faultiness of habits are best cared for in mental hospitals where adequate nursing supervision is available.

II. CEREBRAL HAEMORRHAGE

Arteriosclerosis of the brain renders sufferers prone to intracranial vascular disasters. Under the influence of sudden strenuous exertion, excitement or intense emotion, hardened cerebral vessels may rupture

into the brain. If the bleeding is of any severity the brain tissue is torn up and the haemorrhage may burst into the ventricles. Death is then almost instantaneous. Where there is no immediate fatal issue the patient passes rapidly into coma exhibiting stertorous breathing, a flushed face and a slow, full and bounding pulse. The vessel most commonly affected is the branch of the left middle cerebral which supplies the internal capsule. In this situation are concentrated most of the pyramidal fibres sweeping into it from the pre-central convolution. If ploughed up by haemorrhage the resulting disturbance is a right hemiplegia with perhaps hemi-anaesthesia and dysarthria (motor aphasia, i.e. paralysis of the speech muscles). The tendon reflexes are at first unobtainable and the paralysis, if the patient survives, is flaccid. Later, as shock passes off, the reflexes return in an exaggerated form with clonus, spasticity and an extensor plantar response. Speech becomes an incoherent mumble; for whilst the victim knows what he wants to say he cannot say it. Dysarthria is due to interference with the pyramidal path from the motor speech centre situated in the left pre-central and lower frontal part of the motor cortex in right-handed individuals.

Convalescence is established gradually but the hemiplegia remains as a permanent residual feature. The face, with the exception of the forehead, droops, the arm is adducted and flexed at the wrist and elbow, whilst the leg is extended and carried stiffly. It is swung out when walking so that the foot may clear the ground. This movement is not always successful so that the foot tends to drag. The limbs are spastic (rigid), and whilst coarse movements at the large joints are possible all the finer functions are lost.

Treatment. At first, absolute rest on an air- or water-mattress is essential. Sedatives may be necessary to control restlessness. Attention should be given to the hygiene of the mouth and also to sphincter activity. The skin and pressure points should receive special care.

Later, massage, heat and constant current may be applied to the affected limbs. A certain amount of improvement may be expected but the outlook as to restoration of useful movement is poor.

III. SUBARACHNOID HAEMORRHAGE

Bleeding into the subarachnoid space may be caused by:

Head injury; arteriosclerosis; severe anaemia and other blood diseases; rupture of a cerebral aneurysm.

1. The causation in head injury is obvious enough and has already been described under that heading.

2. Strains, muscular exertion and trifling injuries may result in subarachnoid bleeding where arteriosclerosis has led to the hardening and weakening of cerebral vessels. Sometimes the haemorrhage may be spontaneous.

3. Some blood diseases allow bleeding into the subarachnoid spaces.

4. Aneurysms of the cerebral arteries are usually due to expansion of the vessels brought about by weakening of congenitally deficient arterial walls. They generally arise at a branching point in the circle of Willis.

Arteriosclerosis may also enfeeble the vessel walls to a point when aneurysmal dilatation will occur. Septic material detached from a friable cardiac valve during the course of infective endocarditis may lodge in a cerebral artery and set up therein a septic process leading to aneurysm formation.

The symptoms of subarachnoid haemorrhage are thus complicated by those of the underlying disease. Whatever the cause there is a sudden onset of headache, giddiness, vomiting and pain in the neck and back. Sometimes pains are experienced even lower down, for the exuded blood travels via the base of the brain into the posterior fossa and may find its way down the spinal cord as far as the cauda equina. Unconsciousness may be present at times and there may be mental confusion and even hallucinations. A moderate Kernig's sign suggests meningitis. Paralyses of cranial nerves such as diplopia, pupil changes and facial weakness are often associated signs. Occasionally, the temperature rises suddenly and if the haemorrhage has occurred in the pontine region the temperature may reach hyperpyrexial heights. The pulse is slow and the reflexes are sluggish. Examination of the cerebrospinal fluid reveals the presence of blood and excess of protein.

Treatment. Treatment resolves itself into complete rest, sedatives to control restlessness and delirium, and careful spinal drainage. The underlying cause must receive appropriate attention.

IV. CEREBRAL THROMBOSIS

Cerebral thrombosis is a process in which the arteries of the brain become occluded by clotting. Arteriosclerosis and syphilitic atheroma are the usual causes because they bring about progressive narrowing of arterial channels to the point of total obliteration.

As in cerebral haemorrhage the customary site of such occlusion is the artery supplying the internal capsule.

The onset is slow and may be preceded by preliminary tinglings in the hand or foot or both on one side of the body. Headache and giddiness are complained of. There may be mental confusion. As a rule the blood pressure is on the low side and the final thrombosis may occur when the patient is completely at rest, i.e. when the heart rate is at its slowest and the blood pressure insufficient to force blood past the last obstruction. The symptoms which result depend upon the situation of the thrombosis but usually take a hemiplegic form with associated hemi-anaesthesia and dysarthria. In syphilitic cases the paralysis may be restricted to one arm (monoplegia). As in all other types of upper motor neuron disease, the cutaneous reflexes are abolished, the tendon reflexes exaggerated, the plantar reflex is extensor and the paralysis is spastic.

Treatment. Treatment comprises rest in bed, stimulants to increase the force of the heart-beat and sedatives to control restlessness and confusion, particularly in elderly people. Where the underlying cause is syphilitic the appropriate remedies must be administered. Such cases do best of all and satisfactory results may be expected and obtained. Weak and debilitated patients do not respond very well, however, and in them the thrombosis may spread to other vessels with an ultimate fatal issue.

In favourable cases a fair amount of recovery may follow general and local treatment. Massage, exercises and constant current are of value. Some residual disabilities must nevertheless be expected, especially where speech has been affected.

V. CEREBRAL EMBOLISM

Cerebral embolism or infarction is due to the sudden blocking of a cerebral artery by a fragment of clot or tissue which becomes detached elsewhere and passes into the general circulation. The fragment may come from a clot which has formed in the left auricle or auricular appendage of the heart. It may also be derived from the vegetations deposited on the mitral or aortic valves in mitral or aortic disease. Again, it may come from a lung abscess. Furthermore, if the cardiac disorder is an infective endocarditis the fragment may contain bacteria so that infection is carried to the brain in the form of a septic embolus.

The onset of cerebral embolism is dramatically sudden with immediate unconsciousness and hemiplegia. Later, with recovery of consciousness and absorption of some of the oedema which has contributed to the widespread nature of the symptoms, the embolus shrivels and recedes to some extent. A degree of improvement then follows but the paralysis is permanent. A septic embolism however brings about a uniformly fatal termination, for a cerebral abscess may form around the site of the occlusion, or a blood vessel may be eroded with subsequent extensive cerebral haemorrhage.

Treatment. Absolute rest and careful nursing may serve to minimize the effects of the disaster. Appropriate remedies must be applied to the underlying disease. Nursing comprises diligent attention to the skin, pressure points, bowels and bladder. The paralysed limbs must be splinted to avoid contractures. If recovery from the initial paralysis is to take place it will occur after about two months. Local treatment may then be commenced and may result in a surprising amount of improvement. It consists of massage, heat, electricity and exercises designed to improve the function of the limbs. To be of real value it must be kept up for some years with special emphasis on the exercises.

VI. SINUS THROMBOSIS

The large venous sinuses of the brain are sometimes involved in infective processes and may become thrombosed.

The cavernous sinus situated in the pituitary district may be affected with resulting paralysis of eye muscles, protrusion of the eyes and oedema of the eyelids. Treatment is surgical.

The superior longitudinal sinus running in the superior longitudinal fissure of the brain may become thrombosed with consequent severe and extensive paralyses. The outcome is usually fatal.

The lateral sinus in the mastoid district is liable to infection from boils on the face or scalp, inner ear or mastoid disease. The treatment is surgical.

Additionally. As all nervous diseases are likely to be prolonged and involve lengthy periods in hospital it is quite understandable that worry, introspection, boredom and querulousness are the likeliest mental accompaniments.

To counteract these tendencies it is necessary to provide a cheerful atmosphere, recreations and occupations of all sorts. Occupations must be so directed as to be congenial to each individual. The long hours in bed will otherwise allow much time for morbid reflection and gloomy anticipation. Only by careful adaptation of interests to the individual peculiarities of each patient can the best results be obtained and a wholesome outlook created. This subject will be dealt with in more detail in the psychiatric section.

CHAPTER III

THE MIND

The source from which mind springs is still obscure. By some it is regarded as a secretion of brain cells. There are many other theories, none of them satisfactory. All that can be said at present is that for every thought there must be a corresponding cerebral process. Obviously mind and brain must be intimately related because personality changes and disorders of thinking invariably accompany organic cerebral diseases. Indeed, certain mental disorders reveal characteristic cerebral changes demonstrable both to the naked eye and under the microscope.

However, there are many forms of mental disturbance in which no abnormality of cerebral structure can be detected. Recently, a more delicate method of investigation has been devised which records the minute electrical currents produced by cerebral functioning. Much research is being done, and it is hoped that this new instrument, the electroencephalograph, will help to shed light on much that has so far baffled the neuropsychiatrists.

The relationship between mind and body must next be considered. These two aspects of human existence cannot be regarded as independent features. Rather are they interdependent inasmuch as bodily well-being depends largely upon healthy thinking. Conversely, good physical health contributes to a normal outlook on life. For example, it is a matter of common knowledge that depression and anxiety cause failure of appetite, loss of weight and many other bodily irregularities. Similarly, illnesses such as influenza, jaundice, gout and dyspepsia give rise to depression, irritability and ill-temper.

ELEMENTARY MEDICAL PSYCHOLOGY

Psychology has been defined as the study of the mind and its processes. It has also been called the science of behaviour. The mind is a complex phenomenon deriving its energy from elementary forces or instincts. Instincts are inborn action patterns shaped by heredity and racial modes of living. Instinctive modes of behaviour are astonishing in their delicacy, preparedness and refinement of detail. For example, the newly hatched chick commences to peck at food substances immediately upon emergence from its shell. It is able to distinguish at once between edible and poisonous insects. Similarly, the human infant is equipped at birth with a number of inborn tendencies which are primitive in nature, which emerge in clearer form during growth and development, and which be-

come modified under the influence of growing intelligence in response to the demands of the environment. Instincts are characterized by three primary features which can be incorporated in a single definition. This definition states that an instinct is an inborn tendency to perceive objects of a certain class, to experience a particular emotion in their presence, and to react in a certain prescribed manner. Fear, for instance, illustrates instinctive activity very well. A frightening object is perceived. It induces a sensation of fear with an immediate desire to escape. In technical language, cognition identifies the object, affection describes the emotion, and conation is the scientific term for the tendency to action, in this case the desire to run away. Thus cognition, affection and conation are the basic properties of instinctive life and hence of thinking in general. For the sake of simplicity instincts can be grouped under three major headings:

1. Self preservation

a. Flight with its emotion of fear. Fear is a very strong feeling easily recognized as universally present. It powerfully reinforces the activities of the sympathetic nervous system as described on p. 44, and brings in its train a number of physical disturbances so well known. These include pallor, dilation of the pupils, 'goose-flesh', dryness of the mouth, cold and clammy sweating, palpitation of the heart, flatulence, frequency of micturition, and sometimes diarrhoea. Most examination candidates recognize these phenomena which occur to an even greater extent under other circumstances, for example, important interviews, unpleasant sights and frightening experiences.

Fear, with its tendency to run away from danger, is of biological importance; for in its absence there could be no awareness of dangerous situations. Consequently, the whole of the animal world, including man, would rapidly become extinct. The instinct of flight is seen at its most intense in those of a naturally timid disposition. It is also evoked by obstacles too difficult to surmount, or where the individual is too weak in weapons natural or manufactured. Survival is therefore its ultimate goal.

However, under the complicated conditions of modern life it is neither possible nor, in fact, desirable that instinctive promptings should be obeyed immediately. Situations exist, for instance, in times of war, when conscious control must be exercised over the desire to escape from danger. Conflict between two powerful but opposing trends is thus engendered which may become the starting point for the development of neurosis.

b. Pugnacity and its emotion of anger includes aggressiveness and implies an ability to fight in order to survive. It is enhanced by natural strength and the possession of potent weapons such as teeth and claws in the animal world, and anything from the knife to the atomic bomb in the man-made array of destructive instruments. In children it is manifested in games with toy guns, swords and lead soldiers. In adult life it

evidences itself indirectly in such sports as boxing and competitive games. When over-developed, as it so often is, war is the inevitable outcome.

c. Food-seeking with its organic sensation of hunger is again a power-driving force normally directed into such activities as hunting, fishing, agriculture, and by extension into barter, trade and business of every description. Under less happy conditions, hunger has in the past provoked wars, mutinies, revolutions and other horrors. Famine takes no heed of conventions, social structures, morality or other features of civilization but gives rise to every variety of crime in the calendar not excluding murder. Thus, the medical psychologist has become almost too painfully aware of the nature and intensity of the components of the self-preservative tendencies.

2. The reproductive instinct. This is another extremely strong inborn urge concerned with the perpetuation of all living creatures. It is a complex function including not only the sexual act but also the manifestations of attractions between the sexes, marital partnerships and parenthood. Its emotions are likewise complex and comprise all that is implied in lust, love, affection, parental tenderness and family life. In children its beginnings are observed in games with dolls and other articles representative of home building. During the course of growth and development some of its energy is diverted into the arts, music; dancing, literature and the care of animals. This redirection is especially marked during the earlier stages of young adult life when the sexual instinct must of necessity be denied free and direct expression, and again towards the middle years following sexual frustration.

3. The herd or gregarious tendency—which includes all those features of behaviour and conduct labelled as social. Mankind gathers together in armies, clubs, societies and associations of all kinds for pleasure, amusement, mutual protection, collective security and defence, for government administration and for a hundred and one other reasons. Man is generally speaking happy in the society of his fellows and fearful when alone or cut off from their society. It is only in some types of mental disorder that he becomes solitary.

The advantages of the social instinct are very many. Guided by it, tribes, clans, and nations can devise rules, laws and codes for the proper and orderly conduct of each individual. If not for such regulations life would be chaotic and characterized by all kinds of anti-social behaviour. Thus, this instinct plays upon universally present fear to ensure socially acceptable behaviour.

In one sense then, the herd instinct tends to act as a controlling force upon the other instincts; for amongst modern communities it is obviously impossible to allow free rein to all the inborn desires.

In general, modern methods of athletic and other expression help to dissipate the energies of all the instincts in a harmless and often laudable manner. However, this is to some extent being opposed by the

modern tendency to passive acceptance of one of the so-called visual arts, television, the impact of which is likely to be immense and perhaps unpredictable.

In a complex civilization such as ours thwarting of instincts often leads to inhibition of activity without a simultaneous reduction of the accompanying emotions. Nowadays, therefore, excessive arousal of fear, anger and sexual feelings without corresponding release, has proved injurious to some types of constitution.

The instincts of self, sex and society have other functions besides the provision of mental energy. From all the stimuli which fall on the nervous system throughout waking life, the instincts select those that shall receive attention. All other impulses are rejected with a consequent reduction in the expenditure of nervous energy. Put rather differently, topics which appeal to the instincts arouse interest. Interesting material evokes spontaneous attention whereas 'dry' subjects require voluntary attention necessitating effort.

Growth of the mind. The new-born child only experiences sensations. As it develops it explores its environment seeking pleasurable activities and avoiding painful ones. During this process, sensations acquire meaning. Some of them become linked with satisfaction, others with displeasure. During their repetition they leave memory traces on the mind which can now be termed perceptions. To perceive is therefore not only to sense but also to understand.

At a later stage the mind develops the function of imagination, i.e. images can be conjured up in the mind. Objects once sensed, can thus be thought of in their absence. By easy stages, images can be imagined consecutively in the form of trains of ideas. At the highest level of thought the mind can think of abstract topics such as justice, beauty, love, splendour and eternity.

Association of ideas. Events which occur together or which follow closely upon each other tend to be linked together and remembered together. The strength of the linkage depends upon the amount of emotion aroused, being particularly powerful where instinctive urges have been aroused. For example, a sick child may, because of sickness, reject a certain type of food. For a long time after recovery, the sight of this particular food may revive a feeling of nausea. This is an important principle which has considerable bearing on the development of likes, dislikes and neurotic mechanisms.

Memory. Memorizing consists of several processes:

a. *Registration.* This process is either active or passive. During waking life experiences are passively recorded in the mind as memory traces, some of which are deeper than others depending on the extent to which the emotions have been stirred. Vivid experiences are much more readily recorded than the ordinary humdrum events of life and tend to be recalled more easily except under certain pathological conditions which belong to abnormal psychology.

The active process of registration implies the committing to memory of material as, for example, that contained in textbooks. It implies an effort of voluntary attention.

b. *Retentiveness.* The ability to retain impressions and material which has been registered is probably inborn and cannot be improved by training. Some minds are exceptionally retentive and memory traces are laid down therein as though carved in stone. Other types of mentality are either incapable of retention or retain impressions for very short periods as though the traces had been made in sand, liable to be swept away very easily.

Recall. It is not enough to retain memory traces. Clearly, the essence of memory is the ability to recall accurately and quickly what has been registered and retained. Recall, then, is a revival of past experience. A good memory is capable of recalling events with almost as vivid and intense a colouring as the original experience.

Recall is interfered with by strong emotions. It is a matter of common knowledge that circumstances which are powerfully coloured by emotion, in particular, fear or anxiety, serve to hinder the process of remembering. An examination candidate may have learned a particular subject thoroughly and would under normal circumstances be capable of giving chapter and verse in response to questions. But the mere fact of being confronted with an examiner, for instance, in an oral test, serves in some cases to arouse excessive fear and diffidence with consequent temporary paralysis of recall.

Some types of painful experience, although perfectly well registered, undergo active removal from the mind and can only be remembered under special conditions. This topic, however, belongs to abnormal psychology.

Recognition. What is recalled must be recognized as identical with that which has occurred previously. Recognition, therefore, implies a sense of familiarity, and this involves a judgment of sameness.

The possession of a good memory means that the owner has a well-organized mind.

Of the memory processes described, recall is the only one which can be improved by training; and training involves concentrated voluntary attention. Similarly, memorizing is disturbed by distractions, noise, ill health, worry and other emotional upsets.

Committing to memory. In memorizing it is better to learn a set piece as a whole than in fragments. A general idea of the complete subject is thus obtained and it becomes much easier to fill in the details during subsequent readings. It is important thoroughly to grasp the meaning of the topic so as to establish logical connections between its parts.

The process is further assisted by reading aloud so that memory traces are also laid down in the paths between the ear and the brain. In addition, the mind also records impressions of the manner in which the larynx has operated to produce the sounds. Simultaneous writing of

short notes also helps by reinforcing visual images and establishing the muscular impressions involved in writing.

All these aids to memorizing open up many more channels in the mind than just reading silently. Thus, remembering can be greatly assisted because of the increased number of available avenues of approach, auditory, visual and kinaesthetic (muscle sense).

Belief. This is an important topic upon which much of daily life is founded. An individual is guided by his beliefs to most of which he clings firmly. Religious and other strong beliefs are formed in childhood and are mostly unamenable to argument because they have become part of the mental structure by the time maturity has been attained. There are a number of methods by which beliefs are acquired.

a. *By perception*—'seeing is believing'. Everything that is sensed must exist.

b. *By suggestion or instruction.* Beliefs may be instilled by teaching, suggestion, advertisement and propaganda. Authoritative statements are readily believed by the timid, the gullible and the credulous. Much of modern business methods and salesmanship are founded on suggestion as manifested in clever advertising. Suggestion can be a valuable aid to medical treatment particularly where organic disease is absent.

Doubt. Doubt is a state of uncertainty and indecision. It is often accompanied by mild anxiety, restlessness and inability to proceed. It is converted into belief by judgment which is a process whereby conflicting propositions are examined and one is selected on a basis of reasoning

Sentiments. Mental structure does not remain stationary. It expands as a result of experience and its growth is largely due to the laying down of memory traces or dispositions. When such memory traces are gathered around a particular object and held together by an emotion common to them all, a sentiment is formed. For example, dispositions are laid down by religious instruction around the central idea of God. The common emotion is awe. This is a religious sentiment. The universal sentiment of love is another good illustration. Herein thoughts are clustered round the image of the loved one and may consist of appearance, colouring, dress, perfume and mannerisms all united by a pleasurable emotion. Again, sentiments are built up in connection with music, painting and writing. These are termed 'aesthetic'. Sentiments remain as permanent features of the mind and are at all times fully conscious.

Temperament. Temperament refers to the habitual outlook of a person which results from the influence upon the mind of several factors largely related to bodily functions.

a. The chemical, physical and physiological processes of the body including digestion and other visceral functions somewhat vaguely appreciated as organic sensations (coenaesthesia). Endocrine activities also exert a profound influence upon mental life and doubtless assist materially in shaping and determining individual temperaments. For

example, persistent oversecretion of the thyroid gland renders a person habitually nervous, excitable and apprehensive. In contrast, thyroid deficiency brings about a state of mental dullness, sluggishness and torpor.

b. The degree of introversion or extraversion. These are terms applied to two opposed *attitudes* of mind.

An **introvert** is constitutionally a thoughtful person who relies largely upon his own resources for occupation, amusement and interest. He is cool, thoughtful, reflective, deliberate and averse from revealing any emotion on the surface. Difficult to know and understand, he is aloof and often regarded as unfriendly. He thinks before he acts, a useful characteristic which might be generally welcomed. A poor mixer, he lives a rich inner mental life which he furnishes with his own imaginings.

Extreme degrees of introversion lead to a severe restriction of all activity and withdrawal from reality, a condition seen at its most intense in schizophrenic disorders.

The **extravert** on the other hand, displays completely contrasting trends. He is gay, cheerful, sociable, optimistic and is able to make human contacts readily. He is 'clubbable' and is in every sense a 'doer' rather than a thinker. His activities are sometimes characterized by impulsiveness. Disliking his own company, he is almost entirely governed by his surroundings, for he has few personal resources upon which to call. At times, he may exhibit mood-swings, i.e. he may alternate rapidly between cheerfulness and dejection. In extreme cases he may be pathologically excited, i.e. maniacal, or alternatively excessively depressed and probably suicidal.

Normally, temperament is inborn and fixed for each individual, but it may be temporarily modified by drugs, drink or toxins. For example, a pessimistic outlook may be momentarily relieved by alcohol. It is for the time being converted into one which is less gloomy, less critical and less misanthropic. However, a return to habitual gloom occurs when the effects of alcohol wear off. In fact, the depression may even be intensified. By the same token influenza, jaundice, pharyngitis, gout and dyspepsia are notoriously concerned with the production of depression, irritability and bad temper.

Temperamental types. From earliest times attempts have been made to classify temperaments. The older psychologists soon discovered contrasts such as active and sluggish, tender and tough. Later, humans were grouped as choleric (angry), sanguine (optimistic), phlegmatic (stolid) and melancholic (depressed).

More recently, Jung devised a classification based on his two primary attitudes, namely, introversion and extraversion. He suggested that in addition to these fundamental ways of looking at life there were four mental functions, viz.: *thinking, feeling, intuition* and *sensation* which thus contributed to the establishment of eight primary psychological types:

These may be described briefly as follows:

1. *Introversion.*

a. *The Thinking introvert.* This type is alleged to be cold, inclined to be mystical and to be preoccupied with impractical matters. The group is probably intended to include the typically absent-minded professor engaged in speculations upon abstruse matters.

b. *The Feeling introvert.* Outwardly cold and critical, very little feeling is expressed on the surface except in the form of mystical poetry and religiosity. At times such an individual may reveal himself as ambitious, unscrupulous, scheming and cruel with effeminate trends.

c. *The Intuitive introvert.* This group includes the prophets, seers and mystics who are sometimes unrestrained in their activities and who live by inspiration—again essentially feminine in nature.

d. *The Sensational introvert.* This is an impractical, impulsive person who is eternally 'reaching for the moon'. He is gloomy and tends to create his own gods and devils. He may display dangerous trends at times, and is often given to rites and rituals to ward off the 'evil eye', and thus may display obsessional characteristics.

2. *Extraversion.*

a. *The Thinking extravert.* Herein it is possible to find individuals who adhere rigidly to principles, 'reasonableness' and masculine logic. They are often unrelenting and intolerant at home and are looked upon as pillars of righteousness and integrity. At the same time they may be selfish and suspicious. Some types of 'hard-headed' business men are included here.

b. *The Feeling extravert.* Generally feminine types they base their judgments on their own feelings rather than upon reason and tend to conform rather rigidily to herd patterns of conduct. They may be tactless, impulsive and given to passing offensive opinions on topics outside their sphere of knowledge.

c. *The Intuitive extravert.* This group contains more women than men. It is described as containing good speculators, agents, company promoters and impulsive enthusiasts. They can 'see in a flash' but lack persistence of effort. It is said of them that they can see far in advance of thinking and so often chase after wild goose schemes. Occasionally they become subject to hypochondriacal notions and preoccupations with bodily health.

d. *The Sensational extravert.* This type, exemplified by the county squire, is entirely swayed by conventions of the 'huntin', shootin' and fishin' ' type. He is much concerned with what is and what is not done by polite society. Sociable enough, he is unable to make deep attachments. Impulsiveness is another characteristic based upon the absence of reflection and thoughtfulness.

This classification, which is still further extended in Jung's writings, has been criticized on the grounds that the types described are vague and cannot readily be identified amongst a normal population. More-

over, no attention is paid to bodily structure or the physical attributes of the human being.

In recent years a laudable attempt has been made to associate temperamental variations with characteristic bodily structures. We owe to Bleuler the use of the terms 'cycloid' and 'schizoid' and to Kretschmer the association between these attitudes and definite forms of physical build.

In the first place the cycloid corresponds roughly to the extravert. The mood here tends to be unstable and therefore **cyclothymic**. The *schizoid* on the other hand approximates to the introvert, the mood being **schizothymic** in nature.

As regards the associated physique, the cycloid is said to possess *pyknic* make-up, i.e. thickset, stockiness, whereas the schizoid temperament is aligned with tallness, slenderness, athletic build, and possibly endocrine anomalies. Thus, *asthenic*, *athletic* and *dysplastic* bodily structures have been described.

The value of these psycho-physical groupings lies in the possibility of forecasting what type of mental disturbance might emerge having regard to both temperament and physique. For example, the pyknic cycloid is much more likely to develop disorders characterized by excitement, depression or both. The schizoid individual of asthenic bodily type is, on the other hand, predisposed to schizophrenic psychoses. Such classifications may help in determining the outlook. For instance, a schizophrenic disorder developing in an individual possessing a pyknic physique is said to carry a better prognosis than a similar disorder arising in the asthenic type.

Psychological types. Kretschmer's classification of psychological types is based on the psychosomatic blendings of schizoid and cycloid temperaments with bodily construction and may be briefly described as follows:

1. *Schizoid groups* of three kinds:

a. *Anaesthetic*—including cranks, loafers, work-shys, eccentrics, prostitutes, drug addicts and other antisocial types.

b. *Mid-position*—containing some of the best citizens useful to the community such as scientists, philosophers and students.

c. *Hyperaesthetic*—consisting of haughty, touchy, hypersensitive, cultured and aristocratic individuals.

The associated physique in these groups may be asthenic ('lean and hungry'), athletic or dysplastic (showing endocrine abnormalities).

2. *Cycloid groups* of three types:

a. *Syntonic* or well balanced, solid, reliable individuals so often found in industry, big business and practical politics, fond of the fleshpots but very industrious.

b. *Phlegmatic*—stolid, bovine, imperturbable, reticent and unimaginative persons, examples of which are still to be found in agricultural and country communities.

c. *Hypomanic*—over-active, restless busybodies, boisterous, talkative

and erratic. They may sometimes be unmitigated nuisances. Examples are to be found amongst the so-called high-pressure salesmen.

The associated physique in a, b and c, is pyknic, i.e. a short, stocky, barrel-chested, thick-necked bodily formation.

As regards prophetic estimates of the probable nature of psychotic breakdowns, as has already been mentioned, schizoid soil is the likeliest material for the development of schizophrenia, whilst a cycloid temperament is potentially the background for manic-depressive psychoses. In each case the disorder on analysis proves to be a pathological exaggeration of basic tendencies.

3. *The epileptic temperament* seems to be sufficiently recognizable to be worth describing. It is characterized by religiosity, humbug, hypocrisy, querulousness and resentment of order and discipline. These traits can sometimes be detected long before an epileptic psychosis develops. The fits indicate some gross error of cerebral development with or without some sort of metabolic disorder which has so far evaded recognition.

4. *The paranoid type.* The paranoid person is a difficult, awkward individual, a 'lone wolf', suspicious, aloof, unfriendly, disgruntled and resentful of authority. Although often clever, and even sometimes brilliant, he is never contented. He never feels that the excellence of his work is receiving the credit it merits so that he frequently changes his jobs. Quarrelsomeness, touchiness, and angularity of character make him unfitted for communal life and a difficult person with whom to get on. His constant fear is that he is being 'put upon' or done down. In extreme cases he may progress gradually into a chronic delusional state which requires permanent supervision.

5. *The neurotic type.* a. Hysterics are emotionally immature people who are avid of notice, who are at all times over-dramatic and live, as it were, as if they were acting out their lives. They react childishly to adult problems and retreat very easily into hysterical neuroses by converting their conflicts into physical symptoms imitative of organic illnesses of all kinds including deafness, blindness, abdominal symptoms, paralyses and 'fits'.

b. Anxious people are also immature folk who have never learned to confront their problems honestly. They live in a constant state of mild apprehension and sometimes reveal obsessional trends as a result of their over-anxiety to see that nothing goes wrong. Mild stresses cause them to react with all the mental and physical symptoms of morbid fear.

Still more recently Sheldon has devised a further subdivision of types associating mental attitudes with an entirely different and novel approach to the bodily conformation. His groupings are founded on the fact that all the components of the human organism are derived originally from the three primary layers of body tissue, namely, entoderm, mesoderm and ectoderm.

According to this view there are three types of physique each linked with a distinct mentality or temperament.

a. Derived from entoderm. The endomorph.

The most pronounced feature here is the digestive system and the individual is therefore what is in vulgar parlance termed 'gutsy'. He runs to fat and his chief interests are directed to his interior and its functions. His preoccupations are concerned with appetites, food, drink and all that goes with gastronomy. He is what is known as a *viscerotonic*. There is a close resemblance here with Kretschmer's pyknic type. The links are therefore: entoderm—endomorph—viscerotonia.

b. Of mesodermal origin—the mesomorph.

Here the most prominent components are muscle and bone. The trends are athletic and the individual a sporting type who takes kindly to games, who is sexually virile and who uses his body to bring him into the closest possible contact with his environment and therefore with reality. He corresponds to the extravert or cycloid with an athletic build and is known as a *somatotonic*. The links are: mesoderm—mesomorph—somatotonia.

c. *Based on ectoderm.*

This type is neither concerned with his 'innards' nor is he athletic. He therefore corresponds to Kretschmer's asthenic type. This body build is associated with the *cerebrotonic* temperament which approximates to the introvert or schizoid. There is a definite lack of interest in the outside world, and as Sheldon remarks, 'such an individual is really living within himself', and again, 'the most painful thing for a cerebrotonic to do is to raise his voice'. This indicates a considerable degree of introversion, a rooted diffidence and a tendency towards intellectual pursuits.

The classification goes still further, for Sheldon also postulates a masculine-feminine element (gynandromorphy) in each individual, and moreover places every one on a seven-point scale for each of the three primary types. It is, however, beyond the scope of this book to discuss these further ramifications in detail.

Suffice it to say that classifications are worth while in order to elucidate the complicated problems presented by the human being and his multifarious activities. Unfortunately, man has a habit of deviating from set rules and defying attempts to pigeon-hole him so that his conduct is only predictable up to a point. He refuses to be bound by mathematical formulae and accurate chemical reactions so that type psychology can at best only consist of broad ill-defined groupings.

Character. To describe the character of a person is to describe him as he is known to his friends. Character denotes the conative or active aspect of an individual. It refers to the sentiments, especially the moral sentiments he has acquired under the influence of education and environment. Naturally his innate temperament and disposition enter into the formation of his character. He thus behaves in a certain specified way and in this manner builds up a reputation.

Personality. Personality includes all the mental and physical charac-

teristics of a human being. It is that which enables him to react to his surroundings in a certain way. Personality and therefore behaviour depends upon the interplay of hereditary factors, physical body build, endocrine secretions, body chemistry, instinctive forces and temperament, with the environment. Normally, the average personality reacts to his surroundings in a manner calculated satisfactory to serve his own needs and those of the community. However, should any one of the component parts of his mental structure be at fault, the failing will be reflected in abnormal conduct. It is therefore of importance to be familiar with all those features which go to make up an individual.

Modern psychology. The basis of modern psychological theory is the unconscious mind which is accepted as a repository of instincts, inherited tendencies and racial modes of conduct. In addition it is thought to contain deeply buried memories which cannot easily be recalled and more superficial memory traces which are readily available.

There is a considerable body of evidence to confirm the existence of an unconscious mind. For instance, it is a common experience suddenly to recall a name which has proved elusive. Again, most people have taken 'problems to bed' to find next morning that solutions have presented themselves. Somewhere, therefore, in the interior of the mind thinking must have persisted unconsciously. This process was once termed 'the persistence of conation'.

Under certain circumstances, more especially in association with painful or unpleasant experiences, memories are thrust out of consciousness and can only be recovered by special methods of an analytical kind.

Normally, the conscious mind or ego rules over the unconscious underworld whilst remaining in contact with the environment. Thus, an individual is at all times aware of his surroundings and endeavours to abide by the rules of his particular community. Nevertheless, his instinctive urges continue to demand free play and must be held in check. Modern society is so far removed from animal life that primitive tendencies must be properly regulated. Laws have therefore been devised to discourage timidity, to promote courage and fortitude, to prevent as far as possible promiscuous sexual life, and to ensure orderly conduct. To assist conscious control, super-ego censorship or conscience has come into being. Conscience develops in a subtle manner from infancy onwards.

During the earliest months of life a child is allowed much of its own way. Towards the end of the first year cleanliness of excretory habits becomes desirable. To this end, mother enforces her wishes if necessary by disciplinary measures. Thus, the child receives its first check to its hitherto undisturbed impulses. It then builds up in its young mind an image of its mother and her directions. From this time onwards more and more limitations are imposed and the seedling of conscience or super-ego grows rapidly. This identification with, or imitation of the

parents by building up prohibitions in the mind, is called introjection.

The prohibitions include the father's teachings, codes of behaviour derived from school and from religious instruction. As time goes on the young individual gathers that in addition to the Ten Commandments there are a whole host of laws written and unwritten to which he must conform. His way of life is prescribed for him from the outset. Any departures from these rules of conduct are heavily punished. As a general rule he fits himself into the general pattern; for the child above all dislikes and fears ridicule. He wishes to be like all the other youngsters, to share their tastes, games and modes of living.

At the age of puberty, young people of both sexes must make further and important adjustments to a new set of rules, those governing sexual behaviour. By this time the super-ego has become a mental stucture of considerable size only to be still further enlarged by all kinds of regulations derived from the home, the immediate neighbourhood and the laws of the country. It is therefore evident that freedom as such, exists in name only. Each citizen, youthful or adult, is hedged round by restrictions which can only be ignored or partially ignored by the peculiar genius or the 'madman'. It may be remarked that some of the restrictions are rather futile. For example, there is no real reason why a person should not wear a made-up tie or spats with brown shoes. He does so at the risk of ridicule because of the prevailing standards; and few can bear ridicule. Nevertheless, it is just this ability to accommodate to the standards of a community, whatever their nature, that stamps the normal individual.

By the time adult stature is attained life has become exceedingly complex. Each person carries round in his mind an image of what he should be, known technically as the super-ego or ego-ideal. His conscious behaviour is watched over by this psychological sentry which censors all his activities. Any deviation from this set of standards induces feelings of guilt. In simple language it is the pricking of conscience which keeps most people on the 'straight and narrow path'.

So that whilst childish life is concerned with obtaining pleasure and avoiding pain, the adult is required to adapt himself to reality and to carry out perhaps monotonous or arduous work. The ideal state of affairs has not yet been reached wherein occupations are so distributed as to produce individual contentment. Each person is therefore required to sustain himself throughout a life which may be peaceful and uneventful, or punctuated by pain, sickness, disaster, financial misfortune, tragedy and so on throughout the whole gamut of human vicissitudes. That he can do so speaks well for the amount of conscious control aided by super-ego judgments he is able to exert over his instinctive desires. However, adaptations do fail and, as already indicated, much neurotic sickness may follow which, if prolonged as is often the case, may lead to insecurity and inefficiency. How the super-ego lends itself to symptom formation and nervous illness will be discussed in later chapter.

Freud's theory of psycho-sexual development is a plausible one and would seem to throw light on the origin of many neuroses. It also helps to explain many of the strange sexual difficulties which come to the notice of the psychiatrist.

At the outset, the child is dependent upon its mother for affection, attention and nourishment. It consequently becomes emotionally attached to her. The theory goes on to state that a boy comes to love his mother whilst developing a dislike if not hatred for his father who attempts to upset this attachment at intervals by his periodic claims for love and caresses from the same source. Similarly, but after the early feeding stages have been passed, a girl transfers her affections to her father whilst developing feelings of jealousy against her mother. These cross ties are part of what has been termed the oedipus situation. Furthermore, any other person such as brother or sister who attempts to steal the parental affection which the child feels is his own, also becomes an object of dislike (sibling jealousy). The antagonisms between children in any one family are well known, hence the evils of favouritism. For even at this stage it is not difficult to see how a rejected child can become a warped adult, a rebel, or even an anti-social person; or at the other end of the scale, a timid, apprehensive and insecure individual.

The growing child must free itself gradually from these parental ties so that it may eventually develop into a mature adult who will find a suitable partner in marriage. If this psycho-sexual growth be arrested at any stage the result may be seen in the 'cissy', 'namby-pamby' child, 'tied to his mother's apron strings'. He may marry eventually but is inclined to seek a dominating mother type rather than a true wife. A similar process may produce a girl who endeavours to find a protective father type rather than a lover and husband. Subsequently, all sorts of complications may ensue including domestic disharmonies of all degrees of severity.

This theory explains to some extent the origins of love and hate. It may also account in part for some of the extraordinary hatreds seen in some families, and which, amongst the great, have been recorded in history.

The question of the excretory functions must next be considered. It is said that love is reinforced when the child postpones its excretory habits in accordance with the wishes of its parents. However, the restrictions imposed may also engender hatred; so that the attitude to parents is a fluctuating one and is consequently termed 'ambivalent'.

Continuing the theory, during the first five years of its existence, an infant passes through the following stages.

Oral. This is a stage of sucking and of exploration of objects which are conveyed to the mouth from the mucous membrane of which pleasure is derived. At the same time warmth, bathing and unrestricted excretion add to the pleasurable feeling. This is a phase
i.e. it is constructive.

Late oral. A destructive phase follows during which there is much biting and tearing.

Anal. This stage is concerned with the regulation of excretory habits and with the possible development of aggression together with the seedlings of hatred.

Finally, regular habits having been instituted, destructiveness ceases and the process of construction is renewed.

If these infantile stages are not passed through in a regular procession psycho-sexual development may be arrested at any one of these points, the result being a 'fixation'. Herein it is possible to find an explanation for some of the sexual perversions of later life such as sadism (cruelty and, in particular, sexual cruelty resulting from a fixation at the oral–anal destructive phase), and masochism (sexual pleasure derived from being hurt).

Freudian theory employs the term 'libido' to denote the psychic energy derived from the sex instinct. It is the libido which becomes arrested during the process of fixation. This damming back of sexual energy is the result of obstructive influences in the environment which prevent the smooth transition of the child from infancy through adolescence to complete adult emotional maturity.

These fixations are represented by:

1. The stage of autoerotism. Here, the infant has as yet no realization of self, and simple primitive pleasure is derived from the skin and mucous surfaces.

2. Self-love, wherein there is a knowledge of the existence of Self or Ego, but where the libido is directed inwards towards the Ego. This results in what is termed narcissism (derived from the mythical story of Narcissus who fell in love with his own image reflected in a pool). Narcissism makes itself manifest in excessive attention to clothes, the hair and other aspects of personal adornment.

3. Love for an individual of the same sex (homosexuality) implying a fixation at the anal stage of psycho-sexual development.

4. Normal love for an individual of the opposite sex (heterosexuality).

For reasons of hygiene, morality and for the future welfare of the race, most peoples impose very strict prohibitions upon sex relationships between members of the same family. Incest, as it is called, universally demands the severest of punishments. It is a prolongation into adult life of the oedipus mechanism. Normally, however, these infantile desires for the parent of the opposite sex are subject to repression, i.e. they are never allowed to appear as such in the conscious mind. It then becomes one of the functions of the super-ego to keep such improper thoughts out of consciousness.

Continuing the process of psycho-sexual growth, it is supposed that after five years sexual matters die down whilst physical development continues. The energy of the sex instinct is diverted into socially ap-

proved channels such as games, sports and other innocent amusements which serve to equip the young, both physically and mentally, for the trials of adult life.

With the onset of puberty and the emergence of secondary sexual characteristics, sexual feelings of an adult kind appear but are now strictly localized to the genital area. At about this time the earlier oral–anal phases are rapidly repeated and manifest themselves in excessive self-consciousness and attention to the personal appearance.

The next phase is an important one and is homosexual in nature. It is usually negotiated during school life and is manifested in schoolboy hero-worship for prefects, and athletes, or schoolgirl 'crushes' for older girls and schoolmistresses. Such attachments are normal and usually short-lived. However, a fixation of the libido at this point may result in a continuance of sexuality at the homosexual level.

Finally, maturity is attained when the libido is diverted to the correct love object, the future partner of the other sex, with creative love as the ultimate goal. For the attainment of this end, tentative experimentation, flirtations and so on are permitted, and it may be mentioned in passing that dancing is a socially approved method of instituting indirect sexual contacts.

In review, it is obvious that the most important feature of the transition from child life to adult stature is the escape from parental ties and the assumption of full independence. Parental example assists, however, in the choice of partners. The young man tends to model his life on that of his father and seeks a partner whose qualities resemble those of his mother. 'Just like mother makes' is the highest form of praise that can be given by a young adult to his bride!

It is also not difficult to appreciate that if this throwing off of parental chains is not carried through thoroughly an insecure adult stage is reached. The young man attached to his mother cannot face the world without her protection. Girls are similarly affected inasmuch as those who are emotionally undeveloped and over-protected find marriage difficult because of the severance of home attachments. There is, therefore, a psychological lesson to be learned from the music-hall 'mother-in-law' variety of joke.

Psycho-sexual development thus normally follows a logical course intended to equip the ultimate adult with the qualities and modes of reaction necessary to adapt himself to life situations. He will do so in accordance with the methods he has acquired during his earlier developmental stages. He has learned to postpone the immediate gratification of his desires. He no longer derives any sort of satisfaction from the childish erotic zones, i.e. the skin and mucous membranes. On the other hand he has acquired the mature technique of directing his libido outwards so that he can provide for and give pleasure both tender and sentimental to a prospective bride.

During his growth numerous strivings have sought to appear in his

consciousness but these have been vigorously censored by his super-ego so that he has no conscious knowledge of them. The importance of the super-ego then cannot be over-emphasized. It is fundamental and is at the root of morale and of all right thinking. It is entirely concerned with the individual's ability to check impulsive conduct, and it enables him to conform to the complex set of rules, codes and regulations which have been set up for the guidance of those amongst whom he lives and works.

The expanding mind is greatly assisted in its efforts to attain maturity by the process of *sublimation.* This mental mechanism does not however terminate its activities then but continues throughout life in one way or another. Like repression, sublimation is an entirely unconscious process. In essence, sublimation means the direction of instinctive energies into socially approved channels. Simply, it describes the diverting of energy derived from the sex and other instincts into games, philanthropy and ambition. Much that passes for ambition is in part sublimation and in part neurotically inspired energy. Nevertheless, games, charitable works and ambition are approved of by the herd and therefore do not come under criticism from the super-ego.

Sublimation is not to be confused with conscious re-direction of energy. A boy, obsessed by obtrusive sexual thoughts, who decides to turn his attention away from those subjects by playing a game is not sublimating, he is merely diverting his energies consciously. On the other hand, an old maid who takes blankets and soup to the poor, who throws herself into numerous village activities, who scorns sex and all its 'nasty' ramifications, who keeps cats, parrots and other pets, but who still takes a profound interest in the village 'goings-on', particularly the sexual delinquencies—is sublimating vigorously. Blind to the workings of her own mind she cherishes the notion that she possesses high ideals and would angrily refute any suggestion that thwartedsexual tendencies are the source of her charity, her solicitude for animals and her social activities.

Throughout life the processes of repression and sublimation normally maintain a state of healthy social consciousness and adaptation. It is when the repressed material is too explosive or sublimation fails, that neurotic symptoms appear.

CHAPTER IV

ABNORMAL PSYCHOLOGY

During the course of evolution the human mind has devised a number of methods of achieving some sort of compromise peace in response to mental distress. The passage of time diminishes the vividness of disturbing memories but is insufficient to blunt completely the keenness of painful emotions. It is therefore necessary to consider the other mechanisms which have been developed in order to assist time in bringing about forgetfulness and superficial harmony. These devices can be observed in normal people. It is only when these psychological twists and evasions are carried to a pathological excess that symptoms arise. The neurotic establishes these devious habits of thought to escape from his problems, but in so doing, pays a price, the price being psychoneurosis. In the main, neurotic thinking amounts to self-deception. To understand neurosis it is essential to examine these mental mechanisms in the light of temperamental twists and individual peculiarities.

MENTAL CONFLICT

Internal mental strife heads the list of processes which produce nervous disorder. It is brought about by the warring of two powerful and antagonistic motives. For example, the soldier under fire is in a profound state of conflict. On the one hand he wishes to escape to safety. On the other, he desires to do his duty which desire is of course reinforced by fear of consequences if he deserts. He has three methods of dealing with this situation. His self-respect, i.e. his super-ego, may triumph, in which case he remains at his post. He may belong to a small minority whose fears overcome their sense of duty, and he may therefore run away. A compromise way of escape may result, i.e. he may develop neurotic symptoms. In this manner he satisfies both his self-respect and his instinct to escape from danger. Removal from the battle line causes his symptoms to subside, only to be renewed the moment he is returned to the danger area.

For example, a young flight-sergeant navigator who had shown some neurotic trends in childhood, was involved in a crash landing on returning from his eighth operational flight over enemy territory. On emerging from the aircraft he was found to have injured his right leg and was dragging his right foot. Subsequently, the bruising vanished and his leg was declared organically sound. However, the 'paralysis' of his foot persisted as an hysterical symptom until he was informed that

he was no longer fit for flying duties. Following the reception of this information the 'paralysis' cleared up rapidly.

Obviously, the 'disability' was a psychologically induced symptom which successfully withdrew him from further experiences fraught with the utmost danger.

Similar conflicts occur in everyday life involving both the fear and the sex instincts. In all cases the strife takes place between conscience, i.e. super-ego standards and one of the powerful instinctive forces.

Sometimes the instinctive wish is never allowed to reach consciousness because of the barrier interposed by mental censorship. In this case the sufferer is unable to give any clue as to what is disturbing him but merely produces a set of neurotic symptoms for inspection. The meaning of his illness then has to be discovered by special medical methods including analysis.

In this case the conflict has been dealt with, i.e. one of the warring motives is not permitted to come to light. In all other cases conflict must be resolved somehow before any sort of mental peace can be attained.

The methods of resolving conflict are several:

1. Conscious resolution. On a conscious plane, the alternatives are examined and one or other course is adopted rightly or wrongly. Fortunately for the community 'rightness' generally wins. In some cases, wrong triumphs where the individual thinks he can 'get away with it'. Sometimes he can and does. At other times he is confronted with his conscience and consequently suffers from remorse.

2. Repression. The repugnant wish, i.e. the instinctive force which does not conform to super-ego standards, becomes excluded from consciousness and goes down out of awareness to form a 'complex'. This process of exclusion is termed 'repression'. It really amounts to active forgetting and is an automatic process which occurs without the knowledge of the individual concerned. Although this offending desire has been lost sight of, it continues to give trouble beneath the surface. In effect it reveals itself through nervous symptoms.

At times conflict is so severe as to make waking life a misery. It is then that 'fugues' occur. A fugue means a flight from reality. In a fugal state the victim may drift about at large with complete loss of memory due to massive repression. He may act quite rationally but has no knowledge of his actions when he eventually recovers. The lost memories have to be restored by a special technique.

Repression then is a method used by the mind to 'forget' painful experiences or intolerable ideas. It comes into action in infancy as the result of super-ego growth, and at a very early stage, is exerted against the oedipus situation. As moral standards are constructed so does the barrier of repression emerge to ensure correctness of behaviour and to exclude unworthy notions.

Repression must be distinguished from suppression which is used con-

sciously to turn the thoughts from painful topics or unwholesome desires to pleasanter subjects. In contrast, repression functions out of reach of awareness. It is called into play against all sorts of unpleasant, painful and repellent ideas. These, it more or less successfully squeezes down into the sphere of forgotten things. Nevertheless, repressed material influences thinking and conduct, disturbs sleep and causes symptoms in ways to be described presently.

3. Sublimation. Sublimation is a mental process whereby instinctive energy is diverted from its original object into useful and socially acceptable channels. Ambition, philanthropy and similar socially valuable activities may thus be, and often are, based on redirected sexual forces which have been disguised out of all recognition. This state of affairs is sometimes exemplified amongst missionaries, in monastic and similar institutions, and in fact, in most professions. Sublimation is therefore not only socially approved but is of very great value to the community. It is a process to be encouraged by training from infancy onwards. Like repression, sublimation is an automatic and unconscious mechanism. It is not to be confused with the false charity indulged in by some as a cloak for less worthy deeds.

4. Perversion. In a relatively small percentage of the population, conflicts based on sexual matters are solved by perversion. This describes a state of affairs resulting from the deflection of sexual energy into abnormal channels of expression. Exhibitionism, masturbation and homosexuality are examples of such perversions which are discovered to a considerable extent in the history of neurotic individuals.

THE COMPLEX

Attention has already been directed to the method by which moral, aesthetic and religious sentiments are constructed. It is also understood that sentiments persist as enduring features of mental life and exert conscious influences upon human behaviour. A complex is similarly constructed but is unconscious and therefore an abnormal collection of ideas grouped around an intolerable topic. These ideas are linked together by a common emotion, the revival of which produces remorse and unhappiness. By virtue of the energy with which the complex is endowed it is liable to cause psychological disturbance. It influences conscious thought and it is at the basis of every prejudice and bias. For example, one may possess a particularly unpleasant habit. The awareness of it is repressed. A complex is formed around it which then encourages one to dislike this habit intensely—if observed in others. The new-rich dislike 'bounders' and may become snobs. The old maid who has been denied normal sexual outlets acquires a sex complex by repression of her own desires. Outwardly she is horrified at any suggestion that she might be interested in sexual matters, while at the same time she enjoys the gossip and tittle-tattle surrounding any sexual delinquencies which she may

observe. Thus, to reinforce her repressions she becomes prudish, i.e. the opposite to her natural tendencies. This swing in the opposite direction is called a reaction formation.

Forgetting and amnesia. In addition to complex formation all kinds of major and minor incidents are liable to repression, always providing that an awareness of them would cause remorse or unhappiness. Consequently the operations of the repressing force are described in a colloquial way as forgetting.

Forgetting may be regarded in two ways:

1. Lapse of memory from disuse. Most people are required to acquire a mass of information during school life. Such text-book knowledge includes most subjects such as historical dates, geographical facts and smatterings of foreign languages. Unless an academic career is decided upon a large amount of this matter fades out of memory from sheer lack of use. In this highly industrialized and utilitarian world only those facts of value to the individual are remembered.

2. Active forgetting or repression. Active forgetting or repression is the foundation stone of modern psychopathology. Doubtless it is a mechanism to be observed in daily life. Unpleasant matters are readily forgotten, for example, letters to post, distasteful appointments, the return of borrowed books, addresses and telephone numbers of casual acquaintances, of bores, or in general, of people with whom a further meeting is not desired.

The forgetfulness thus induced is called amnesia. In some mental disorders repression is exerted against the whole of waking life which perhaps has become too difficult to be endured. This accounts for the frequency of the incidents already referred to as 'wandering at large', 'loss of memory', and so on. Another form of amnesic loss is the so-called double personality of which the classical illustration is the 'Dr. Jekyll and Mr. Hyde' phenomenon. It is said that a totally new individual can emerge under the influence of a massive type of forgetting which blots out the past completely. A warning note must be sounded here. The double or multiple personality lays itself open to suspicion as also do some kinds of so-called amnesia; for the motives are invariably the evasion of responsibilities or just punishment for criminal acts. When charged with stealing, or as in the Services, absence without leave, some individuals plead loss of memory as an excuse for their misdeeds. However, genuine major and minor amnesias do occur and special methods are required to recover these memories.

DISSOCIATION

Dissociation is not an easy mental process to understand. In the simplest terms it denotes splitting of the mind. Large or small sections of the mentality can be cut off and treated by the remaining portion as

foreign bodies. Where the cleavage is a single division a double personality may be produced. There are two smaller personalities within the same mind, each quite unlike the other. Each takes command of the body in turn so that at one time 'Dr. Jekyll' is in possession, and at another, 'Mr. Hyde'. Such cases are extremely rare but have been recorded. Dr. Morton Prince has described a patient of his, Sally Beauchamp, who owned three personalities which he labelled B, C, A. On a lesser scale a limb or limbs may be dissociated. For example, a woman who became overburdened with drab, tiring and monotonous household duties developed a paralysis of her right arm which she said was due to neuritis. A complete cure was effected when her husband succeeded in obtaining domestic help. In this case the mental conflict caused a separation between the mind-right-arm apparatus and the rest of the mind so that the limb was disowned and treated as a foreign body. The significance of this form of hysteria lies in the fact that it was the right arm, i.e. the one most used in performing household chores. A soldier received a minor flesh wound in the right arm. He too thereupon developed a paralysis of the arm which resolved his conflict, removed him from the battle line and also satisfied his conscience. Examples can be multiplied indefinitely.

PROJECTION

'The bad workman blames his tools'. The bad tennis-player glares at his racquet after a poor shot. In his view the bad stroke has been brought about by the almost criminal folly of the manufacturers who have made an inferior racquet—or his shoes are slipping—or the grass is wet—or someone in the audience has disturbed his concentration by daring to breathe! He seeks any excuse rather than admit the supreme and only fact, namely that the stroke was badly played. This type of thinking is all too common. There is a general tendency in man to blame the environment rather than the self for failures. His want of success is always due to his employers, or his teachers, or to bad luck, or in fact, to any circumstances rather than his own inadequacy. This mechanism is called projection, and it serves the purpose of preventing remorse and self-accusation. It is a comforting thought to regard oneself as the victim of a relentless world or of a conspiracy. This mental process turns up with monotonous frequency amongst the embittered failures who arrive in the psychiatrist's consulting-room. In technical language, projection is a mechanism whereby personal inadequacies and insecurities are disowned by the mind and thrown on to the environment. It is seen in its most virulent form in the serious mental disorders known as the delusional psychoses.

RATIONALIZATION

This is an interesting form of thinking again detectable in normal people. It provides pseudo-rational explanations for speech and actions

which are based on unconscious or instinctive motives. For example, many normal folk will not walk under ladders for fear of bad luck overtaking them. The more intelligent ones rather than admit that they are unreasoningly superstitious, put forward the explanation that they do not walk under ladders to avoid falling paint-pots! Another example may be quoted. A girl who had been influenced on romantic lines by a succession of inflammatory Arab sheik films proposed to take her mother on holiday to North Africa as it would do the old lady's rheumatism so much good! The last phrase is an obvious rationalization inspired by unconscious sexual motives. Dr. Hart quotes the schoolmaster who suddenly developed a dislike of church bells and religion in general. He marshalled his arguments against religion with great skill. Actually the basis of his sudden change of heart was jealousy of the parson whose literary efforts had been accepted by a local paper whereas the schoolmaster's had been rejected.

HALLUCINATIONS

Hallucinations are false perceptions without any sensory basis, i.e. sensations may be experienced in the absence of any external stimulus. The commonest hallucinations are those of hearing but they may occur in any of the sensory fields. For example the sufferer may complain that he is continually tormented by abusive, threatening or commanding voices. He may state that he sees visions. He may claim that he can taste poison in his food or that he is being deliberately annoyed by bad smells, or that he is subjected to bodily interference at night because he experiences strange feelings on his skin. Hallucinations then may be auditory, visual, olfactory (smell), gustatory (taste) or tactile (haptic or touch).

Hallucinations are projections of remorse and self-accusation. For example, guilt feelings on account of some misdeed become repressed. They are then disowned, projected, and thus made to appear as if coming from outside the self. In other words, 'I hate myself because of my folly', becomes by projection 'He hates me and torments me with his voice'. Hallucinations are therefore pathological ways of stilling the voice of conscience. The victims of such hallucinatory experiences are at great pains to explain how the voices reach them. Consequently they complain that they are persecuted by loud-speakers, megaphones, electrical machinery, or perhaps relatives, neighbours, the police and so on.

Similar explanations account for hallucinations of the other senses. For instance, the heavy drinker represses the remorse he feels on account of his uncontrollable alcoholic habits. He may develop delirium tremens, and during the course of this disorder, projects his remorse so that it returns to him in the form of accusatory voices and terrifying visions of disgusting reptiles.

ILLUSIONS

Illusions are misinterpretations of things, seen, heard or touched. A good example can be culled from recent times wherein anticipatory fears transformed the noise of a car changing gears into an air-raid warning. The echo of one's own footsteps may sound like a pursuer, or one's own shadow by moonlight may be interpreted as a nocturnal prowler. Some types of mirage seen in the deserts of tropical lands are also illusory phenomena.

Illusions of identity occur with some frequency in those suffering from the effects of internal or external poisons, i.e. in the toxic psychoses.

DELUSIONS

Delusions may be defined as false beliefs resulting from disorder of the mind. They are not correctable by appeals to reason and such ideas are not held by persons of the same rank, class and cultural level as the sufferer. Thus, should an ordinary working man seriously declare that he is a king and owns much property then he is undoubtedly deluded. It is not enough to define a delusion as a false belief. The explanation must be given in full as not all untrue beliefs are delusions. Primitive people, savages and simpletons have ideas which are quite erroneous but which have developed because of lack of culture and absence of factual knowledge. Such erroneous notions are not delusions.

Delusions may be classified under several headings:

Persecution.

Grandeur or exaltation.

Unworthiness.

Bodily change (*hypochondriasis*).

They may be fleeting, that is to say false notions produced during delirium or mental confusion which vanish when the fever or cerebral disturbance passes; or they may be fixed, i.e. once developed, such delusions become permanently incorporated into the mental structure.

Again, delusions may be systematized or unsystematized. Systematized delusions are built up as a result of reasoning based on an original false idea. The reasoning may be perfectly correct but the basic idea erroneous. For example, an hallucinated person is invariably deluded. At the outset he believes in the reality of the hallucinatory experience. Then, since hallucinations usually consist of accusatory, threatening or scandalizing 'voices', he considers that he is being persecuted. He then begins to feel that he must be a great man otherwise he would not be selected for victimization. So the delusional process goes on until a vast elaborate mass of falsity is constructed in which the original personality becomes almost entirely obscured.

Non-systematized delusions generally take the form of bizarre and fantastic notions which are totally unrelated to each other and which are observed in the delusional states of young people. They are thus weird and odd statements thrown up by seriously disordered minds.

Delusions of persecution. (a) Persecutory delusions develop in response to hallucinations. The patient feels that he is being victimized. He may select various organizations, religious and otherwise, as his tormentors. He may complain bitterly that he is being shadowed and plotted against by the police, the Jews, the Roman Catholics, Freemasons, Bolsheviks and so on. As the voices never cease he may move from address to address, from one town to another and even from one country to another in a vain attempt to elude his tormentors and thus evade persecution.

(b) In some cases delusions arise without the presence of hallucinations. The explanation is as follows. The patient has perpetrated some action or committed some offence of which he is ashamed and on which account he feels guilty. Or he may cherish unworthy notions which never rise to consciousness and which are subjected to severe repression. Whatever the cause, the mind is suffused with remorse. The mental state may be described as 'I hate myself'. Projection comes into play which transforms self-accusation into 'He hates me', and therefore, 'He is persecuting me'.

Delusions of grandeur. (a) The persecuted person eventually comes to the conclusion that he must be a notability and often invents ingenious explanations to prove—at any rate to himself—that he is the product of an aristocratic family who has been deprived of his titles and land by gangs of swindlers, fraudulent solicitors and perhaps even his own relatives. At the same time, should he be relegated to a mental hospital he may carry out all sorts of tasks with more or less contentment. Mental hospitals contain a fair proportion of 'kings', 'dukes', 'earls', 'knights' and other types of 'notabilities' not excluding famous historical and biblical characters.

(b) In some types of grandiose patient it is evident that the delusions of exaltation are but compensatory mechanisms. Assuming 'titles' and high rank is an easy but psychotic way of attaining in phantasy what cannot be achieved in reality. In other words it is a pathological form of wishful thinking.

Delusions of unworthiness. During the course of a depressive psychosis, repression never succeeds in entirely excluding from consciousness feelings of guilt and remorse. These obtrusive feelings together with the depression must be accounted for somehow. The patient explains his misery by rationalizations. He suggests that he feels guilty and morbidly miserable because he is not fit to live, that he has committed the unpardonable sin, and that he will in consequence be tortured or condemned to everlasting damnation.

Hypochondriacal delusions. The feelings of guilt may be mobilized

around his bodily organs in which event he will produce hypochondriacal delusions, i.e. delusions of bodily change. He may proclaim that his insides are stopped up, that he must not eat otherwise he might become so full of food as to choke, that his bones have shrunk and so on *ad infinitum.*

REGRESSION

It is evident that the organism becomes aware of a constant stream of stimuli throughout its waking life. To these it reacts either reflexly or by conscious deliberation. Life then consists of reception of sensations, their interpretation, the display of appropriate emotions and adjustment of the total personality to the varying and various vicissitudes encountered. Apart from these immediate responses an individual has to think ahead, exhibit foresight and judgment, planning out his daily life whilst prospecting into a future which stretches dimly ahead of him. If his nervous organization is constitutionally sound and free from hereditary or acquired weaknesses he can live, love and work satisfactorily. Should he be so psychologically constituted by heredity or faulty upbringing as to react badly or childishly to life situations he is liable to develop neurotic or psychotic disorders. Such immature modes of reaction are indicative of an undeveloped emotional state and are part of the process known as regression.

Regression, then, is a form of childish response to adult problems. A child deprived of a toy or refused a demand may indulge in tantrums until it learns to abandon this kind of attitude to temporary frustration. An adult performing in a similar manner is regarded as abnormal, i.e. hysterical. By the same token, a youngster may plead a headache as an excuse for not going to school or running an errand or performing some other irksome task. If the parent weakly submits without a closer examination of this symptom the child gains its first neurotic victory. Headache may persist into adult life as a neurotic reason for shirking arduous and unpleasant but necessary duties.

Regression thus means a retirement to earlier and less mature methods of reaction in the face of thwarting or lack of gratification. It explains in part the origin of sexual perversions; for if frustration takes place in the sexual sphere the individual may slip back along the course of psychosexual development to an earlier form of sexuality, e.g. homosexuality. Regression may drag him back still further to exhibitionism, i.e. modified sexual self-display, or to auto-erotism, i.e. masturbation. The process can be regarded therefore as a mode of escape from a world too difficult to cope with; for it is much easier to give in than to go on.

PHANTASY

Phantasy is the term applied to reverie, daydreaming or 'brown study'. In a state of comfortable relaxation thought processes are easy,

the mind slips along comfortably and pleasantly, and it is possible to construct a world of one's own with all kinds of pleasant imaginings. One thought recalls another by association and ideas throng the mind in rapid succession and in unlimited number. Phantasy may win honours, achieve wealth, power, position, fame and homage. A glowing and rosy future is thereby elaborated without effort and from a position of arm-chaired ease. Normal people, however, recall themselves to reality, dispel their visions and carry out their humdrum tasks with a good-humoured or at least, tolerant realization of their necessity. A certain amount of daydreaming is practised by all and is permissible to a limited extent. The mind prospects into the future, it lays plans and devises schemes which may bear fruit if the necessary application to these ambitions is applied through the only possible channel, hard work.

In certain types of mental disorder, notably schizophrenia, the sufferer has found the struggle with reality too difficult and the results obtained meagre. He then retires into a pleasant dreamland of his own, and in phantasy becomes lost in the fictional and romantic episodes which his own mind has devised. If carried to the extent when contact with reality is lost, daydreaming becomes pathological.

Phantasy, therefore, is thinking which is moulded and directed by instinctive forces, complexes and unconscious tendencies. It is emotional and not rational.

IDENTIFICATION

Identification is a form of introjection. The latter has already been referred to as a mechanism by which ideas and images are taken up from the external world and erected in the mind. It is essentially the process by which the super-ego is constructed and is the exact opposite of projection.

Identification is then a mental function whereby an individual is able to regard himself as at one with another individual, real or imaginary. He 'identifies' himself with the other person and may assign to himself the other's faults and virtues.

The mechanism of identification is at the root of childish mimicry. Children always endeavour to imitate those from whom they receive affection, care and attention. Emotional bonds are thus created which assist them to incorporate the behaviour of the admired ones into their own growing personalities.

Indentification is operative in hero-worship. It can also be observed in the theatre or cinema amongst an adult audience, susceptible members of which identify themselves with the heroes and heroines of the stage and screen, living with them through all their trials and tribulations. In this process lies the explanation for the phrase 'going to the pictures to have a good cry'. The ancient Greeks referred to this phenomenon as one 'which purged the soul with pity and terror'.

The same process may, as a result of parental tyranny and rigid discipline in the home, cause children to emerge into adult life as rebels. In this instance the identification is with the 'underdogs' of the world and with all those intolerant of discipline and 'agin the government'.

Ambitious parents denied advantages in their youth often identify themselves with their children. They, so to speak, see themselves in their offspring and experience with them the joys of success or the depression of failure.

Finally, it is possible for a person to identify himself with a group or a group with a person. The late and very much unlamented Hitler definitely identified himself with the German people, and by the same process these misguided and deluded folk were one with him in a pathological state of ecstatic fervour.

SYMBOLIZATION

Symbolization signifies an expression of wishes and desires by means of specialized words or deeds very much in the same way as white represents purity or the lion stands for courage in a conventional world. In the psychiatric sphere the meaning of such symbols is hidden from the individual using them and may only become clear to a trained observer after analysis. Thus, in one form of the obsessional neurosis handwashing may be a prominent symptom. The physical cleansing of the hands symbolizes the purification of the mind. It is a ritualistic performance, and therefore a felt compulsion to atone for sin. Obsessional counting of certain numbers, or as in one patient, compulsive walking between two churches four miles apart four times, are other examples of symbolic activities.

Symbolization has its roots in repression which excludes the memory of painful or shameful incidents from consciousness. However, the emotion cannot be entirely denied an exit so that it suffuses the mind with guilt feelings which require expiation by a symbolic act. As a rule the repressed material concerns some abnormal practice such as masturbation which latter often lies in the background of the washing compulsion.

Symbolism plays an important role in dream life wherein powerful but repressed desires are distorted and symbolized in pictorial form.

COMPENSATORY MECHANISMS

Reaction formation has already been described as a method of reenforcing repression. It is a mode of compensation with the aid of which the real personality appears to be altered to its opposite. For example, excessive prudery helps in the repression of strong sexual desire. Again, excessive care and devotion are often found on analysis to be reaction formations concealing death wishes. Strong prejudices are almost cer-

tainly indicative of unconscious opposite trends. These mechanisms are detectable in a normal environment. The little man is proverbially bumptious, compensating for his lack of inches by length of tongue. The frustrated spinster shrinks from all matters concerning sex. The new-rich are often excessively snobbish.

By the same token physical or mental inadequacies sometimes provide a basis for ambitious drives which may occasionally succeed particularly if directed into one specific channel. The late chief Nazi propagandist Goebbels, illustrates this point clearly. A good brain allied to a wretched physique produced by intense over-compensation directed to one end, a locally successful but socially evil force. Only in this way could this unpleasant little man achieve rank, position, fortune and even the adulation of women.

In practice there are three modes of reacting to sensations of physical or mental inferiority.

a. The sufferer compensates sufficiently to balance his difficulties. The classical instance is that of Demosthenes, who, stammering severely in early life, was yet able to overcome his disability and become a famous orator.

b. Over-compensation may occur which may be manifested in noisiness, conceit, truculence and aggression. It is more than possible that the Teutonic Herrenvolk falsity is an over-compensation for a nation-wide feeling of inferiority induced by the very severe defeat of 1918.

c. Flight into neurosis. This method of escape uses the felt disability as a central point about which to group other symptoms. For example, a person with a club foot or some similar disability may be capable of quite useful work. On the other hand, if he owns an inadequate personality he may use this incapacity to evade all his responsibilities.

The 'fatigue' excuse. Driven by ambition a person may set himself a goal which is unattainable because of lack of mental or physical equipment. He may work hard to show sympathetic relatives and friends how zealous he is. Nevertheless he is bound to fail and in doing so may develop a neurosis. He experiences no sense of failure, however, because his excuse is overwork. This explanation is readily received by those around him and it remains a permanent method of evading difficulties. It is a known fact, for instance, that a considerable number of medical students fall by the wayside because although attracted to the profession, they are insufficiently equipped to cope with a long and arduous course in spite of the burning of much midnight oil. A fair proportion of such failures find temporary salvation paradoxically enough in nervous breakdowns which effectively prevent them from pursuing their studies further.

DREAMING

Modern theory considers dreams to be full of meaning and not disturbances produced by dyspepsia. Dreams are almost always of the

'wish-fulfilment' type and partake of the same qualities as phantasy. During a dream all manner of instinctive desires and wishes can be gratified. Other types of dreaming appear to solve the problems of waking life, and yet others are prospective, inasmuch as they explore possibilities of the future. It has also been suggested that their content may even be of a prophetic nature.

Two instances of simple 'wish-fulfilment' may be given:

1. After a meal consisting of salty or spiced food the sleeper may dream that he is consuming great quantities of water to allay his thirst. He may even be compelled to wake and do so in reality.

2. The sleeper dreams that he has risen from bed, performed his toilet and gone off to work. This dream is designed to protect sleep.

Most dreams, however, are not so simple as these examples. They have a manifest content, i.e. wild, chaotic and apparently silly pictures thrown together without obvious rhyme or reason. These manifestations conceal and are symbolic of, a latent content, i.e. the real meaning of the dream, which can only be ascertained by a special analytical technique. In other words, dreams reveal in a distorted form all the instinctive wishes, urges and desires which have undergone repression; and it is the partial weakening of repression during sleep which has permitted these excluded desires to appear at all. Distortion is necessary to satisfy super-ego censorship; for the repressed desires adopt disguises to evade detection by conscience. Although far from perfect such operations protect sleep and ensure that it shall be continuous and undisturbed by shame, remorse or guilt. Occasionally this protective mechanism fails as will be seen during the discussion on the nature of nightmares (anxiety dreams).

There are other interesting characteristics of dream life. Dreams are pictorial and therefore primitive modes of thinking so that they consist of images strung together in a theatrical form, i.e. they are dramatized. Furthermore, the incidents of many years may be compressed into a short dramatic episode, a process known as condensation. To mislead super-ego scrutiny still further, the emotional emphasis may become displaced from a particular desire and attached to a quite insignificant image. Dreams are thus symbolic in nature and require interpretation before their meaning can be fully elicited. This is not always an easy matter, for many dreams, although vivid, are almost immediately forgotten on waking. The onset of wakefulness causes repression to resume its active functions so that dream incidents are quickly removed. Or when a dream is remembered it is often retailed with such a wealth of detail and in such a sequential form that secondary elaboration must have taken place.

The occurrence of nightmares or anxiety dreams means that the protective mechanisms have failed in their purpose and sleep has been disturbed. Briefly, the dream incidents centre round some horrifying experience such as falling from heights, being pursued by wild animals or by assassins. Just before the climax and when terror is at its highest

intensity, the dreamer awakes in a cold and profuse sweat, with dyspnoea and slow but forcible and almost painful pounding of the heart. As the familiarity and safety of his surroundings penetrates the mists of sleep the acute symptoms subside. Nevertheless, in some cases the victim is afraid to go to sleep again for fear of renewal of the terror. If the sufferer is a child it may call out and require reassurance and comfort from its parents.

The basis of the anxiety dream is repression of instinctive and infantile urges. During sleep repression like every other bodily and mental process lightens because of fatigue. This allows partial escape of desires which in waking life are regarded as repugnant. Actually, it is the emotion attached to the desires that obtains partial release. To evade censorship it attaches itself to some insignificant object such as a precipice, tall building or wild animal which then comes to represent pictorially and symbolically the hidden difficulties.

Falling then may become symbolic of falling from grace should the unconscious wishes be gratified. The disturbing terror, fear and anxiety which are associated in dreams with dangerous adventures are thus those which would be aroused by the conscious knowledge of the presence of such disreputable wishes. Analysis of many dreams appears to show that nightmares often represent conflicts in the sexual sphere.

PSYCHOANALYSIS

Psychoanalysis is a form of mental therapy devised by Freud and employed in the understanding of psychoses and treatment of the neuroses. It is a system by which the mind can be explored, troublesome repression relieved and mental energy released for more useful effort than repressing complexes. With the aid of psychoanalysis the patient is brought to face his desires, wishes and urges in an intelligent and adult manner. The ideal to be attained is intellectual honesty and a complete understanding of the way in which his thought processes have gone astray. He learns to deal with his problems both present and future in a sensible way without shutting them out from his mind or seeking to escape from them in a neurotic fashion; for repression is an ostrich policy which can only provide temporary freedom from disturbing thoughts at the price of symptoms. During analysis he acquires the art of conscious control of his instinctive urges and learns useful methods of diverting the mental forces contained therein.

Psychoanalysis demands complete honesty and freedom from false modesty. The technique in many ways is simple enough. In a state of comfortable relaxation the patient just recounts everything that comes to mind and he is encouraged to associate freely so that he can pour out his mental contents. Free association is the essence of this system of analysis. In point of fact the word 'free' is incorrectly applied here because thinking is bound to be directed along lines suggested by his

complexes, so that on the contrary, his associations are tied to his unconscious strivings. At any rate significant facts and circumstances which have been 'forgotten', i.e. repressed, are thus brought to mind by easy stages, one incident recalling another. As the repressed and troublesome memories become conscious there is a display of emotion known as the 'abreaction' after which the patient experiences considerable relief.

During the course of analysis the patient establishes a 'transference' for the doctor which may be positive or negative, depending on whether the sentiments aroused are those of affection or dislike. These attitudes arise as the patient relives his life using the doctor as a figure upon which to hang his emotions. At one time the doctor is assigned the roles of affectionate parent, and at another he becomes hateful or tyrannical. Later, the transference also undergoes analysis so that the patient discovers exactly what has been happening to his thought processes. When the primary cause of his difficulties has been revealed, then and then only can he competently redirect his infantile wishes and childish urges along proper channels.

It is apparent that psychological methods of approach to nervous problems must be far superior to drug treatment. Sedatives such as bromide and barbitone can only temporarily allay nervous irritability, sleeplessness and all the many symptoms of neurosis. Moreover, after the effects of such medicines have worn off, the patient for obvious reasons remains basically unchanged so that his condition is liable to become chronic.

The drawback to psychoanalysis is the time consumed, the treatment occupying many months and sometimes even years. In addition, the analyst must himself have been analysed in order that he should be free from complexes and prejudices. Again, in unskilled hands analytical treatment is not free from danger. Some patients cannot face the revelations which are brought to the surface. Others may become permanently dependent upon the analyst. Finally, analysis is an expensive business as it involves several interviews per week for several months. However, there are a number of shorter methods of approach which sometimes give satisfactory results.

In summary, the analytic method has resulted in a much better understanding of the workings of normal, neurotic, psychotic and criminal minds. In addition to its therapeutic functions when applied to mental illness it is an established avenue of approach to certain types of delinquents who can sometimes be freed from anti-social tendencies when the factors underlying their transgressions are elucidated. It should be noted that psychoanalysis is a system of psychology as well as a mode of treatment and it has proved of great service in the advancement of psychological science.

Other Analytical Techniques. There are other schools of analytical psychology associated with eminent psychiatrists such as Jung and Adler, and there are of course adherents to, and practitioners of, each

system. In contrast with the Freudian method these psychologies, whilst variously accepting the doctrine of the unconscious, seek to work with the patient and are not passive techniques. Rather is the practitioner expected to give personal guidance of an active kind.

However, whichever psychological theory is adopted the essence of treatment in neurotic disorders is exploration of the mind in all its aspects. The mentality is, so to speak, stripped down to its component parts and reassembled as an instrument which will function in such a way as to avoid symptom-formation.

Finally, whatever form of psychotherapeutic technique is adopted, the personality of the physician looms very large. In fact, it is confidently suggested in many quarters that the doctor rather than the method is the most important factor in the success or failure of treatment.

CHAPTER V

THE CAUSES OF MENTAL DISORDER

It has been the custom to distinguish between sufferers from 'nerves' and those who are 'mental'. This distinction is inaccurate and misleading. Mental disorder in the widest sense of the term must include all the minor nervous ailments as well as the severest forms of mental derangement. However, so much stigma has become attached to the word 'mental' that it has in itself become a source of anxiety to patients. They have a horror of the term, for to them it implies insanity. Consequently they are vastly relieved when assured that their particular illnesses are only due to 'nerves'. Thus, one patient will state that the 'nerves of his stomach have been shattered', another will declare that the 'nerves in his head have been bad for years'. This is all nonsense but is honoured by time and, regrettably enough, by well-intentioned though ill-informed expressions of medical opinion. It is therefore necessary to bow one's head to the inevitable until such time as increased knowledge and better education, both lay and medical, dispel the 'mental' bogey.

Although the distinction drawn above is theoretically incorrect and a discussion upon this point purely academic, it is of some value clinically and legally.

Neurosis or psychoneurosis (the terms are for all practical purposes interchangeable), describes a set of mental and, more often than not, physical symptoms for which no organic basis exists as far as is at present known. The psychoneurotic personality is developed as the result of faulty training and education. The possessor of such an immature mental structure continues throughout his life to react with childish modes of conduct to adult difficulties. The symptoms are such that though perhaps severe and incapacitating, they cause little or no alteration in personality or conduct. The sufferer is still wholly recognizable and can take his place as a citizen in any organized community. Moreover, the neurotic knows he is ill and seeks treatment. He has what is termed insight into his condition.

The word 'mental' as usually employed implies such disturbance of mind as to warrant the employment of the word 'psychosis'.

Psychosis indicates a degree of mental disorganization sufficient to transform the total personality and render it unfamiliar. It is often the product of faulty inheritance and family degeneration. The disorder manifests itself in strange behaviour and unpredictable conduct. Very often a psychotic is a danger to himself and others. He is without insight into his condition, is anti-social, queer and odd. Not realizing that he is

ill he rarely seeks medical aid. He may exhibit violence, impulsiveness, homicidal frenzies and suicidal tendencies. Because of memory defects or delusions he may be unable to manage his affairs. In addition, he may not have 'the sound disposing mind' so necessary in making a will. So that from the legal point of view such terms as psychosis and insanity are convenient. Clinically, however, there would seem to be no justification for the distinction between neurosis and psychosis.

Experience and observation appear to show that mild neurotic troubles are extremely common, that neuroses are of all degrees of severity, and that the more serious and disabling conditions merge gradually into disorders which may be called psychotic.

Using mental disorder in its widest implications it now becomes possible to survey the problems of causation.

AETIOLOGY

The causation of mental disorder is still very obscure. Very gradually, but disappointingly slowly, the story of aetiology is being written. Our methods of investigation are, unfortunately, still very crude, and laboratory approach so far not very fruitful. Accordingly, there are a few facts and much theory.

Before reviewing the aetiological factors it is necessary to emphasize that mental diseases are abnormal psychological patterns to which many circumstances have contributed. It is seldom possible to place the finger upon one agent and definitely pronounce it to be the one and only cause of any particular mental breakdown. Further, the reaction to such circumstances involves the whole of the personality. The type of psychotic response will then depend upon the organization of the latter.

1. THE ROLE OF HEREDITY

Hereditary traits are those human characteristics which are passed on from parent to child. Each particular trend is known as a unit characteristic or gene and the various genes are contained in the germ plasm of both ova and spermatozoa. Modes of thinking just like physical features can be inherited. Nevertheless, whilst heredity plays a significant and even an important part in the causation of psychosis or neurosis it must not be over-stressed. To begin with it is difficult to obtain accurate family histories because of shame or lack of knowledge. Psychotic skeletons in the family cupboard are often concealed. Further, research is interfered with by artificial family limitation due to economic pressure. Consequently not enough is known about heritable factors and much more investigation is desirable. At the moment it is perhaps safe to say that feeble and neurotic stocks may probably be strengthened and revived by marriage with healthy families. Naturally, if two individuals both of whom come from mentally unhealthy ancestry, unite, the risks

of reproducing mental disorder or defect are vastly increased. Dogmatic statements, therefore, cannot be made; for these might result in the prevention of quite a number of successful and fruitful unions. In Great Britain, the population of which is already tending to decline, this is a serious matter.

At the present time the accent as regards the birth-rate is falling upon the mentally less well endowed section of the population. Hence shiftless folk, loafers, delinquents, the backward and the higher grade mental defectives are reproducing because of poverty of wisdom, lack of restraint and absence of socio-legal restrictions. Consequently, thrifty and thoughtful folk who are limiting their families in accordance with their financial commitments, are becoming disproportionately fewer in number. In the final analysis it is this intelligent section of the community which is finding increasing difficulty in supporting the burden of the increasing masses of dependent members of the first group. From the psychiatric point of view it can be anticipated that insanity is bound to increase if this problem is not dealt with vigorously.

With regard to what is actually known about heritable features, it is clear that certain well-defined diseases such as Huntington's chorea descend directly from parent to child. Manic-depressive psychosis likewise appears as a direct inheritance. These diseases are said to have dominant hereditary properties. Schizophrenia, a mental disorder of adolescence, would seem to skip a generation and is therefore regarded as recessive in its inheritance value. Again, there are more epileptics among the forebears of epileptics than amongst normal people.

As regards neurosis there is no doubt that in a large majority of cases nervous ancestry can be detected on inquiry. Headaches, temperamental instability, eccentricity, preoccupations with health, and in general, a disposition to be 'highly strung' or 'sensitive', appear in the family histories. Therefore it would appear that the seeds of neurotic disorder may be transmissible. Here, however, the situation is complicated by the fact that neurosis is 'infectious' and that neurotic reactions may be acquired from parents by mimicry as well as by hereditary installation.

Much remains yet to be discovered, and when advice is sought upon the questions of marriage and children, each case must be judged on its individual merits. No hard and fast rules can be laid down. A similar state of affairs exists when considering the problems of mental defectiveness.

2. CONSTITUTIONAL FACTORS

Reference has already been made to the types of personality make-up It is known that schizoid, cycloid, paranoid and neurotic temperament each react to mental stress with a particular and definite pattern, clearly recognizable clinically. It is probable that the constitutional or inborn structure plays a considerable part in determining the kind and severity of any breakdown in mental health.

Thus the syntonic cycloid and mid-position schizothyme pursue a normal existence. They are able to react to life's vicissitudes with normal standards of behaviour. Other cycloid types respond to stress, severe, moderate or mild, with periodic bouts of excitement, depression or both. Schizoids tend to retreat into a psychosis of a bizarre and fantastic kind and live in worlds peopled by creatures of their own imagination. Paranoid temperaments create delusional and persecutory systems of which they are the exalted victims. Psychoneurotics produce all varieties of bodily and other symptoms as an excuse for evading their responsibilities.

It is therefore important to elucidate the constitutional or temperamental pattern in order to understand the symptoms shown, to forecast the behaviour pattern and to assess the possible effects of treatment.

3. PREDISPOSITION

Predisposition really goes hand in hand with constitution but has been separated out here for reasons of clarity. It is a term applied to cover collectively all tendencies to neurotic or psychotic disorder. A predisposed person may never break down in ordered and sheltered surroundings. He is nevertheless much more likely to collapse under stress than an individual who has never shown early neurotic traits. A person may be predisposed to mental or nervous disorder by reason of:

(a) Constitutional factors as already described; or (b) because of isolated difficulties or complexes derived from personal experience. Under this heading it is necessary to underline the importance of infantile and early childish experiences such as emotional shocks, frights and other unpleasant and terrifying incidents, collectively known as psychic trauma. For instance, a child frightened by a dog may under certain conditions carry throughout life an apparently unreasoning fear of animals.

The factors of constitutional predisposition have already been described. As regards neurotic difficulties the following is a list, by no means complete, of some of the commoner neurotic traits.

i. Nervousness.

ii. Timidity including fears of the dark, animals and heights; avoidance of the ordinary 'rough and tumble scraps' and 'rough' games at school; fear of water, inability to swim and dive.

iii. Nervous habits such as nail-biting, thumb-sucking, rag-chewing, pica (dirt eating), nose-picking, sniffing, coughing, shoulder-shrugging, grimacing, blinking or twitching of the forehead or eyelids, or both.

iv. Sleep-walking.

v. Night terrors and nightmares.

vi. Bed-wetting.

vii. Stammer.

viii. Temper-tantrums.

ix. Truancy.

x. Stealing and other delinquencies including precocious sexual habits.

xi. Obsessional trends.

Note. By obsessional trends are meant three kinds of phenomena:

(a) Doubt—the inability to come to a decision or make a choice. This symptom extends to such activities as checking and rechecking of figures, gas and water taps, and doors. It may become a distressing symptom later on in life.

(b) The constant occurrence of the same thought in the mind, examples of which are tunes, phrases, short sentences and obscene words. This phenomenon is known as perseveration.

(c) Compulsive actions such as avoiding cracks in the pavement when walking, counting in certain numbers, touching particular objects a certain number of times.

The 'foolishness' of obsessions is fully realized by the sufferer who is unable however to stop or prevent them.

4. PHYSIOLOGICAL EPOCHS

i. Puberty. With the onset of puberty new and difficult adjustments have to be made. Sexual matters begin to intrude and there is an increasing preoccupation with members of the opposite sex. The onset of menstruation if not properly explained, or the girl not forewarned, may result in a severe shock. This clearly emerges from the histories of many neurotic girls who, with the appearance of the first menstrual period, have been very frightened and have suffered from fears of bleeding to death.

At this critical time of transition from childhood to adult life a number of poorly constituted characters break down with neuroses and psychoses of varying severity. It is at this point that schizophrenic disorders so often emerge.

ii. Marriage calls forth another set of circumstances requiring adjustments by both parties to the union. Quite a number of persons are totally unfitted for the responsibilities involved and the result may be much unhappiness and domestic discord. Marriage is so very much more than licensed sexual indulgence. It is a delicate psycho-physical relationship liable to be wrecked on the rocky shores of sexual adjustment if the parties to it are ill-equipped. Thus, it is a fruitful source of neurosis in one or other or even both of the partners.

iii. Childbirth. Neuroses and psychoses are met with before, during and after confinement. The view taken here is that the incidents connected with childbirth are precipitating factors and that the soil is already prepared. In other words the victims of puerperal disorders are predisposed people in whom the stress of childbirth has provoked mental disorder.

iv. The climacteric. The menopause, climacteric, involutional period or change of life as it is popularly known, occurs in the forties and is

again a difficult phase to negotiate. Involution, broadly speaking, involves atrophy of the uterus and ovaries with consequent loss of ovarian hormones and cessation of menstruation. This upsets the smooth working of the other endocrine glands (the endocrine balance) so that symptoms of all kinds may arise. One of the commonest abnormalities is some disturbance of thyroid activity. It is probably correct to state that most normal women experience some degree of discomfort during the climacteric. Headaches, irritability and vaso-motor irregularities such as 'hot flushes' are too well known to require further description. The amount of glandular disturbance together with its psychological repercussions may be sufficient to upset the mental stability of the nervously predisposed and constitutionally unsound.

In some males a similar sort of involutional process may take place in the middle fifties, the symptoms of which may be severe enough to precipitate a neurotic or psychotic breakdown.

v. Senility. At the latter end of life certain persons become weak-minded. Senile psychoses of various types develop and are probably the result of the influence of years acting upon poor nervous material to produce premature degeneration.

5. FATIGUE

The part played by fatigue and overwork in the causation of nervous symptoms is much exaggerated particularly by the layman. Overwork is often in itself a neurotic drive. Occasionally it is an over-compensation for feelings of inadequacy and inferiority. Nevertheless, when persisted in it doubtless contributes materially to the aggravation of existing symptoms. On the other hand, many persons overwork grossly as judged by ordinary standards but are never a whit the worse for it. So that when fatigue and excessively long hours are put forward as excuses for a breakdown inquiry should be made as to psychological factors. Emotional crises frequently repeated result in an excessive secretion of adrenaline which in its turn accelerates all bodily processes with consequent earlier exhaustion than normal. The neurotic is therefore in the grip of a vicious circle; for as long as the abnormal emotional state persists so long will sympathetic over-stimulation occur.

6. TRAUMA

i. Injury to the head may cause severe damage to brain tissue with resulting mental symptoms of the organic type.

ii. Head injury may precipitate a neurosis or a psychosis from predisposed soil. These may take the form prescribed by the temperamental structure.

iii. Epileptic fits may be initiated, but here once more it is probably safe to say that when there has been no structural damage to the brain

or its membranes, the prime cause is instability of the cerebral cortex.

iv. Trivial injuries in any part of the body may produce neurosis, especially when the question of compensation arises. The site of the injury becomes the focal point round which symptoms are grouped.

7. TOXINS

Attention has already been drawn to the various metabolic and other poisons which produce mental symptoms. A number of chemical substances used in industry inadvertently cause toxic psychoses. Of these the commonest are lead, mercury and arsenic. Drugs such as atropine and hyoscine produce transient delirious states when given in overdoses. Gases, and especially carbon monoxide, give rise to mental disorders of some severity.

Alcohol requires special discussion because of its widespread bearing upon economic and social life. To summarize the situation it may be stated that alcohol is unquestionably a neuronic poison and can produce well-known deleterious effects. Delirium tremens, Korsakoff's psychosis and chronic alcoholic deterioration are directly attributable to the effects of the drug upon the central nervous system. Nevertheless, these diseases are but a very small proportion of the psychoses wherein alcoholism is discovered without any other associated factor. The evidence therefore goes to show that a large majority of cases where drinking to excess is elicited on investigation, are unstable psychopathic individuals in whom alcoholism is a symptom rather than a cause. It follows that disorders once labelled alcoholic hallucinosis, alcoholic paranoia and so on are primarily schizophrenic or paranoid in nature, the associated alcoholism being symptomatic.

There is also evidence, not at present conclusive, that parental alcoholism may affect the reproductive cells sufficiently to reduce their vitality with subsequent impairment of offspring.

8. INFECTIONS

Syphilis, encephalitis lethargica and other forms of encephalitis give rise to characteristic psychotic illnesses. Syphilis in particular results in definite clinically well-defined abnormalities of conduct. Other bacteria and bacterial toxins give rise to states of delirium and transitory psychotic episodes. For example, the severe depression which frequently follows a sharp attack of influenza is well known, as is also the delirium accompanying the high fever of pneumonia and malaria.

9. PSYCHOGENIC

Psychogenic factors are of great importance in the genesis of psychiatric trouble. Under this heading are included all powerful emotional

experiences, mental conflicts, frights, shocks, bereavements, separations, the breaking of close family ties, unemployment and economic difficulties. Such agencies play their part from infancy onwards and may be encountered at home, during school life and during attempts at vocational adjustment. The 'square-peg-in-the-round-hole' phenomenon quite frequently leads to dissatisfaction, querulousness and neurotic manifestations. Other influences which must be taken into account in assessing causal factors are war stress and reactions to the awareness of the presence of chronic diseases.

10. THE DUCTLESS GLANDS

There is some, but not sufficient, evidence to associate endocrine failure with mental disorder. Much more research is required into this subject before categorical pronouncements can be made. All that can be said at present is that thyroid, pituitary, adrenal and genital gland disturbances are frequently associated with psychological disorder.

CHAPTER VI

THE CHILD

It is generally agreed that, taking them by and large, most adult neurotic disorders are founded in childhood. In fact it is not too much to say that most mentally disabled persons have been psychologically unhealthy virtually from infancy. Very rarely does neurosis emerge out of the blue so to speak. The whole personality being involved in the many adaptations an individual has to make to his surroundings, it follows that defects in the psychological make-up will show up very clearly under stress.

It is necessary then to explore the early factors which contribute to the many adaptive failures so prominent in the history of neurotics. In this respect the methods of reaction which each individual learns during his early life are of the utmost significance. For example, if a child is permitted to show its displeasure for what it feels is a tiresome restriction, by a display of bad temper and disobedience, it can be said to have won the first battle against discipline. Again, it may employ headache to avoid school. Herein lie the seedlings of adult modes of neurotic escape from difficulties, monotony and boredom.

In more detail, home circumstances require consideration. To begin with there is nothing so infectious as nervousness in the home. A child is sensitive to 'atmosphere'. It readily detects emotional disturbances and panic so that it soon comes to feel insecure. In general, a placid atmosphere produces a placid and contented child. On the other hand, a restless, crying, peevish infant who is difficult to manage, is the product of domestic irritabilities, parental disharmonies and frequent quarrels. Moreover, the matter of discipline is still not fully understood by some parents. The unintelligent 'spare the rod, spoil the child' principle is still encountered here and there. As against this, indiscipline, lack of order, spoiling, coddling and over-protection exist in other quarters. Both tyranny and foolish petting are crimes against the child. Experience at clinics and elsewhere reveals the regrettable fact that an appreciable proportion of the population is totally unfitted for the duties and responsibilities of marriage and parenthood. The remedy lies of course in the proper instruction of parents or prospective parents in sexual hygiene and child management.

The following quotation very ably sums up the position as regards the psychological problems of childhood:

'Adjusting the child to the reasonable demands of a suitable environment is one of the principle objects of psychiatric treatment. It includes

proper sanitation and physical care, adequate feeding and clothing, regular hours, sufficient recreational outlets, frank and sensible information, good example and that degree of socialization, which is commensurate with the child's age.

'To give the child the best possible start in life its psychological problems, if any, must be dealt with promptly and efficiently. To treat it successfully a psychiatric approach to the parents is of paramount importance. They too must be treated and if necessary re-educated. The physician may, and quite often does, encounter resistance from the parents who are blind to the fact that they are primarily at fault. They may respond with astonished hostility to this suggestion. In consequence, tact and cautious explanation must be used to overcome their antagonisms.'

Unfortunately, many parents consider their children's problems under the heading of original sin or as part of some physical disorder which on investigation proves to be non-existent. In consequence, faulty modes of reaction are allowed to persist into adult life so that eventually even minor stresses provoke nervous breakdowns. Much therefore can be done with the child, and incidentally the parents, to restore a useful degree of mental health.

The following is a classification of the commoner childish neurotic ailments:

1. Personality difficulties such as timidity, obstinacy, shyness, daydreaming and irritability.
2. Behaviour disorders including truancy, temper-tantrums, lying, stealing, cruelty, food-fads and sexual waywardness.
3. Habit troubles such as nail-biting, thumb-sucking, bed-wetting and stammer.
4. Disorders such as migraine, night-terrors, sleeplessness and vomiting.
5. Neuroses including anxiety, hysteria and obsessions.
6. Psychoses. These are rare but do occur even in quite young children.
7. Epilepsy.
8. Mental deficiency.
9. Mental disorders with physical disease.
10. Conditions in which the primary cause can be traced to disease or dysfunction of the endocrine glands.

The classification is at present rather vague on account of the difficulty in assigning accurate labels to the various groups of neurotic illnesses. In any event name-tags are only clinical conveniences and are not absolutely essential.

The abnormalities detailed in groups 1–5 are widespread and call for special modes of treatment.

Child psychoses may be dismissed briefly. The nurse is not likely to encounter many children in mental hospital practice—although excite-

ment, depression and schizophrenia do occur. Such illnesses are not very frequently seen below the age of about thirteen. Similar remarks apply to groups 7–10 except that mental deficiency must be referred to again.

THE PSYCHOLOGICAL PROBLEMS OF CHILDHOOD

Only the briefest outline can be given here of the problems which beset the growing child and of the factors which act adversely in infancy.

(a) In the first place the emotional interests of the child cluster around its parents and the family circle. It is dependent upon this environment for all its nutritional and other expectations. Or if there are no parents, comparable duties are assigned to guardians. At this stage the child demands and should receive love and affection.

(b) Next, the oedipus situation already described, requires careful management so that the child can free itself by easy stages from parental over-attachments. If this is not successfully accomplished excessive coddling, petting and over-protection may render the growing youngster dependent and helpless. It is necessary gradually to instil notions of independence so that later the young adult can stand on his own feet.

(c) With regard to the personal habits excessive severity may implant feelings of guilt into the young mind. The establishment of cleanliness can be brought about by judicious handling which is neither indulgent nor harsh. Again, the child must learn that speedy gratification of every other wish is neither possible nor desirable.

(d) Bad example or faulty discipline in the home may prevent proper super-ego development; for obviously the child has no way of distinguishing right from wrong under such circumstances. Thus, the young delinquent may easily develop into a law-breaking adult. Anti-social conduct may also be a form of neurotic expression, hence the relationship between neurosis and delinquency is more than a coincidence. For example, truancy and vagabondage may be the earliest manifestations of hysterical fugues in response to harshness or disharmony in the home.

(e) The tendency to temperamental mood-swing or excessive shyness and seclusiveness becomes apparent at an early age and should be dealt with promptly.

(f) The processes known as repression and complex formation can be detected in infancy. Accidents, frights and other unpleasant experiences are expelled from the memory. Nevertheless, they do not lose their unconscious emotional force so that they remain as constant mental irritants. Restlessness, bad behaviour, tics and nervous habits are some of the ways in which these repressed memories show themselves outwardly.

(g) The position of the child in the family is of some importance. For example, the only child is often in danger of becoming spoiled and

dependent because of parental coddling and excessive petting. Favouritism induces jealousies among children. The 'unwanted' or 'accidental' infant may come to feel rejected by its parents.

(h) In general, the home situation requires careful consideration. The background in many a juvenile neurosis is often found to consist of such disturbances as domestic troubles, poverty, hasty tempers, irritabilities, alcoholism, cruelty, carelessness, broken homes and divorce.

As examples, some of the commoner conduct problems are briefly analysed in the following table:

Truancy may be a response to such circumstances as over-pressure at school or sheer dislike of school. It may signify a form of rebellion or a variety of fugue.

Temper-tantrums are the outcome of incorrect home discipline or may be due to the persistence of infantile methods of demanding satisfaction for various wants.

Lying is often set up as a defence when the child is detected in some offence. It may be the outcome of confusion of the real with the imaginary. Or it may be due to childish ego-inflation, conceit or 'shooting a line'.

Sexual disturbances may be due to precocity, to tuition by older children or by certain unpleasant types of adult, or may be associated with childish crime.

Stealing may be due to sugar starvation, to envy, or to neglect of provision of pocket-money by parents. By association it may come to represent a kind of childish sexual expression.

These and many other circumstances have to be considered.

Treatment. The psychological treatment of children is best conducted at special clinics. In recent years many such departments have sprung up either alone or in connection with general hospitals.

Child guidance is the object of such centres and they have consequently been named child guidance clinics. Children's problems are examined from three aspects. Firstly, intelligence testing is of prime importance; for much more can be accomplished with a bright child than with a backward one. Whereas the intelligent youngster is easy to approach from a psychological angle, the most that can be done with a dullard is to place it in the easiest possible environment. Secondly, home circumstances require investigation. Lastly, there is the matter of therapy which will naturally depend upon the intelligence factor and the family background.

MEANING AND ASSESSMENT OF INTELLIGENCE

Intelligence is hard to define. It has been variously called 'gumption', 'nous' and 'common sense'. For practical purposes it can be regarded as the ability of an individual to learn by experience and to adapt adequately to a constantly changing environment. Intelligence is arbitrarily accepted as developing until about the age of sixteen. After that,

knowledge increases but the capacity to make use of the information gained does not expand further.

From experience of the abilities of many children of all ages tests have been devised to estimate the mental capacity of each year of life until sixteen. For example, if a child of ten can succeed in doing all the tests relating to his age group then his intelligence is normal. In other words both his real age and his mental age on testing are equal. Should he, however, only manage the set tests of the year eight then he is subnormal and two years retarded; his mental age is eight as opposed to his true age. The results of testing are usually expressed as percentages. For example, the intelligence of a normal child of ten can be expressed as follows:

$$\frac{\text{Mental age as found by testing}}{\text{Chronological age (i.e. real age)}} \times 100 = \frac{10}{10} \times 100 = 100 \text{ per cent.}$$

The child of ten, two years retarded, is calculated similarly:

$$\frac{\text{Mental age} - 8}{\text{Real age} - 10} \times 100 = 80 \text{ per cent.}$$

The percentage result is known as the Intelligence Quotient, or shortly, the I.Q. As regards the standard scales of tests used, those commonly employed are the Binet-Simon, the Stanford Revision of the Binet-Simon, and the Herring Revision. There are of course many other types of test. In addition many ingenious devices are employed for testing knowledge, memory, associative powers and practical abilities. The practical tests are known as performance tests.

At this stage it becomes necessary to distinguish between the truly intelligent and the 'clever fools'. Those who are able to apply their knowledge exhibit wisdom, foresight and the ability to adjust themselves to a life situation which perhaps changes daily. The 'clever fools' may be crammed with learning and yet may lack the mental means of using their knowledge to the best advantage. In other words they exhibit no common sense and may even require guidance in order that they may cope with the simplest problems of life.

As has already been mentioned, the approach to children's problems is threefold.

1. First, treatment commences with the assessment of the I.Q. This is carried out by a trained psychologist who should be able not only to give the tests but also judge the emotional state of the child in relation to the tests.

2. Secondly, a trained social worker is employed to visit and investigate home conditions and the neighbourhood. She is required to interview parents and also obtain school progress reports. In more detail the social history should take in the following points of significance.

i. Parental disagreements.

ii. Parental alcoholism.

iii. Homes broken by death, separation or divorce

iv. Jealousy reactions to a favoured brother or sister.

v. Moral and social standards in the home. Children are very imitative and readily adopt the habits, good or bad, of those around them.

vi. Accommodation as it concerns sleeping arrangements and privacy.

vii. The question of foster- or step-parents. Obviously the relationship between child and step-parent cannot imply the same degree of care and supervision as that in a normal family.

viii. The neighbourhood. The friendships of precocious and delinquent children in the immediate neighbourhood may adversely influence susceptible and easily led youngsters. Occasionally, as the result of some of the less pleasant cinema shows, such young people band together. The escapades of such juvenile gangsterdom are stealing, truancy and other forms of bad behaviour.

ix. The school: (a) class level; (b) relationship with classmates; (c) progress or otherwise as regards lessons.

3. The psychiatrist conducts the actual treatment deriving much help from the reports of his assistants. He combines the intelligence factor, the social circumstances and his own findings to build up a clear picture in each of his cases. It becomes possible for him to determine whether positive treatment is necessary or whether the trouble is a situational one. He can then either work directly with the child or attempt to adjust the child by altering its environment. Should the intelligence fall below what is necessary for proper co-operation special methods of approach are used.

During the course of treatment the doctor may use 'play therapy' with good effect. The child is provided with toys, blocks, coloured chalks and pencils. It may be allowed free scope in a sand-pit where it can dabble with sand and water to its heart's content. The child is neither scolded nor punished for soiling its hands or clothes and thus obtains complete emotional freedom. Often it will work out its psychological problems with the aid of the materials provided. Drawing sometimes serves as a useful outlet for infantile loves, hatreds and jealousies.

Analysis of the problems presented may point to the home as the source of the trouble. In that case it may be necessary to advise and if necessary treat the parents too. As domestic conditions loom so large in the background of childish nervous ailments some amplification of the known facts may be helpful.

Parents by precept and example can make or mar their children. Lax moral standards at home, drunkenness, cruelty and so on influence the young mind profoundly. Nurture under such circumstances can end only in the production of a difficult, insecure and shiftless individual. If any of the other adverse factors already detailed are also operative, the final product is altogether unhappy. In rare instances certain unusually strong nervous constitutions are able to throw off even such regrettable influences. Weaker structures, however, succumb. In all cases some warping

of the mind inevitably occurs. Unfortunately, little is as yet known of this so-called constitutional factor. It is probably in part hereditary and in part due to imperfect nervous development.

A warning note must be sounded here with reference to the question of mental defectiveness. This should not be too readily diagnosed in the absence of concrete evidence. Some children make no headway at school because of emotional disturbances, childish mental conflicts and boredom. Emotional upsets definitely interfere with learning capacity. It is just this affective factor which must be analysed and removed. The amount of improvement which follows skilful handling in this respect is sometimes astonishing.

Another source of school difficulties is related to the intelligence factor itself. There are two types of children who suffer when viewed from this angle. The dull and backward infant may find itself in a class of normal children whose work is much beyond its capacities. It may experience neurotic headaches and other symptoms because of a sheer inability to cope. On the other hand, the highly intelligent child may skip through average class lessons very quickly. It is thus left with time on its hands and boredom rapidly ensues in response to tasks which are beneath it. Mischievous and faulty behaviour may be seen in both the dull and the bright under these conditions.

It is essential therefore to classify children carefully according to their respective abilities rather than to herd them in age-groups. The dullard may require education at a special school where sympathetic and leisurely handling may be expected to produce slow but steady progress. The unusually clever child must be catered for in a similar manner.

In conclusion it is once more necessary to affirm that simple diagnostic labels cannot be attached to the neurotic problems of childhood. Each individual child requires careful study particularly of its emotional life.

This very brief survey may serve to impress the fact that many adult neuroses met with in hospital are almost without exception founded upon early infantile conflicts, unhappy experiences, and in general, upon a failure to attain emotional maturity.

CLASSIFICATION OF MENTAL DISORDERS

There are a number of methods of classifying the disorders of the mind which vary with the particular schools of psychiatric thought. The grouping adopted here has been somewhat simplified to include only those diseases which have been established as well-defined syndromes.

A. The neuroses

1. Neurasthenia.
2. Anxiety neurosis.
3. Anxiety hysteria.

4. Hysteria, including the 'traumatic' neuroses.
5. Obsessional neurosis:
   i. Compulsive; ii. ruminative; iii. doubt.
6. Reactive depression (psychoneurotic depression).

B. The psychoses

1. *Affective disorders:*
   Excitement; depression; alternating states.
2. *Schizophrenic—paranoid* psychoses:
   Schizophrenia: (1) simple; (2) hebephrenic; (3) catatonic; (4) paranoid.
   Chronic delusional psychoses: (1) paraphrenia; (2) paranoia.
3. *Psychopathic personality.*
   Creative; aggressive; inadequate; drug addiction.
4. *Organic psychoses.*
   i. Psychoses with syphilis and other infections.
   a. Syphilis: G.P.I.; cerebral syphilis; tabo-paresis; congenital neurosyphilis.
   b. With epidemic encephalitis (lethargica).
   c. With other forms of encephalitis.
   d. With general infections.
   ii. Toxic psychoses.
   A. Alcohol: pathological intoxication; dipsomania; delirium tremens; Korsakoff's disease; chronic alcoholism. B. Other drugs: metals, e.g. lead; non-metals, e.g. arsenic; narcotics, e.g. opium; gases, e.g. carbon monoxide.
   iii. Traumatic psychoses (psychoses with head injury):
   Post-traumatic delirium; post-traumatic personality changes; post-traumatic dementia.
   iv. Psychoses with arteriosclerosis of the cerebral arteries; psychoses with cerebral tumour; Huntington's chorea; disseminated sclerosis.
5. *Senile psychoses:*
   Simple senile deterioration; presbyophrenia; delirious states; depressive states; paranoid states.
6. *Pre-senile dementia:*
   Alzheimer's disease; Pick's disease; Jakob-Creutzfeld's disease.
7. *Psychoses with avitaminosis.*
8. *Psychoses with endocrine disorder.*
9. *Psychoses with pernicious anaemia.*
10. *Epilepsy.*
11. *Mental deficiency.*

CHAPTER VII

THE NEUROSES (PSYCHONEUROSES)

The neuroses form a large group of mental disabilities which may be justly regarded as 'borderland' disorders. Until quite recently they were regarded as imaginary ailments and sufferers were treated as malingerers fit only for curt and contemptuous dismissal with derogatory comments and a bottle of useless medicine. In hospital they were, and still unfortunately are, relegated to that refuse heap of departmental non-success, the psychiatric clinic, only after crude methods of treatment had failed. This angry acknowledgement of therapeutic failure has perpetuated perhaps for a lifetime many a neurosis which, with adequate understanding, would have been reduced in intensity if not entirely cured. The brutal truth is that despite the absence of tumours, heart, lung and other lesions, visible, palpable or otherwise detectable, neurotics suffer agonies of mind, may be seriously disabled for long periods, and, in general, bulk largely among the unhappy people of this world. It is safe to say that approximately half the average doctor's practice is concerned with psychoneurosis in one form or another. A great many diseases variously labelled as 'rheumatism', anaemia, debility, dyspepsia and so on are instances of neurotic mechanisms at work. Much of the so-called absenteeism of modern industrial life is due to nothing but neurosis. The sooner this fact is appreciated by responsible authorities the better will be the organization for dealing with such vast numbers of unstable people. At present, there are not nearly enough experienced psychiatrists to cope with them.

As regards treatment, neuroses are not amenable to the ordinary and casual methods at present largely employed; for the salvation of the neurotic does not lie in a bottle of medicine. Nor for that matter are the numerous 'nerve tonics', vitamin pills and other much vaunted preparations of any value whatsoever. Furthermore, the customary advice to 'pull yourself together, there is nothing wrong with you', is sterile. The patient seeks sympathetic consideration rather than constant rebuffs. Unfortunately, the symptoms of neurosis mimic organic disease; so that there is a continuous and ever-growing procession of patients who pass through all the departments of a hospital, collecting *en route* a pair of spectacles here, an X-ray there, an electrocardiogram elsewhere, and so on, right through the whole gamut of diagnostic medicine. The primary condition escaping detection tends to become chronic throughout the time wasted in useless investigations, so that the task of the psychiatrist is eventually rendered infinitely harder.

It is apparent that early diagnosis and treatment are essential to restore neurotics to gainful occupations as soon as possible. Not only are they thus helped to attain economic security but also to acquire a measure of personal contentment and improved morale.

CAUSATION

As regards the genesis of neuroses, some indications have already been given during the discussion on mental mechanisms. They are borderland states between the healthy and the psychotic. In them, the mechanisms present to some extent in all normal individuals, are seen at their most pronounced.

Taken by and large, neurotics are emotionally immature people in whom hereditary weaknesses and constitutional inefficiencies battle unsuccessfully with external circumstances. Such folk fail to react to the ordinary trials of life in an adult fashion. Instead, they seek ways of escape by means of a psychological ostrich policy. Burying their heads so to speak, in the sands of symptoms, they fail to observe what is going on around them and therefore the problems of life are to some extent regarded as non-existent. Their methods of living entail the use of repression with subsequent symptom-formation and intellectual dishonesty. In discussing neurotics in such terms it must be clearly understood that such reactions are not deliberate, wilful, or consciously inspired, but are the results of faulty adjustments combined with ignorance of the correct ways of adaptation to the environment.

In many cases over-protection or rejection in childhood produces weak and shrinking characters in whom there is a rooted diffidence. Consequently, such individuals feel insecure, timid, frightened, and over-anxious.

General symptomatology. Anxious worriers attempt to surround themselves with safeguards of all kinds. A number of homely clichés, although trite, explain in simplified terms some of the observed neurotic processes. For example, because of firmly established anxious expectation, they tend to 'cross their bridges before getting to them'; they 'go out to meet trouble half-way'; they are adepts at 'shutting the stable door after the horse has bolted'; they avoid sports, fearful of getting hurt. Similarly, they avoid adventures, gambles, risky business ventures, unfamiliar surroundings, harrowing screen or stage plays, exciting literature and other cognate circumstances. In fact they spend much of their waking lives attempting to evade the grim realities of life which might stir them up emotionally. In extreme cases, chronically anxious individuals even avoid reading the daily newspaper in case they might encounter reports of fatalities or suicides.

Personal anticipation of accidents converts them into 'back-seat drivers' and uncertain travellers. Examinations, interviews with superiors, mishaps, or the sight of blood produce internal flutterings ('butter-

flies in the stomach'), fear, nausea and even vomiting, such symptoms being known collectively as 'excessive visceral responses'.

Summarizing the situation, neurotics, particularly of the apprehensive class, attempt to live a 'cotton-wool' existence retreating from instead of facing their problems. In point of fact they are at all times in a state of chronic mild anxiety which means that they are so constituted as to react with florid symptoms to any circumstance which implies a threat to their security. In some cases 'conditioning' is responsible for this state of affairs. For example, a nervous individual may have experienced a motor-car crash in which he was badly shaken up. Subsequently, he may fear to enter a car. In fact the very sight of a vehicle may evoke anxiety symptoms. In other words he has been 'conditioned' by the accident to respond with acute fear to the presence or even the thought of a motor-car. The same mechanism is operative with other forms of potentially dangerous circumstances, in particular, where aircraft are concerned.

Sometimes anxious apprehension is combined with mild obsessional traits. In an endeavour to prevent anything going wrong anxious obsessionals tend to check and re-check their work, whilst gas-taps, water-taps, doors, windows and fires are a constant source of worry. They will insert the whole hand into the slot of a pillar-box when posting a letter; they fumble frequently and feverishly with their pocket-books and purses to see if money, tickets and so forth are still there, and appear on railway platforms hours before their train is due. In fact, they live at a high rate of nervous output.

With obsessional characteristics goes a neurotic drive which causes sufferers to persist long after they should have given in and sought treatment. Some are 'perfectionists', i.e. they seek all that is perfect in this most imperfect of worlds, and they require life to be 'just so' because of this powerful inner urge. Needless to say, disappointments and frustrations are frequent because of the absence of a good-humoured philosophy which will tolerate the inevitable shortcomings of people and things.

Hysterical disorders contrast in many ways with states of anxiety. There is not always a display of surface emotion. The essence of hysteria is the easy conversion of mental disharmonies, conflicts and fears, into physical symptoms which may be related to any organ in the body. Once the 'paralysis' or other disability has been established and the difficulties, psychological or environmental, successfully evaded, the greater part of the superficial emotion disappears to be replaced as often as not by a smiling indifference. There is almost an air of satisfaction in the way an hysteric presents a disability to the doctor, as it were — throwing the onus of cure entirely upon the latter. It is just this attitude which so infuriates those inexperienced in the ways of psychological medicine. In the earlier days of mental medicine, this seemingly beatific nonchalance was called by Charcot, a French neurologist, 'la belle indifférence'.

The end result then of a chain of faulty developmental processes acting upon hereditary failings is a greater or lesser degree of neurotic predisposition and a liability to nervous breakdown. The greater the extent of the predisposition the less the amount of stress required to overthrow the stability and vice versa.

From the psychological angle neuroses are based upon mental conflict which ends in repression and 'complex' formation. The buried memories (complexes) disturb both conscious life and sleep. In addition to attacks of panic by day, undesirable wishes steal past the censorship in a disguised form and intrude into sleep, giving rise to nightmarish dream experiences.

In hysteria, repression functions in much the same way but, in addition, dissociation quite frequently occurs to produce paralyses, blindness, deafness and a whole host of 'functional' disturbances which are not dependent upon any organic changes in the organs. Dissociation acts by splitting off from the mind all knowledge of the limb or organ in question which then becomes temporarily powerless.

Some neurotics because of thwarting or frustation of normal sexual urges, retire to less mature forms of sexual gratification, in other words, perversions. If such folk marry, sexual maladjustments frequently occur. Impotence, premature ejaculation and frigidity are symptoms which arrive with monotonous frequency in the consulting room. Herein, is a vast field of distressing psychological disturbances, which, because of their very nature and origin are often intractable and are unlikely to respond to the usual forms of sedative treatment.

Neuroses are classified as follows:

1. Neurasthenia.
2. Anxiety neurosis.
3. Anxiety hysteria.
4. Hysteria.
5. Obsessional neurosis.

1. NEURASTHENIA

Neurasthenia conveniently describes a type of very easily fatigued individual with nervous symptoms. For many years the word was used to cover a whole host of different mental ailments and therefore fell into disuse, because of the uncertainty of its application. The term has been restored to include a rare group of persons who are by constitution physically and mentally below par. The illness is often brought to light by prolonged toxaemia, exhaustion or infection. Feelings of intense weakness and fatigue after the slightest effort are the predominant symptoms. Sleep is variable, sometimes good, but at all times unrefreshing. Headaches are common and are often described as band-like sensations round the head. Irritability, peevishness and depression are

complained of often. Impairment of concentration, apparent failure of memory and inability to attend to essentials complete the picture. Physically, neurasthenics tend to be of slender build, the circulation is poor and the blood pressure low. Not infrequently, sexual vigour is lost or diminished, and this, in itself, increases the depression.

Illustrative case. Mrs. E. K., aet. Fifty-six. A woman of moderate intelligence, married with two children. Her father had always been moody and difficult, inclined to drink excessively when worried. He died at fifty-eight of a 'stroke'. Her mother was an anxious worrier who suffered from high blood pressure and who had a nervous breakdown at the change of life.

The patient, E.K., was one of three children, the other two being 'nervy' and 'highly strung'. From childhood onwards she had been a 'bag of nerves', lost much schooling on account of various ailments and was regarded as 'delicate'. In adult life she managed to work successfully enough as a packer in a jam factory. Marriage was happy enough, but was punctuated by frequent attendances upon her doctor.

When first seen at an out-patient clinic she gave a fourteen-year history of gradual loss of enthusiasm. She complained of vice-like gripping sensations all round her head, irritability, intolerance of noise, and there were times when she could not cope with her children. She alternately slapped and coddled them. Her mood was one of depression and a general feeling of ill health. Gradually, her housework became increasingly difficult to manage and the least exertion completely exhausted her. For a time, she endeavoured to rest each afternoon, but eventually even this failed. She became increasingly forgetful, absent-minded and preoccupied with herself. As usual, she tried many so-called remedies including 'nerve tonics', patent medicines and 'nerve foods' without obtaining any benefit. She inspected her tongue frequently and took to counting her pulse until finally she felt so exhausted that she could not exert the slightest effort. The whole of the housework devolved on her husband.

Physically, she was a thin, spare, worried woman who recited her symptoms at great length and with a wealth of detail. Her memory, orientation and insight were perfectly sound.

After several months in a neurosis hospital she improved, and following a period of convalescence in the country she was able to return to her home and take up her household duties again with instructions as how to manage her life.

Neurasthenia must be distinguished from anxiety states, states of psychotic depression, hysterical depression, early general paralysis and commencing organic cerebral diseases.

Treatment. Rest and change of occupation are of value. But these are subsidiary measures. Attention to the general health must be the first concern. Where toxic or infective factors are at work steps should be taken to eliminate them. The neurasthenic requires constant reassurance

as regards his bodily functions, and diagnostic investigations should be reduced to a minimum. Tonics of a simple bitter type are useful chiefly for encouraging appetite. As regards sleep, insomnia must be combated by the provision of quiet and peaceful surroundings, hot drinks at night and by the use of the milder analgesics such as aspirin. If no success results then recourse must be had to barbitone preparations. Above all, neurasthenics must be taught to live within their physical and mental capacities, to avoid all tasks and recreations which call for prolonged efforts of concentration and physical energy, and in other ways to order their lives so as to avoid mental bankruptcy.

2. STATES OF ANXIETY

The anxiety neurosis in its purest form is characterized by attacks of apparently causeless panic by day and terrifying dreams at night. Sufferers from this disability are conditioned to respond with morbid fear to the presence of any threat to their security. The threat may come from within the mind or from the environment. In the large majority of cases, the neurotic is more or less predisposed to nervous breakdown by reason of the developmental anomalies already detailed in a previous chapter. Thus, he attains adult status totally unaware of 'complex' formations laid down in his mind. In other words, he has through faulty instruction and upbringing, learned to evade the clamours of his instincts by repression rather than conscious acknowledgement. If his intelligence is of a good order, he may have accomplished much with the aid of compensatory but nevertheless neurotic drives. Even so, being in a state of unstable equilibrium he feels insecure without knowing the reason for such feelings. The threats to his peace of mind are ever present, ready to be touched off by some adverse circumstance in his environment.

In peace-time, he may be capable of maintaining a precarious emotional balance under more or less sheltered conditions. However, an accident, a frightening experience, domestic or financial stress, air-raids and other vicissitudes of war often suffice to evoke florid anxiety symptoms. Amongst fighting men, similar experiences such as shell-fire, bombing, aircraft accidents and immersion act as precipitants of acute neurosis.

In effect, acute neuroses are gross exacerbations of mild chronic states of anxiety. There are certain exceptions to this general statement. Modern warfare has shown that every man has his breaking-point, but it requires very exceptional stress to break down a really stable personality.

To complicate the matter still further anxiety states are often associated with mildly obsessional trends particularly where morale and self-respect are high. There is less tendency to give in, but when the break does occur the subsequent neurosis is likely to be severe because of the moral factors involved.

The signs are those of prolonged and morbid dread. In the earlier stages periods of freedom from symptoms may be observed so that the illness takes on an episodic character. During these episodes there are vague fears, irritability, depression, loss of appetite, attacks of unreasoning panic, fear of impending disaster, fears of specified situations such as travelling in a tube train, closed spaces, knives and other objects. Attacks of palpitation are frequent and dyspnoea on exertion is commonly reported. There may be insomnia or sleep disturbed by vivid nightmares. Headaches are frequent and severe. They are as often as not entirely unrelieved by aspirin and similar drugs. Trembling is a common symptom. Gastro-intestinal upsets occur and flatulent dyspepsia is a constant symptom. Frequency of micturition is sometimes a distressing nuisance. Attacks of 'lienteric' diarrhoea may occur especially prior to interviews, important meetings, examinations and similar circumstances.

On account of the many bodily symptoms displayed patients are frequently submitted to medical examinations of all kinds with, of course, negative results. The combination of palpitation and dyspnoea simulates heart disease. Abdominal and gastric symptoms resemble peptic ulceration whilst the general nervousness, anxiety and tremor are often mistaken for thyrotoxicosis. If therefore not recognized sufficiently early, a neurosis may become chronic so that whilst the more acute symptoms subside, headaches, giddiness, depression, insomnia and apprehensiveness remain as residua for years. The disability is often severe enough to cause frequent absences from work ; for impairment of memory and concentration and emotional interference with judgment prevent systematic effort. Combatants have to be withdrawn temporarily from the battle line, rested and treated.

Psychopathology. The psychological background of anxiety neurosis has already been described. From time to time, the repressive forces lighten to allow the intrusion of morbid fear into both waking and dream life. With regard to the former, the unpleasant emotion in its upward surge detaches itself from the buried memories which are tenaciously held, remain undisturbed and therefore unrecognized.

Fear then appears in consciousness either as free floating anxiety or it attaches itself to apparently insignificant objects in the environment such as tube-trains and knives. Actually these objects are carefully selected to symbolize the repressed material and become the subjects of phobias.

At night morbid fears enter into the dream life in the guise often of horrifying objects or situations to give rise to sleep-disturbing nightmares.

Bodily accompaniments of anxiety. The chain of morbid phenomena is thought to be as follows. Repressed memories maintain disagreeable emotions in the mind which cause impulses to stream down the central nervous system to the suprarenal glands via the sympathetic nerves. An oversecretion of adrenaline ensues which in its turn stimulates the sympath-

etic nerve endings. The effects produced are the familiar physical accompaniments of fear, namely dilation of the pupils, palpitation of the heart, dryness of the mouth, frequency of micturition and alimentary inhibition, to mention only a few. These phenomena serve to place the individual under the best possible conditions for fight or flight.

Illustrative Case. J.H.W. An intelligent man of thirty-five, of nervous stock and distinctly mother-fixated. All his life he had been coddled. As a child he had suffered from frequent night-terrors, and could not sleep without a night-light. He was timid and nervous, never joined in 'rough' sports, was very afraid of water and never learned to swim. In fact, he was escorted to and from school as he was afraid to cross the road alone. His response to the sight of blood and accidents was one of nausea and vomiting. Before interviews and examinations he 'got worked up inside' to a pitiable extent. However, his school and university records were excellent and he became an expert meteorologist. However, he could not face important meetings and on more than one occasion developed diarrhoea severe enough to cause him to turn his car for home in order to avoid them. Eventually, he married an equally neurotic woman with disastrous results. Marital responsibilities increased his anxieties enormously so that he was unable to consummate the marriage. He then broke down with headache, tremor, exhaustion, palpitation, acute panic reactions, insomnia, depression and inability to work. It was at this point and only after treating himself with various patent medicines and occasional doses of sedative prescribed by his doctor, that he sought psychiatric advice.

After prolonged treatment of an analytical variety he recovered sufficiently to return to work. A year later, he reported the probability of an addition to his family.

Treatment. It is evident that the basis of anxiety states is the vicious circle of sustained morbid fear and its associated physical symptoms. The only possible remedy is to break this circle by dissipating the unpleasant emotion. This is best effected by analytical treatment which revives the buried memories. Relief of repression ensues which allows the disagreeable affect to discharge itself harmlessly on the surface. Occasionally, simple discussion, explanation and reassurance may be of great benefit. The sufferer comes to realize the nature of his personality defects and methods of evasion. He acquires adult forms of reactions to personal problems and makes conscious compensations for inherent weaknesses. Phobias vanish when their symbolic connection with hidden memories is discovered.

Illustrative Case. L. T. G., aged forty, married with no children. He came of neurotic stock and was brought up against a background of squalid poverty and economic insecurity. As a child he manifested numerous neurotic traits, chief amongst them being timidity

When first seen he complained of depression, giddiness, headaches, impairment of concentration and attacks of unreasoning panic in tube-

trains, closed spaces, or when confronted by the word 'suicide' in newspapers, periodicals or books. Such circumstances were invariably calculated to throw him into a pitiable state of acute sweating fright. His nights were disturbed by terrifying dreams which occurred so often that he deliberately kept himself awake. Tremor of his hands and lips was very marked and to 'soothe his nerves' he smoked as many as sixty cigarettes a day.

During the course of treatment which was conducted on analytical lines it was elicited that as a young boy he had been taught, and had indulged in, sexual malpractices. His companion was an older and sexually precocious youth. In addition, he recalled stealing coppers and odd sixpences from his mother's purse. Later, whilst employed as an office boy he appropriated postage stamps and small sums of money entrusted to him.

As he developed, these earlier sexual and other delinquencies ceased and were ostensibly 'forgotten', i.e. repressed. However, the guilt feelings persisted to worry him increasingly for many years. Not knowing the sources of these feelings he continued without treatment other than mild sedatives until aged forty when he could no longer obtain any further relief therefrom.

The panic attacks, the nightmares and the suicide-phobia were obviously indicative of repression successful enough to exclude the repugnant memories, but not powerful enough to hold in check the associated feelings of guilt, remorse and self-accusation.

Bringing to light the significant events in his past effected a considerable improvement and he was subsequently able to return to work from which he had been away for many months.

Acute anxiety responses to accidents and acute fright reaction to terrifying incidents can be considerably relieved if dealt with promptly by a short period of narcosis with any of the sedatives in common use such as thiopentone sodium (Pentothal), Sodium Amytal, sodium barbitone or phenobarbitone.

The Use of Methedrine. Methedrine (deoxyephedrine) is of value particularly in neurotic states of recent arousal, both as a euphoriant and as an aid to mental exploration.

It is given intravenously in doses of 15–20 mgm. dissolved in distilled sterile water (1 cc.). Immediately after the injection, loquacity temporarily relieves depression and facilitates access to the deeper mental thought processes. It thus enables patients to disclose material which had hitherto been repressed or withheld. Occasionally, emotional outbursts occur and the relief obtained by some patients is considerable.

The drug is therefore of some value when applied with discrimination. It has also been used as a diagnostic agent in psychoses such as schizophrenia to reveal delusional patterns previously unsuspected.

Caution must be exercised where thyrotoxicosis or hypertensive arteriosclerosis is present because of the tendency of methedrine to raise the blood pressure.

In long standing and chronic cases analyses must be intensive and prolonged. Otherwise, explanations and reassurance in the form of therapeutic conversations are all that can be undertaken. Some doctors claim good results from the use of electrical shock treatment, but on the whole, the response to such a drastic proceeding is disappointing. Moreover, patients so treated sometimes become fearful of the procedure and refuse treatment before the effects can accurately be assessed.

As regards nursing, very few anxious patients care to come into mental hospitals because of the presence of so-called 'mad' people. Generally speaking, there is little indication for hospitalization. Sometimes, however, the severity of the symptoms may necessitate in-patient treatment. To this end some general hospitals have set aside a certain number of beds, and in addition, there are special neurosis hospitals, regrettably too few in number. Should the patient be admitted, it is the task of the nurse to listen sympathetically, provide encouragement and reinforcement of the physician's suggestions, and supervize interesting occupational tasks.

Sometimes a course of modified insulin treatment may be prescribed, particularly where there is marked loss of appetite (anorexia) and loss of weight.

Technique. This treatment commences with an initial intramuscular injection of 10 units of insulin given as a rule between 7.15 a.m. and 7.30 a.m. Generally speaking, this dose produces little or no reaction. However, its effects are neutralized by a lemon drink containing 60 grammes of glucose (dextrose). Injections are subsequently given daily except on Sundays, which is regarded as a rest day. The dosage of insulin can be increased rapidly by daily increments of 10 units. It is the duty of the nurse to watch the patient carefully. As soon as the patient begins to perspire and feel uneasy, a phenomenon which occurs between half an hour and two hours after the injection, the session is terminated with a drink containing approximately 100 grammes of glucose. No patient is permitted to go into coma and the maximum insulin dosage depends upon the patient and may reach upwards of a 100 units. The usual duration of the treatment is about six weeks.

The patient gains weight; for insulin causes the blood sugar to disappear and so evokes a sensation of hunger which needs to be appeased. Moreover, the sugar used to terminate the effects of insulin is converted into fat.

Some patients experience considerable relief of symptoms but others do not respond at all, for the treatment can obviously do nothing to relieve mental conflict. No useful purpose is served in prolonging modified insulin therapy beyond the usual course if no benefit results.

3. ANXIETY HYSTERIA

Anxiety hysteria combines both anxious tension and hysterical 'con-

version' symptoms. It arises in the same neurotically predisposed soil as anxiety states in general except that it is perhaps possible to find hysterical trends such as bed-wetting, sleep-walking and grimacing among the early neurotic traits which emerge during an historical inquiry into the situation. Thus, in addition to panic attacks, depression, headaches and other symptoms, many disturbances superficially resembling organic disease may occur. One such set of phenomena has unwisely been erected into a spurious clinical entity called the 'effort syndrome'. This consists of precordial pain, palpitation and dyspnoea coming on during exertion and resembling attacks of angina pectoris.

Visual disturbances, diarrhoea, vomiting, enuresis and a whole host of functional derangements may be present. In fact it is an endless task to detail all the symptomatic possibilities, for no part of the body escapes. The mind of the sufferer is so organized as to refuse to accept mental causes for the presenting illness. Psychic conflict being readily 'converted' into alarming bodily distress causes the victim to seek physical remedies for his 'diseases'. The part selected for the chief incidence of the neurosis is that which is most used in vocational life. For example, those who are called upon to do close work such as intensive reading or fine manipulations which involve prolonged concentration may develop so-called 'eye-strain'. Blurring of the vision and headaches lead the sufferer to consult eye specialists and opticians. This results in the acquisition of many unnecessary pairs of spectacles for the correction of minor degrees of astigmatism and delays the recognition of the psychological disturbances underlying the complaint.

It is more than probable that some types of latent squint (heterophoria) are hysterical in origin. If the psychogenic background is not explored much valuable time may be wasted in giving unnecessary orthoptic treatment. Flatulent dyspepsia with frequent air swallowing and belching of wind is another distressing symptom so commonly found in anxious hysterics. The stomach is notoriously vulnerable and reflects many anxieties, apprehensions and minor tensions of psychic origin. Associated with such gastric symptoms, cardiac anomalies such as missed beats (extra-systoles) may be provoked. These are due to pressure against the diaphragm by flatulent distension of the stomach with consequent interference with the rhythm of the heart. The sufferer needs much convincing that he is not suffering from heart disease.

Amongst other nervous phenomena blushing is the cause of much embarrassment. Frequent enough during adolescence it may persist throughout life as a symptom of vaso-motor instability based on feelings of guilt induced by earlier auto-erotic practices, timidity, shyness and inferiority feelings.

Fainting attacks or 'black-outs' are again signs of vaso-motor instability. They require to be distinguished from epileptic seizures, petit mal, epileptiform convulsions and the syncopal attacks of heart trouble. They occur in response to unpleasant sights or sounds, situations

fraught with danger or as the result of personal emotional difficulties.

The appearance of bald patches on the scalp (alopecia areata) is often provoked by nervousness, environmental difficulties and psychic conflict occurring in a nervously predisposed individual.

Illustrative case. Mrs. A. L., aged thirty-eight, married with one child, was referred to the psychiatric department from the skin clinic of a general hospital. She displayed large patches of baldness distributed all over the scalp. In addition, she stammered badly, complained of headaches and exhibited phases of tearful depression.

She came of neurotic stock, her mother being unstable, chronically alcoholic, and so irresponsible as to require detention in an institution.

In early life Mrs. A. L. had been nervous, shy, timid, afraid of the dark, heights, animals, and water, and had stammered at times. Her marriage had been consistently unsatisfactory because of her husband's infidelity. She, too, sought consolation elsewhere, but although not consciously perturbed by her own conduct, it became patently obvious that unconsciously she felt extremely guilty on this score. During the course of an inquiry into her mental state it became apparent that these guilt feelings were producing depression, increased stammer, sleep disturbed by terrifying dreams and worst of all, her hair was falling out in large quantities.

Following explanation and reassurance, both of which she accepted intelligently, her symptoms markedly diminished. The scalp condition was arrested and with the aid of stimulative local treatment, the hair renewed its growth.

Some types of asthma, hay-fever, and other allergic troubles are undoubtedly of hysterical origin. Unsuitable work sometimes produces neuroses of hysterical motor action in nervously predisposed people.

'Writer's' and 'telegraphist's cramp' and 'miner's nystagmus' are examples of functional (hysterical) disorders symbolic of mal-adaptation to these particular tasks.

Illustrative Case. L.H. a married man of thirty-two had shown nervous trends and hysterical mechanisms in his early childhood. Becoming a skilled carpenter he was promised a senior foreman's post which, however, never materialized. One day, when working in a rather cramped position under an aircraft he developed a severe pain and spasm in the 'anatomical snuff-box' district of his right hand. This caused him to drop his chisel. The spasm spread to his fingers so that he could no longer write. With this 'paralysis' he developed headaches, tremor, excessive sweating and nightmares. All kinds of splints, physiotherapy and other treatments were applied without avail. But under the influence of a small dose of Pentothal he wrote perfectly without any difficulty, proving conclusively the hysterical nature of his disability. In this particular case his psychological disharmonies were reflected in a mixture of anxiety and hysterical symptoms. He therefore achieved his object, namely withdrawing himself from work with which he was dissatisfied,

but at a price. In other words, like so many other neurotics, he cut off his nose to spite his face. The disability was completely removed by explanation and readjustment of his environment.

Treatment. Treatment must be directed towards elucidating the adaptive difficulties which have made it necessary for the patient to seek refuge, sympathy and attention in a set of symptoms without organic basis. Reassurance and re-education are necessary as is also vocational adjustment, i.e. fitting square pegs into square holes. Some form of analytical procedure may be required during the course of which the patient is encouraged to use his own mental energies to solve his problems instead of relying on symptoms or friends to deal with them for him.

4. HYSTERIA

Hysteria is a strange disease in which the mechanisms of repression and dissociation are seen at their best. True hysteria implies a special type of personality the chief features of which are emotional immaturity, selfishness, egocentricity, dramatic posing, shallowness of feeling, childishness and dependence. Hysterics are easily discouraged, they lack persistence and appear to be stubborn, wilful, obstinate and sometimes spiteful. They are very suggestible and often produce as their own the last expressions of opinion they may have heard, hence their apparent inconsistency. In times of stress or in the face of normal adult problems they retire into neurosis, and with a smiling indifference, expect sympathy and kindness from those around them. Sexually, they are more often than not quite inadequate so that marriage frequently ends in disaster. Disabilities such as impotence and frigidity are commonly found as hysterical reactions to marital responsibilities. Vanity, conceit and indifference to the discomfort caused to others complete a picture of personalities, futile, dependent and difficult to adjust. Although so many derogatory adjectives have been used to describe hysterics it must not be assumed that hysteria and malingering are equivalent. It is of course true to say that sometimes the difference is not easy to detect; for the motives are the same in each case, namely the evasion of responsibilities or punishment. Nevertheless, the malingerer, although having much to gain, very rarely inflicts or permits severe injury on himself. The hysteric, on the other hand, may submit to all kinds of surgical and other procedures even to the extent of an amputation of a limb rather than give up symptoms which subserve his deep-seated and unconscious needs. Therefore, his attitude to the doctor is often unco-operative. He expects magical remedies without the least insight into the fact that he unconsciously clings tenaciously to his disabilities.

The symptomatology is vast and entirely based on the solution of mental conflict by repression, dissociation and conversion. Symptoms correspond more or less closely with what the lay mind would imagine

them to be if organic disease were really present. For example, an hysterical paralysis always involves a limb or a movement but never an individual muscle. Anaesthesia never follows the distribution of a nerve because the patient lacks knowledge of the exact anatomy. In general, hysterical symptoms can be increased or produced by suggestion, and removed by the same means. They run through the whole calendar of bodily ills and include blindness, deafness, loss of voice, stammer, spasms and tics of all kinds, paralyses, skin diseases, sensory disturbances, tremors, vomiting, anorexia, vasomotor disorders, fits, amnesias, fugues, sleep-walking, enuresis, impotence and multiple personalities. Hysterical motivation underlies some kinds of sciatica, fibrositis and cardiac conditions. It may prolong symptoms of what was once an organic condition. Insomnia and depression are often associated features. Occasionally, hysterics will stage dramatic faints or suicidal gestures. The latter are often alarming but it should be remembered that the last thing desired by an hysteric is an escape via death. Sometimes there is a fatal termination because of unskilful planning, so that hysterics need observation.

It is impossible to illustrate all the hysterical phenomena but the following case exemplifies hysterical fits and paralyses. *Mrs. C.L.B.*, aged twenty, an immature young woman, walked in her sleep as a child, suffered from numerous bilious attacks, 'was always at the doctor's', received very little schooling because of many minor disabilities all undoubtedly psychogenic. She was very home-attached and could formulate no decision without the aid of her mother. She became a domestic servant eventually. At eighteen and a half she joined the W.A.A.F. as a cook but at once began to exhibit adaptive difficulties including headache and 'eye-strain'. She also came under observation because of a 'brassy' and obviously functional cough. During her earlier career she met a soldier and married him after a short engagement. Marriage was too much of a problem for her. It was never consummated because of her frigidity and she parted from her husband. About six months later, whilst receiving a routine T.A.B. injection, she fell comfortably to the ground and exhibited a typical hysterical fit during which she foamed at the mouth, laughed and cried alternately and was incontinent of urine. When she recovered after about two hours it was found that the fingers of her left hand were 'paralysed'. They could not be moved and the finger-nails were firmly embedded in the skin of her palm. The condition could not be relieved and it was found necessary to invalid her. After four months she had forgotten how to 'undo' the contracture but badly wanted to get rid of it because it had served its purpose, i.e. removed her from an environment to which she was unadjusted. One visit to a psychiatrist produced an instantaneous cure and she returned home quite happily. The sequence of hysterical events is clearly indicated and it is evident that so long as she remained in the W.A.A.F. so long would she remain 'paralysed'. In this case there was not enough intelligence to

warrant intensive psychotherapy so that treatment had to be restricted to the local condition.

Treatment. Treatment must necessarily depend upon how much intelligent co-operation can be expected. Where the presenting signs are hysterical perpetuations of what was once organic trouble, explanation, reassurance and removal of symptoms by suggestion are often all that is required. In those of low intelligence it must suffice to relieve the disability by persuasive methods with or without hypnosis. An intravenous injection of Pentothal or Amytal is sometimes of value in overcoming the patient's mental resistance and rendering him more accessible to suggestion.

Anorexia Nervosa. Anorexia nervosa is a psychogenetically determined illness which clearly belongs to the hysterical group of phenomena. There is no organic basis for the disorder, but it may indeed prove an intractable condition. From the aetiological standpoint, both sexes may be affected, but the chief incidence is in the female. As far as psychopathology is concerned, this may depend on a number of factors which have to be elicited separately in each case. It is a severe form of neurotic escapism with the usual histrionic colouring so common to hysterical ailments.

In effect, close inquiry elicits factors of neurotic predisposition common to the whole of this group of sufferers. As far as precipitants are concerned, the diminished intake of food may have originated in a desire for slimming. Subsequently the anorexia and loss of all desire for food develops out of all proportion to the original motivation.

The condition has to be distinguished from Simmond's disease (pituitary cachexia) from which it can be separated by the fact that wasting is not the cardinal feature in the latter disorder.

The clinical picture presented is extreme loss of weight to the point of emaciation. The patient may acquire a wizened, almost senile, look, together with pallor and coldness and cyanosis of the distal extremities. Nausea is a prominent symptom, as is also constipation together with amenorrhoea. The outlook is one of depression together with apathy and listlessness. Exhaustion may eventually supervene, and in fact death may occur from starvation or from some intercurrent infection to which the under-nourishment predisposes.

Prognosis. The prognosis in most cases is fair provided that physical and psychotherapeutic methods are instituted as soon as possible. In the first place, there must be an unyielding insistence upon the taking of food, if necessary to the point when tube-feeding becomes necessary. Careful nursing supervision is essential because the patient cannot be trusted to take food alone. She may even induce vomiting to relieve the degree of distension which is at first an inevitable accompaniment. Meals must be small at first, bulk being achieved gradually until a caloric value of 3,500 per day is attained. Opinions on drug adjuncts vary: in some quarters it is held that the administration of insulin is undesirable; on

the other hand, an injection of 5 units of insulin once or twice a day is known to stimulate hunger and, together with the administration of 50 gm. glucose twice a day, may be of considerable value in maintaining nutrition. The insulin need not be pushed to the point when the symptoms of toxaemia develop.

More importantly, exhaustive history-taking, not necessarily on analytical lines, must be pursued. Occasionally a deeper penetration of the mind, together with the elucidation of the motives, may be assisted by the use of disinhibiting drugs such as Pentothal or Sodium Amytal.

By these means, the material can be elevated from the depths of the patient's mind which she must be brought to face so that this form of neurotic escapism can be denied her in the future. Subsequently reassurance and the application of a working philosophy may do much to restore an anorexic individual and relapse, if the treatment has been carried out firmly and efficiently, is not common.

Technique. Pentothal is issued in ampoules of 0·5 grs. and 1·0 grs. The total dose required for a satisfactory narcosis varies between ·25 grs. and ·5 grs.

A tray should therefore be set out as for intravenous injection (see p. 267).

The patient is isolated in a partially darkened room and is told that the injection he is to receive will make him drowsy. The drug is then slowly injected into the ante-cubital vein at a rate not exceeding ·1 grains per minute, whilst the patient is told to count backwards from 100. Presently the counting becomes confused. At this point and just before he goes to sleep, the injection is discontinued. By this time the patient is in a state resembling the early stages of alcoholic intoxication.

As a rule, the patient has to be stimulated to talk. The keynote of the stimulus is provided by a description of the circumstances which produced the symptoms. The patient then talks freely and is allowed to proceed without interruption. Occasionally it becomes necessary for the doctor to give advice, sympathy or whatever is required by the circumstances.

A typical case will illustrate the technique better than any description:

Illustrative case. R.A.F. Warrant Officer *L.A.B.*, aged twenty-eight, single, had baled out over Germany after his aircraft had been shot down. Subsequently, he spent four years in a prisoner-of-war camp. During his detention he became increasingly conscious of a tremor in his right hand which prevented him from writing except in an illegible scrawl. Released by the American Army, he was repatriated and admitted to hospital. Nothing of significance emerged from his family or personal history except that he had obviously been submitted to severe stress by his adventures.

It was decided to submit him to a Pentothal narcosis. Soon after the injection was discontinued he began to talk spontaneously and described

his state of terror when the aircraft was hit and the difficulty he experienced in baling out. Then followed an account of his fears as to his fate in the hands of the Germans. He continued with a description of life in a prison camp, his hatred of a tyrannical camp commandant, and he relived his feelings of rage against the camp authorities. There was a considerable discharge of emotion together with a stream of indescribable obscenities directed against the Hun in general. Subsequently his mood changed to a kind of drunken jollity and he discussed in terms of crude surgery what he would like to have done to his captors.

At this point, a pencil was placed in his right hand, he was supported and asked to write his name and anything else that occurred to him on a piece of paper. He did as requested, and with an air of intoxicated triumph wrote his name clearly and well, finishing off with a whole series of linked noughts. The tremor had entirely disappeared. Presently he slept for a short while and waking up proceeded to write once more distinctly and without trace of impediment.

Clearly he had repressed a considerable amount of fear and, later, much aggression. All that remained superficially was a tremor and an inability to write, symbolic of trembling both with fear and rage. Under the influence of the narcotic he re-lived his experiences and dissipated all his repressed emotions to effect a complete cure in one session.

Naturally, narcosis does not always go as well as this. Sometimes, several sessions are required.

The less severe degrees of hysteria do not require hospitalization but can be dealt with as out-patients or in the consulting-room. Where paralyses, vomiting and the more disabling forms of this ailment are present admission to hospital becomes necessary. It may be appropriate to isolate the patient completely for a time. The attitude of the nurse should be kindly but not over-sympathetic, for excessive solicitude merely feeds the neurosis. It must always be borne in mind that hysteria is not shamming but a severe type of mental disorder. In fact, no suggestion must even be indicated that the disability is being malingered. An optimistic attitude prepares the soil for complete relief of symptoms. Nursing must therefore be carried out with coolness and confidence.

The doctor may decide that some form of analytical treatment is desirable. He will carry this out in the manner already described. The object of analysis is to elucidate the factors which provoked the neurosis, to give the patient insight into the meaning of his symptoms and what problems he has evaded by flight into neurosis. Moreover, he is instructed in mature methods of coping with difficulties so that eventually he may learn to discard all childish, self-deceiving and unprofitable modes of reaction.

During the analytical process the patient may re-live the unpleasant experiences and thus dispel the buried and therefore harmful emotions. Unquestionably, efficient analysis gives the best chance of, if not a per-

manent cure, at least considerable periods of freedom from disabling symptoms. Unfortunately, the procedure is lengthy, tedious and expensive so that short-cut methods are a matter of sheer economic necessity. In the past many ingenious mechanical and other methods of suggestion have been employed. These include electric shocks, baths, massage and so on. All have succeeded where the patient has been convinced of a certain cure. At best such methods can only temporarily relieve the symptoms. Therefore personality studies and logical analysis promise the most hopeful results.

Traumatic neuroses. Special mention must be made of neuroses which arise after accidents or injuries. They include anxiety states and hysterical conditions which differ in no respect from those already described. Head injury is particularly liable to form a focal incident around which are grouped a cluster of neurotic symptoms.

After severe blows on the skull concussion is, with some exceptions, the rule. Generally speaking, there is a period of amnesia of varying duration for the events leading up to the injury and for some time afterwards. The subsequent headaches, irritability, depression, moodiness and inadequacy may prove refractory to treatment. Occasionally, psychiatric investigations fail to reveal any predisposition to nervous breakdown. It has therefore been suggested that such subjects have experienced true cerebral damage which has so far escaped detection by the diagnostic methods at present available. On the other hand, it is quite clear that most of these post-traumatic neuroses reveal vulnerable personalities. The position then is not quite clear, and the distinction between post-traumatic mental states and neuroses must depend upon the underlying personality.

The hysteric or anxiety hysteric is almost invariably a neurotic personality who ascribes all his subsequent troubles to the injury whatever its severity and whatever part of the body it involves. In point of fact trivial injuries often produce the most severe neuroses. On inquiry, it is found that the accident has upset a precarious emotional stability and adjustment. Ensuing disabilities tend to cluster round the injured part and are particularly persistent where the question of compensation arises. They are likely to endure in spite of treatment until the patient is satisfied that he has received adequate financial balm to his wounds. It is a regrettable fact, but one which must be faced, that whilst the present legal system relating to accidents lasts, hysterics will endeavour consciously and unconsciously, to make as much capital as possible out of their disabilities.

Another form of hysteria which must be recognized is the so-called hysterical overlay. This term refers to the neurotic persistence of symptoms long after the physical effects of an injury have passed off.

Illustrative case. Sergeant-Observer B. L. M., *aet.* thirty-four, married with one child, complained of paralysis of his right foot following an aircraft crash.

He was the only son of mildly unstable parents, in particular, an anxious and nervous mother who had done her best to prevent him from volunteering for air-crew duties.

He himself had shown diffident trends in early life such as timidity, fear of heights, reluctance to learn to swim and inability to dive because his first attempt, made under pressure from an instructor, had resulted in a 'belly-flop'.

However, in the R.A.F., he had trained more or less uneventfully and had managed to complete seven operational flights over enemy territory becoming increasingly tense, nervous and frightened. His eighth and last trip ended in a crash landing on the return journey, during the course of which he was badly shaken and sustained a fracture of the right fibula. He then noted that his right foot had dropped and this was diagnosed as an injury to the nerve supplying the muscles of the front of the leg.

The fracture healed normally, there was no muscular wasting, anaesthesia or changes in the overlying skin. The 'paralysis' persisted in spite of all forms of physiotherapy, and it became apparent that the condition was an hysterical overlay.

During psychiatric investigation it became abundantly clear that he had been badly frightened by flying duties.

The paradoxically fortunate but insignificant fracture had been seized upon by his unconscious mind as the seat of a difficulty and a 'paralysis' which would preserve his self-respect and yet remove him from danger. The mechanisms of repression, dissociation and conversion are clearly seen here.

Moreover, as long as the threat to his security, i.e. flying duties, remained, so long would the 'paralysis' persist. Under Pentothal narcosis he was able to move the foot freely and easily, but he soon relapsed. When he was informed that he would be permanently grounded a complete cure was effected.

Herein, as with all hysterical and for that matter, neurotic conditions, the most important aspect of treatment is removal from an environment fraught with danger, whether it be military, vocational or financial.

5. OBSESSIONAL NEUROSES

Obsessional neuroses are peculiar states of mind more nearly related to the graver forms of mental disorder than are conditions of anxiety and hysteria. They are especially distressing because of the presence of complete insight at all times. A person beset with obsessions fully realizes their seeming absurdity but at the same time is overwhelmed by the irresistible urge with which these phenomena are endowed.

In itself an obsession is a constant preoccupation with a persistent thought, or a felt compulsion to perform an apparently ridiculous task, or in yet a third group, it may consist of a state of chronic doubt which is at times exceedingly disturbing. Occasionally, the three types, namely

rumination, compulsion and indecision, may be present in the one patient.

Obsessions commonly emerge from a special type of personality, the characteristics of which are over-conscientiousness, over-scrupulousness, meticulousness, tidiness, fear of dirt and anxieties over the possibility of error.

Obsessional persons are often rigid in their outlook, intolerant, somewhat humourless, parsimonious, 'old-maidish', fussy, pernickety and perfectionistic. They require that their lives shall be ordered to a strict time-table. They are for ever 'squaring up', tidying and folding. Neatness and order are often carried to excess. The obsessional housewife continually runs her finger along shelves and persistently dusts the 'tops of things'. She may boast proudly that one can 'eat off her floor'. There exists almost a panic of overwork paradoxical as this might sound.

Literally hours before a train is due to leave intending travellers with anxious and obsessional trends are to be found pacing the platform restlessly. They are often extremely honest and reliable, excellent at carrying out orders but unable to take responsibility or delegate responsibility to others. For the sake of personal peace of mind they cannot at any time afford to transgress any rules or laws of the community because of a highly developed conscience. Should they occasionally give way to unlawful impulses they suffer agonies of torment which must be appeased somehow. Therein lies the explanation of the 'Conscience money', which the Exchequer receives anonymously from time to time, the receipt of which is acknowledged in the 'personal' columns of the daily press. The appearance of such an acknowledgement clearly indicates that an obsessional has 'fiddled' his income tax and has suffered in consequence.

The underlying psychopathology is severe repression of strong instinctive urges, some of which are possibly homosexual, under the influence of a powerfully developed and tyrannical super-ego. Because of this severe super-ego censorship feelings of guilt are engendered which persist in consciousness. There is naturally no awareness of what provokes such painful emotions. In expiation thereof, the sufferer is compelled to indulge in semi-religious, mystical or ritualistic performances. He may experience a compulsion to carry charms and mascots to avert the 'evil eye' or ward off impending disaster. His whole life, therefore, consists of symbolic acts of penance. At times fear may become obsessively developed in connection with certain features of the environment such as closed spaces, open spaces, fires, tube-trains and sharp and pointed objects.

For example, a middle-aged woman had suffered for many years from a fear of swallowing needles. In consequence she had to refuse invitations to other people's houses. If she did accept by any stray chance, she would refuse all food and drink for fear that needles might

have been dropped in by accident. At home she was at great pains to filter every item of food, solid or liquid through fine muslin to hold back needles.

A young man's particular preoccupation was a fear of fire. He was admitted to hospital for treatment, but did not improve. When finally discharged he was found to be carrying two large parcels. In the one were contained all the cigarette-ends he had stubbed out and in the other all the match-ends he had used. His predominant obsession was that if not meticulously gathered one of these might have caused a fire!

Compulsions. Compulsions are irresistible urges to carry out certain tasks in order to allay anxiety, to expiate feelings of guilt or to ward off disaster. They sometimes appear in early childhood in the form of avoidance of cracks in the pavement when walking. Amongst the commonest of these obsessional acts are hand-washing, touching objects a specified number of times, walking in certain ways and counting in special numbers. At times these compulsive performances occupy the whole of the subject's waking life. In addition to these somewhat bizarre phenomena, anxiety and uncertainty may extend to ordinary domestic and vocational tasks. Gas and water taps are repeatedly turned off or inspected, doors are examined to see if they have been properly locked, columns of figures are checked and rechecked. Examples may be quoted. One patient, for instance, was compelled to walk between two churches, one at Acton and another at Ealing, four times or multiples of four. He could not get past the first four lines of a page or column of print. In hospital he walked between his bed and his washstand innumerable times, each number being divisible by four. Another patient would 'clock in' at his office and would be forced to return to inspect his signature over and over again. He was forced to turn a wire letter-basket upside down to make sure that it was empty although he could see that it was so. He had much trouble with stoves, gas-taps, water-taps, windows, doors and fire-screens, having to return repeatedly to make certain that all was well. When posting a letter he was compelled to insert his hand into the slot of the pillar box over and over again to ensure that the letter was properly posted.

A girl spent most of the day washing her hands until the skin became sodden and unhealthy. With reference to hand-washing, it is obviously an expiation ceremony which signifies cleansing of the hands as being symbolic of cleansing mental soiling.

Ruminations. Ruminations generally take the form of persistent philosophical or metaphysical ideas. Sometimes the idea is an isolated phrase, tune or nonsense rhyme, such as Mark Twain's famous 'Punch brothers, punch with care, punch in the presence of the passenjare.' It is a matter of everyday knowledge that a tune cannot sometimes 'be got out of the head'. Carried to a pathological degree it becomes an obsessive rumination. It may obscure all thinking and become distressing. For example, a patient felt guilty because he was wearing clothes which

others had devised. He contemplated all day on how to invent something in return for the good of humanity. He wondered how the world was constructed and why the grass was green. He could not accept emotionally the facts of sex although intellectually, (and from experience), he knew they were correct.

Doubt. In this form of obsessive disorder sufferers are in a chronic state of indecision. They are simply unable to make up their minds at all. For instance, one patient was very distressed because he was afraid to enter a shop. He quoted as a sample of his difficulties an occasion when he went into a hosier's to buy a tie. After two hours of fingering a number of ties in turn he still could not decide and had completely exhausted the salesman's patience and temper. By this time he was in an acute state of anxiety with palpitation, tremor and profuse sweating as bodily accompaniments. He invariably had to assist his methods of choice by spinning a coin or inducing a friend to make purchases for him. Doubt intruded into practically every one of his waking activities.

Obsessional troubles are often extremely harassing because of the restrictions they impose upon the ordinary features of living. The prognosis, unless obsessive disorder takes on an episodic character, is not at all good. There is a tendency to secondary depression and suicide is not altogether unknown.

Treatment. Treatment is unsatisfactory. Obsessions, particularly of the periodic type, sometimes subside only to reappear in times of stress. Statistics would appear to show that neither analytical nor other types of psychotherapy materially influence obsessional difficulties. However, something can be done by means of reassurance, superficial analysis and sedatives to lessen the disturbances. It may be necessary to direct the life of the patient so that he may avoid situations which aggravate his condition. More recently, some benefit has resulted from prolonged sleep treatment. The brain operation known as pre-frontal leucotomy appears to have been successful in some cases and should be considered if all else fails.

6. REACTIVE DEPRESSION

There is still some confusion of thought regarding the use of the term 'reactive depression'. By some it is thought to be an acute depression provoked by some clearly defined precipitating circumstance. Others use the label as indicating 'hysterical' depression and more latterly these states have been regarded as 'atypical' miseries. Occasionally these disorders are displayed by patients with a reasonably sound previous personality.

On the whole it is better that this diagnosis should be restricted to psychoneurotic depressions which are disproportionate responses to stress such as frustrations, bereavements or similar unhappy experiences.

Reactive depression is actually shallow in its nature and is often accompanied by headache, insomnia, anorexia, irritability, feelings of extreme fatigue and lethargy, restlessness, pre-menstrual tension, anxiety and hysterical symptoms of all kinds. Retardation is absent, insight is always present and there is a definite desire to get well. Occasionally, feelings of guilt and self-accusatory trends develop but these are nearly always manifestations demanding sympathy. The risk of suicide is present but is not very great, whilst occasionally suicidal gestures are made which may appear to be alarming but are in point of fact dramatic and stagey affairs rather than genuine attempts at self-destruction.

Illustrative case. L.A.C.B., aged thirty-nine, a married man with six children, had shown a number of minor neurotic traits in infancy. He had managed to work successfully in non-strenuous occupations. His marriage was apparently happy and there were no domestic or financial stresses.

Whilst abroad he received a perfunctory note from his wife stating that she was in love with another man and wished him to divorce her. He became very depressed, tremulous and sleepless. A slight stammer developed and he complained of blurred vision. There were numerous other hysterical symptoms.

Returning to England his symptoms subsided to vanish completely when he had adjusted this major domestic crisis to which his psychoneurotic depression was reactive.

Treatment. Treatment consists of general physical methods to improve the appetite and health, sedatives to ensure sound sleep, and one or other of the anti-depressant drugs such as Nardil 15 mgm. t.d.s., Marplan 10 mgm. t.d.s. or Cavodil 6 mgm. daily. In addition, psychotherapy should be employed and directed towards reassuring the patient and helping him to acquire a more philosophical outlook. Endeavours are made to persuade the patient to examine his difficulties in their true perspective instead of against a background of exaggerated apprehension.

Subsequently, anti-depressant medicines may be prescribed in small doses following recovery in order to prevent relapses, particularly in individuals liable to periodic recurrences of symptoms.

DRUG TREATMENT IN NEUROSES

Treatment by medicines excludes those drugs used in narco-analysis which obviously subserve a special purpose and are not therapeutic as such.

Drugs have had a place for many years in the treatment of neurotic disorders. In most cases they have been of a sedative nature, their purpose to allay anxiety and tension. From what has already been said in respect of the psychopathology it must be obvious that drug treatment is doomed to failure from the outset.

It is fashionable these days to prescribe what are called 'tranquillizers'.

In point of fact, the populace is taking these in enormous doses to obtain some equanimity in the face of crises of all sorts, stressful situations and even driving tests. Recently, whole hosts of these drugs have been synthesized and marketed. They include Largactil, Pacatal, Drinamyl, Meretran, Miltown, Suavitil and many others. Brilliant results are claimed for them all in the treatment of anxiety and tension states in general.

It may be stated at the very outset that their use is only permissible to tide over an emergency or to ensure sleep. At first the relief obtained may be considerable but subsequently they lose their effect and have to be prescribed in increasing doses. Finally, they cease to operate and the unfortunate patient, having lost his chemical prop, is stranded and his lot becomes pitiable. He has come to rely on the precarious support afforded by medicines and flounders helplessly when the stage of ineffectiveness has been reached.

Indeed, experience has proved conclusively that responses are only obtained from tranquillizers in cases where acute neuroses have emerged from an otherwise previously reasonably stable personality. Such symptoms as depersonalization or derealization are definitely worsened by drugs such as Chlorpromazine and Reserpine. In the case of the latter substance, grave suicidal depression may be brought about so that the only real indication for its use is neurosis or psychosis with co-existing arterial hypertension and high blood pressure. It has been found, moreover, that anxious, obsessional and hysterical patients may become profoundly disturbed by the motor retardation and autonomic side-effects which tranquillizing drugs produce.

To repeat then, sedatives and tranquillizers are only of value to help the patient over an emergency. Prolonged medication is useless, or even worse than useless, and the best therapy is still psychotherapy. Naturally, this is time-consuming and requires skill, patience and energy. When carried out well, its results are infinitely better and much more enduring than slot-machine methods. It enables the patient to acquire a sound-working philosophy rather than a deleterious drug habit.

CHAPTER VIII

THE PSYCHOSES

1. AFFECTIVE DISORDERS

Affective disorders include the excitements and depressions comprising the manic-depressive psychosis formerly subdivided into mania and melancholia. Recent observations have made it abundantly clear that these two mental states are but part and parcel of a psychosis characterized by violent oscillations of mood from uproarious hilarity to extreme misery. The older terms have now been virtually discarded.

As regards aetiology, hereditary predisposition is undoubtedly the most important factor and there is evidence to show that the disease has a dominant heritable tendency. Precipitating circumstances such as financial and domestic troubles may be implicated in the causation but do not attain the same significance as the 'endogenous' factor. This term designates a total personality reaction. In other words manic-depressive disorder is a pathological process that occurs within the personality rather than as a response to adversity.

The disease affects individuals who possess a cyclothymic temperament together with a pyknic bodily build. In its milder forms where the swings of mood alternate between moderate elation and dejection, the symptoms are not very severe and do not require treatment. The cyclothyme is emotionally unstable. At one time gay, vivacious, aggressive, talkative and optimistic, he may suddenly and without apparent cause, fall into a gloomy, pessimistic state and withdraw into silent depression. This variability makes him a difficult person with whom to live or work because of the uncertainty of his mood from moment to moment.

In addition to those who are temperamentally unstable there are individuals whose outlook is perpetually coloured by one or other of the opposing moods. For example, one meets with those who are chronically mildly excited, over-enthusiastic, over-active, noisy and boisterous. In contrast, there are those who are born misanthropes, irritable, unfriendly, mildly depressed, humourless and rather repellent. It is in folk with such more or less normal characteristics that the manic-depressive psychosis occurs; for it is but a pathological exaggeration of cyclothymic mood-swings.

I. EXCITEMENT

States of excitement fall under four headings:

a. Hypomania; b. acute mania; c. acute delirious excitement; d. chronic excitement.

a. Hypomania is the mildest type of excitement and may pass for good fellowship and *bonhomie* until it just oversteps the boundaries of normality. It is met with in daily life. The hypomanic is a rather fluffy-minded person, restless, full of energy, who must always be doing something, although he never finishes a task. He is unreliable and erratic, lacks persistence, invariably knows better than everybody else, airs his opinions freely, loves the sound of his own voice, and is, in general, an interfering busybody. If the restlessness passes over the border, it may be necessary to hospitalize him. In the ward he is unamenable to discipline, breaks the rules, instructs those around him in their work and even attempts to treat his fellow patients. He shares in common with all excited patients the scribbling itch and writes innumerable letters to those in authority, to high-ranking individuals and to the medical superintendent. His choice of notepaper is sometimes peculiar, particularly when he runs short of writing material! His tendencies to querulousness and complaining make him an unpleasant patient to nurse, whilst his interfering habits may arouse his fellow patients to inflict injuries on him. He may occasionally exhibit erotic tendencies.

b. The acute phase usually appears without any warning. It is characterized by elation, extreme restlessness, complete insomnia and great over-activity. The mood, though commonly a happy one, may at any moment change to one of irritability, aggressiveness and violence. There is a pathological acceleration of all bodily processes, both mental and physical. The stream of conversation appears to be disconnected and incoherent but actually there are links between individual statements and words, these being the result of 'clang' associations. Words introduced by the observer will cause the manic patient to evolve rhymes. For example, should the word introduced be 'bell', the patient almost immediately bring forth words like 'tell', 'smell', 'well', and so forth. Thinking is so rapid that the sufferer is said to be producing 'flights of ideas'. Distractibility is very marked, anything in the environment immediately catching the patient's eye. At times the gaiety is infectious and contact with such patients, particularly in less acute conditions, is readily made. This is a point of distinction between the excitement of mania and that of schizophrenia which latter is apparently wild and purposeless.

The conduct and behaviour match the mental state. Personal habits tend to become dirty and degraded, soiling and other disgusting activities becoming very marked. The appetite is often capricious, varying from voracious gluttony to complete and angry rejection of food. Violence may take the form of homicidal attacks or even sexual assault, and there is complete disregard for the decencies of life in every respect. The skin is hypersensitive and consequently a number of manic patients spend the early days of their psychosis in a state of nudity. Whilst knowledge of time, space and people, that is to say, orientation, is quite cor-

rect, insight is completely lost. In view of the great over-activity and absolute insomnia, exhaustion is liable to supervene at any moment. Therefore sedative treatment must be instituted at once, in order to minimize, as far as possible, the risks of wasting, exhaustion and secondary infection. Some very severe types of excitement end fatally in spite of all treatment. Death takes place either from exhaustion or from intercurrent infection. As a rule, however, the excitement gradually subsides, noisiness diminishes and destructiveness ceases. When recovery does take place, it is complete.

A number of manic patients show delusions and at times hallucinations, but these are on the whole uncommon. The delusions are appropriate to the feeling of well-being and are of a grandiose type. For example, a patient will insist that he is the strongest man in the world and will proceed to demonstrate this fact by tearing his clothes and destroying furniture, accompanying his activities as often as not by a stream of foul and obscene language.

Another matter well worth bearing in mind is that excited patients are extraordinarily observant; for hearing, sight and general powers of perception take part in the acceleration of mental processes. Thus, patents will inconveniently overhear what is not intended for their ears. They will also pick upon physical characteristics of their attendants and will have no hesitation in passing derogatory comments upon them. It is necessary for the nurse to keep her temper, to exercise tact, and to understand fully that such insults are merely the products of mental disorder and must be tolerated.

Illustrative case. Rev. J. H. W., an elderly clergyman, was admitted to hospital in a state of acute excitement. He sang heartily and continuously, he would retain no clothing, his habits were very faulty and degraded. It was found necessary to nurse him in a protected room. He ate and drank greedily and at first insomnia was absolute. Presently, he responded to sedatives and was able to sleep for some hours at night.

His mood was gay and jolly whilst his language was distinctly unclerical. Having been admitted at Christmas time he was given a paper cap from a cracker, which he donned. Then, rolling his mattress into a cylinder he bestrode it declaring he was 'Fred Archer, the famous jockey'. At no time, however, did he lose contact with his surroundings.

Physically, he was a thickset man of the pyknic type but during the course of his excitement he lost four stones in weight. Moreover his ill-looking appearance contradicted his gaiety. On investigation, it was found that recently he had had to contend with severe domestic and financial stress. Psychologically, therefore, his illness was an extreme over-compensation for his unhappy circumstances. His instinctive forces overthrew the control exerted by his super-ego so that he was able to give rein to all his primitive desires.

After some months the excitement subsided and he made a complete

recovery, later apologizing somewhat shamefacedly for his uncontrolled conduct.

c. Delirious mania. There is some doubt as to whether delirious mania is a clinical entity or not. The illness may commence with wild excitement which then becomes more and more acute reaching a stage of delirium, confusion and disorientation. The over-activity is intense and if not speedily controlled may lead to rapid exhaustion and death. Hallucinations and delusions are often present. The outlook is serious and a fatal issue not uncommon.

d. Chronic excitement. Chronic mania resembles hypomania very strongly except in so far as the latter is a temperamental type and is not the result of an acute psychosis.

Instead of subsiding completely, acute excitement may settle down to a point when ease of management becomes possible. Over-activity continues and the chronic patient shows a mild but continual press of activity. He is often an interfering nuisance in the ward, restless, unsettled and difficult to employ because of his inability to concentrate on any set task and because of distractibility. Euphoria and grandiosity persist but there are no delusions or hallucinations. The physical state improves and the patient gains weight. In women, the menstrual function which ceases during the acute state, recommences. Where the physical health returns without concomitant mental improvement, the outlook is bad and the necessity for continued detention in hospital remains.

Illustrative case. Mrs. R. P., aet. fifty-five. Married. This patient experienced her first manic breakdown at the age of thirty-two and since then has spent most of the last twenty-three years in hospital with the exception of remissions of very short duration.

She is now in a state of mild chronic excitement. Her present condition which has now persisted for many years is one of garrulous over-activity. She is readily provoked to aggressive turbulence, is often abusive and occasionally obscene.

Even now she displays grandiose notions. For example, she is still determined to separate from her husband towards whom she is very hostile. She plans a honeymoon in Canada at some future date and states that she can easily find sufficient money to implement her schemes.

Her appetite borders on gluttony, she is restless and constantly 'on the go'. Fortunately, her activities can be re-directed into useful channels so that she is a useful and untiring ward worker. Her physical health is satisfactory. So far no form of treatment, sedative or otherwise, has proved of any benefit so that she will require permanent detention in hospital.

The outlook in any individual attack of acute excitement is good but the liability to recurrence is very great. Occasionally, there may be a complete swing of mood to profound depression. Hypomanic and chronically maniacal patients do badly. The very mild forms of mood-swing known as cyclothymia do not usually require hospital treatment

and from time to time may be stabilized by means of mild sedatives and psychotherapy. Nevertheless, these temperamental instabilities are of lifelong duration.

Treatment. It is quite impossible to nurse an acutely excited patient at home. Such a case should be removed to a mental hospital forthwith and sedation commenced at once. Because of violence, destructiveness and degradation of habits, nursing is sometimes carried out in protected rooms or single rooms. The former are fast being discarded everywhere but where they are still in use or where confinement in a single room is considered necessary, these procedures must be sanctioned by the doctor in charge.

Again, it is the practice in some hospitals to prescribe strong clothing where destructive tendencies are marked. Seclusion and special clothing are inheritances from the past and are being fast discarded everywhere as methods of treatment improve. Soon they will pass into the stormy history of psychiatric medicine.

Mechanical restraint should never be necessary. With proper sedation and early treatment such an ancient and barbaric method of enforcing rest becomes redundant. Nudity, destructiveness and great restlessness are best dealt with in single rooms provided with adequate amounts of bedding, blankets and warmth. Nursing on the floor is arduous but it avoids the risks of injury which restless patients may incur in falling out of bed or in striking their heads against pieces of furniture.

Violent patients should never be approached from the front nor by one nurse. A sufficient number of staff should deal with them from behind so that the arms can be gently but firmly pinioned. Powerful pressure should never be exerted on the front of the chest for fear of breaking ribs. If patients attempt violence with articles of furniture, approach should be made under cover of pillows or mattresses, and an endeavour must be made to envelop the patient in a sheet or blanket.

It is, of course, difficult to legislate for all the emergencies which may arise so that the nurse must use her common sense and intelligence, always bearing in mind that she is dealing with very sick people who are not responsible for their actions.

Where the excitement is extremely acute, extra care must be taken to maintain nutrition by every possible means. Heart stimulants such as digitalin and strophanthin may be necessary, particularly if the delirium is associated with general infections such as influenza and pneumonia.

In less acute conditions where the physical state has not deteriorated, prolonged warm baths at about 100° F. are useful. However, the excellence and rapid action of modern sedatives and similar chemical bodies are steadily diminishing the use of baths to the vanishing point. They are time-consuming and involve the use of nursing staff who can be ill-spared in these modern days of universal shortage of nursing personnel. Thus, they too are passing into history.

Recently, the introduction of tranquillizing drugs has added con-

siderably to the treatment possibilities. Chlorpromazine (Largactil) is the best known of these bodies. It can be given both by mouth and by intramuscular injection if the oral route is not possible.

Treatment commences initially with a dosage of 150 mg. daily. This amount may be increased rapidly up to 300 mg. There is no rigid scheme of dosage which varies according to the response obtained. Under the influence of this treatment, excitement subsides rapidly so that the quantity of drug given can be diminished progressively once the remission has set in, and finally abandoned. It remains to be seen, however, whether chlorpromazine will finally displace all other treatments in manic illnesses.

PROLONGED NARCOSIS

Once a popular treatment of choice, prolonged narcosis is now only very infrequently employed, having been displaced by modern drugs of the tranquillizer and anti-depressant class. Sedatives of the barbiturate class were employed in considerable dosage.

It was used until recently to produce a state of prolonged sleep or drowsiness to counteract psychotic excitement or extreme restless agitation. The value of this treatment lay in its capacity to produce complete mental and physical rest and freedom from disturbing thoughts, vivid hallucinations and extraneous impressions. Careful observation was needed throughout the treatment which lasted approximately two weeks, after which the patient was allowed to emerge into full consciousness by gradual withdrawal of the sedatives used. This form of treatment has now passed into history.

The activity of hypomanic and chronically excited patients should not be thwarted. Rather should their energies be directed into useful channels by means of occupational or other hospital work. Such patients, at first restless and unsettled, can with patience and tact, eventually be made useful members of the community.

In general, less acute cases respond to general nursing methods and to the order and discipline enforced by a hospital regime with the assistance of mild sedatives of the barbiturate type. Foci of infection if found should be dealt with surgically. As the general and mental health improves, lost weight is gradually regained.

Attacks of excitement are variable in duration but the average length of stay in hospital is between two and four months. It is customary for patients to be released from state hospitals on one month's trial prior to discharge, i.e. if they have been admitted under certificate. There are unfortunately no uniform arrangements for convalescence but the Mental After Care Association's Homes are extensively used to provide an intermediate phase between hospital life and the cares and anxieties of the outside world. Some hospitals employ trained social workers to follow up discharged patients in order to provide them with

employment, supervize them, modify their surroundings perhaps, and, in general, instruct them in a mode of living adjusted so as to minimize as far as possible the chances of recurrence. In this, as in other psychoses, after-care plays an important part in the rehabilitation of patients and their restoration to the community of working citizens.

II. DEPRESSION

Depression is perhaps the commonest of all emotions. There is so much in life that is stressful, unpleasant, horrible and vile, that sadness, sorrow, dejection and misery are understandably very prevalent. It is held by some that even laughter is merely an over-compensation for depression, i.e. a salutary tonic to fortify the spirit against the multitude of trials which confront human beings. To be depressed in association with adverse circumstances is a normal and congruous emotional state. It is the antithesis of excitement and in itself is part of the emotional oscillation of the manic-depressive psychosis. It also accompanies the early stages of a number of other mental disorders. For example, it is a usual accompaniment of the neuroses. It may be seen in the early stages of some types of general paralysis, of epilepsy, of schizophrenic and paranoid states. It may be part of the breaking up process in involutional melancholia. Some senile psychoses commence with depression. At times it is a matter of some difficulty to come to a correct diagnosis. Nevertheless, this can usually be arrived at by studying the associated mental symptoms.

True or endogenous depression is a disease of the temperament. It may be precipitated from cyclothymic soil by a variety of factors most of which have already been discussed. The nurse and psychiatrist are not really concerned with the normal lowering of the spirits by difficulties; for those soundly constructed mentally are usually able to work out their own salvation with or without the assistance of friends. Rather is it the business of a psychiatric unit to cope with disproportionate depressions and those which arise spontaneously.

Depression falls into four groups for the purposes of classification: a. acute depression (endogenous melancholia); b. involutional depression; c. chronic depression; d. hysterical, neurotic or reactive depression.

a. Acute depression (melancholia). If an attitude the exact opposite of excitement can be imagined, a notion of what a depressive state is like can easily be conjured up. In contrast to the maniacal acceleration of all bodily and mental processes there is reduction, diminution and retardation. The milder depressions however may show no more than apathy, loss of interest and a tendency to self-accusation. The more acute cases exhibit agitation, restlessness and sluggishness of thought. The facial aspect is one of misery and tearful agitation. Some patients are dull and listless; others wring their hands and wander about aimlessly, moaning, whining and groaning. Thought may be so retarded that ideas are ex-

pressed very slowly and at long intervals. Preoccupation with woes, imagined or real, may occupy the entire waking life of the sufferer. Feelings of inferiority and inadequacy are very marked and very real to the patient. Occasionally he may be overcome by mute and resistive stupor. He is then most difficult to deal with from the nursing point of view. Because of gloom and self-absorption, sleep may be impossible or, if obtained, is unrefreshing. The depth of depression is so profound that he is led to express delusions of unworthiness. For example, he may proclaim that he has committed the 'unpardonable sin' and is therefore condemned to everlasting damnation. He may declare that he is not real, that he has no body (depersonalization), that nothing exists (delusions of nihilism), that the world is unreal and strange (derealization). All sorts of minor delinquencies, particularly those in the sexual sphere, are magnified into cardinal sins. The delusional material may take a hypochondriacal form. For example, a depressive may state that his bowels are choked up and that his inside is a mass of corruption. He may state that he is not fit to live, that he is infecting other patients with vile diseases, that he is ruined bodily and financially, that he is eating the food which rightly belongs to others and so on, right through the whole gamut of every imaginable form of self-condemnation. Occasionally he may demand to be killed. He spends much time debating on the horrible forms of torture to be inflicted on him in the near future. Sometimes auditory hallucinations seem to confirm his wickedness.

Refusal of food may be absolute, partly because of lack of appetite and partly because of a desire to starve to death, such a wish being an essay at self-destruction. The loss of interest in the business of living is almost invariably associated with severe depression, hence the frequent occurrence of suicidal attempts. Murderous attacks on relatives are not unknown in order to spare them imagined miseries to come.

Another type of depression occurs in a background of clear consciousness without retardation. In fact, intense misery is frequently the only symptom. Such patients often make very determined, sometimes successful, attempts at suicide. Tragically enough these occur after apparent recovery from the psychosis.

In respect of suicide in general, the commonest time of its occurrence is in the early hours of the morning when vitality is at its lowest.

Illustrative cases. (1) *J.C.G.*, aged forty-five. A wealthy business man whose previous personality had been rather rigid and humourless. He lived only for his work and had no recreational outlets. The only relevant family history concerned his father who had suffered from a depressive breakdown in middle life.

J.C.G. was free from all personal and domestic stresses as far as could be ascertained. During a week of strenuous work in connection with his firm's balance sheets, he broke down quite suddenly into tearful depression, complained of fulness in the head and of insomnia. Milder remedies were of no avail. Gradually his depression intensified and he

became extremely agitated and sleepless. He declared he no longer wanted to live, that he was a disgrace to his family upon whom he had brought ruin, that he had defrauded the income-tax authorities and that in consequence the police were after him. He hallucinated threatening voices and demanded to be killed. It was in this state he was admitted to hospital. Herein he was soothed by an injection which he thought was going to put him out of his misery. On waking, he became very agitated at finding himself still alive. It was then he stated that he had committed the unpardonable sin which in his case was founded on minor sexual irregularities. He described 'voices' which threatened to pour vitriol into his anal and urethral orifices.

A fortnight's narcosis brought about some betterment and he was quieter for a time. He relapsed however and then began to refuse food. Tube feeding became a strenuous affair for he succeeded in making himself vomit and no sedative was powerful enough to overcome this habit. In consequence he lost weight rapidly, developed an acute parotitis, and in spite of every possible care and attention he died of exhaustion. This case occurred before the introduction of electroplexy and illustrates the intensity of depression together with an absence of any desire whatsoever to go on living.

(2) *L.C.McG.* The captain of a canal barge. His mother had had several nervous illnesses which in retrospect were very like depressive breakdowns.

On admission he was depressed, retarded and difficult of access. He stated that he had the 'bad disorder' and was infecting those around him with 'filthy venereal diseases'. Minor spots and blemishes on his skin were regarded by him as evidence of disease. He proclaimed that his insides were rotten, that he was a ghost and nothing about him existed, that he had no body and that 'they' would soon make an end of him. Irreconcilable, he was with difficulty aroused from his gloomy self-absorption after which he would declare that all he wanted was to 'make a hole in the water'. One visiting day he seized his wife by the throat and attempted to throttle her. He explained that he wanted to kill her so that she might be spared the disasters about to overtake her.

Presently, he brightened a trifle, and after many attempts had been made to rouse him, he became interested in the construction of a Spanish galleon which he eventually completed. Thus diverted, he improved steadily and at the end of three and a half months recovered completely. Returning to work he was still quite well a year later.

b. Involutional depression. The involutional period of life is one during which there is a gradual diminution of physiological sexual activity. The ovaries and uterus atrophy. Menstruation becomes irregular and finally ceases so that reproductive functions come to an end. Ovarian involution disturbs the delicate harmony maintained by the ductless glands with resulting endocrine upsets with especial reference to the thyroid. With this derangement are associated certain well-known symptoms which

indicate that the menopause is taking place. Emotional fluctuation of a mild type is common and even tearful depression is not unknown. Vaso-motor instability gives rise to 'hot flushes', fainting attacks and dizziness.

Eventually, these symptoms pass away, and normally the post-climacteric period is one of calm freedom from sexual urges and other intense strivings. A similar state of affairs occurs in some men but at a much later age, but obviously there are no special circumstances to mark it.

At this epoch some individuals are liable to fall into a state of morbid depression. They feel their lives receding from them. They are confronted with the spectre of old age which prevents them from growing old with grace and dignity. Loss of grip on life, anxiety and apprehensiveness herald the onset of involutional depression.

Gradually the symptoms increase in intensity and number. To depression are added irritability, insomnia, poor appetite and vague bodily symptoms. The full-blown psychosis resembles that already described under acute melancholia. The characteristic features are agitated depression without intellectual retardation, feelings of depersonalization, feelings of unreality and both hypochondriacal and nihilistic delusions. Often the agitation leads to picking of the skin of the scalp, face and hands, plucking out of the hair and other minor injuries. Other physical signs are enlargement of the thyroid in women patients, constipation, greasy skin and loss of flesh.

The prognosis has been vastly improved for the better following the introduction of E.C.T. and the anti-depressant drugs. There is hope now even for long-standing cases of involutional depression which have failed to respond to other forms of treatment.

Illustrative case. K.L.W., age forty-eight. A spinster lady who had broken down during her climacteric and had had to leave her school teaching. She was admitted in an agitated, depressed and sleepless condition. Her symptoms intensified, she became mute, stuporose, resistive and faulty. Feeding had to be accomplished by tube. She picked at the skin of her left wrist, the right side of her forehead and at her scalp, denuding large areas of hair. The self-inflicted ulcers remained chronically sore as she would not permit them to heal. Later she emerged from her stupor and spoke in monosyllables, and declared that she had offended against the Holy Ghost and was therefore never to be allowed to die. Instead, she was destined for eternal torture. 'Voices' called her a prostitute and an evil woman so that she regarded herself as unclean and immoral.

After a year the agitation had partially subsided and she could now be fully employed in knitting. She was still silent, seclusive, humourless and difficult of access. Her physical state had been so poor as to rule out intravenous shock treatment. She had now improved to the extent that convulsive therapy was worth a trial. Electroplexy having recently come into being, she received a dozen convulsions with resulting im-

provement just short of the miraculous. She became cheerful, lively, alert and vivacious. After a successful trial period she was discharged, recovered.

c. Chronic depression. An attack of depression lasts longer than one of excitement and may take up to a year to pass away. Recovery when it does occur, and this is usual, is complete. However, some cases do not end so happily. Instead, the physical health improves without complete subsidence of symptoms so that the end result is a chronic depression with a continuance of gloom and self-absorption.

The prognosis in uncomplicated cases of endogenous depression is good on the whole, but the liability to recurrence remains.

From the psychological point of view it is suggested that the cause of depression is to be found in the excessive force exerted by conscience. In technical language, super-ego censorship, in seeking to repress earlier instinctive desires, overwhelms the ego. The self thus belittled, is made to feel guilty and remorseful. To explain these feelings the patient rationalizes them into delusions of unworthiness.

III. ALTERNATING STATES

Cyclothymia has already been mentioned. Mild attacks of depression, or equally, minor attacks of elation, may never come under medical notice. Other individuals alternate between euphoria and dejection but manage to carry on their lives and vocations successfully. Occasionally, the excited types come into conflict with the law because of various delinquent acts. They may indulge over-freely in alcohol, commit minor sexual crimes and go in for an orgy of spending to the detriment of the family fortunes. Psychotherapy may be of some value herein.

There are types of manic-depressive disorder in which alternating states of excitement and depression are observed. The psychosis may commence with one or the other and then apparently recover only to be followed hot foot by a swing of mood in the opposite direction. At times there are regular clockwork-like alternations. At other times the attacks are of an irregular nature being perhaps depressive for two or three attacks and then maniacal. Occasionally, the attacks are widely separated in time. For example, a man who had a typical attack of maniacal excitement in 1915 remained well until 1937 when he became very depressed and suicidal. Here, as in other forms of manic-depressive psychoses, recovery is the rule and treatment follows the usual lines.

Manic-depressive states and in particular, depression, may occur during pregnancy, confinement or the nursing period. At one time an elaborate classification of these disorders was in vogue. Nowadays, the incidents connected with child-bearing are regarded as precipitants, and the disorders produced differ in no way from the usual excited or depressive states. Such phases generally occur in connection with the birth of the first baby. Treatment entails separation from the child, as in some

cases infanticide or the impulse to kill the baby may be a symptom. Suicide is rare but not unknown.

Treatment. There are three outstandingly important features of depression which must be borne in mind when considering treatment: a. the risk of suicide which is considerable; b. the fact that a melancholic patient may make homicidal attacks on his nearest relatives. His object in doing so is to spare them the miseries which he believes are about to overtake them; c. refusal of food.

Nursing and treatment are therefore best carried out in a mental hospital where skilled supervision is available at all times.

On admission, careful search should be made for sharp objects such as scissors, penknives, hairpins, needles and all articles which might be used to inflict self-injury. These must be removed. Even the hair and orifices must be explored; for patients often exercise much ingenuity and cunning in concealing potentially lethal instruments. Furthermore, tapes, strings, belts and any such loose materials must be detached so as to obviate the risk of suicide by strangulation. The methods employed in attempts at self-destruction are many and varied. They consist of throat and wrist slashing, poisoning by coal gas or other chemical agents, precipitation from windows, strangulation and drowning in the bath. If unobserved, a suicidal patient may smash a window or a piece of crockery and use the sharp fragments in an attempt to kill himself. It is possible for blankets and sheets to be torn quietly under the bedclothes, the strips being used for self-strangulation.

In hospital it is customary to use a special warning notice whereby the attention of the staff is drawn to any particular case of depression requiring special observation. The medical officer in charge issues a 'suicide caution card' colloquially known as a 'parchment' for every patient suspected of such intentions. It is signed by the doctor, the ward sister and her assistant nurses. This card indicates that a suicidal risk exists and that the instructions it contains must be scrupulously followed. The facts should be noted in the day and night journals.

Depressives should be watched unobtrusively every moment of the day and night. To be really effective the patient should never be allowed to suspect that this close supervision amounts to policing. There should be no possibility of access to poisons or open windows. Bathing and the toilet must be closely superintended. A patient may succeed in evading scrutiny and injure himself. It is therefore essential to have always at hand instruments and dressings for the administration of first aid whilst medical aid is being summoned.

If possible, and provided that suitable precautions can be taken, nursing should be conducted on verandas to ensure that the patient obtains the maximum amount of fresh air. Refusal of food must be overcome by tube feeding if hand feeding fails. Aperients may be required to counteract constipation. Sleep may be promoted by hot drinks at night together with one of the milder barbiturates such as Medinal gr.x, Nembutal or

Sodium Amytal gr. iii. It is of very little value to toy tentatively with small doses of drugs, for it is of first importance to procure sound sleep and to allay restless agitation as soon as possible. Sedatives can be gradually withdrawn as improvement takes place. Where agitation is very acute prolonged narcosis is beneficial and should be employed. Even if no permanent betterment results, the treatment is of administrative value in diminishing noisiness and making nursing easier. More often than not substantial improvement does ensue.

As soon as the mental condition permits endeavours should be made to arouse interest in the surroundings by means of games and work of a simple character. Later, the patient's attention can be directed to more complicated forms of occupation.

TREATMENT OF DEPRESSION

Recently a number of compounds have been discovered which are now increasingly used in the treatment of depression. In fact we have a whole range of anti-depressant drugs which can be variously employed under appropriate conditions. There is much evidence to suggest that a judicious combination of electroplexy and anti-depressants may bring about more relief than by the use of either treatment alone.

The most popular of these mediums at the moment is imipramine (Tofranil). This drug belongs to the chlorpromazine (Largactil) group of substances and is of considerable value in endogenous (psychotic) depression. It is given in doses of 25–75 mgm. t.d.s. and in mild cases may abolish the need for E.C.T. On the whole, however, its action is slower than other anti-depressants and may require up to a month for relief to become apparent.

Other drugs in common use nowadays are grouped under the heading mono-amine-oxidase inhibitors, so named because of their action on brain metabolism. How they function is far from being understood but what knowledge there is suggests that faulty brain physiology may be at the root of depressive illness. It is therefore only possible to speculate and to hope that further research will lead to fresh discoveries.

The drugs then generally employed are phelzine sulphate (Nardil) 15 mgm. t.d.s., isocarboxazid (Marplan) 10 mgm. t.d.s., iproniazid (Marsilid) 25 mgm. t.d.s., nialomide (Niamid) 25–75 mgm., and pheniprazine hydrochloride (Cavodil) 6 mgm. daily. More recently tranylcypromine (Parnate) 10 mgm. b.d. and amitriptyline (Tryptizol) 25 mgm. t.d.s. have been introduced.

They all have their advantages but of course there are side-effects of which the most prominent are dizziness, headache, drowsiness, weakness, mild gastro-intestinal disturbances, hypo- or hyper-tension and jaundice. These must be looked for and reported at once. They can quite often readily be dealt with by reduction in dosage. Occasionally their administration must be discontinued.

Obviously the changes in these drugs must be rung, having regard to the depth and intensity of the depression. As previously mentioned, some of them—in particular, Tofranil—can be used together with electroplexy with success.

Electro-narcosis. Electro-narcosis was an attempt to prolong the effects of electrical treatment by the continuous passage of a current through the brain. It has now been abandoned and is of historic interest only.

CONVULSION THERAPY

Under the name 'shock treatment' a form of therapy was introduced for the treatment of schizophrenia which involved the use of convulsant drugs. Like so many other therapeutic agents it was found of even greater service in depressions when used within strictly prescribed limits. The substances which were employed were Cardiazol or its modifications, Azoman, Metrazol and Phrenazol. They were injected intravenously in doses sufficient to produce epileptiform convulsions. For some as yet unexplained reason, such induced seizures brought about temperamental alterations which broke up depressive and stuporose trends with consequent improvement in the outlook. Occasionally, truly brilliant results were obtained.

It has been suggested that minute association fibres in the cerebrum are ruptured thereby severing links between thinking districts and the centres controlling the emotions. A form of traumatic forgetfulness may thus be established which dispels unhappy moods and disagreeable thoughts.

Convulsant drugs have almost completely been supplanted by electrical methods so that no useful purpose would be subserved by describing their use.

Electroplexy. Electrical apparatus is now in universal use and convulsant drugs have no further place in treatment. It is clean, rapid, and many patients can be treated in a short time. Moreover, the machine is more reliable and much more easily controlled than drugs. The current is an alternating one of small amperage but of sufficient voltage to overcome the skin resistance. Prior to the introduction of muscle relaxants there were a number of difficult and occasionally dangerous complications of convulsion therapy. Crush fractures of the middle thoracic vertebrae were not uncommon. Fractures and dislocations of the jaw, scapula, humerus, radius and pelvis had all been recorded, particularly in muscular subjects. Other mishaps which were noted were cardiovascular collapse, aspiration pneumonia, lung abscess, status epilepticus and the occasional provocation of spontaneous epilepsy, the latter probably only occurring in individuals with a previously undetected epileptic tendency. Nowadays electroplexy is modified and the use of what might be called 'straight E.C.T.' is fading out. The technique is

comparatively simple. Prior to treatment, an injection of atropine 1/100–1/75 gr. is made and this is followed by an injection of Brevidil E or M in dosages of 25–50 mgm. together with thiopentone sodium (Pentothal 1½–7½ gr. or 100–500 mgm. intravenously. Atropine minimizes salivation and Brevidil is a muscular relaxant with action comparable to that of curare. It is injected in sufficient amount to paralyse all the muscles so that the ideal state to be attained is where the patient is just unable to raise the head. The patient lies comfortably on a bed. His temporal areas are cleaned thoroughly with spirit soap. Electrodes moistened in saline are placed in position on the prepared temporal districts, being held in place by a strap or firm rubber band. The current passes through the brain and produces a modified epileptiform convulsion.

As far as the treatment itself is concerned, it causes very little disturbance to the patient if all goes well. It is not pleasant to look upon, however, so that care must be observed to ensure that patients awaiting their turn can neither see nor hear what is in progress in the treatment room.

Occasional respiratory difficulties follow which are best combated with the application of 5 per cent carbon dioxide in oxygen. In general terms, electroplexy has very few unpleasant sequelae. There is a remote possibility of damage to the brain substance. Moreover, convulsions not only give rise to amnesia for the fits but may be followed by large memory losses extending far into the past. Most of these memory gaps, however, are eventually closed. Nevertheless, for skilled workers and those whose livelihood depends upon intellectual effort, there may be a real loss of efficiency. Other reported sequelae are mood swings from depression to hypomania and even to acute maniacal excitement, and persistent states of confusion are not unknown. At times improvement is only maintained by regular and continued introduction of fits over long periods on a maintenance basis. When the treatment is discontinued relapse is liable to occur.

The results of E.C.T. are on the whole very satisfactory; in particular, the involutional and chronic depressions of middle life respond very well. In fact the outlook in these distressing psychotic conditions has altered very considerably for the better, having regard to the newer drugs of the anti-depressant group which can be added or combined with electroplexy. As regards manic-depressive disorders in general, the eventual results are perhaps, not so much better than those obtained by more conservative methods, but the length of stay in hospital is markedly diminished. This in itself is an important social and economic factor which makes the treatment worthwhile.

It must be emphasized that convulsion therapy should not be reduced to a machine-like ritual. It is important to bear in mind all the other medical adjuncts such as psychotherapy and occupational guidance which contribute directly to the patient's welfare.

Finally, reverting to the question of technique, it must be mentioned that

a proper team should be organized consisting of one doctor, and another to act as anaesthetist if possible, and at least two nurses so that the ritual can be proceeded with in an orderly and unhurried manner.

As regards the neuroses, it has already been mentioned that the value of convulsion treatment is the subject of conflicting reports. On the face thereof it is unlikely that a neurotic pattern can be modified by induced seizures. Moreover the suggestibility of hysterics lends itself to any form of treatment that produces temporary relief.

NEUROSURGICAL TREATMENT OF PSYCHOSES

In recent years a number of surgical operations have been performed on the brain in a more or less despairing effort to relieve chronic mental disorder.

Pre-frontal leucotomy. This is a recently devised method of treatment designed to allay chronic agitation, anxiety and restlessness which have not responded to any other form of therapy. A special surgical technique has been elaborated whereby a brain-knife or leucotome, is inserted through burr or trephine holes in the skull and manœuvred so as to separate the pre-frontal lobes from the remainder of the brain.

Indications. The general consensus of informed opinion suggests that the operation is of value in all psychiatric conditions which display persistent fears, guilt, anxious apprehension and severe hypochondriasis. Moreover, improvement is likely to result in all cases where some degree of emotional life remains. Those uninfluenced by this psycho-surgical procedure are patients in a state of chronic apathy or complete detachment from reality.

Another set of indications, perhaps more of an administrative than a clinical nature, is presented by noisiness, destructiveness and violence where all other forms of treatment have failed. Sexual psychopathy is said to be worth treating by leucotomy. In fact, any psychosis of long duration may be so treated apart from chronic manic excitement, epilepsy and G.P.I. Amongst recent cases, those should be selected which have failed to respond to insulin therapy and electroplexy.

Contra-indications. The contra-indications are those operative for all surgical procedures. In addition, the risks are greatly increased by a very high systolic blood pressure and a diastolic pressure of over 100 mm. Hg.

Technique. Although the technique varies in different surgical hands there is a similarity of approach in each method.

The patient is prepared for a cranial operation in the usual way, the head being completely shaved. Most surgeons agree that intratracheal anaesthesia is the most useful, restful and least anxious of methods for all concerned.

A skin incision 2–3 cm. long is made down to the bone at a point 3 cm. behind the lateral margin of the orbit and 5–6 cm. above the

zygoma. A 1 cm. burr hole is then made into the bone exposing the dura mater which is then incised. The cutting instrument may take several forms, namely, the Crombie leucotome, a narrow paper-knife or a blunt brain needle. It is inserted into the aperture in a direction which passes close in front of the anterior horn of the lateral ventricle and swept upwards towards the upper surface of the frontal lobe. The needle is then withdrawn and reintroduced along the original line and pivoted downwards. A wet dressing is left in the bony opening and the procedure is repeated on the other side. The incisions are subsequently closed and head-dressings applied.

Post-operative care. The following points must be closely observed by those responsible for the post-operative nursing.

In the first place, the patient should not be removed from the operating theatre annexe until fully conscious, and then only if pulse, respiration and blood pressure are satisfactory. Following return to the ward strict observation must be maintained and particular attention paid to the nature of the conscious state, speech, state of the pupils and muscular twitchings should these occur. Pulse and respiration rates must be recorded half-hourly and the blood pressure hourly for the first twelve hours at least. After thirty-six hours a two- or four-hourly temperature chart must be kept in accordance with the surgeon's instructions.

Fluids should be given sparingly throughout the first twelve hours but frequent mouth washes are desirable and comforting. As a guide, one ounce of fluid may be given every quarter or half-hour if the patient is awake and not vomiting.

On the morning after the operation mag. sulph. 2 oz. in 2 oz. of water must be given per rectum and the patient encouraged to retain the enema for as long as possible. This procedure is repeated twice daily for about one week.

At the end of the eighth hour after operation the head should be gradually elevated until the patient is sitting up fairly well and feels comfortable.

Should the temperature rise to 102° F. or over, the blankets must be withdrawn and a tepid or a spirit sponge down administered. Should this prove unsuccessful and the temperature continue to rise the nightgown must be removed and replaced by a sheet. The body is then exposed to the current of air from an electric fan. Should these measures likewise fail, a cold water enema should be prepared and the surgeon notified.

Bladder. If urine has not been passed at the end of the first eight hours the surgeon must be informed and preparations made for catheterization.

Drugs. Restlessness may be controlled by phenobarbitone gr. 1½ which may be repeated four-hourly with safety. If not effective the surgeon must be informed of the fact. Headache may be relieved by subcutaneous injections of codeine phosphate in doses of 1 gr. and repeated four-

hourly if necessary. Sucrose, 100 cc. of a 50 per cent solution, should always be at hand for intravenous injection but may only be given with the surgeon's sanction.

On no account should morphia be administered in any shape or form, and this incidentally applies in all intracranial lesions as well as after craniotomy.

The sutures are removed on the fifth day and subsequently the patient is permitted to get up for short periods after the tenth day. No special dietary is required and in practice most patients appreciate light food on the following day.

Complications. The most serious early post-operative complication is haemorrhage, immediate or delayed. This is indicated by a progressive fall in the pulse and respiration rates together with a rise in blood pressure. Open operation is required at once to deal with the source of the bleeding.

Restlessness and irritability sometimes amounting to violence may be encountered. Incontinence of urine and sometimes of faeces is usual but clears up within a fortnight or three weeks if the patient's habits have previously been good. Other reported sequelae include monoplegia, hemiplegia, aphasia and convulsions.

Re-education. Convalescence must be allowed to proceed at a leisurely and unhurried pace. It must be emphatically stated that the management of this period is of the utmost importance. Following pre-frontal leucotomy patients are plastic material so to speak, very suggestible and trainable. Rehabilitation competently carried out is perhaps the most valuable part of the treatment. As soon as possible, therefore, properly organized occupational therapy must be instituted to assist whatever form of psychological treatment is found appropriate. It has been pointed out that the operation brings about a 'secondarily induced childishness' and immaturity, so that the subject has to re-learn vocational and existential habits. Under skilled guidance striking occupational and social results can be obtained. It is a fact that a measurably large percentage of cases operated upon are usefully if not gainfully employed.

Results of operation. Although pre-frontal leucotomy is undoubtedly a barbaric method of treatment dignified by the term psycho-surgery it yet constitutes a tremendous advance in treatment. Nevertheless, it must not be undertaken lightly but only after competent psychiatric scrutiny indicates that nothing else is applicable.

Personality changes. It must be remembered that what is effected by surgery is permanent and irreversible. It must be expected that severing the frontal lobes from the rest of the brain results in changes in character and conduct which have still to be accurately assessed. It may take months or even years for the mentality to settle down into its new pattern.

Certain clearly recognizable facts do emerge. From the anatomical

point of view it is definitely established that there is much loss of nervous tissue with replacement by neuroglia and formation of cysts.

Mentally, the most pronounced change is the appearance of an easy nonchalance, a 'couldn't care less' attitude, and a lack of responsibility. Wisdom and foresight seem to diminish, sometimes to the vanishing point and considerable emotional flattening may be one of the results. Occasionally, the instinctive patterns of behaviour remain, as do also characteristic habitual trends which were present before the operation. Restriction of interests may be yet another sequel leaving only a capacity for day to day living. However, some patients, even under the closest scrutiny, appear to have regained normality.

Some interesting facts emerge from a survey undertaken by the Board of Control into the results of operation upon one thousand cases of mental disorder. The facts elicited are briefly as follows:

Generally speaking, male patients responded better than females, and the older age groups fared better than the younger. As with most forms of treatment, earlier operation yielded better figures than when performed in long standing cases. Nevertheless, there was a 'discharged improved' rate of about 10 per cent in patients ill for between ten and twenty years. This in itself is something to bring fresh hope to chronic sufferers.

In more detail:

1. Of 599 chronic schizophrenics 5 per cent died, 25 per cent were discharged, and 36 per cent remained in hospital but in an improved condition. Therefore over 60 per cent could be regarded as improved. The relapse rate was about 4 per cent. Results then are encouraging considering the gravity of the disorder and its refractoriness to other forms of treatment.

2. Of 250 manic-depressive patients including an unspecified number of cases of involutional depression, the results were better still. Eight per cent died, but nearly 80 per cent improved of which over half were discharged from hospital and 45 per cent regarded as recovered.

3. Of 29 patients suffering from obsessional neurosis 2 died, 1 did not improve and 23 were discharged of which 17 were regarded as recovered. A miscellaneous group of epileptics, mental defectives and post-encephalitics were also treated but showed less striking results.

In conclusion then, pre-frontal leucotomy is worth while until perhaps in the fulness of time more subtle and less empirical methods of treatment are discovered.

The standard pre-frontal leucotomy operation has become increasingly restricted both in America and this country. A much more limited operation using the orbital route has proved almost as effective and has reduced the risks of severe post-operative personality changes considerably.

CHAPTER IX

THE PSYCHOSES (*cont.*)

2. SCHIZOPHRENIC—PARANOID PSYCHOSES

Schizophrenic and paranoid psychoses are closely related to each other and can conveniently be considered together. They are characterized by several features some of which are temperamental and others, destructive:

a. The schizoid or introvert temperament which has already been described.

b. The paranoid attitude to life.

c. Dissociation.

d. Projection.

As a consequence schizophrenic-paranoid diseases exhibit severe disorder of thought marked by delusions of a more or less bizarre character supported by vivid hallucinations of all kinds. In general, these psychoses are pathological exaggerations of basic trends. The schizoid make-up is more vulnerable than the paranoid and tends to break down earlier in life. In fact, the break quite often occurs during adolescence; hence schizophrenia is a disease of early life. Moreover, the earlier this disaster takes place the greater the disintegration of the personality. It follows therefore that older patients are on the whole more stable, showing paranoid trends to a greater extent than schizophrenic destruction of the mind. In addition, the tendency to dementia is not present, or at any rate, not so pronounced as it is in schizophrenics.

As there are so many points of similarity between schizophrenic and paranoid disorders they are described as a continuous series for ease of understanding.

Schizophrenic disorders are classified as follows:

1. Simple.
2. Hebephrenic.
3. Catatonic: a. excitement; b. stupor.
4. Paranoid.

At this point paranoid schizophrenia blends with the chronic delusional psychoses which are two in number:

1. Paraphrenia.
2. Paranoia.

SCHIZOPHRENIA

This disease, once known as dementia praecox, is perhaps the commonest of all psychoses. Once regarded as hopelessly incurable, it has

ceased to carry such a gloomy prognosis, but is still a very grave condition and in unfavourable cases is distressing in its rapid progress towards profound weak-mindedness.

It is a malignant mental disease requiring a schizoid soil in which to develop. This particular psychotic type of temperament has already been described as one characterized by reticence, aloofness and partial divorcement from reality. Thus, the schizoid experiences many adaptive difficulties from childhood onwards. Occasionally his conduct may be noted as queer, odd and eccentric. His shyness leads to seclusiveness and an inability to make human contacts. Naturally there are all degrees of this condition. A large number of folk so temperamentally handicapped never break down under ordinary circumstances, probably because they have managed to find a niche for themselves in which they can work and at the same time indulge in phantasy. The poorer the contact with reality the greater the liability to schizophrenic breakdown. On the physical side there are certain types of build which are associated with this disease, namely the asthenic, the athletico-asthenic and dysplastic. As regards causation, hereditary factors are suspected but not definitely proved. Injury, accidents and other adverse circumstances are not causative but merely serve to precipitate this disorder from a fertile constitutional make-up.

The significant feature then of the schizoid is the greater or lesser tendency to take flight from reality with its complex problems of adjustment. In face of the usual developmental features of life such as puberty, a schizophrenic type of breakdown is likely to occur. Puberty with its physiological happenings, and in particular menstruation, is a mild stress with which the confirmed schizoid cannot easily cope. This accounts for the sexual colouring which so many schizophrenic disorders take. Marriage with the intricate and intimate adjustments implied therein is another possible point of mental fracture. Childbirth brings in its train a set of mental and physical stresses which some schizoids find too overwhelming.

Although four types of schizophrenic psychoses have been described, the position is not so simple. All four may show the characteristics of each other. For the present, until further research has clarified the matter, schizophrenia must be regarded as a group of all sorts of unclassifiable mental diseases which show splitting of the mind to a gross degree. The diagnostic features are introversion in a schizoid temperamental background, severe thought disorder, fantastic and grotesque delusions supported by vivid hallucinations, tendencies to stereotyped actions, stupor alternating with frenzy, impulsive violence and suicide. Schizophrenic thinking is complex directed or 'autistic', that is guided from within rather than by external objects. The chief manifestation of such disordered thinking is the disharmony between mood and thought. For example, the schizophrenic will relate a tragic incident with a smile or he may describe an amusing episode cheerlessly. In the later stages of the

disease emotional indifference becomes marked. As regards delusions, these never form a logical system but are fleeting and may change daily. Illusions may occur and mistakes of identity are often made. Occasionally odd and stereotyped actions remain to symbolize what were once occupational movements. For example, a grossly demented needlewoman may go through the motions of sewing.

It is interesting to note that some schizophrenics have a little insight at the outset of their illness. They realize vaguely that there is something wrong and sometimes seek help. During the course of the disease all insight is of course lost. Finally, those cases which do not remit proceed to fragmentation and to total disintegration of the mind so that the ultimate picture is one of extreme dementia.

1. Simple. This group contains a number of minor delinquents, loafers, tramps, work-shys, eccentrics and oddities of all kinds. Impulsive acts of a silly kind occur frequently. Inertia, which in the early stages is regarded as apathetic laziness, may be a prominent symptom. Indifference to surroundings, shamelessness and defective conduct are other features. Such individuals drift aimlessly from one casual job to another and eventually join what has been called 'the hard core of unemployment'. Actually, the simple schizophrenic is almost unemployable. He has not the capacity for concentration or sustained effort. Withdrawal into apathy and dreamy disinterestedness increases as the disease progresses. Insight is absent from the beginning of the illness. Hallucinations may be present but are not very vivid. Ideas of reference are more common than delusions of persecution. On the whole the disease is not very colourful and not easy to recognize. Some individuals can live under protected conditions in their homes. Others exhibit definite antisocial tendencies, such as stealing, indecent exposure and other offences, and are consequently best segregated in mental hospitals.

The prognosis is not good, for the disease is often chronic and progressive, but the use of chlorpromazine 50 mgm. with or without Stelazine 2 mgm. t.d.s. may sometimes arrest the illness and allow of the patient to return to the community.

Illustrative case. L.K.J., a man of twenty-one, was referred by the magistrates for a psychiatric opinion because his responses in court were peculiar. He had been indicted for stealing a bicycle.

His history was characteristic. Brought up against a background of poverty he was the illegitimate son of a dissolute mother. School records were poor, revealing truancy and inability to concentrate. After school he drifted from one job to another, commencing with a newspaper round and graduating through van-boy to casual labouring. Eventually, becoming unemployed, he drifted around the streets and, one day seeing an unattended bicycle, jumped on to it and rode away. He left the machine a mile or two away and walked back aimlessly, was detected and arrested. On questioning he recounted the story in a dreamy way, smiled rather vacantly and was obviously unable to appreciate the rights

or wrongs of the situation. Criminal proceedings were dropped after a diagnosis of schizophrenia simplex had been made.

2. Hebephrenic. This is a disease of adolescence and its name indicates that torpor is a characteristic feature. The onset may be insidiously slow, the first noticeable abnormality being a failure of interest. Such patients tend to stand or sit about in odd corners grinning fatuously. They laugh uproariously at nothing. There may be little or no response to questions or the replies may be quite incoherent, rambling, disconnected and irrelevant. The phrase 'word-salad' is quite an apt description of the conversation. Hallucinations are the rule and may affect any of the senses, but in particular, hearing. To describe the queer sensations experienced new words (neologisms) are invented. For example, a patient may suggest that he is being influenced by an 'electrical psychograph' or that he is being 'sprockelled'. Delusions when elicited are of a bizarre and fantastic nature. One patient claimed that his chest was opened each night, his heart manipulated and then replaced. He also declared that he was being tortured by 'an enema with a green band on it'.

The conduct is influenced by the hallucinations. The habits deteriorate into faultiness, masturbation may be flagrant, frequent and unashamed, impulsive window smashing is common and violence may occur in response to hallucinatory commands. Weird mannerisms, absurd antics and curious eccentricities of speech are all very frequently observed. If not supervized, hebephrenics tend to become dirty, slovenly, unkempt and soiled because of inattention to the ordinary matters of clothing and toilet.

The prognisis in this disorder, once poor, has to some extent been improved by the use of Largactil and Stelazine so that, at times, reasonable remissions can be obtained, but the relapse rate is unfortunately quite high.

Illustrative case. D.K.B., a young pupil teacher of nineteen whose conduct slowly altered for the worse. She became dreamy, retarded, slow to answer questions and exhibited an inane and smiling indifference to her surroundings. What little conversation could be obtained from her consisted of irrelevances, incoherent remarks and occasional obscene words and phrases.

In hospital she gradually deteriorated. She needed every care and attention and her habits became degraded. It was apparent that she was hallucinated as she would smile and at times make remarks as if in answer to the voices. One day she crashed her fist through a window apropos of nothing at all, cutting several flexor tendons of the wrist and severing the ulnar nerve. This incident did not disturb her nor did the ensuing 'claw hand' affect her unduly. There was no response to treatment. She became almost unemployable except for the sorting of coloured strips of cloth. From time to time she would mince round the ward with a curious gait holding her dress like a ballet dancer and pouring out a stream of gibberish. Her conduct appeared at all times to be responsive

to hallucinatory commands. She has continued to deteriorate over a period of years.

3. Catatonia. Catatonic schizophrenia tends to come on acutely and almost without warning. After perhaps a very brief period of irritability, malaise and confusion, the disease emerges in one of two patterns:

a. *Excitement.* This takes the form of a wild, purposeless overactivity, a frenzy to which the popular term 'raving' may be applied. It includes impulsive violence, homicidal attacks and suicidal attempts. The waking life consists of screaming incoherencies, yelling, shouting and noisy singing. There is complete divorcement from reality, and mental inaccessibility. Disorientation for time and place is a natural consequence. The habits may be filthy and degraded in the extreme. Refusal of food is often absolute. Destruction of clothing, bedding and even furniture is often seen. Such patients are extremely difficult to nurse as they are difficult to approach. After a varying period of time which may be influenced by the measures taken to enforce rest, the excitement subsides, and here and there a catatonic schizophrenic recovers completely in a very short time. Such acute schizophrenic episodes are not altogether uncommon but are more likely to be seen in the observation wards of a general hospital rather than in the mental hospital itself; for the majority of cases do not end so happily. The excitement may then give place to:

b. *Catatonic stupor.* This is a condition of rigid immobility assumed by the catatonic schizophrenic. Consciousness is not in abeyance at all and the memory is preserved. After emergence from stupor such patients may recount a number of incidents which they have seen and the conversations which they have heard. It is as well, therefore, for the nurse to guard against conversational indiscretions and carelessly dropped remarks which may be hurtful to a sensitive patient.

The rigidity of this form of stupor is a muscular tenseness; its characteristics make it the easiest of the schizophrenic disorders to diagnose. The patient may respond to commands in one of two ways. In the one, negativism precludes the patient from carrying out any order or instruction. Mutism (refusal to speak) is absolute and such silence may last for days, weeks, months and even years. In fact, any suggestion may call forth an entirely opposite reaction. For example, the request to put out the tongue may be followed by a firm closure of the mouth. Resistiveness to attention renders nursing difficult. Refusal of food necessitates tube feeding. On the other hand, catatonics may show automatic obedience and will obey ridiculous orders. All sorts of grotesque positions can be impressed upon them, their limbs exhibiting a sort of waxy plasticity (flexibilitas cerea). Statuesque and curious attitudes can be maintained tirelessly for many hours at a stretch. They may repeat a stereotyped phrase with monotonous regularity throughout the day (verbigeration). It is not unusual for them to repeat words or phrases said to them (echolalia) or mimic actions they see (echopraxia). From time to time

the stupor gives place to outbursts of frenzy during which acts of impulsive violence may take place. These outbursts are probably the result of hallucinatory commands. After such episodes the stupor is again resumed. Physically, poor circulation leads to blueness of the hands and feet. Abnormal growths of hair tend to occur. Menstruation ceases.

The prognosis in this type of schizophrenia is perhaps better than in any other. Remissions quite frequently occur and between the attacks patients are employable and are able to resume normal ways of life without supervision. The liability to recurrence is very great however, and it takes very little external stress to throw them back into catatonic withdrawal from reality. Those that do not recover and they, unfortunately, form a considerable percentage, continue to deteriorate progressively. On account of physical inertia and diminished respiratory movements the liability to lung infections is greatly increased so that some chronic schizophrenics are carried off by pulmonary tuberculosis.

Illustrative case. Mrs. J.H., a policeman's wife, aged thirty-three, was admitted to hospital in a state of acute excitement some days after having made a violent assault on her husband.

She talked rapidly and continuously, laughing and crying alternately. There was no semblance of coherence in her talk which was highly coloured by sexual obscenities. The excitement subsided after a few days' treatment with sedatives and prolonged warm baths. She became more accessible but would break off a conversation to shout back at what must have been an insulting hallucinatory voice. She accused her husband of all sorts of indecencies and stated that he was responsible for all the swastikas painted on the doors of the houses in her neighbourhood.

Later, she improved and it was hoped that she might remit. However, she developed an attack of catarrhal jaundice. When this had cleared up she slowly slipped into a resistive stupor, opposed all attention, was faulty and required tube feeding. She exhibited negativism to a marked degree. One day, she rushed out of bed and struck another patient a violent blow on the face.

She was then treated by insulin shock. At first unresponsive she slowly began to emerge from her stupor and finally recovered, having gained about three stones in weight.

Illustrative case. Prolonged catatonic stupor. R.R., a tall, asthenic shop assistant was admitted in a semi-stuporose condition during which she repeated a single phrase constantly (verbigeration). She also repeated words she heard uttered around her (echolalia) and copied actions shown her (echopraxia). Mentally, she was almost inaccessible. She was faulty and dependent. Negativism was very marked and she resisted attention vigorously. Any order provoked an immediate opposite response. She adopted statuesque poses which she maintained as long as was permitted. Flexibilitas cerea was present so that all sorts of ridiculous attitudes could be imposed upon her. Tube feeding was necessary.

From time to time the stupor broke down and she would throw articles of crockery about or smash windows, subsequently withdrawing back into stupor. She also exhibited a curious facial contortion known as schnauzkrampf (an expressive and descriptive German word).

In this state she remained for many years, unemployable and dependent. Finally, a low grade tubercular infection brought about her death.

4. Paranoid type. Paranoid schizophrenia occurs in rather older individuals and may be diagnosed up to thirty-five years of age at which time it blends imperceptibly with paraphrenia. It is characterized by greater retention of the personality than in the other types, and by the presence of delusions of all kinds accompanied by vivid hallucinations. The onset tends to be gradual and the mental changes more subtle. Further, the tendency to dementia is not so pronounced nor the degradation so marked.

In the earlier stages it is more elusive and not so readily detected because of the reticence and suspicion which these patients reveal. The first abnormality noted is the presence of ideas of reference. They complain that groups of people whom they see are talking about them in a disparaging manner. They detect covert sneers everywhere. All they read in newspapers and books, all they see at the cinema or hear on the radio, is taken as applying to themselves. Delusions of persecution, conspiracy and of bodily change are usual and are nearly always of a bizarre and fantastic nature. Patients claim to be influenced by hypnotism and that their minds and bodies are controlled by various forces. Electricity and machinery of all kinds enter into their schemes of persecution. Other complaints are that their thoughts are being read or that they are assaulted sexually in a fantastic manner. Occasionally, religiosity is well marked. In fact, the psychosis in general is coloured by sexual and religious matters. At times self-mutilation, particularly of the genitalia, occurs in order to gratify some sexual phantasy. The conduct is dominated by hallucinatory voices which may be insulting, accusatory or commanding. Often some completely innocent person becomes the victim of a violent assault because he is saddled with the responsibility of having made derogatory remarks about the patient. In the full-blown psychosis, delusions of grandeur are not uncommon. For example, one patient entitled himself 'King Syd' and wrote regularly to his wife 'Queen Ethel Mary P.—' and his children whom he addressed as princes and princesses.

In conformity with the grandiosity, the clothing tends to be grotesque and bizarrely decorative. Because of the influence of hallucinations the paranoid schizophrenic is a dangerous person. His conduct is unpredictable and requires careful observation. Murderous assaults have been recorded and fatalities are not unknown. Recently, a schizophrenic soldier armed with a rifle committed murder.

From every point of view, paranoid schizophrenics are best cared for

in hospital, although occasionally some whose conduct is not too disturbed can be treated in day hospitals or at out-patient clinics. The prognosis has been vastly altered under the influence of tranquillizers, and it is in this group of schizophrenic illnesses that the most startling results have been obtained. Experience has shown that good responses have been obtained with Largactil 10–100 mgm. t.d.s. with the addition of Stelazine 2–5 mgm. t.d.s. Stelazine sometimes produces unpleasant parkinsonian side-effects so that Disipal 50 mgm. t.d.s. can be added to the treatment to counteract these.

Illustrative case. Mrs. L.B. broke down almost immediately after her first confinement and developed hostile feelings against both her child and husband. She accused the latter of substituting his own child by another woman for her infant and stated that she was being got rid of by poisoning. All food given her was regarded with suspicion. Accusatory and scandalizing 'voices' bewildered and perplexed her.

She claimed that the nurses were in league with her husband who, she said, was carrying on a clandestine affair with one of them.

After removal to hospital she inveighed bitterly against the authorities because of her alleged illegal detention. Everywhere she detected sneers and derogatory remarks, repeating over and over again that she had never indulged in loose conduct. Presently she began to complain of persecution by electric shocks. To support her delusional state she drew a complicated and fantastic diagram to show how the electric lighting and the radiators were wired together in a circuit which included her bed. This system, she alleged, caused her to receive regular electrical discharges. It also put 'voices' into her head and influenced her thinking so that she 'spoke with a mind not her own'. Later, she claimed to be descended from Queen Elizabeth 'on the wrong side of the blanket'. In conformity with these grandiose ideas, she began to decorate her clothing with grotesque ornamentations, developed an eccentric gait and a very affected voice. One of her frequent remarks was, 'I thought I would have been discharged e'er now'. She did not respond to treatment and has very slowly deteriorated.

Treatment. Whilst a certain number of 'encysted' schizophrenics may be nursed at home, it is advisable on the whole that they should be removed to hospital. There are a number of methods of treatment nowadays for each of which success has been claimed. Some of them are difficult to carry out, are not without attendant risks, and are, to say the least of it, barbaric. Perhaps in the fulness of time and with increased knowledge of the disease, more subtle avenues of approach will be used. However, the present methods should be tried so that systematic examination of results can be carried out in order to justify or reject these treatments.

Apathy. In the first place, since apathy and withdrawal from reality are so obvious, attempts must be made to exteriorize the schizophrenic. In other words, he must be brought into contact with his environment.

It is the task of the nurse to encourage the patient by word and gesture to attend to his personal needs, and to develop regular habits in connection with the toilet and the calls of nature. Sitting about in odd corners should be vigorously discouraged. It is of great importance to provide interesting occupations whether conducted in the ward or in a special occupational therapy centre. Patients should be persuaded to take part in games, exercises and recreations. Especially is physical exercise necessary for the schizophrenic whose inertia prevents proper aeration of the lungs.

General observation and supervision will facilitate detection of physical and mental changes, which alterations should at once be reported to the doctor in charge.

Stupor requires constant attention. Resistiveness must be overcome if necessary with the help of assistants. Stuporose schizophrenics require every form of nursing care and attention in respect of bathing, dressing and the personal habits. Tube feeding is essential. Occasionally, it may be possible for sufficient liquid nourishment to be introduced by means of a feeding cup. Food should consist of easily digested substances such as milk and eggs beaten up together. Each feed should contain a sufficiency of vitamin B_1 and vitamin C, the first to prevent neurological complications such as polyneuritis, the second to ward off scurvy which begins first as stomatitis and later makes itself evident in foul breath and bleeding of the gums. Hand feeding requires much time and patience but is the best method to pursue if at all possible.

Tube feeding. The requirements for tube feeding are an oesophageal or nasal tube attached to a medium-sized funnel, a mouth gag, the jaws of which are protected by rubber sleeves and which can be kept open by a clamp or screw, a vessel containing glycerin to be used as a lubricant, towels, a jug of boiled water, the feed and medicine glasses, some containing vitamin substances such as orange juice, others containing sedatives and laxatives. The feed usually consists of a pint of milk, one or two eggs and meat extracts heated together to about 100° F.

The patient must be flat on his back, and if resistive must be gently but firmly restrained with the aid of as many assistants as is deemed necessary. The head must be kept steady by a folded towel stretched over the forehead. A self-retaining gag is inserted into the mouth, care being taken not to lacerate the gums or mucous membrane. The lubricated end of the tube is then inserted into the pharynx. A little water poured into the funnel will ensure that the tube is caught up by the oesophageal musculature after which it is a simple matter to smooth it into the stomach. The feed should be delivered in small quantities. This prevents regurgitation and spilling due to the patient's struggles, retching and gagging. All medicaments can be delivered through the funnel, after which the tube should be slowly withdrawn. A short interval is then allowed for the feed to pass on. Being liquid, it is not retained for very long in the stomach. This, too, prevents the patient from making himself

sick. In this way the health and nutrition can be maintained for many weeks or months. Incidentally, some patients may find this method of taking food so unpleasant that they may from then on take food themselves.

Excitement. Catatonic excitement with its wild, purposeless activity, its destructiveness and blind fury may tax all the resources of the nursing staff. Sedatives are required, and as a rule such patients are best looked after in special wards. Occasionally, the use of a protected room may become necessary to prevent them from injuring themselves or others. Destructive tendencies require the provision of strong clothing and bedding. It may be quite impossible to give sedatives by mouth so that hypodermic injections are essential. A combination of hyoscine hydrobromide, gr. $\frac{1}{100}$–$\frac{1}{75}$, and morphine sulphate gr. $\frac{1}{4}$, is quite effective but must not be employed too frequently because of the toxic and depressing effect of these drugs. It may be possible to use the sedative effect of prolonged baths. Where the physical state allows it, prolonged narcosis is a useful form of treatment, and here and there may bring about a complete remission. At any rate, it allays the acute excitement sufficiently to permit of other treatments being administered.

INSULIN TREATMENT

Insulin treatment is another form of therapy which is fast passing into history. It has been completely replaced by the introduction and application of modern tranquillizing drugs and it is probably only used to a very minimal degree.

It was a lengthy, difficult and at times dangerous procedure to carry out. It depended upon the fact that large doses of insulin wash out the sugar from the blood-stream and give rise to hypoglycaemia which in turn interferes with the nutrition and metabolism of the brain tissue, thereby producing coma. In the past, dosage was so arranged as to produce a daily coma for six days in the week.

It may be stated at once that for the trouble, responsibility and risk involved, the results were disappointing. Nevertheless, a number of schizophrenics were improved, even to the point of complete remission, and the illness was at times shortened, particularly in those who commenced to improve from the outset. The relapse rate was, however, considerable and, as already mentioned, insulin treatment has practically fallen into complete disuse and therefore no useful purpose would be subserved in describing it in detail.

OTHER TREATMENTS

Nitrogen shock. This is an experimental method which has been tried abroad. The patient is made to inhale nitrogen from a breathing bag for a minute or two. The effect resembles that of insulin but the total shock

process only takes a few seconds and is terminated by the introduction of oxygen. Within a few minutes the patient is able to walk about. Treatment is given three times per week. No figures as regards results are as yet available. There are apparently no complications.

The Endocrine Factor. Amongst the vast number of therapeutic adventures in the field of schizophrenia, a new method is being experimented with which is promising. It is a modification of an older treatment which had as its basis the theory that genital failure coupled with physical immaturity loomed large in the pathology of this disease. The glandular therapies of the past failed in great part because of the hit-and-miss nature of the preparations used.

More recently it has been discovered that some schizophrenics display what is referred to as an abnormal 17-ketosteroid excretion. It is not possible to delve further into this subject as it requires a considerable knowledge of biochemistry. What can be said is that the drug employed is given to replace what is lost in subjects who do reveal physical and genital ill-development. The substance carries the unwieldy name of dehydro-isoandrosterone, and it belongs to the group of genital internal secretions.

It is injected intramuscularly and dosage must be carefully controlled, special care being necessary where aggression is a prominent symptom. From observations already made, it appears to produce a feeling of well-being, it tends to revive interest in matters sexual and general, resulting in increased self-confidence and alertness.

However, it remains to be seen whether the good results reported are maintained and whether in general the way of the glands is the correct approach.

TRANQUILLIZERS

Tranquillizing drugs have become the treatment of choice nowadays in a variety of mental illnesses, in particular schizophrenic-paranoid disorders. It is safe to say that these substances, of which there are a large and ever-increasing number, have revolutionized psychiatric therapeutics within the last decade. In consequence the prognosis in otherwise malignant and deteriorating mental diseases has been altered vastly for the better.

There are a whole host of new synthetic preparations bearing such names as Largactil, Pacatal, Miltown, Notensil, Stemetil, Stelazine, Equanil, Sparine and Librium, to mention only a few. Many more are to be expected in the near future as clinical and pharmacological research proceeds at an ever-increasing pace. The general usefulness of some of them is undeniable, but some of the more glowing and optimistic reports must be received with caution.

Mode of Action. Little is as yet known of the action of tranquillizing drugs. It was at one time suggested that they act to produce, as it were, a

chemical leucotomy. Whether they act directly on the cerebral cells, thereby altering their nutrition, or whether they act at the synaptic functions is not clear. Experimentation with lysergic acid (L.S.D.), mescaline and other drugs producing hallucinations may and probably will throw some light on the biochemistry of schizophrenic processes.

The best and most useful of these substances has proved to be chlorpromazine (Largactil). The method of treatment in schizophrenia varies very little from that outlined in the section on excitement. Chlorpromazine can be coupled with barbiturates of the amylobarbitone (Amytal) group and used to procure prolonged sleep for patients in the throes of acute catatonic excitement. Alternately, it can be used in doses of 150–300 mg. daily by intramuscular injection or by mouth to produce quiescence.

In milder cases treatment can be commenced with 25 mg. t.d.s. increasing the dose until side-effects appear. In general, the effects are not those of sedation but rather tranquillization which is subtly different. The most marked response is observed in fairly rapid diminution in the intensity of hallucinatory experiences. Subsequently, the associated delusions, whatever their nature, fade, restlessness and excitement subside and betterment supervenes.

In general, it has been found in practice that an acute psychotic episode can be cut short much more rapidly with chlorpromazine than with any other form of treatment. Indeed, as compared with insulin, the length of stay in hospital is reduced on an average by as much as six weeks.

Remarkably enough even long-standing cases of chronic schizophrenia sometimes react favourably to Largactil and even if a remission is not obtained, quiescence and much more orderly conduct can often be observed. Each and every long-standing schizophrenic patient is nowadays offered the drug which is only discontinued if no material improvement occurs after three months.

This form of therapy with its simple application and almost complete absence of serious complications, is likely to become the treatment of the future and will oust insulin eventually from the place it has held for so many years.

Complications. At the outset of administration, chlorpromazine may give rise to a short-lived pyrexia of no real significance. Occasionally, both patients and staff display skin sensitiveness to the drug and develop rashes which subside when it is withdrawn. Patients taking Largactil react strongly at times to sunshine and the skin particularly of the face and hands becomes covered with a rash which, however, responds readily to withdrawal from direct sunlight and emollient creams of a simple variety.

Largactil is, as has already been mentioned, absolutely contraindicated where passive congestion of the liver exists. The danger

herein is contained in the supervention of a progressive jaundice due to liver deterioration which may proceed to a fatal issue.

Evanescent jaundice is yet another possibility which has to be borne in mind during the course of chlorpromazine therapy. Its occurrence necessitates temporary cessation of treatment.

Very rarely, the drug attacks the bone marrow leading to diminution of white corpuscles, i.e. an agranulocytic anaemia which may be dangerous if allowed to persist.

Again, when the drug is exhibited in very large doses a toxic parkinsonism may occur which may be associated with severe mental retardation. The indications are that the drug has been 'pushed' too vigorously and that therefore the dose must be lessened.

Finally, some patients require small maintenance doses of the order of 25 mg. t.d.s. to prevent relapse. This supportive treatment can be readily carried out in an out-patient department.

As has already been mentioned, sometimes a combination of chlorpromazine and Stelazine may be more effective than either drug used alone with the addition of Disipal to ward off parkinsonian complications.

CHRONIC DELUSIONAL PSYCHOSES

1. PARAPHRENIA

Paraphrenia. This is a chronic delusional state similar in many ways to paranoid schizophrenia, but from which it is differentiated by a markedly lessened tendency to deterioration. In fact the paraphrenic as originally described does not dement to any extent. From what has been described in a previous chapter it is evident that paraphrenia develops in a special type of personality.

The paranoid personality is noticed at an early age. It is characterized by shyness, feelings of insecurity, seclusiveness and inability to mix freely with others. Suspicions are entertained as to the motives of others. The paranoid individual always suspects that he is being 'put upon', that people are 'getting at him'. He is uneasy and mistrustful. Generally very ambitious, he is inclined to ascribe his failures to the hostile efforts of others. He claims that he is kept down. As he develops, he becomes awkward and difficult to adjust to any surroundings. Sometimes capable of very good work he is yet incapable of adapting himself to others. He is lonely, irritable, quarrelsome, humourless, always on the lookout for slights and sneers. Gradually he comes to believe that he is better than the next man and becomes vain, conceited and superior. It is during middle life, i.e. the forties, that he becomes definitely psychotic. His insecurities are projected and returned to him in the form of hallucinations of the various senses but in particular, hearing. Accusatory, scandalizing and threatening voices seem to persecute him continually. He can get no rest from the 'megaphones', 'radio', 'electricity' and other

forms of machinery which transmit these unpleasant sounds. Delusions of persecution and of compensatory grandeur appear. One middle-aged man, for example, in ordinary life a labourer, claimed that he was 'Sir William Barty Plum O——', the Earl of Eltham, that he was being deprived of his estates by a 'sidneykate' (syndicate) which was working under the floor of the hospital against him, that he was continually being assaulted with a 'syphilis-malaria sponge'. This, he stated, robbed him of his ribs and his back passage. It was his custom to swathe his pelvic regions with masses of newspaper to ward off the attacks by germs. His history revealed the typical emergence of a chronic delusional and hallucinatory state from a paranoid background characterized by lifelong suspicion, lack of humour and chronic dissatisfaction.

It would seem that the basis of some paranoid states is homosexuality, remorse for which is projected and returned in the form of derogatory 'voices'. Sometimes the delusions are fantastic and inclined to be changeable rather like those in schizophrenia. At other times they appear to have been elaborated in a systematic fashion on the basis of one false argument. The subject is a difficult one for it would appear that paraphrenia is closely allied to schizophrenia on the one hand and paranoid states on the other. It is commoner in men than in women.

2. PARANOIA

The strict definition of paranoia makes it clear that this is a group of chronic systematized delusional psychoses like paraphrenia but without evidence of hallucinations. It is again a disease of middle life, appears in some cases to be coloured by homosexuality, and is more frequent in the male. In general, it crystallizes out of intelligent but paranoid soil. The intellect, memory and orientation are well retained and indeed, some patients can converse readily and extremely intelligently upon all subjects except those which touch on their delusional systems. Paranoiacs are irritable, hypersensitive, touchy and quarrelsome. The mood is one of querulous depression. Suspicion and irritability may lead them to engage in lawsuits. They may become exceedingly angry with their alleged enemies, even to the extent of making violent and even murderous assaults upon them. Paranoiacs are therefore dangerous people. Their state of mind often remains undetected for long periods because of their plausibility, appearance of rationality and seemingly convincing arguments. They may induce others to believe that they have been victimized for years, spied upon, followed about by the police, detectives and members of various bodies such as the Freemasons, Jews, Roman Catholic organizations, and so on. Every now and then one particular individual may succeed in taking advantage of the gullibility and mass grievances of a population and erect himself into their leader or to use a much better known word, their Führer.

Eventually, it dawns on relatives, friends and others that there must

be something wrong. The police, for example, receive innumerable letters from mild paranoiacs complaining of persecution by neighbours and others, all of which complaints are without foundation. For example, H.L.B., a single man of forty-three, had exhibited ingenious inventive tendencies all his life. He had always been a secretive, solitary and suspicious individual but very intelligent. In his twenties he had a 'nervous breakdown' after which he took to drinking heavily. However, his inventions brought him a fair income.

Continuing a rather dissolute career he later invented an article concerned with traffic lights. For various reasons it was not taken up. Gradually, he became 'queer' and began to complain that there was a conspiracy against him inspired by his solicitor. When sent into hospital because of his irritable, angry and violent conduct, he declared that his solicitor had conspired with the hospital authorities to 'put him away' for good so that his invention could be exploited unscrupulously. On examination, he was found to have congenitally unequal pupils. He ingeniously explained this by stating that he was accustomed to sleep with the abnormal side facing the light and so had developed a permanent contraction. In hospital, his language and his writings were full of bitter invective against his relatives, his lawyers, and the staff. He declared that his food was poisoned, that boys were bribed to annoy him and that statues were arranged in a manner so as to give him offence. He was seclusive, solitary and too grandiose to employ himself except in constructing weird machines such as 'water barometers' and another which held the secret of 'perpetual motion'.

His delusions remained unchanged for many years but he eventually became less truculent and aggressive although always aloof and suspicious. In this state he continued until at length he died of chronic nephritis. His intellect, memory and orientation were preserved to the very end.

Milder paranoiacs who are clever enough to shift their ground, never get into mental hospitals. They learn to avoid discussing their whims with those in authority. There are others of the eccentric type who dress queerly, who are incapable of holding down a steady job, who frequent race meetings, and so on. Others join curious religious and other cranky movements and spend much time tub-thumping and ranting against all authority. Querulous, complaining and dissatisfied people, they are always 'agin' the Government'. As long as they do not interfere with the comfort of others, a benign government permits them to indulge their delusional systems in Hyde Park and other open spaces. Like all paranoid pyschotics they have no insight at all.

In hospital, paranoiacs and paraphrenics are difficult patients. They are often hostile, aloof, truculent, aggressive, suspicious, reticent and asocial. Some are inclined to sit about and brood, others are far too grandiose to demean themselves by working and are therefore unemployable. They may make violent assaults on fellow patients and on members

of the staff whom they accuse of taking part in the conspiracy against them. They are jealous of any little privilege granted to others.

Nursing and treatment. The outlook in the paranoid states of middle life was at one time uniformly bad. All that could be done was to remove such sufferers to hospital where they were made as comfortable as possible. The prognosis has altered somewhat for the better since the advent of chlorpromazine and its derivatives. Some remarkable remissions have been obtained and certainly these drugs should be given a trial on the lines outlined in the treatment of schizophrenia. They should only be abandoned when no perceptible betterment results.

In general, if there is no response to the newer drugs, and this is regrettably likely to be the case in most of the chronic systematized psychoses of the middle decades, a concentrated effort should be made to resocialize these patients. They should if possible be fully employed. It is a waste of time to argue with them in the hope that their delusions will prove amenable to reason. Argument only acts as an irritant and makes them less adjustable to ward discipline.

It must be fully realized that paranoid people are mentally sick and if they make no headway with modern drugs and other physical treatments they are likely to remain in hospital for the rest of their lives. They require tactful guidance at all times. Doubtless they may occasionally be exceedingly provoking. Their language is often abusive and obscene. Even so, these trends must be disregarded and accepted as part of a severe and probably incurable mental disease. Loss of temper with them is a tacit acknowledgement of failure and is indicative of bad nursing.

Nursing then resolves itself into general attention to the bodily health where this is required or tactful supervision. Some paraphrenics and paranoiacs settle down moderately well and resign themselves more or less philosophically to hospital life in perpetuity. They may become amenable enough to be permitted freedom of the grounds (ground parole) or even town privileges. They may even be sufficiently well-conducted to spend periods of leave with responsible relatives in order to enjoy a pleasant break from the comparative monotony of hospital life.

Finally, full understanding of each individual's peculiarities and sympathetic insight into his conditions make management of this type of patient much simpler.

Communicated psychosis. Paranoid illnesses are sometimes 'catching', particularly within the close confines of a family circle. Where only two people are concerned, the situation is described in the French phrase *folie à deux*. Sometimes the contagion may affect a number of closely related folk or even whole villages or townships wherein live simple or primitive people by mass spread.

In the classical *folie à deux*, the dominant partner is usually quite disturbed, the illness taking the form of a paranoid illness of the schizo-

phrenic or paraphrenic type. Delusional notions are conveyed to a second individual who may be husband, wife or daughter. The sick person naturally requires treatment whereas the other partner is only socially ill and can readily be treated by separation and logical argument.

Illustrative case. A mother and daughter were admitted together, both alleged to be suffering from delusional psychoses. Mother was a paraphrenic who complained of persecutions and adversities of many kinds. She claimed she could hear her tormentors and in fact stated that she could hear the 'swishing' of syringes which were being prepared to inject her with noxious fluids. This and other notions infected her daughter who was at first convinced that her mother was quite sane and correct in her description of the conspiracy against her. They were both indignant at what they considered to be illegal detention in hospital. The daughter was subsequently separated from her mother and in another ward steps were taken to prove to her that whilst she was well, she had absorbed delusional beliefs from her sick mother. She soon accepted the facts as pointed out to her and was discharged. The mother remained considerably disturbed for many years but was eventually sent home in the care of another relative.

CHAPTER X

THE PSYCHOSES (*cont.*)

Psychopathic personality is a collective term recently devised to include a number of ill-defined cases of character and conduct disturbances, emotional disorders and instinctive aberrations which do not belong to the well-known psychotic or neurotic groups. One definition states that the psychopathic personality is an individual who habitually displays excess or defect of emotional reactions, together with impaired judgment and inadequate or anti-social behaviour, and in whom there commonly occur transient or permanent mental disturbances which are merely exaggerations of his normal condition (Henderson and Gillespie). The same authorities describe three sub-groups:

i. Those predominantly inadequate; ii. those largely aggressive; iii. those largely creative.

It is probable that the term psychopathic personality covers such curiously ordered people as pathological liars, petty swindlers, 'kleptomaniacs', sexual perverts and drug addicts. Certainly, a number of such people belong to the class defined by Kretschmer as anaesthetic schizothymes. They were formerly regarded as moral imbeciles or moral defectives, which meant that they were not mentally deficient as far as intelligence measurements went, yet they seemed to be without moral sentiments or control over their instincts and habits. In other quarters, lack of proper super-ego growth is the reason adduced for this state of affairs. The whole subject is still fraught with many difficulties as there are many minor degrees of psychopathy which do not come under psychiatric notice. Then again, psychopathy and its association with crime still require considerable study. Whilst many chronic criminals (recidivists) are mentally defective, a fair number of the regular prison population are impulsive opportunists with apparently no conscience, no thought for others and no emotional appreciation of the meaning of their anti-social acts. Plausible, rational in conversation, well set-up, sometimes above normal in intelligence, in some cases good-looking and attractive, they are parasites and of no value to any community. Moreover, they are quite unaffected by punishment. In fact, imprisonment and other disciplinary measures appear to intensify their anti-social tendencies.

1. PSYCHOPATHIC INADEQUACY

This comprises a group of weak types who in spite of every advantage offered by good educational facilities, decent homes and sufficient means,

succeed in accomplishing precisely nothing. An undistinguished school career is followed by wandering from job to job. Such people have an infinite capacity for becoming bored. Shiftless folk, they can never settle to any task, show marked lack of persistence and tenacity of purpose. Their business and marriage careers are almost invariably failures. Wartime conditions reveal their weaknesses to the fullest extent. Incapable of adapting themselves to service life they often react with neurotic symptoms. One class of inadequates comprises the petty thieves, prostitutes, swindlers, confidence tricksters, thimble riggers, three-card men, racing touts and tipsters.

Illustrative case. F.N.P. An early colourless history was followed by a moderate school career. Then, apprenticed in a boot shop, he was soon in trouble with the police for stealing, and received a birching. Then he held a variety of menial jobs, some of which he 'packed up', from others he was speedily sacked. In 1936 he had to marry a neurotic woman hastily because a child was on the way. He then worked in an ordnance factory before going into the R.A.F. Here he worked fairly well for about three years until posted overseas. His record there was one of loose living, alcoholism, doubtful companions and intimacy with negresses. He acquired two attacks of venereal disease in the process. Then he broke down with tearful depression, insomnia and nightmares.

This is an inadequate psychopath who reacted to separation from home with florid anxiety symptoms and uncontrolled conduct.

a. Pathological liars. Such folk tell lies which are wishful thinking in nature. Pathological lying may be a continuation into adult life of childish story-telling and phantasies. Pathological liars are full of specious arguments and unreliable information. Nevertheless the lies never amount to delusions.

Illustrative case. An airman recently awarded himself the George Medal and Bar, the British Empire Medal, gave a long and circumstantial account of his own bravery during air-raids and during the evacuation from Crete (he had never been to Crete), conveniently killed off a second wife and child (he had only one wife and no children) in a London 'blitz' and so on *ad infinitum.*

Actually he had joined the R.A.F. to escape the London air-raids. In hospital he consciously adopted a limp which vanished when he thought he was not observed, and inflicted numerous minor abrasions on exposed parts to back up his stories of falling down.

When taxed with his lying, he shifted his psychological ground uncomfortably and stated that at any rate he had been commended by his Commanding Officer in the Home Guard!

b. Kleptomania. This occurs more frequently in women than in men and is said to be associated with sexual abnormalities and frustrations. Stealing becomes linked at an early age with sexual delinquencies. Whilst the latter are subjected to repression the former remains to symbolize the more heavily tabooed activities. Strictly speaking, kleptomania should

not include the petty pilfering and shop-lifting that is carried out by women suitably equipped with shopping bags and well-pocketed undergarments. Kleptomania refers only to the pathological stealing of useless objects and unconsidered trifles.

c. Pyromania. Denotes a passion for setting fire to objects. Firing hayricks, for example, is amongst the manifestations of a psychopathic personality. Again this would seem to be the outcome of the striving for infantile pleasure with a sexual colouring.

Illustrative case. G.R.H. He was a seclusive and lonely boy who at an early age indulged in masturbation, in the wearing of female clothing, and in minor homosexual practices. After school he tried many jobs, finally joining the R.A.F. because he could not get on in 'civvy street.'

Early on he experienced phases of depression which he relieved by excessive drinking followed by setting things on fire. Throughout his service career he was insubordinate, impulsive, alcoholic and incendiary. Punishments were entirely without effect on him. Obviously an aggressive psychopath with pyromanic tendencies, yet he was plausible, intelligent, pleasant and spuriously contrite.

d. Sexual perversions and difficulties. i. *Masturbation* is very common indeed during adolescence but is a habit of pathological importance if it persists into adult life. It is an indication of sexual immaturity and of the conditioning of the genitalia to respond to abnormal stimuli. It is also common during the course of mental disorder when control over the instinctive tendencies is in abeyance. Whilst in itself not injurious except when practised to excess, it causes psychological disturbance because of the feelings of guilt and remorse which it engenders. The habitual masturbator is best treated by explanation, reassurance, encouragement and an historical investigation as to first causes.

ii. *Impotence* of psychological origin is often a manifestation of an anxiety state and is a common and distressing symptom in the male. It is the cause of a number of marital disasters, and may give rise to secondary depressive states and even suicide. One form of it, premature ejaculation, is a very disturbing condition and very refractory to treatment. Treatment must be prolonged, intensive and carried out on analytical lines.

iii. *Frigidity* in the female is an hysterical reaction manifested in vaginal spasm which effectually prevents the consummation of marriage. It implies sexual immaturity and symbolizes rejection of the male. If part of an hysterical personality, it is very difficult to overcome and the sufferer requires prolonged treatment of an analytical kind.

iv. *Exhibitionism* is an adult continuation of a childish desire to show off, particularly from the sexual point of view. It reveals itself either directly or indirectly. The direct form of exhibitionism comes under the heading of 'indecent exposure' and is a form of sexual gratification obtained by exhibiting the genitalia. In the indirect method it is shown by

the wearing of 'daring' clothing, generous display of the shape with lack of concealment bordering on the nude.

v. *Sadism* finds its outlet in the infliction of pain upon the loved one who, in consenting to such a performance, generally reveals:

vi. *Masochism*, i.e. obtains sexual delight in submitting to the painful attentions of the partner.

vii. *Homosexuality* (*sexual inversion*) describes love between members of the same sex. There are two aspects of this perversion, the active and the passive. Nothing in particular distinguishes the active male invert, but the passive partner is usually an effeminate person with a mincing gait, a characteristically affected voice together with essentially feminine habits, such as the training of the eyelashes to curl upwards and the use of cosmetics. The female active homosexual is a masculine type of person, deep-voiced, aggressive, swaggering, and displays mannish clothes and tendencies.

Illustrative case. J.L. He was brought up against a background of domestic strife inspired by an alcoholic father so that his early history contains many neurotic traits. At fifteen he first fell naturally into homosexual practices and his career was characteristic. He worked with homosexuals, did some stage work, tap-dancing and valeting. At one time he lived with a man as his companion.

In the service he experienced adaptive difficulties at once, and whilst overseas he felt the separation from his erstwhile friends very keenly. In fact he became sufficiently depressed to make a serious attempt at suicide and was only saved by the skill and energy of the medical officers.

He had trained his eyelashes to curl upwards, used cosmetics, minced as he walked and had a characteristic voice.

A psychopath with sexual abnormality who reacted to removal from his abnormal (but to him satisfactory) environment with suicidal depression.

viii. *Fetishism* describes sexual stimulation and even gratification in response to objects which symbolize the loved one. Such articles as raincoats, shoes, bits of ribbon, plaits of hair, under-garments and so on may become linked up with a love object and used as a substitute for it.

ix. *Transvestism* denotes a condition in which an individual derives sexual pleasure from wearing female clothing. It is closely allied to passive homosexuality but often proceeds no further than the clothing abnormality.

There are a number of other forms of sexual perversion which need not be detailed here. Occasionally, perverts are persons of a very high order of intelligence but are psychopathic because of the disturbance of their emotional life.

2. PSYCHOPATHIC AGGRESSIVENESS

Aggressive psychopaths display a pathological degree of emotional in-

stability which leads to phases of violence. Their conduct from infancy onwards is erratic and truculent, with a display of fierce temper and general unreliability. They exhibit a chilliness, absence of remorse or conscience and an almost absolute disregard for the feelings or comfort of others. Occasionally they display a complete amnesia for these outbursts. Subsequent phases of confusion sometimes occur. Following such episodes there are periods of comparative calm. This group contains sexual perverts, alcoholics and drug addicts. Recent investigation has shown that a number of such psychopaths show abnormal electroencephalograms.

Illustrative case. J.M.M. An individual of good family who showed some neurotic traits in infancy. He received an excellent education at a good school but his character revealed itself early and he went to sea. Eventually he rose to become assistant purser but led an alcoholic and dissolute life. During the 1929–31 slump he left the sea and wandered from pillar to post until he joined the services. Overseas he at once got into serious trouble for impersonating an army captain, attempting to obtain money under false pretences, indecent assault, stealing and various other offences. Punishments were unavailing but he came under psychiatric notice because of nervousness, insomnia and delinquency.

An intelligent, plausible, untruthful, unreliable and erratic psychopath of the aggressive type with anti-social trends.

3. CREATIVE PSYCHOPATHS

There is some evidence to show that history has from time to time thrown up men and women who must be acknowledged as great and yet who have shown distinct psychopathic traits. Magnificent qualities of leadership, inventiveness and directive genius have been associated with queerness and oddities of conduct. 'There is an uncanniness and an inspiration about them which is far beyond what, ordinarily, may be expected' (Henderson and Gillespie). These authors cite Joan of Arc, Napoleon and Lawrence of Arabia as examples. Additionally, some of the creative genius of our great composers and musicians has been allied to curious mental quirks. It would appear that nature exacts a toll for the gifts which she disburses.

Treatment of psychopathic states. Psychopathic personalities are being increasingly heard of in the Press, in the Courts and in hospital. The treatment of such individuals is at best difficult and must follow both medical and social directions. War and military service bring many such cases to light because of their adaptive difficulties and because methods of selection are still imperfect. Better knowledge of hereditary and constitutional factors together with improved methods of legislation and disposal may assist in dealing with this very trying problem group. At present there is no machinery for the permanent detention of the more grossly disturbed members of this antisocial section of the popula-

tion. Many psychopaths are a menace to society, are non-producers, distributors of venereal disease and, in general, are with certain exceptions in the creative field, utterly useless individuals. Some of them constitute the irretrievable core of unemployment and are often totally dependent upon the State for their maintenance. An attempt has been made to rehabilitate some of them, in particular those with criminal propensities, and at least one hospital exists where gallant attempts are being made to bring about resocialization. The methods used comprise a permissive attitude on the part of the staff, group therapy, psychological analysis and occupational techniques. Most psychopaths are, however, refractory to any form of treatment. The lives of some of them are punctuated by prison sentences alternating with periods of treatment in mental hospitals.

As regards sexual difficulties and perversions, psychological impotence can sometimes be cured by a psychological approach. Masturbation is occasionally amenable to treatment. In this respect it must be borne in mind that marriage should *not* be prescribed for the masturbator nor should any form of loose conduct be suggested. More often than not, he is impotent, so that marriage is bound to end disastrously. The other perversions, if ingrained, are almost impossible to eradicate. There may be, and judging from the physical make-up there often is, a fundamental glandular anomaly. The most that can be done is to provide such unfortunates with enough philosophy to enable them to acquire a modicum of contentment. In this respect, a fair proportion of perverts find their own particular level and do not request treatment.

4. DRUG ADDICTION

The habitual taking of powerful drugs of the narcotic or stimulant type is still a tremendous socio-economic problem particularly if alcohol is included. Excluding the latter, the commonest drugs of addiction are opium and its derivatives such as laudanum and morphine, heroin, cocaine, bromides and to a lesser extent the various barbiturates including Veronal, Medinal, Luminal and others. In other parts of the world hashish (cannabis indica), and mescal buttons (mescaline) are minor problems. Addiction usually arises in people of a psychopathic disposition who cannot face their problems without artificial aid, or who are afflicted with chronic pain for which there is no form of permanent medical relief.

In the first place, it is necessary to distinguish between analgesics and narcotics. Opium and related drugs are used for the relief of pain, narcosis being a secondary effect; whereas barbiturates have little or no effect on pain but are employed to overcome sleeplessness and nervous tension. Cocaine is a useful local anaesthetic and is particularly valuable for removing pain sensibility when applied to the mucous membranes of, for example, the mouth and nose. It is of immense service too in dental

and eye-work. It is under such circumstances that the anodyne qualities of these substances are discovered. At first used legitimately, drugs cease to be the servants and become the masters of those who seek their aid. Doctors and nurses who have easy access to sedatives sometimes fall by the wayside in this manner.

Those who are nervously unstable seize eagerly upon anything which will provide even temporary relief from insurmountable difficulties. They resort to drugs in order to banish depression and escape momentarily from intolerable mental conflict. Manic-depressives seek to alleviate the depressive phase of their illness. Those with intractable pain such as neuralgia turn to analgesics such as morphine, heroin and cocaine. Some psychopaths incline to narcotics because they have become satiated with ordinary forms of pleasure and consequently seek new thrills in the chemical world. They are commonly degenerate types who are quite often members of the criminal classes. It is notable that the statistics of gangsterdom in the United States loom large with 'hop-heads' (drug addicts).

Feelings of betterment, spurious cheerfulness and elation are engendered, or pain is temporarily relieved whilst the drug of choice is circulating. As is only to be expected, symptoms return when the effects of the drug wear off to be relieved once more by further doses. In time, tolerance is established so that larger and larger doses are required to recapture the desired effects. At length, colossal amounts are necessary to produce any result at all. Naturally, side-effects soon become prominent and the body begins to show evidence of chemical poisoning.

Once the habit has been firmly established, the life of the addict becomes directed to one purpose and to one purpose only, namely obtaining his favourite drug. He will spare no effort to get it even to the extent of committing any and every type of crime not excluding murder; so that drug addiction is to be found par excellence in the so-called underworld which consists largely of recidivists and prostitutes. Occasionally, those of wealth and education become involved in drug taking because of idleness and complete exploration of every other form of amusement. Such folk are defective in their personality make-up. Every so often an addict dies of an accidental over-dose and the entire scandalous affair is aired in the popular press.

It remains to describe briefly the effects, mental and physical, of some of these narcotics. Alcohol is dealt with under another heading because of its world-wide implications.

Opium. Used medically, opium is a valuable extractive, its chief ingredient being morphine. For the relief of exhausting pain and suffering it is unparalleled. De Quincey's account, *The Confessions of an Opium-eater*, gives a classical description of its use and effects, a description which has not yet been bettered. In the East it has been used for an historic length of time and even to this day opium smoking is still very prevalent. It is the least harmful method of ingestion, and indulgence in

'pipe-dreams' has become part of everyday conversation to illustrate a retirement into phantasy, illusion and wishful thinking.

Morphine. Morphine is the commonest drug of addiction. It relieves pain rapidly and produces a pleasant sense of euphoria. However, tolerance is very easily established and eventually stupendous doses are required to reproduce the initial experience.

The effect of morphinism on the mind is to produce a lessening of all inhibitions, a lowering of morale, reduction in self-respect, impairment of judgment and of memory. Morphine addicts become crooked, lying individuals who can barely exist without the sedative effects of the drug. They exhibit no philosophy, humour or other redeeming feature. The inevitable degeneration of morals occurs with the consequence that sooner or later morphinists find themselves in the hands of the police. Physical deterioration takes place too. The pupils contract to pin-points. The skin becomes sallow and, if morphine is injected hypodermically, carelessness of self-administration causes the needle punctures to become septic. The tongue is coated and the bowels are constipated because of the direct inhibitory effect on the alimentary canal. Colicky abdominal pain may be complained of. Loss of appetite causes loss of flesh, and resistance to infections becomes lowered.

Deprivation of the drug provokes 'withdrawal' symptoms which resemble those of shock, collapse or delirium. Sweating, pallor, faintness, restlessness and agitation all occur. The pupils become widely dilated, the pulse is thin and thready, abdominal pain and diarrhoea occur, and the general condition is alarming. The symptoms are relieved at once by the injection of a small dose of the drug. Withdrawal never ends fatally, however, and if treatment is to be carried out thoroughly the administration of morphine should cease at once.

Heroin is another drug of addiction and its effects, because it is a synthetic preparation, are even more powerful than those of morphine. Like the latter substance it produces a delightful euphoria and a dreamy state coloured by sexual longings. In spite of this, 'desire doth outrun performance', its chemical action, like that of other drugs of its class, being to lower sexual efficiency to the point of impotence. It is a powerful chemical causing very rapid deterioration both mental and physical, of the kind described under morphinism.

Cocaine, apart from its local anaesthetic action, first stimulates and then depresses the nervous system. It is usually taken in the form of snuff, hence the occasional accidental deaths from over-dosage because a 'pinch' of such dangerous 'snuff' varies very much in quantity for obvious reasons.

It lessens feelings of fatigue and relieves exhaustion making the subject feel 'grand' temporarily. The stimulation is real enough and the results are manifested in false gaiety, talkativeness and even brilliance of conversation together with heightened sexual feelings. The depression which follows is equally intense and creates a demand for another dose

to alleviate the gloom. Over-dosage produces intoxication, ataxia, visual and, very commonly, haptic hallucinations, i.e. hallucinations of touch. The cocaine addict suffers from 'cocaine-bugs', i.e. a sensation as if insects were crawling under the skin.

Barbiturates. Many variations of the original barbiturate (Veronal) are now in use as sedatives. They include barbitone sodium (Medinal), phenobarbitone (Luminal), Somnifaine, Dial, Amytal, Pentothal and Nembutal. Barbiturates properly used are excellent hypnotics for allaying excitement and procuring restful sleep. They are also used to produce relaxation for the purpose of psychological analysis. From time to time cases of barbitone addiction are encountered but the tendency is not very great and the drug can be withdrawn with much greater ease than the vegetable alkaloids.

Normal doses induce sound sleep with no tendency to 'hang-over'. In excessive amounts grave symptoms arise very rapidly. A veronal pneumonia has been described. In addition to the somnolence and lethargy symptoms may occur which resemble those of an acute encephalitis, with pyrexia, paralysis of eye muscles, dysarthria, disturbances of reflexes, ataxic gait and kidney trouble. The urine may be diminished in amount and may contain albumin and casts. Occasionally, automatic conduct is observed; cases of accidental death whilst under the influence of barbiturates have been reported. Phenyl-barbitone may be inadvertently taken in excess by epileptics. In addition to narcosis, gastro-intestinal disturbances and scarlatiniform skin rashes appear. As in other instances of drug addiction, the underlying nervous structure is that of the cyclothyme or psychopathic personality.

Acute barbiturate poisoning is treated in the usual way by means of stomach washouts, warmth, and frequent injections of small doses of picrotoxin.

Other drugs of addiction include paraldehyde, bromides, aspirin, pethidine, benzedrine, dexamphetamine, codeine, methedrine and other substances. The basic psychopathology is the same.

Treatment. Drug addiction is best treated in hospital where access to the favourite 'dope' cannot be obtained.

Addicts must be watched very carefully because of their lying propensities and erratic conduct. They may attempt to bribe nurses to obtain drugs for them. The modern tendency is to discontinue the drug gradually so as to avoid alarming and distressing withdrawal symptoms with consequent depression and risk of suicide. Many treatments have been devised which depend upon the substitution of non-habit forming drugs. For example, apomorphine has been given together with morphine on the theory that since apomorphine induces vomiting, morphine will be conditioned to do likewise. Ultimately it will become nauseous to the point when it is discarded. A more recent treatment employs large doses of insulin. Insulin induces hunger and therefore sets up a desire for food rather than a craving for morphine.

The ordered regime of hospital life helps materially. Light diet, ample fluids, hydrotherapy and regular exercise and occupation are of considerable value. Attention to the bowels overcomes constipation.

In less severe cases some form of analysis must be employed to elucidate the causes of the underlying mental conflict which arouses the craving. At the same time endeavour must be made to provide addicts with a more wholesome outlook, and some sort of philosophy. Occasionally, a brilliant result is obtained, but the outlook on the whole is not good. The underlying instability is often beyond remedy and the tendency to relapse is very great. In spite of the general improvement in health, weight and sexual vigour, one dose is sufficient to bring about a return of the craving. All the good resolutions, fervent promises and even 'crocodile' tears go by the board and the whole dreary business is renewed.

CHAPTER XI

ORGANIC PSYCHOSES

I. SYPHILIS AND OTHER INFECTIONS

Under this heading are described mental disorders due to actual invasion of the brain by viruses and bacteria.

a. Syphilis of the central nervous system. Syphilitic diseases of the nervous system usually appear between five and fifteen years after primary infection with a specific organism known as the treponema pallidum (spirochaete). On an average about 10 per cent of those who acquire syphilis develop specific nervous disorder.

The following disorders are recognized:

(i) *General paralysis of the insane.* Because of the chief incidence of the disease upon the brain substance and lesser effect upon the meninges, the disease is sometimes referred to as syphilitic meningo-encephalitis.

(ii) *Cerebral syphilis.* In this disease the meninges and blood vessels bear the brunt of the infection (meningovascular syphilis).

(iii) *Taboparesis.* Herein there is a combination of tabetic and paretic symptoms.

(iv) *Congenital G.P.I. and taboparesis.*

I. GENERAL PARALYSIS

Spirochaetes invade the brain and can be found in large numbers in the frontal lobes. They cause many pathological changes in the brain and its coverings resulting in both neurological and psychological symptoms.

The disease may come on gradually or commence with great excitement. Occasionally, the disease may be ushered in by an apoplectiform fit which leaves a residual paralysis. Usually, personality changes are noticed first. A hitherto quiet and orderly citizen may by easy stages become talkative and boastful. He is suggestible inasmuch as he will accept any fantastic statement uncritically. Previously tidy and meticulous he becomes increasingly careless in his dress and personal habits. He takes to living more and more extravagantly, spending money he can ill afford. With this attitude goes an increasing failure of memory and loss of moral control. Drinking to excess and heightened sexual activity are other symptoms which appear at this stage. Sexual and other offences may be committed. This phase merges imperceptibly with the second stage during which the bombast becomes part of a mass of delusional ideas, all of a fantastic and grandiose kind. Auditory hallucina-

tions are rare but are sometimes present. He may claim to own vast properties and immense wealth. The mood is expansive, jolly and euphoric but may be interspersed with phases of irritability and violence. Sometimes the excitement becomes intense enough to resemble acute mania. At this time the physical characteristics of the disease are well in evidence. The pupils are irregular in outline, unequal in size and sometimes fixed. More commonly their reaction to light is sluggish although their contraction on accommodation is preserved. The folds between the nose and lips are smoothed out. The facial muscles and the tongue are tremulous so that speech becomes slurred and indistinct. Words are omitted. On account of the tremor of the fingers and the interference with consecutive thought processes writing becomes characteristically shaky and whole words or syllables are left out. The tendon reflexes are exaggerated, except in tabo-paresis where they are absent. Very occasionally, a double extensor plantar response may be found, indicative of pyramidal damage. Towards the end of this phase there is a liability to convulsions or congestive seizures, and at times the fits may be so frequent as to resemble serial epilepsy. The bones become brittle and minor accidents may result in fractures. There is a tendency to increase in weight on account of unrestrained appetite. The obesity, the fits and the silly fatuous mentality make a characteristic picture of the 'fat, fitty and fatuous' stage of G.P.I.

As the disease continues, serious and irreversible changes occur in the brain which lead to dementia, comprising failure of memory and intelligence, and degraded habits. Without treatment, death takes place within two to five years. Treatment as a general rule arrests the degenerative process leaving the patient in a state of mild dementia with impairment of memory and intelligence, fleeting delusions and untidiness of habits. Occasional fits may occur. Otherwise the victim can exist in this state for many years.

Various types of G.P.I. have been described but classifications are of no real value. What is noticeable nowadays is that the euphoric and expansive type does not occur with such frequency. The commonest form of G.P.I. is a 'demented' variety with confusion, disorientation and inaccessibility as its characteristics. Another kind may show depression, but even this emotion is fatuous in nature. Still more rarely schizophrenic and paranoid psychoses may be closely simulated.

The following describes a typically expansive case of G.P.I., *J.K.W.*, age forty-two, a builder's labourer, had been noticed by his wife to be 'queer'. Recently, he had taken to leaving home each night, spending his money freely in public-houses and laughing uproariously at very little. Gradually, his opinion of himself became inflated and he boasted about the things he was going to accomplish. He purchased an expensive radio on credit, an instrument quite beyond his financial reach, was restless, troublesome and truculent at home, declaring that his surroundings were not good enough for him. It was evident then that he was severely de-

ranged mentally. He was removed to an observation ward, certified, and transferred to hospital.

There, his notions became even more expansive and bizarre. He claimed to possess a mansion with thirty gold ceilings, thirty or forty Rolls-Royce cars and many thousands of pounds in cash. His mood was one of fatuous elation.

On examination, the left pupil was widely dilated and fixed, the right pupil was irregular in outline, small, and reacted very sluggishly to light but normally on accommodation. The tendon reflexes were also slightly exaggerated. His blood and spinal fluid were positive to the usual tests.

He responded well to malarial treatment. Little by little his fatuosity and euphoria subsided, his ideas became less and less grandiose, and he became employable. The absurdity of his earlier notions dawned on him and finally he became well enough to be discharged.

Diagnosis. The diagnosis rests on the euphoria, dysarthria, pupil changes and serological tests. A Wassermann or Kahn test of the blood is nearly always positive. The cerebrospinal fluid is always under pressure and shows a large increase of cells, chiefly lymphocytes, increased protein content, a characteristic colloidal gold curve (Lange's test) of the paretic type and a positive Wassermann reaction.

Treatment. Treatment must be carried out in hospital. G.P.I. does not respond to the usual antisyphilitic remedies. Central end-arteries, selective filtration by the choroid plexuses, and lack of free anastomosis prevent drugs given intravenously from reaching the spirochaetes or the affected cells. Good results have, however, been reported from the use of tryparsamide, but this is doubtful for the possibility of spontaneous remissions which are known to occur cannot be excluded.

Until the introduction of antibiotics, malarial therapy was the treatment of choice and as it is still widely used it is worth describing. It consists in inoculating the patient with benign tertian malaria in order to produce regular bouts of high fever. Two methods of inducing pyrexia are employed. In the first, 2–5 cc. of blood are removed from an already infected patient, or from an individual suffering from benign tertian malaria, and injected subcutaneously in the region of the shoulder blades. This site is purposely chosen to minimize scratching with consequent risk of secondary infection. The second method consists in permitting infected mosquitoes to bite the patient. Whichever procedure is employed, the incubation period varies from five to twenty-one days, being shorter where direct blood inoculation is employed. It is important to nurse the patient in a room protected by mosquito netting.

Presently, the temperature rises and the patient begins to experience malarial rigors. Should these occur every day instead of every other day, a dose of quinine sulphate gr. 5 must be given. This kills off some of the malarial parasites and regularizes the fever. The temperature rises

steeply and may attain hyperpyrexial heights if unchecked. Should the pyrexia rise above 105°, tepid sponging should at once be commenced in order to lower it. The rigor takes the usual course and whilst the temperature is rising, the patient shivers and feels intensely cold. Extra blankets and hot water bottles must be provided. During defervescence these may be removed. Perspiration is profuse so that sponging down and a complete change of bed linen and night attire are required. It is necessary to guard against retention of urine. During the whole of this period the patient must be carefully watched for signs of collapse. The fluid lost by sweating must be replaced by lemon and glucose drinks given in quantity.

About eight rigors are allowed after which the fever is terminated by an intravenous injection of quinine dihydrochloride gr. 15 followed by quinine sulphate by mouth in gr. 5 doses t.d.s. for three days. During the course of the fever, blood counts and haemoglobin estimations must be made repeatedly; for the destruction of red corpuscles by the malarial parasite produces a considerable degree of anaemia. There is also marked loss of flesh. Jaundice is liable to occur and is an indication for stopping the treatment at once. Exhaustion may be profound, so that the patient should be closely observed in order to avert the more serious effects of the treatment.

After cessation of the fever, the bodily strength can be built up by means of tonics, iron in large doses, and nourishing food together with malt and cod-liver oil. Recovery of weight and blood-content takes place rapidly as a rule. Should all go well euphoria and excitement gradually diminish, delusions become less and less absurdly grandiose and finally disappear. Eventually a complete remission occurs which may last for many years. Some authorities advise regular courses of arsenicals or tryparsamide at intervals to complete the treatment. The value of such injections is still doubtful.

Malaria taxes the strength considerably. It is therefore never prescribed for older or severely debilitated patients. Less drastic methods of producing fever consist of intravenous injections of bacterial emulsions and typhoid vaccine. Collosal sulphur by the intramuscular route has also been employed. Rises of temperature have been brought about by various kinds of heat-cabinets. Some success has been claimed for all these procedures.

In addition to special therapy, general supervisory measures are necessary. The voracious appetite which may cause choking must be curbed. The bladder and bowels require regular attention, and should the patient eventually become bed-ridden owing to non-success of treatment, the customary care must be directed to the prevention of bed-sores and contractures. Seizures are dealt with by insertion of a guarded spatula between the teeth and loosening of all tight clothing. Care must be taken to see that the patient does not bury his face in the pillow during a fit otherwise he is liable to suffocate. Should the seizure continue,

phenobarbitone gr. iii, dissolved in sterile water 10 cc., injected intramuscularly may prove very effective.

It is not known how induced fever brings about remission, but it is thought that the introduction of an acute illness intensifies the bodily resistance so that a chronic disease is converted into an acute one. Malarial treatment has a quite definite mortality rate of about 10 per cent, which means that precautions must be taken in selecting suitable cases. Nevertheless, it has altered the outlook in general paralysis tremendously, and even when not completely successful it has arrested the progress of the disease sufficiently to turn a fair number of patients into good hospital citizens. The remission rate is in the region of 25–30 per cent.

The effects of penicillin therapy are now thoroughly known. It is almost certain that malarial treatment will finally give way to it and will in the future only be prescribed where there is absolutely no contra-indication to its use or where clinical improvement using penicillin alone has proved inadequate or unsatisfactory.

Penicillin is employed in much the same way as that described for cerebral syphilis (see below) except that iodides and bismuth are apparently not required.

II. CEREBRAL SYPHILIS

In this disease the brunt of the infection falls upon the meninges and blood vessels whilst the actual brain tissue is, to a greater or lesser extent, spared. It is much more amenable to ordinary antisyphilitic treatment than G.P.I. and comes on very much more quickly, often within the first six months or a year after the primary infection.

Cerebral syphilis tends to run a more acute course commencing with feelings of uneasiness, dullness, lethargy and impairment of memory for recent events. Headache, particularly severe at night, dizziness and sleeplessness are also complained of. Where the intracranial pressure increases markedly, the patient may become torpid and stuporose. Occasionally delirium, confusion and excitement are present. Cranial nerve paralyses are common, pupil changes are often detected and other reflex disturbances may occur. Occasionally, convulsive seizures may be followed by paralyses of limbs. Every now and then acute hallucinatory episodes are observed. Expansive or persecutory delusions have also been recorded. Rarely, the meningeal and arterial reaction to syphilitic infection result in gummatous formations which behave like cerebral tumours. The blood Wassermann reaction is always positive, but that in the C.S.F. is not infrequently negative. Protein and other changes occur as in G.P.I. but the gold curve is of a meningitic and not a paretic type.

Treatment. Treatment should commence with a course of ten weekly intramuscular injections of bismuth oxychloride in 0·2 gm. doses. Similarly, potassium iodide when well-tolerated as it usually is must be given by mouth in 60–90 grains per day for some weeks. Bismuth is

spirochaeticidal and iodides prepare the patient for the use of penicillin in order to avoid what is called a Herxheimer reaction, a form of shock.

After this preliminary premedication lasting about three weeks, penicillin injections may be commenced in doses of ½ million units twice daily up to a total of 10 or 12 million units. Alternatively, procaine penicillin can be used in similar dosage. The course need only be repeated subsequently if recovery, clinical and serological, is delayed beyond four or six months. It is advisable that the patient should be re-examined each year for five years and Wassermann tests performed. Beyond 2 or 3 years, if the blood reaction does not alter, treatment should be abandoned.

III. TABOPARESIS

Taboparesis is practically identical in its nature with dementia paralytica except that in addition to the Argyll-Robertson pupils, the knee and ankle jerks are lost, sphincter trouble is prominent, and the sites of anaesthesia and analgesia are as described under tabes dorsalis. Optic atrophy may occur. In fact taboparesis is a combination of tabes and general paralysis.

Treatment is as previously described.

IV. CONGENITAL G.P.I. AND TABOPARESIS

These diseases are dreadful inheritances from infected parents. The child may look and behave normally until puberty or a little later, although in many cases it is mentally and physically feeble from birth. Soon after puberty the classical symptoms and signs of paresis make their appearance. Sometimes the characteristic Hutchinson's teeth and other physical signs of congenital syphilis are in evidence. The age of onset makes the diagnosis clear. As a rule the delusions are not so expansive and on the whole the disease tends to run a 'demented' course. With regard to treatment the response to malaria and arsenicals is very poor. Very exceptionally, improvement has been reported but in the large majority of cases the tendency is towards a progressive dementia.

b. Epidemic encephalitis (encephalitis lethargica). Acute phase. The neurological aspects of this disease have already been described. Although the lethargic or stuporose aspects of this disorder have been stressed, an acute maniacal onset is not unknown. Insomnia, impulsive violence, destructive and homicidal tendencies have all been reported. Confusion, delirium and disorientation have also been described. Sometimes the acute mental disturbance is very short-lived; in fact it is an episode which often subsides quickly with complete recovery. It must also be remembered that encephalitis lethargica may arouse a typical manic-depressive or schizophrenic psychosis out of a personality predisposed to the development of these diseases.

Treatment. Measures must be instituted at once to control the excitement and delirium. Hyoscine and morphine injections may be required at first, but these should be discontinued as soon as possible and reliance placed on sponging, warm packs and prolonged warm baths. The bowels should be opened as soon as possible with enemata, a procedure which in itself tends to lessen the excitement. Intravenous saline and glucose together with intravenous colloidal iodine given during a quiescent phase are often of value. Sedation should be continued with paraldehyde dr. 1–2 or barbiturates (Medinal gr. 10).

Chronic phase. The usual state of mind after the disease has become established is one of apathy. In Parkinsonism the attitude is one of depression and discouragement as a reaction to the knowledge of physical disabilities. Irritability, morbid bitterness, gloom, misery and dejection follow in its train. Emotional instability, anxiety, other psychoneurotic manifestations, hallucinatory and delusional trends occur too but are less common. At times organic dementia with failure of interests, memory and other intellectual functions, sometimes occurs. Attempts at suicide are not uncommon amongst patients who find their way into mental hospitals. Sleep disturbances are frequent and consist of drowsiness during the day and insomnia at night.

Treatment. Such patients must be cared for sympathetically and every attempt made to interest them in external affairs. Psychotherapy and encouragement are of value. The more helplessly dependent types will require attention as regards dressing, the toilet and the sphincters. The outlook is not good because there is no specific treatment. Relief is sometimes possible through the agency of belladonna preparations as already detailed in the neurological section.

Children. Children react rather differently from adults. The super-ego and sentiments not being properly formed, encephalitis has very severe effects on the mentality. Youngsters are converted into vicious little creatures. Lying, stealing, sexual precocity, violence, filthiness of habits, in fact every form of delinquency is indulged in. Such children are beyond control except in special types of hospital. They reveal all kinds of complex tics such as sniffing, grunting, spitting, obsessional touching, and other numbered rituals which are refractory to treatment. In hospital firm discipline, sedatives and simple occupations sometimes produce a considerable amount of improvement.

c. Other forms of encephalitis. The brain may become inflamed during the course of a number of infections such as typhoid, mumps, measles, chicken-pox, vaccinia and smallpox. Encephalitis is particularly liable to occur as a complication of virus diseases. The onset may be sudden with excitement, delirium, acute confusion, disorientation in time and place, terrifying hallucinations and occasional convulsions. The temperature is nearly always high and the urine reveals albumin and casts indicative of a severe toxaemia.

Treatment. Treatment is directed to lessening the toxaemia and excite-

ment. Sedation, hydrotherapy and a nourishing diet are necessary. Mild restraint may have to be employed to control the violence of the excitement. General attention to the hygiene of the mouth and to the toilet takes the usual form.

The outlook in such acute mental disturbances is good on the whole and recovery is nearly always complete. Occasionally, mental residua are observed. For example, one patient after recovery from a measles encephalitis developed an obsessional fear of dirt and moths. She changed her residence and sold her furniture four times before the true nature of her disorder was discovered.

d. General infections. General infections such as influenza, pneumonia and acute rheumatism may unmask a psychosis of the schizophrenic or manic-depressive type. Otherwise, the usual symptoms are those of delirium and may appear before, during or after the illness. Delirium takes the usual form of restless excitement, confusion, disorientation, horrible dreams, hallucinations and insomnia, all in an emotional setting of terror. Later, drowsiness or the 'typhoid state' may supervene, i.e. a low muttering delirium with complete loss of interest in the surroundings, and double incontinence.

After the fever has subsided, exhaustion, apathy and depression may remain as post-febrile symptoms. The risk of suicide is considerable, particularly after influenzal depression.

Treatment. The tendency in most cases is towards complete recovery. Treatment resolves itself into the cure of the underlying physical disease together with the appropriate remedies in cases where schizophrenic or manic-depressive psychoses have been precipitated out. Convalescence may be sometimes prolonged so that tonics and attention to the physical health are required. Interesting occupation helps to restore the mental outlook to normality.

CHAPTER XII

ORGANIC PSYCHOSES (*cont.*)

II. TOXIC PSYCHOSES DUE TO ALCOHOL AND OTHER DRUGS

A. ALCOHOLIC DISORDERS

The subject of alcohol in its relationship to mental disorder is a difficult one because alcoholism may be a symptom of many disorders. Unstable psychopaths fly to alcohol as an escape from their difficulties, and for the sake of attaining that delightful state of euphoria wherein life takes on a rosy hue. Sufferers from anxiety states seek relief, if only temporary, from their worries. Depressives drink to relieve their gloom. General paralytics indulge in alcohol because of the loss of inhibition and control which follows invasion of the brain by syphilis. Feebleminded persons take to drink because of inborn lack of restraint and common sense. Schizophrenics and paranoid people drink to escape from intolerable mental conflict. It is therefore necessary when attempting to formulate a diagnosis to bear in mind that the taking of alcohol is a mechanism of escape, that it may become a habit in no way different from drug addiction, and that it complicates a number of mental disorders.

The effects of alcoholic ingestion are well known. In small doses it produces a feeling of well-being, it diminishes the critical faculty, and it enables the taker to laugh at jokes which normally he would have rejected as silly and fatuous. It increases the social sense for a time, and personal relationships become smoother under its influence. Doubtless, in such small amounts it has a psychological value inasmuch as it leaves the individual with the memory of good times well spent. In larger doses the symptoms of intoxication begin to appear: for alcohol is not a stimulant. It is purely and simply a narcotic, the action of which is to reduce the efficiency of the highest developed parts of the mind, thus releasing instinctive activities from control. Increased talkativeness, raising of spirits and heightened sexual activity are all release phenomena and are not due to stimulation.

Continued ingestion of alcohol causes neurological symptoms such as double vision, slurring of the speech, ataxia and other familiar symptoms. These signs are followed by vomiting and drowsiness which finally lead to deep narcotic sleep which may continue into coma and death in the event of an overdose.

Slowly but surely, social approval is being withdrawn from drunken-

ness which is becoming increasingly a matter for contempt rather than congratulation. The taking of alcohol is of historic interest and most countries have what might be called a 'national tipple'. The social and economic ramifications of alcoholism are enormous, and the dreary accounts of associated poverty, squalor, misery, broken homes and crimes of violence are immense in number. Nevertheless, economic insecurity, unemployment and the lack of proper recreational facilities have much to do with the problem.

Apart from the effects of alcohol as a complication and its socio-economic aspect, it produces a number of true alcoholic psychoses.

Accordingly, the following disorders are described:

a. Pathological intoxication (mania à potu); b. dipsomania; c. delirium tremens; d. Korsakoff's psychosis; e. chronic alcoholism (chronic alcoholic deterioration).

a. Pathological intoxication is a state of acute excitement with confusion, violence, fear and rage, which arises in unusually susceptible people as a response to quite small doses of alcohol. Such people are often psychopathic and come of abnormal stock. The victims of head injury are often unduly sensitive to drink.

Treatment. The stomach should be washed out with weak bicarbonate of soda solution. A sedative such as sodium barbitone gr. x, should be left in the stomach. The bowel should be cleared. An injection of 5cc. of a 10 per cent solution of Cardiazol over a period of half a minute is a useful measure both to stimulate the circulation and to quieten excitement. The patient should then be made comfortable and warm, after which he should be permitted to sleep. To avoid future attacks he must never take alcohol in any shape or form.

b. Dipsomania, describes a condition characterized by periodic drinking bouts inspired by a recurring and irresistible craving for alcohol. This intense desire vanishes with the gratification thereof only to return with renewed vigour a few weeks or months hence. In between times the patient may remain perfectly sober and may even find drink distasteful. The underlying psychology is that of the psychopathic, neurotic or manic-depressive personality.

Treatment. Treatment is as prescribed for mania à potu. There is nothing much else that can be done, for the time of onset of each attack is unpredictable. In rare cases psychotherapy is of value in giving the patient greater self-knowledge to increase his self-control.

c. Delirium tremens, is almost always confined to chronic alcoholics who have indulged in a debauch which has lasted longer than usual. It also occurs in the same individuals during the course of an intercurrent illness such as pneumonia, fracture or accident. The symptoms are well known, having been popularized on the music-hall stage and in the so-called comic press.

D.T.'s is an acute illness of fairly sudden onset characterized by delirium, great excitement, restlessness, confusion and disorientation. The

emotion is one of acute terror and is a response to vivid terrifying visual hallucinations comprising disgusting animals such as rats, snakes and spiders, supported by hallucinatory 'voices' of a threatening and accusatory kind, haptic hallucinations (sensation as if animals were crawling on the skin), and absolute insomnia. It has been suggested that the terrifying hallucinations are projections of remorse and self-accusation. Occasionally, the delirium is of the occupational type inasmuch as the victim carries out the movements connected with his trade or profession. At times terror may give place to violent rage, and homicidal attacks may be made on those around.

Physically, the patient is very ill with toxaemia, furred tongue, chronic alcoholic gastritis, pyrexia, rapid pulse, flushed face and sweating. The urine may contain albumin and casts. There is a characteristic tremor of all the limbs and tongue. Convulsions sometimes occur. The more seriously affected patients may die of exhaustion and the outlook is always grave in D.T.'s complicating infections and accidents. A straightforward case normally recovers completely in from three to five days.

Treatment. Bed and a quiet room are essential. Steps should be taken to ensure that the patient does not fall out of bed during his extreme restlessness. Hydrotherapy is useful to allay restlessness but rapid sedation is best obtained by means of drugs such as barbitone gr. x–xv. Occasionally, hyoscine and morphine may be required. The heart must be encouraged by means of digitalis or strophanthin injections. Fluids should be given to the maximum possible intake so as to flush out the kidneys and assist the process of detoxication. To the same end the bowels must be kept active by means of enemata and saline purgatives such as magnesium or sodium sulphate in ounce doses. To encourage appetite the mouth and tongue should be cleansed. Insulin in doses of 10–20 units repeated at intervals creates a craving for food. The latter should be light, nutritious and should contain plenty of carbohydrate in the form of glucose. It may be necessary to give glucose and saline intravenously. The chronic gastritis of chronic alcoholism seriously interferes with the absorption of vitamins. Therefore vitamins C and B should be given in large quantity both by mouth and intravenously to prevent degeneration of nervous tissue; for it has been shown that the blood and spinal fluid of chronic alcoholics are deficient in vitamin content.

If delirium tremens has occurred during the course of another illness such as infection, head or other injury, fractures and so on, these must receive adequate attention.

As soon as possible, a full and nutritious diet of high vitamin content must be provided. Convalescence should be complete and a return to work gradual.

d. Korsakoff's psychosis. This is another disease confined to chronic alcoholics. However, a similar sort of picture may be presented in G.P.I., head injury, parietal tumours, pre-senile dementia and arsenical poisoning. The disease is characterized by two sets of symptoms, the one

mental and the other physical. It is a disorder combining psychosis with polyneuritis, although cases have been recorded in which the latter has been absent. It is commoner in females than in males and rarely occurs before the age of fifty.

Mentally, there develops a curious memory defect based on failure of retention together with the elaboration of false notions to fill in the amnesic gaps (paramnesia, pseudologia phantastica, pseudo-reminiscences, confabulation). The patient will give long and circumstantial accounts of his activities, business and travels, although it is obvious that he has not moved from his bed. When taxed with the inconsistency of his tales, he cheerfully shifts his ground and recounts other and equally fantastic stories. All insight is lost. There may be episodes of confusion and even of mild delirium. Disorientation in time and place is usual. Delusions are common, illusions not infrequent, and mistakes of identity are frequently made. Auditory and visual hallucinations are sometimes present. The mood is one of euphoria although it may change rapidly to querulousness and anger.

On the physical side there is evidence of peripheral neuritis. Wrist-drop and foot-drop are present. Ocular palsies and nystagmus may occur. The skin of the hands and feet becomes glossy, the fingers taper, the nails become brittle and the calves are exquisitely tender. Sensory loss of the 'glove and stocking' type is detectable. All deep reflexes are lost.

The disease tends to run a prolonged course for months or even years. No case of complete recovery has been recorded although great improvement does occur. At best the memory defect persists to a minor degree and there is some emotional blunting together with other evidence of intellectual impairment. Some cases proceed progressively to dementia with complete failure of memory and intelligence.

Treatment. Absolute rest in bed is necessary, for the heart is weakened as a result of the toxaemia. It is not uncommon for sudden death to occur from cardiac failure after moderate exertion. The painful limbs should be wrapped in cotton wool and protected by a cradle from the weight of the bedclothes. If they can be tolerated splints should be applied to correct foot and wrist drop and to prevent contractures. Insomnia and restlessness are controlled by small nightly doses of barbiturate drugs. The ordinary principles of nursing are applicable. The diet should be nutritious, easily digestible and rich in vitamin B_1 content which latter should also be supplied additionally in large doses. As the pain and tenderness in the extremities subside massage and exercises may be prescribed. During convalescence all patients should be provided with appropriate recreational and occupational facilities.

e. Chronic alcoholism (chronic alcoholic deterioration). This is a condition found in those who have been habitual drinkers for many years. Publicans, barmen and commercial travellers usually have access to large quantities of alcohol and are thus found in the ranks of the chronic

alcoholics. Others imbibe abnormal quantities because of social demands.

The habitual toper gradually deteriorates mentally, morally and physically. He may be reasonably efficient at his job at first, but eventually his work suffers. Memory defects, failure of judgment, suggestibility, crocodile tears, shallow emotion, childishness, lying, irritability, violent outbursts and cruelty are amongst the manifestations of the disorder. Carelessness over finance often leads to economic distress, poverty, neglect of home and family, and domestic discords. As long as there is sufficient money to obtain drink, such an individual cares little about anything else. He is happiest with his boon companions and in their company is often cheerful and merry. His moral slackness and infidelities cause him remorse. This feeling, however, is quickly repressed and projected so that he becomes intensely jealous of his wife. He feels that he is ill-used, that the world is against him and does not permit him to get on. At another time he may become sufficiently depressed to attempt or commit suicide in a fit of alcoholic remorse. Insight is absent so that he tends to bring law suits against his detractors and persecutors.

Physically, the health deteriorates too. Obesity, lack of appetite, coated tongue, foul breath, nasal congestion, catarrh, cirrhosis of the liver, kidney trouble, tremors, sensory disturbances, impotence and arteriosclerosis, are all common. These are the direct effects of alcoholic poisoning. The outlook is poor and the condition progressive. The resistance to infections is lowered so that diseases like influenza and pneumonia are very serious and often fatal.

Treatment. Whilst treatment is of little or no avail, general nursing supervision is required together with a liberal diet of high vitamin content. Gastro-intestinal disturbances should be checked by the usual symptomatic remedies.

TREATMENT OF ALCOHOLISM IN GENERAL

Treatment demands patience and persistence. Primarily, it is essential accurately to elucidate the factors motivating alcoholic excess.

Secondarily, when the diagnosis has been correctly formulated, active therapy must be instituted and continued as long as is necessary, preferably in hospital. The underlying malady, whether it be schizophrenic, manic-depressive, syphilitic or neurotic, must be attacked.

Immediate withdrawal of alcohol is essential, followed by detoxication employing intravenous injections of a glucose-insulin-vitamin preparation called Curethyl. This helps to overcome defective vitamin absorption resulting from associated alcoholic gastritis.

In the absence of any specific disorder other than psychopathy, the requisite drug treatment can then be applied. This nowadays is almost entirely restricted to a substance called Antabuse. A recent discovery, it is prescribed in daily doses of ½–1 gramme. After two or three days, a test drink is given. Within fifteen minutes a violent reaction takes place

between alcohol and Antabuse to produce alarming symptoms such as flushing, dyspnoea, urticaria, palpitation, nausea and vomiting.

The dose of Antabuse is thereafter adjusted in accordance with the severity of the symptoms aroused.

This treatment is sometimes dangerous and is contraindicated in the presence of cardiac or liver disease wherein there is a possibility of fatal collapse.

Obviously, as long as Antabuse is taken regularly, alcohol is ruled out because of the intensely unpleasant effects engendered.

Additionally, psychotherapy and every other adjunct to treatment must continue hand in hand with drug administration. Once more, co-operation and a sincere desire for cure are of paramount importance. In this connection a body called 'Alcoholics Anonymous' offers valuable help to those in need. Its address in England is BM/AAL W.C.1

The results of treatment are variable, but about half the patients are considerably helped.

B. PSYCHOSES DUE TO DRUGS AND OTHER TOXIC AGENTS

(i) Metals. Lead poisoning results from the inhalation of absorption of the metal from substances used in industry such as paint, cosmetics and 'doped' petrol. Lead is deposited in the long bones displacing the calcium content.

Poisoning causes a variety of symptoms such as gingivitis, colic, diarrhoea and vomiting, diseases of muscles, peripheral neuritis (wrist and foot drop), optic atrophy and encephalopathy (lead psychosis). The disorder is characterized by states of delirium, stupor or coma. Occasionally there is wild excitement, and epileptiform convulsions are not uncommon. Eventually, if the poisoning continues, a chronic deteriorative delusional psychosis develops with hallucinations and delusions of persecution.

Characteristic blood changes and a blue line around the gum margins clinch the diagnosis.

Treatment. Treatment consists of eliminative measures by means of stomach and colon washouts, administration of intravenous glucose and saline, calcium salts, viosterol and sodium thiosulphate to hurry the lead out of the system. Convulsions may be controlled by the subcutaneous injection of phenobarbitone gr. iii in sterile water.

(ii) Other metallic and non-metallic substances. Mercury, arsenic and other substances used either in industry or in medicine occasionally produce mental disturbances of a greater or lesser severity. Arsenic in particular is of interest both medically and medico-legally. It was once prescribed almost indiscriminately for a variety of illnesses particularly chorea and blood disorders. Certain races in Europe have been known to take the drug for the benefit of their complexions. At other times it has been used with homicidal intent. Apart from the symptoms of

poisoning such as vomiting, diarrhoea, pigmentation of the skin, herpes zoster and peripheral neuritis, it is instrumental in producing a Korsakoff's syndrome almost indistinguishable from that caused by alcohol. *Treatment.* The treatment is eliminative and general.

(iii) Other drugs. Alkaloids such as atropine and hyoscine may cause acute hallucinatory episodes when given in excessive dosage. Salicylates, quinine, aspirin and other medicines in common use may cause states of acute confusion with ringing and buzzing noises in the ears, blindness, hallucinations and delusions.

Narcotics like Veronal and opium seldom produce true psychoses. It has already been indicated that their habitual use results in personality changes which do not amount to severe psychotic disturbance. Occasionally, however, delusional states do develop. Cocaine poisoning may give rise to delirious states and hallucinations of touch. Bromides are used so extensively in general medical practice, particularly in epilepsy and the neuroses, that it is hardly surprising to find cases of intoxication now and then. Excessive bromide intake causes a dull, enfeebled physical condition with constipation, foul breath, acneiform skin eruptions, ataxia, generalized tremor and slurring of the speech. Mentally there may be torpor, confusion, defective memory and even delirium. At times the condition is apt to resemble general paralysis.

Treatment. Administration of the offending drug must cease forthwith. The usual measures must then be taken to eliminate it completely by enforcing fluid intake by mouth after a preliminary stomach washout and intravenous glucose injections, picrotoxin, Coramine and cardiac stimulants such as strophanthin, digitalin or Cardiazol.

Warmth and warm packs are of value to promote sweating and kidney activity. The bowels should be kept active after an initial enema or colon lavage. Needless to say bromides must never be prescribed again in such cases.

(iv) Psychoses due to gases. Structural changes in the brain may be caused by a number of gases the most important being coal-gas the chief constituent of which is carbon monoxide. Accidental leakages from gas-taps, motor-car exhaust fumes in a closed garage, emanations from sewers and suicidal attempts are all circumstances under which carbon monoxide poisoning may occur.

Apart from its effects on the blood where it combines with the haemoglobin of the red cells, it causes degeneration of the cerebral neurons, in particular the cells of the corpus striatum. A Parkinsonian state may eventually develop.

The immediate result of gas poisoning is to produce headache, sickness, delirium, coma and death within a short time. Sometimes phases of acute excitement occur. Dreamy states with final recovery have been reported. Occasionally, there is an apparent recovery to be followed later by mental symptoms.

During the chronic stage, i.e. after all acute symptoms have subsided,

paralyses, speech disturbances and other nervous signs may develop. Mentally, memory defects are apparent of which the most prominent are childishness, restriction of interests, poorness of attention and concentration, disorientation and a tendency to confabulate. The confabulation arises out of attempts to fill the memory gaps as already described in Korsakoff's psychosis. The outlook in the chronic psychotic state is very poor.

Treatment. The acute phase will have been dealt with by the usual first aid procedures. Should it occur by mischance in hospital the best treatment is a mixture of CO_2 5 per cent and oxygen 95 per cent given by inhalation together with cardiac and respiratory stimulants by injection. Blood transfusion may help, and hypertonic saline injections may reduce the cerebral congestion.

In the deteriorated phase nothing can be done other than prescribe for such patients the ordered routine and shelter of a mental hospital.

CHAPTER XIII

ORGANIC PSYCHOSES (*cont.*)

The group of mental disorders to be described here includes those brought about by:

(a) Trauma to the skull with consequent brain injury; (b) new growths within the skull; (c) degenerative organic nervous diseases; (d) cerebral arterial disease; (e) senility, including pre-senility.

In all these psychoses true structural cerebral changes can be demonstrated in the form of gross visible naked-eye damage, or as derangements, atrophy and degeneration as seen under the microscope.

III. TRAUMATIC PSYCHOSES

HEAD INJURY

Psychoses following head injury are not common. There is no doubt at all that trauma is as likely to excite a manic-depressive or schizophrenic psychosis as any other precipitating factor provided that the temperamental soil is prepared. For example, injury to the skull in a cycloid may arouse excitement, depression or both. Similarly, if the temperamental basis is schizoid, the reaction to head trauma might quite well be a schizophrenic psychosis. It has already been noted that neurotically predisposed personalities respond with florid psychoneuroses to blows on the head. Nevertheless, there is a limited group of psychoses which is distinctly related to head injury. Even here it is true to say that historical inquiry often reveals evidence of underlying nervous instability.

The types of traumatic psychoses are grouped under three headings:

a. Post-traumatic deliria. This group comprises all those cases in which mental symptoms have arisen directly after a head injury. The reaction is a delirious one with excitement, restlessness, euphoria, confusion, disorientation and an amnesia for a varying length of time. It has been declared that the length of the forgetfulness and non-recognition is a guide to the severity of the illness. Another view suggests that prolonged amnesia is due to the intracranial pressure produced by an effusion of cerebrospinal fluid into the cranial cavity, a condition which can only be relieved by opening the skull and releasing the fluid.

This delirious state may last for a varying length of time but eventually subsides. It may, occasionally, continue and become chronic, in which event the picture presented is similar to that of Korsakoff's

psychoses, with memory gaps and confabulation. The outlook then is modified for the worse.

b. Post-traumatic personality changes. In certain cases although the patient appears to have recovered from the immediate effects of the head injury it is noticed that there is a profound alteration in personality. There is increased susceptibility to alcohol, very little of which produces acute intoxication and violent conduct disturbances. Resistance to infection is lessened. Postural dizziness is a symptom and frequent headaches occur often aggravated by sneezing, coughing and exercise. The patient complains of abnormal tiredness after very little exertion, irritability and insomnia. He experiences sensations of heat and cold in various districts, a disinclination for work and restriction of interests. Dislike of noise, bright lights, pettish querulousness and general dissatisfaction are also in evidence. There may be a liability to fainting attacks. Other cases show episodic outbursts of violence and bad temper, and hysterical fugues. Delusional, epileptic and paranoid trends have also been observed. Memory is impaired and the ability to concentrate is diminished. Such patients realize that they are ill, their working capacity is negligible, and they may cherish a sense of grievance against their doctors for their lack of improvement. In many ways the post-traumatic constitution as it is called, resembles the neurosis which develops in response to head injury, yet it arouses a suspicion that there must be some underlying organic cerebral disturbance.

c. Post-traumatic dementia. Dementia sometimes develops gradually after a delirious episode which has resulted from a head injury. The trauma may have been severe or apparently very slight. Memory fails by degrees and there is impairment of all intellectual functions. Testing by means of a reading card or a set piece of prose reveals retention defects. Confusion, defective judgment, poverty of ideas, shrinking interests, violence, slovenliness and faulty habits make up a picture of mental enfeeblement not difficult to recognize. Neurological complications such as speech disturbance and convulsions may occur.

As an illustrative case, a middle-aged woman was struck on the head by a fragment of a bomb which burst near her during an air-raid. The injury caused a laceration of the scalp and the loss of an eye. Following this she became delirious, noisy and intractable, spending most of her time shouting and singing obscene songs. Her habits were disgusting. She was disorientated in time and place and failed to recognize her attendants. Presently, the excitement subsided and from that time on it became evident that she was becoming increasingly weak-minded, childish, silly, fatuous and inane. Memory and intelligence tests of the Binet-Simon type revealed a marked reduction of intellectual capacity compared with what was described by her relations as her pre-psychotic state. Two years after her admission to hospital she was amnesic, demented and inaccessible mentally.

It is suggested that in post-traumatic conditions neither the length of

the amnesia nor the site of injury is as important as the age of the patient, i.e. the older the patient the worse the prognosis. Some authorities, on the other hand, state that damage to the frontal lobes leads to emotional blunting, loss of initiative and urge together with impairment of the finer mental functions.

d. Post-traumatic epilepsy. This is uncommon but does occur if the vault of the skull has been cracked or if there are signs of focal cortical damage. A year or so after the injury, persistent headaches and organic mental symptoms sometimes develop in association with the fits.

Treatment. Post-traumatic psychoses are very resistant to treatment. If it is suspected that an effusion of blood or C.S.F. has occurred into the subdural space, operation must be undertaken to release the fluid. Surgical elevation of a depressed cranial fracture may be required.

In general, absolute rest is essential until all post-concussional symptoms have vanished. Nursing should be carried out in quiet surroundings where there is freedom from noise and the usual bustle of a hospital. Lumbar puncture should be performed both for diagnosis and treatment. If the spinal fluid pressure is high it is advisable to reduce it by drainage and by the use of intravenous hypertonic saline together with magnesium sulphate by mouth or per rectum. In other directions the usual methods of nursing supervision should be applied. Convalescence should be slow and return to full activity very gradual.

Any paralyses should be treated by means of massage and re-education. Alcohol should be strictly forbidden for at least one year from the date of injury. Mental testing must be employed at regular intervals to ascertain the intellectual capacity, and restoration to work will depend on the findings thereof. Chronic cases of mental deterioration require custodial care.

IV. PSYCHOSES WITH ARTERIOSCLEROSIS OF THE CEREBRAL ARTERIES

Mention has already been made in the neurological section of some of the mental and physical changes which occur in association with sclerosis of the cerebral vessels. Among the factors which produce this condition are worry, financial, domestic or other environmental difficulties, overwork, alcoholism, syphilis and other infections. Nevertheless, it is probable that those who tend to worry excessively are basically nervous and anxious individuals. Furthermore, those who overwork regularly are undoubtedly persons who do so because of neurotically motivated ambition.

a. Cerebral arteriosclerosis. Cerebral arteriosclerosis is a disorder of the later middle years and is unlikely to occur before the age of fifty. As a rule, attention is drawn to it by an apoplectic disaster of some kind. It is then noticed that in addition to any residual paralyses there are confusion, irritability, and perhaps phases of excitement. Once the

condition has been established, deterioration tends to be progressive. Memory for recent events fails and the gaps may sometimes be filled in by false reminiscences. The patient becomes increasingly conscious of his disabilities. Pettiness, irritability, emotional instability, restlessness, insomnia and morbid anger result from this realization. Definite psychotic trends may then become apparent. These take the form of depressive phases with agitation, suspicion and other paranoid phenomena such as jealousy, delusions of persecution, or phases of homicidal violence. As time passes, the memory defect extends from recent to remote circumstances. With this increasing deterioration, insight is lost, the habits tend to slovenliness, carelessness and degradation, the final result being a disintegration of the personality.

Subjectively, headache, dizziness and noises in the head are the earliest complaints. A residual hemiplegia may be found together with aphasia, apraxia and the usual signs of upper motor neuron damage. There is a liability to apoplectic or epileptiform seizures. The blood pressure may be elevated but this is not necessarily always the case. If it is, epistaxis may occur with some frequency. Eventually the gait becomes ataxic, confining the patient to bed.

The outlook is poor on the whole, the tendency being towards progressive dementia and physical helplessness. Occasionally, with rest and adequate supervision, a number of such patients recover temporarily and may even be restored to some sort of gainful employment.

Treatment. There is no special form of treatment other than general supervision, tactful management and control of restlessness and insomnia. Paralyses are treated by massage and constant current. The sphincters may require attention. The best sedatives to employ are barbiturates in small doses. Largactil sometimes has a place in controlling restless noisiness when given in 150 mg. doses as required. Potassium iodide and thyroid extract are sometimes useful. Confusion, stupor or coma may respond to nicotinic acid 100 mg. by mouth for five doses, and 100 mg. of nicotinamide intravenously each day. Epileptiform convulsions may be diminished or abolished by regular nightly doses of phenobarbitone gr. 1. Should the patient become helplessly bed-ridden and dependent great care must be taken of the pressure points, for bedsores occur very readily.

b. Psychoses with cerebral tumour. More than 80 per cent of individuals afflicted with tumours of the brain show mental symptoms sooner or later. Sometimes the symptoms revealed are most misleading and in the early stages are suggestive of neurosis. As a rule no help can be obtained from the phenomena presented as regards localization of the tumour. Mental symptoms only arise when the intracranial pressure increases to the extent of producing drowsiness and apathy. Memory disturbances are frequent and a Korsakoff-like syndrome may be produced especially by tumours of the parietal areas. Occasionally, hallucinations of smell may lead to the detection of growths in the hippocampal district. Hal-

lucinations are sometimes visual in character and take the form of figures which may either be tiny or extremely large and grotesque. In addition, dullness, somnolence, irritability and emotional instability are among the symptoms common to all cases of cerebral tumour.

The neurological and localizing signs have already been described in a previous section and need not again be detailed.

Treatment. Patients with cerebral neoplasms are sometimes admitted to mental hospitals because of personality changes which may not at first clearly point to the correct diagnosis. The treatment is surgical and careful after-nursing. Even successful removal of a cerebral new growth does not necessarily ensure return to normal mental functioning and a number of such cases progress to organic dementia necessitating mental hospital supervision for the remainder of their span of life which is not, as a rule, prolonged.

c. Huntington's chorea. This is a familial disease which is conveyed directly from parent to offspring. It is characterized by uncontrollable writhing movements of the body and limbs and a tendency to severe cerebral degeneration. The latter is reflected in mental symptoms which begin with alteration in conduct for the worse, irritability, violence, faultiness of habits and depression. The memory gradually fails, and delusions of persecution develop in association with hallucinations of hearing. The writhing movements are of the choreo-athetoid (snake-like writhing) type and cease only during sleep. The speech becomes dysarthric and explosive.

This disease sets in between thirty and fifty and its average duration is about fifteen years. Towards the end, the patient becomes grossly demented, bed-ridden and in need of every form of nursing care and attention.

Treatment. Treatment consists of hospitalization, care and supervision. There is no specific remedy and no known method of arresting either the movements or the disease.

d. Disseminated Sclerosis with psychosis. When mental changes supervene in disseminated sclerosis, particularly in the more advanced cases, there is a striking resemblance to both hysteria and schizophrenia. The most characteristic emotion, however, is euphoria. Outbursts of alternate laughing and crying are not uncommon especially in women afflicted with this disorder. Memory defects and impairment of intellectual functions are often noted. Delusions, hallucinations and convulsions have all been reported but are infrequent. The mental changes are said to result from patches of sclerosis in the brain.

V. SENILE PSYCHOSES

Senility is an arbitrary designation covering the years from about sixty-five onwards.

A number of people grow old gracefully and apart from minor defects

of memory and a tendency to reminisce about the 'good old days', remain quite alert and useful members of society. Other types are not so fortunate and degenerate rapidly. With the increased expectation of life nowadays those with senile mental changes tend to survive longer and longer, so that the problem of institutional accommodation is becoming increasingly acute.

Senile psychoses are basically due to degenerative brain changes consisting of neuronic destruction and replacement by neuroglial tissue. The frontal lobes gradually shrink and the space previously occupied by them is filled up with cerebrospinal fluid. Scattered throughout the brain there is evidence of cortical damage in the shape of 'plaques' which are masses of fibres twisted around each other containing the remnants of degenerated cerebral neurons. The amount of cerebral atrophy varies from person to person. In some the wearing out process is more rapid and devastating having been assisted perhaps by overwork, worry, syphilis, alcohol and other toxic substances. Additionally, much depends upon hereditary factors and congenital nervous organization.

It is thought that not all the psychiatric abnormalities revealed are due to cerebral destruction; for it is possible that some of the findings are the results of attempts by what remains of healthy brain tissue to compensate for the deficiencies. Finally, the whole matter is further complicated by arteriosclerosis of the cerebral blood vessels.

Senile psychoses can be classified under five headings for descriptive purposes, but these subdivisions are not very clearly marked and any one case may show the symptoms of each and every other group.

a. Simple senile deterioration. This group contains cases which show a pathological exaggeration of normal senile trends. There is a progressive restriction of interests, a dislike of change and a tendency to decry progress or 'new fangled' notions. Failure of memory, especially as regards recent events, is a prominent symptom. Such senile patients will retail ancient reminiscences and stories time and again with a considerable degree of egotistical self-satisfaction. Defects of remembering cause them to fail in the realization that they are becoming bores and that few of their listeners are interested in the twice-told tale. Memory gaps extend progressively until the whole of recent existence is wiped out. Sometimes such amnesic gaps may be replaced by inventions and fabrications. Forgetfulness and mislaying of articles may arouse suspicion sufficiently for it to crystallize into accusations of theft directed against relatives and attendants. Suspicion often solidifies into actual delusions of persecution. Another feature so characteristic of senile dementia is the hoarding of rubbish. Scraps of paper, bits of string, rusty nails and all sorts of worthless objects are treasured and often found in immense quantities in the pockets of the innumerable garments which these disordered folk often wear. In the later stages, auditory hallucinations may develop and cause the conduct still further to deteriorate Aimless wandering and restlessness are difficult abnormalities to control

Such patients lose themselves in the streets and have to be directed to shelter by the police or passers-by. At home, they become a menace in many directions. They amble about in a disorientated condition and may even set fire to the premises by the careless use of matches. Water- and gas-taps may be left turned on. Occasionally, senile loss of moral control permits of minor sexual offences such as indecent exposure. At length, dementia proceeds to gross weak-mindedness with failure of all intellectual functions. Physical deterioration goes hand in hand with mental enfeeblement to produce a dependent, vegetating mass of tissue which is barely sentient.

b. Presbyophrenic type of dementia. This type is one in which the symptoms are severe from the outset and the resemblance to Korsakoff's syndrome much more striking. The confusion is much greater, suggestibility is marked and the tendency to fabrication very prominent.

c. Senile delirious states. These come on acutely generally in response to bodily illness such as an acute infection, a surgical operation, head injury or severe toxaemia. Senile delirium is marked by extreme restlessness, absolute insomnia, confusion, excitement, disorientation, resistiveness, hallucinations and delusions of persecution.

d. Depressive types. Here, depression and agitation are superimposed upon the general senile picture. Delusions of unworthiness, moaning and restless agonized wandering present a dismal picture similar to that of earlier depressive states, except that the memory and intellectual defects of dementia are abundantly clear.

e. Paranoid states. In addition to the usual features of dementia some senile patients show marked delusional trends in association with hallucinatory experiences. The delusions take a persecutory form but may be grotesque and fantastic on account of the failure of judgment. There is perhaps a trifleless tendency to gross dementia than in the other groups.

Treatment. As a rule treatment is best carried out at home, but wherever relatives are not available and the patient lives alone, hospitalization must be carried out. Again, acute delirium, delusions of persecution, aimless wandering, dangerous behaviour in the home and depression with suicidal tendencies, are all indications for removal to hospital.

Close observation is necessary to prevent falls and cot sides are of considerable value in preventing falls from bed. The bones of senile patients are very brittle and break easily and even spontaneously. Fracture of the neck of the femur is the commonest of all disasters following even a minor tumble. Furthermore, the skin bruises easily and must be handled gently. Food should be given in small amounts at frequent intervals. Double incontinence is quite common and therefore the sphincters require supervision. Sleeplessness responds to small doses of barbiturates of the Amytal group and Largactil has an occasional place in the control of restlessness and aimless wandering. Patients must be warmly clothed because of enfeebled circulation. When bed-ridden the usual precautions are necessary to prevent bedsores.

VI. PRESENILE DEMENTIA

Three types of early dementia are described: a. Alzheimer's disease; b. Pick's disease; c. Jakob-Creutzfeld's disease.

The onset is in the early forties and it is not easy to distinguish between the three diseases although the underlying pathology is very different. The distinction can only be made by careful inquiry into the family history, Pick's disease tending to be hereditary and Jakob-Creutzfeld's being characterized by many neurological complications largely of cerebellar origin.

All three disorders are marked by progressive and profound dementia with speech disorders (aphasia) and difficulty in carrying out manual activities (apraxia) etc., etc. The personality alters, the memory becomes impaired, interests are restricted, and there is increasing irritability. Later, dullness supervenes together with tiredness and apathy. Fleeting delusions of persecution may be evidenced. The next stage is one of disorientation, euphoria and a regression to childishness. Perseveration is an important and notable symptom indicating slowing up and failure of mental processes. The patient, asked to name an object, will do so correctly; when asked to name a second, third or fourth article, the reply will be the name of the first thing shown. Just as normally a tune or rhyme will persist for a short time 'in the head', so does the particular name persist or perseverate, but for very much longer periods.

Physical decline runs parallel with mental deterioration. In the end the patient becomes grossly demented, emaciated, helpless, bed-ridden and utterly dependent, a pure negation of everything human. The average duration of the disease is about five years.

The underlying pathology is sclerosis of the brain tissue, with atrophy and replacement by cerebrospinal fluid. In Alzheimer's disorder tangles and whorls (plaques) are found similar in structure to those present in the brains of sufferers from senile dementia. The cerebral arteries are often involved in the sclerotic process.

Treatment. None is available. The disease progresses comparatively rapidly and all that can be done is to provide the usual forms of nursing supervision.

VII. PSYCHOSES WITH AVITAMINOSIS

Information is already being gathered about the relationship of vitamins to nervous ailments. Although there is some evidence to show that a number of ailments hitherto labelled 'neurasthenia', 'neurosis' and 'psychosis' are really vitamin deficiency diseases, there are not enough data to justify clinical descriptions with one or two exceptions.

Pellagra. Pellagra is a deficiency disease with psychotic manifestations due to the absence from the food of vitamin 'B' (the P.P. factor, i.e.

pellagra-prevention factor). The associated skin trouble, gastro-intestinal disturbances and neurological symptoms are said to be caused by deficiency of other members of the vitamin B_1 group.

In recent years the importance of pellagra has become increasingly recognized. It is estimated that about one-tenth of all pellagrins develop mental symptoms so that it is necessary to study the condition further. Cases have been described in many countries and several continents. A certain number of mental hospital patients develop the disease probably as a result of dietary deficiencies. Particularly is it found in those who, for mental reasons, cannot take an ordinary mixed diet.

The disease appears in four systems:

1. *The skin* shows a pigmented rash on the face, chest and backs of the hands, light brown in colour.

2. *Mucous membranes*, particularly of the mouth, show inflammation with glossitis, gastric symptoms and diarrhoea alternating with constipation.

3. *Peripheral nervous symptoms* such as tremors, reflex changes and even peripheral neuritis may develop.

4. *Psychiatric symptoms.*

Pellagra may complicate the course of other psychoses and does so in mental hospital patients. Elsewhere, depressive states, organic responses (memory defects, childishness, and so on), paranoid states or delirious conditions with confusion and disorientation, are the usual types of psychosis produced by the disease.

Depression when present is a reaction to an awareness of the presence of a severe and disabling physical disease. It is not common. The organic type of psychotic disorder occurs with more frequency, and the same remarks apply to paranoid states wherein delusions of suspicion and persecution occur. On the whole, delirious confusion is the commonest manifestation.

Treatment. Nursing consists of the usual supervisory methods. Because of diarrhoea and nutritional deficiency, weakness and emaciation may be so profound that sufferers from pellagra will require every form of attention.

Treatment is directed towards the provision of a nutritious diet composed of milk, eggs, fresh meat, beef, potatoes, spinach, cress, liver, kidney, fish and other substances of high vitamin content. It is particularly important to ensure that the diet of tube-fed patients contains protective substances in quantity. Nicotinic acid is given in large doses by mouth or by injection, and it may be necessary to supplement it with other components of the B group. Fluids should be given in large amounts to replace what is lost by the bowel. Liver extract is of value. As a result of such intensive treatment it is possible to bring about considerable improvement.

Wernicke's Encephalopathy. This disease is based almost entirely on thiamine deficiency and is linked with beri-beri, at one time very preva-

lent in the Far East, and certainly very common indeed in prisoner-of-war camps during the Second World War, particularly in Singapore.

In the early stages the symptoms tend to be neurasthenic in character and comprise depression, irritability, weakness, anorexia, nausea and insomnia. The fully developed Wernicke illness or syndrome manifests paralysis of eye muscles (ophthalmoplegia), peripheral neuritis and a mental condition which may at first resemble an acute delirium or a Korsakoff-like picture.

Wernicke's disease may occur in elderly people who, when living alone, neglect to take sufficient food; or in chronic alcoholics who almost invariably suffer from gastritis; or in those suffering from advanced carcinoma of the stomach.

Treatment. Generally, the only treatment required is thiamine in doses of 50–100 mgm. daily. Often the whole of the vitamin B complex is given by injection. Early cases respond very well, but where the condition has been in existence for some time there must inevitably be organic deterioration and destruction of nervous tissue so that only limited benefit can be expected.

VIII. PSYCHOSES WITH ENDOCRINE DISORDER

There are no specific psychoses as such in association with ductless gland disorder. Nevertheless, careful scrutiny has brought to light the fact that endocrine abnormalities are often associated with mental disturbances, particularly among the schizophrenic population. In general it may be said that there is much endocrine disorder but very little psychosis.

The best known mental disturbances are those related to thyroid and suprarenal disease. Evidence is now also accumulating as regards the relationship of the sex glands to psychological structure, and recently there has been a revival of a once rather despised theory that subtle gonadal malfunction is responsible, at least in part, for the mental changes in schizophrenia.

a. Thyroid disease. Hyperthyroidism is very frequently brought on by shock or by prolonged stressful emotion. The thyroid enlarges and the eyes become prominent and rather staring. Metabolism is increased so that loss of weight may be severe to the point of emaciation. The skin is flushed, warm and moist. Tremors of the fingers and eyelids are pronounced. The heart beats rapidly and the sufferer may be conscious of palpitation. Diarrhoea may become distressing.

Mentally, the patient is anxious and emotionally unstable, easily giving way to profound depression with outbursts of noisy weeping. Every degree of this disorder exists from mild thyrotoxicosis to severe and dangerous exophthalmic goitre (Grave's disease). Psychotic symptoms have been described, among which excitement, confusion and delirium are prominent. In other cases irritability, suspicions and vague delusions of per-

secution appear. Rapid changes of mood from hilarious gaiety to agitated depression are frequent, and suicidal tendencies are not unknown.

Anxious apprehension is thought on the one hand to be provoked by excessive thyroxin secretion, and on the other, to be caused by such over-activity. The matter is still not very clear; for occasionally, patients respond to partial thyroidectomy after prolonged psychotherapy has failed. As against this, a history of emotional stress and difficulties of all kinds is so often obtained in cases of Grave's disease that an emotional origin must be suspected. Furthermore, the diagnosis between hyperthyroidism and anxiety neurosis is sometimes a matter of real difficulty.

When a psychosis of the classical type appears it is probably true to say that the thyroid toxaemia has provoked mental disorder out of an unstable nervous background.

The prognosis in all sufferers from nervous disturbance associated with thyroid over-activity must be guarded, for the response to treatment is still unsatisfactory. Occasionally, in very severe cases a toxic delirium may supervene and pass over into coma with an ultimately fatal termination.

Treatment. The treatment of hyperthyroidism in any degree still presents much difficulty. The usual procedures prescribed are rest, sedatives and a very liberal diet to counteract the wasting. It has been considered that septic conditions of the teeth, tonsils and elsewhere may contribute to the production of the illness. Certainly if such septic foci are discovered they should be eradicated in order to lighten the burden placed upon the bodily powers of resistance. Much can be done by skilled psychotherapy to explore the emotional resources and difficulties of the patient before more drastic measures are instituted. If this should fail a physical approach must be employed. X-rays to the thyroid gland have sometimes given good results. The danger lies in the fact that if no benefit is produced, the fibrosis consequent on X-ray treatment makes the organ much more difficult to operate upon later. More often surgical removal to the extent of a lobe and three-quarters causes diminution of the symptoms and very occasionally complete recovery. Operation is preceded by the oral administration of Lugol's iodine solution for about three weeks. This brings about considerable but only temporary relief. Even so, psychotherapy is still of value in dealing with any underlying neurotic condition.

More recently a drug called thiouracil has been tried with beneficial effects but it remains to be seen whether it is likely to be of real value in the future. If a true psychosis is present it must be dealt with in the manner already described.

b. Thyroid insufficiency covers the well-known myxoedematous syndrome comprising torpor, loss of interest, failure of memory, sluggishness of thought and lowered metabolism. In a certain percentage of cases depressive states occur and hallucinations have been reported.

Treatment. In addition to thyroid medication, treatment must be adapted to the associated psychosis.

c. Adrenal disease. The classical symptoms of Addison's disease depend entirely on the physiological abnormalities arising out of adrenaline deficiency and general adrenaline insufficiency. As the disease progresses delirium may occur, giving place to convulsions, stupor and coma. The condition responds to treatment with desoxycorticosterone (cortin), sodium chloride and sodium citrate.

d. The Sex Glands. The evidence for the influence of the gonads upon the mentality may be summed up as follows:

i. Mental disease may arise at puberty, before, during and after pregnancy and during the climacteric.

ii. There is a marked sexual colouring to the thought-content particularly in the schizophrenic-paranoid disorders.

iii. Frequent abnormalities of the sexual characteristics both primary and secondary have been noted in psychotics, e.g. a large number of female patients have abnormal hair distribution of a masculine type, with an exactly opposite situation in males.

iv. Castration produces profound bodily and psychological changes in both sexes.

It is not possible to say more at present but evidently this subject requires fuller investigation. What can safely be stated is that the sex glands and the powerful biological urge or instinct which they engender, are intimately concerned with the general attitude to life, with ambition, temperament, goal-motive and many other features of existence.

XI. PSYCHOSES WITH PERNICIOUS ANAEMIA (MACROCYTIC ANAEMIA)

Figures given for the incidence of psychosis in pernicious anaemia vary between 2–15 per cent. A certain number of such psychotics are admitted to mental hospitals before the anaemia has been detected.

The early stages of the mental disturbance comprise irritability, fatigue, anxiety and depression. As time passes the typical signs of subacute combined degeneration of the spinal cord appear. Depression and anxiety increase in response to the patient's awareness of the physical disabilities. Still later, the mental picture is one of depressed querulousness, irritability, jealousy and hypochondriacal preoccupations with the stomach, bowels and other internal organs. Gradually, a paranoid state emerges. Delusions of persecution are the usual psychotic manifestations. Excitement, depression, hallucinosis, delirium, confusion and terminal dementia have also been described.

On investigation, the blood shows the characteristic features of pernicious anaemia including abnormally large red corpuscles, diminution in number (in one reported case to as low as 750,000 cells per c. mm. as contrasted with the normal 5,000,000), lowered haemoglobin content,

and a colour index of more than one, i.e. each red cell containing more than the normal amount of haemoglobin.

Gastric analysis after a test-meal reveals a complete absence of hydrochloric acid (achlorhydria).

Treatment. Treatment follows the lines already laid down under the heading of subacute combined degeneration of the spinal cord. Remedies include diluted hydrochloric acid by mouth, iron and liver extract in full doses. Some good results have been reported but on the whole the mental state tends to chronicity and weak-mindedness.

CHAPTER XIV

EPILEPSY

Convulsions may be described as immediate and generalized cortical motor disturbances which result in unconsciousness, gross disturbance of cerebral function and muscular spasms.

The causes are numerous. Infants whose brains are unstable sometimes experience convulsions at the commencement of some acute illness such as pneumonia, scarlet fever, or measles. Birth injuries to the skull, encephalitis, tetany and intoxications may all evoke fits. In the adult, disease of the brain, tumours, fractures of the skull, chronic kidney or heart disease, poisoning by lead, alcohol, syphilis and other bacterial or toxic agents all provoke epileptiform attacks.

Seizures may be produced by hypoglycaemia (overdosage of insulin given in diabetes or schizophrenia). They are also brought about for therapeutic purposes by drugs such as Cardiazol, or by electric currents.

There still remain a large number of epileptics whose fits cannot be ascribed to any particular cause and it is this so-called idiopathic group with which this section is concerned. It is a chronic disease and in the majority of cases its manifestations are periodic seizures of characteristic type. Some subjects show fits of a Jacksonian variety. Yet others reveal psychotic abnormalities which take the place of fits and which are called epileptic equivalents.

THEORIES OF CAUSATION

Many suggestions have been advanced to account for 'idiopathic' epilepsy but none is completely satisfactory. What is known so far may be summarized as follows:

1. Heredity. Less and less importance is being attached to the question of inheritance of the epileptic tendency. Amongst the ancestors of epileptics are found cases of alcoholism, syphilis and migraine which suggests that faulty but non-epileptic stock may give rise to epileptic offspring.

2. Precipitants. All kinds of circumstances may precipitate fits when acting on a nervous system constitutionally disposed to produce them. Such circumstances include drugs, head injury and strong emotion.

3. The electro-encephalogram reveals abnormal waves of electrical discharge from the cerebral cortex.

4. The state of the blood appears to be related to the production of fits. If it tends to be alkaline (alkalosis) seizures are much more likely to

occur. In fact they may be produced by voluntary over-breathing which gives rise to a temporary alkalosis. In contrast, the administration of chlorides or acids produces the opposite effect, namely a tendency to acidity (acidosis), a condition which tends to diminish the frequency of fits particularly in children.

Theories of causation include oedema of the brain, constriction of the cerebral vessels and metabolic toxins. Even a psychological explanation has been put forward. None of these covers the facts, however, and idiopathic epilepsy still remains an unsolved problem.

A more hopeful line of study is presented by the epileptic personality. This has already been described. To recapitulate briefly, epileptics are shallow, religiose, hypocritical people who parade their so-called thoughtfulness and consideration for others with a great show of righteous fervour. There is a restriction of interest in the environment with an increased preoccupation with self and selfish notions. Boastfulness, vanity, conceit, superciliousness and indiscipline are other characteristics. Although the epileptic character cannot always be demonstrated in the early stages, it generally appears in a florid form in those epileptics who develop mental disorder.

The onset of the disorder may take place in infancy but usually fits begin during adolescence, which suggests that the gonads may have more than a little to do with the condition. In women, for example, it is sometimes noted that fits tend to be grouped around the menstrual function and that in any event, menstruation temporarily increases the frequency of occurrence. Where there is associated endocrine imbalance such as may result from thyroid insufficiency, the convulsive tendency is markedly increased. Seizures may occur both by day and by night. They are principally of two types, major and minor (grand mal and petit mal).

THE MAJOR FIT (GRAND MAL)

a. In about half the cases there is a warning that a fit is about to occur. This is known as the aura and it may take various forms such as a choking sensation, a queer feeling in the epigastrium, a flash of light, a loud sound, tinglings or numbness in one extremity. Sometimes the aura is even more complicated and may be described as an hallucination of one of the senses.

b. The next phenomenon is the epileptic cry which is due to the fact that the body becomes rigid and forces air past the vocal cords. The patient loses consciousness and falls to the ground. In so doing severe injury such as fractures of bones and damage to the skull may occur. Epileptics have been known to fall into the fire in their homes and most subjects show scars of injuries or burns. On account of the generalized spasm, respiration ceases temporarily and the patient becomes cyanosed.

c. The tonic stage lasts for a few seconds and then passes over into the clonic phase during which all the muscles jerk violently and rhythmic-

ally. During this phase the tongue is often bitten so that the saliva which is churned into foam by the spasmodic movements of the jaws, becomes bloodstained. In addition, faeces and urine may be passed involuntarily. In fact, urinary incontinence is quite frequent.

d. The violence of the jerking subsides gradually, and after a minute or two the patient passes into coma with stertorous breathing. Stroking the soles of the feet at this stage may elicit a double Babinski sign indicating interference with pyramidal functioning. Sleep follows the coma and it is the sleep of severe exhaustion. After awakening, the patient is often confused, bewildered and may behave in an automatic fashion without full awareness. Generally he complains of severe headache, feelings of fatigue and aching in the muscles. In some cases, especially in psychotic epileptics, violent excitement or furor may follow each fit. Recently, attention has been drawn to the fact that crush fractures of the vertebrae are liable to occur in the course of a fit. Finally, there remains no memory of the incidents associated with the seizure.

Serial epilepsy. From time to time it is observed that no sooner has the patient recovered from one fit than he has another. This state of affairs may continue perhaps to a fatal issue if left untreated.

Status epilepticus. The patient may not recover between fits but may pass from one severe attack to another. This is a dangerous condition and the outlook is always grave, for sometimes remedies have no effect. As time passes and the fits continue unchecked, the temperature begins to rise, congestion of the lungs occurs and the patient may die of exhaustion. Status epilepticus is particularly liable to occur if for any reason treatment is suddenly discontinued. The danger is greatest if barbiturates have been employed and then discontinued.

Minor epilepsy (petit mal). Some epileptics experience major and minor fits; others suffer from minor attacks only. There is, however, no hard and fast distinction to be drawn between the two varieties.

The mildest form of petit mal is often described by patients as a 'sensation'. It is a momentary disturbance of consciousness during which giddiness may be experienced. A more severe type of minor fit immobilizes the patient for a moment or two. He turns pale and appears to be lost and confused. This state may be associated with smacking of the lips, rolling of the eyes and twitching of the mouth or limbs. Occasionally, incontinence of urine may occur. After recovery he may continue with whatever he was doing prior to the attack. Headache or automatic behaviour may follow the seizure. It is during this post-epileptic period that crimes or anti-social acts may be committed for which there is total amnesia.

EPILEPTIC EQUIVALENTS

Epileptic equivalents (psychic epilepsy) describe disturbances of consciousness manifested in complex automatic behaviour which represent epileptic seizures and wherein no actual convulsions occur. These attacks

behave just like epilepsy as regards their frequency. They are characterized by periods of irritable excitement, confusion, violence, dreamy states or fugal wanderings of which the patient is quite unaware. These episodes, like all post-epileptic automatism, are of medico-legal importance because serious crimes and even murder may be committed. The patient cannot be held responsible for his actions if epilepsy is definitely proved.

Other forms of epilepsy. Jacksonian attacks have already been described as have also cataplexy, pyknolepsy and narcolepsy. Reflex epilepsy denotes a condition wherein lights or sound provoke fits. Again, true convulsions may be precipitated by sudden intense emotions. For example, one unhappy woman was forced to renounce sexual congress with her husband because of a series of fits which followed each such incident.

Diagnosis. It is of importance to distinguish between epileptic and hysterical fits always bearing in mind that the two conditions may coexist in the same patient. The main points of differentiation are as follows:

Epilepsy	Hysteria
Cause. Except where fits are aroused by emotion or sensory disturbances there is, as a rule, no obvious cause.	There is practically always a crisis of some sort or an emotional situation from which the patient hopes to escape by way of a pseudo-convulsion which may excite sympathy.
Personality. Epileptic.	Hysterical.
Situation. Fits often occur when the patient is quite alone.	The hysterical convulsion always requires an audience, otherwise it is of no value to the patient.
Onset. Nearly always sudden and dramatic.	Often preceded by 'playing up'.
Aura. Present in half the cases.	Nil.
Course. Well-marked tonic, clonic and comatose phases. Cyanosis during the tonic phase. Absolute loss of consciousness.	There is no order about an hysterical fit and no cyanosis. The arms and legs are thrown about in a wild purposeless way. There never is an absolute loss of consciousness.
Incidents. The epileptic falls, often very heavily and may injure himself severely.	Very rarely does an hysteric damage himself except possibly for some minor abrasions.
Tongue biting. Yes.	No.
Incontinence of faeces and urine.	Never, unless the hysteric has learned that passing urine is an epileptic phenomenon.

Epilepsy	Hysteria
Coma. Deep and unrousable.	Nil. Patient is rousable by special methods.
Duration. A few minutes.	For many minutes and even hours.
Babinski. Positive.	Always negative.
Termination. In deep sleep.	In emotional instability, hysterical laughing and crying.
Sequelae. Headache, confusion, automatic actions, bewilderment, furor, etc.	No particular incidents.

At times, however, the diagnosis is not so clear cut and it is necessary to keep a patient under observation before the true nature of the convulsion reveals itself.

So far the basic manifestations of epilepsy have been described. There are a large number of sufferers from this disorder, who, with suitable treatment, manage to live useful lives under properly prescribed conditions. In them the epileptic character may not be so manifest. As against this quite a number of epileptics tend to deteriorate mentally, especially those afflicted with petit mal, so that eventual commitment to hospital becomes necessary. Such mentally disordered epileptics are described in the following section.

PSYCHOSIS WITH EPILEPSY

A certain number of epileptics become psychotic. The earlier the age at which fits commence, the greater the tendency to mental disorder. It is a fact of observation that convulsions inhibit the growth of the young mind. However, some subjects may attain adult stature having suffered from no more than the immediate after-effects of the periodic seizures. In adults epileptic insanity reveals itself in increasing dullness, difficulty of thought, mental retardation, defective memory, irritability and abnormality of conduct. This is an organic type of reaction and it tends towards dementia.

A number of epileptics develop paranoid trends characterized by delusions of persecution associated with auditory hallucinations. Furthermore, they often become hypochondriacal, manifesting preoccupations with their bodily functions. They are in general unpleasant people. The fully-fledged psychotic is irritable, quarrelsome, suspicious, hostile, jealous, childish and conceited. His superiority is often combined with spurious religiosity and canting humbug. To illustrate these points the following description of a hospital patient may be given:

A dangerous and homicidal epileptic adopted a Christ-like posture even going to the length of cultivating a similar beard. It was his custom to stand beneath the ward loud speaker, listening in a devout and rever-

ent manner to a broadcast religious service. At its conclusion he would proceed about his nefarious practices. When remonstrated with he would innocently disclaim any evil intentions, mouthing biblical phrases the while.

Such psychotics are often dangerously violent, destructive and murderous. They make indiscriminate attacks upon those around them and their frenzy is horrifyingly astounding. At times the instability and violence seem to work up to a climax at which point seizures commence. The convulsions appear to relieve their condition after which they become much more amenable to nursing and general ward discipline.

In contrast other epileptics exhibit furor after their fits. It therefore becomes necessary to study the individual variations of each patient, for each is a law unto himself. Careful observation will assist in forecasting within a little what kind of epileptic behaviour to expect at any moment. Such knowledge and foresight will help considerably with supervision and nursing.

The outlook in epilepsy taking all its manifestations into consideration depends upon when the patient commences treatment. The earlier anticonvulsant therapy is instituted, the better. In many cases treatment will diminish the frequency and severity of the fits. Every now and then a brilliant result is obtained wherein the fits vanish for long periods of time, in rare instances, forever. The psychotic epileptic, however, tends to degenerate progressively to a gross and profound dementia until such time as the patient no longer resembles anything human and ekes out a purely vegetative existence.

In general,epilepsy or cerebral dysrhythmia is an interesting condition which so far has evaded proper recognition as to causation. There are many minor and ill-defined conditions which show periodic 'absences' or 'fainting turns', which may prove to belong to this group of disorders. It is hoped that the electro-encephalogram will assist in solving some of these problems of irregular cortical activity. It is now known that some types of psychopathic personality and certain individuals who indulge in curious modes of impulsive conduct show abnormal E.E.G.s (electro-encephalograms) so that the future may shed more light on the origin of these difficult and at the moment, obscure cerebral abnormalities.

Treatment. It is generally agreed that epileptic psychoses are the most dangerous, intractable and difficult types of mental disorder to nurse and manage. Nevertheless there are certain routine procedures which are of value.

Should the epileptic give any sort of warning of the approach of a convulsion an attempt should be made to reach him to prevent injury during the fall. The mouth should be forcibly opened for the insertion of a hard object between the teeth. This precludes the tongue from being bitten during the clonic stage. All tight clothing should be loosened, and a pillow placed under the head. If the fit has occurred during a meal, the

mouth must be cleared so that food cannot be inhaled when respiration recommences. In bed it is essential to turn the patient's head away from the pillow because of the danger of suffocation. After these elementary precautions have been taken, he should be permitted to remain undisturbed whilst the fit takes its course. After recovery, aspirin will relieve any subsequent headache.

Bromides were for many years the foundation-stone of treatment for convulsions. They have practically disappeared from the therapeutic field because of the risks of bromism which consists of intellectual retardation, acne, drowsiness and cerebral deterioration. Instead, phenobarbitone and a number of newer drugs have entered the field with consequent improvement in treatment. Phenobarbitone is prescribed in doses of ½–2 gr. daily. Prominal 3 gr. daily is another useful drug. Epanutin (Dilantin, sodium diphenylhydantoinate) sometimes gives excellent results where other drugs have failed. The dose is 1½–9 gr. in divided amounts after meals. It must be administered with care, for toxic effects occur with some frequency. Poisonous reactions are manifested in skin rashes, double vision, ataxia, indigestion and other symptoms, all of which disappear when the drug is withdrawn. Other drugs are methoin, troxidone (Tridione), paramethadione, Mysoline, which last is often effective when other drugs fail. Amphetamine is of value in pyknolepsy and narcolepsy.

Hitherto the treatment of minor epilepsy has been difficult and on the whole unsatisfactory. Recently, however, a new drug has been introduced which is now the treatment of choice and reasonably effective particularly in the so-called pyknolepsy of children. Tridione is the name of the substance and it is given in capsules containing 0·3 gramme. The usual dose for an adult is four capsules daily, although the commencing dose must be much smaller and gradually increased. Great care must be exercised during Tridione treatment and every patient must be vigilantly supervised. The wearing of dark glasses may be necessary because of a developing dislike for light (photophobia). In addition, rashes may break out on the skin necessitating temporary withdrawal of the drug. Regular blood counts must be performed also so that a fall in the polymorphonuclear leucocyte or blood-platelet count may give warning of the development of agranulocytosis (aplastic anaemia).

Other remedies of value, particularly in those psychopaths who manifest explosive or impulsively violent behaviour so closely related to epilepsy, are glutamic acid and amphetamine sulphate.

Glutamic acid is given to children suffering from *petit mal* in doses of 100 grains daily, washed down with copious drinks of water to prevent gastric upsets.

Amphetamine sulphate likewise can be prescribed for children in doses of 15 milligrammes a day. Adults, however, can take up to 40 milligrammes daily, sometimes with astonishingly good effects.

It must be emphasized that treatment once begun must be continued

without a break for fear of provoking status epilepticus, a most serious complication and one which often ends fatally. It is best dealt with by the intramuscular or intravenous injection of Luminal (gr. 3–5) in 10 cc. of sterile water combined with lumbar puncture and spinal drainage. Magnesium sulphate by mouth and CO_2 10 per cent and oxygen 90 per cent by inhalation are also of value.

When the fits are grouped around the menstrual period it may be necessary only to prescribe treatment at that time with a small maintenance dose throughout the rest of the month. If epilepsy is complicated by deficient glandular activity, preparations such as thyroid substance may help considerably.

Some children have been treated successfully by means of a ketogenic diet. This implies feeding which emphasizes the fats at the expense of carbohydrates and proteins. Such a diet brings about an acidosis with the excretion of acetone and diacetic acid in the urine. By this means about one-third of child patients are very much benefited. The treatment needs careful administration and must be kept up for more than a year. It is of no value in adults.

As regards general supervision, the non-psychotic epileptic whose fits are so frequent as to prevent him from earning a living, does fairly well in an epileptic colony. The ordered and sheltered life together with treatment helps to reduce the number of fits and allows of some form of interesting occupation. In other cases the chronic epileptic may react to his environment with bitterness or aggressiveness and therefore must be taught how to live and how to cope with his disability. Freedom from anxiety and stress or fatigue is essential. Physically, the general health must be maintained and septic conditions eradicated. Alcohol is absolutely forbidden. The bowels must be kept active. Children require special schooling. As far as work is concerned epileptics must not be allowed to drive motor-cars, handle machinery, work in high places, climb ladders or engage in any pursuit where there is risk to life or limb during a fit. With proper guidance and treatment there is no reason why an epileptic should not become and remain a useful member of society. On the whole, marriage is unwise not only because of the transmission of an epileptic tendency which in any case is doubtful, but because of the real risk of passing on other unsuitable characteristics.

As regards institutionalized psychotic epileptics similar remarks apply as regards treatment. In addition, day and night observation must be provided. They should not be allowed to climb on chairs or ladders. Fireplaces are usually guarded so that the danger of burns is eliminated. Cramming or bolting of food should be prevented. As has already been mentioned nurses can learn when a patient is about to become 'fitty', and can take suitable precautions. Some patients always fall forwards, others always backwards. A properly padded turban will obviate serious head injury. At night, epileptics should sleep in low beds and on hard pillows. Artificial teeth should always be removed.

The regular life of a hospital is in itself beneficial. Apart from the management by trained and knowledgeable nurses, occupational and recreational facilities are at least as important as drugs in retarding the onset of dementia.

CHAPTER XV

MENTAL DEFICIENCY (AMENTIA)

Mental defect must be carefully distinguished from psychosis. Mental defectiveness implies that the mind has never developed properly whereas psychosis may afflict even the most brilliant intellects. Amentia exists from birth or from an early age, and its detection depends upon physical, physiological and psychological features. In the first place, every child passes through important developmental epochs. If these are not attained in an orderly sequence and within a reasonable time intellectual retardation must be suspected. Later in life, diagnosis is assisted by intelligence tests. Whilst these give a very fair indication of real or potential capabilities too much reliance must not be placed upon them. Rather must they be considered as part of a general scrutiny which takes account of the family and personal histories, the environment, the emotional life and the past and present health. The basic tests are those originally devised by Binet and Simon. Since then many modifications have been devised including the Stanford and Herring revisions and many others. Not only is academic or book knowledge tested but also ingenuity, foresight, planning and manual dexterities. A great deal of mental testing is done nowadays both in civilian and service life in order to assess the vocational possibilities of each subject. Some of it is indiscriminate so that wrong application under adverse circumstances has led to criticism by the uninstructed and uninformed. To have a real value intelligence testing must be carried out by experienced psychologists under proper conditions of quiet and freedom from distraction.

DEVELOPMENTAL EPOCHS

The standards used are as follows:

1. Normally, a child begins to appreciate light and moving objects at about six months. The first tooth appears at this time or perhaps a little later.

2. A child should be capable of sitting up at about nine months. It should appear bright and alert. Active movements of all the limbs are characteristic of this period.

3. At about one year or a little later the first articulate words should be heard. Attempts at walking should be apparent and progressive by now.

4. Bowel and bladder cleanliness should be established by eighteen months to two years. The child should be playing actively, investigating inquisitively and, in general, showing interest in its surroundings.

From the age of three onwards the growing mind can be investigated by tests of the Binet-Simon or Merrill-Palmer type. For example, a child of three years should be able to name objects such as keys, knives, pencils, watches and copper coins; should be able to point to its nose, eyes, hair or mouth. It should be capable of saying whether it is a boy or girl. Thereafter tests have been worked out for each age group until sixteen. It is assumed that intelligence does not develop beyond this age; in other words, at sixteen one has attained an adult mental stature.

For convenience, the results of the tests are expressed in figures. For example, should a child of ten accomplish the tests for the year ten and no more, its mental age is also ten. Expressed as a percentage the figure then becomes 10/10 x 100 =100 per cent. Therefore 100 is the Intelligence Quotient or I.Q. The average normal I.Q. lies between 90 and 100. Figures below 90 indicate dullness of every gradation extending down to idiocy, the I.Q. of which lies between 0–25. Above 110 intelligence is regarded as superior (110–40). A scale can thus be arranged to touch mindlessness at one extreme and genius at the other. The situation is, however, complicated by the fact that in addition to a general level of intelligence there are special abilities some of which are displayed even by those who are defective in the accepted sense of the term. These special faculties include musical and artistic talents, mathematical and mechanical genius, inventiveness and special abilities at games like chess. Individual instances have not necessarily shown an associated high degree of intellect. The psycho-physiology of such gifted folk is very far from being understood.

PHYSICAL FEATURES OF AMENTIA

There are a number of physical anomalies which so often accompany mental defect. These are known as the 'stigmata of degeneration'. They are malformations of the body which are linked up with maldevelopment of the brain. In the lower grade aments the brain is smaller than normal and shows much simplification of the convolutional pattern detectable post-mortem with the naked eye. As regards the bodily configuration the following are the commoner irregularities most often encountered:

The cranium	Excessively small head—microcephaly.
	Excessively large head—hydrocephaly.
	Tower skull.
	Delayed closure of fontanelles.
The ears	Too large or too small.
	Irregularities in shape.
	Abnormally adherent lobules.
The eyes	Oblique direction, with a redundant fold of skin at each inner angle (Mongolian).
	Nystagmus.

	Corneal opacities.
	Cataract.
The nose	Depressed bridge of congenital syphilis.
	Gross irregularities.
The mouth	Misshapen jaws and teeth.
	High, arched palate.
	Fissured tongue.
The trunk	Supplementary nipples.
	Pot-belly.
Hands and feet	Incurved and short little finger.
	Too many fingers or toes.
	Webbed fingers and toes.
	Absence of pattern on palms and soles.

The presence of one abnormality must not be regarded as significant. Only when a number of such deformities exist together are they pointers to the presence of cerebral maldevelopment, and consequently mental defectiveness.

It is evident from what has already been stated that the nurse is not likely to meet with genius in her work. Rather will she be called upon to deal with various grades of mental retardation. It is part of her task to learn to bear patiently with the deficient; for under the system at present extant the community must support the not inconsiderable burden of maintaining a fair number of such useless or restrictedly useful individuals.

TYPES OF AMENTIA

It is now customary to recognize three classes of defectives, namely idiots, imbeciles and feeble-minded. A fourth class, previously designated as morally defective, has now been separated off, and in accordance with modern authoritative usage, is described under the heading of psychopathic personality. As already indicated psychopaths include a considerable proportion of abnormal people who although intellectually, averagely or even supernormally equipped, are yet deficient in their moral and ethical standards.

Idiocy. The standard definition declares that idiots are those so grossly defective in mind from birth or from an early age as to be unable to guard themselves from common physical dangers. The worst cases barely resemble anything human because of deformities, and they inspire nothing but a feeling of sick horror. Fortunately, they are sterile and thus cannot add to their numbers. The habits are degraded and disgusting; the speech consists of grunts, screeches and other animal noises; epileptic fits are frequent, and spitefulness is common. Again, fortunately, the mortality rate is very high. The I.Q. lies between 0 and 25.

Imbecility. Imbeciles are persons in whose case there exists from birth or from an early age mental defectiveness not amounting to idiocy, yet so pronounced that they are incapable of managing themselves and their

affairs, or, in the case of children, of being taught to do so. The I.Q. ranges between 25 and 50. They are unresponsive, destructive and may be spiteful. Although just about able to avoid ordinary physical dangers they are unable to earn a living, are incapable of carrying on a conversation and require supervision as regards the toilet. At best they may be taught a simple routine job. Stigmata are numerous. On inquiry the developmental landmarks are found to be late in their appearance.

Feeble-mindedness. Feeble-minded folk are those in whom there exists from birth or from an early age mental defectiveness not amounting to imbecility, yet so pronounced that they require care, supervision and control for their own protection, or for the protection of others, or in the case of children, that they by reason of such defectiveness, appear to be permanently incapable of receiving proper benefit from the instruction in ordinary schools. The I.Q. lies between 50 and 75. Again, physical stigmata are apparent. The developmental epochs are late, clumsiness is the rule, defects of articulation are evident and there are defects of perception and discrimination. Inattention, lack of common sense and incapacity for adaptation to surroundings are associated features. They are capable only of routine work, some are shiftless, others become petty sneak-thieves or petty delinquents. Incidentally, it is in this group that one finds occasional real brilliance in one or other capacity. For example, the famous 'idiot savant' of Earlswood revealed what amounted to mechanical genius. Another feeble-minded patient had a phenomenal memory.

With regard to all three groupings it must be remembered that there are low-, mid-, and high-grade subdivisions in each class.

Dullness. Above an I.Q. of 75 there are individuals known collectively as the 'dull and backward'. Dull children show I.Q.s of 80–5. They are backward at school and make up the 'dunces' and 'dim' population. They suffer much from thoughtless practical jokes and are often sent on fruitless errands of the 'powdered-steam' type. As a rule they can be employed in routine factory or farm jobs which require little skill or initiative. This group contains the largest proportion of all defectives and it constitutes a problem of some magnitude.

Backwardness. Backwardness does not necessarily imply dullness. Slowness to learn at school and slowness of adaptation may be due to emotional factors. Such children are excluded from the ament classification.

CAUSATION OF AMENTIA

1. Heredity. This is difficult ground and there is still much obscurity and uncertainty about the whole subject. What is known, however, is that defectives have many more psychopathic people amongst their ancestry than a numerically equal group of normal children. Incidentally, the marriage of blood relations is only likely to transmit defect if both parents come of psychopathic stock.

2. Environmental causes. Antenatal intra-uterine influences may have some bearing on the problem. Unsuccessful attempts to procure abortion have sometimes resulted in injury to the growing brain. During confinement prolonged labour may likewise cause cerebral damage.

After birth the commonest causes of cerebral maldevelopment are falls, tumours, bursting of blood vessels, meningitis, encephalitis and infectious diseases. Congenital deafness and blindness obviously interfere with the full development of the brain. There have, however, been notable exceptions to this general statement.

3. Indirect toxaemia. According to one theory indirect intoxication because of parental alcoholism, tuberculosis and syphilis are regarded as antecedents of mental deficiency in the offspring. It is suggested that the presence of toxins in the blood-stream adversely affects the germ plasm in the genital glands.

CLASSIFICATION

The following grouping has been adopted after Dr. Tredgold:

1. Primary amentia, due to defective germ plasm.

a. Simple.
b. Microcephalic.
c. Mongolism.
d. Sclerotic.
e. Naevoid.
f. Amaurotic and other cerebral degenerations.

2. Secondary amentia, due to arrest of cerebral development by external causes acting after fertilization of the ovum.

a. Traumatic, including vascular lesions.
b. Inflammatory and toxic—encephalitic; meningitic; hydrocephalic; syphilitic.
c. Epileptic.
d. Endocrine—cretinism.
e. Nutritional.
f. Deprivation of the senses.

SOME COMMONER TYPES OF AMENTIA

1. Microcephalic

Skull: less than seventeen inches in circumference.
Shape: tower skull.
Scalp: thrown into folds.
Class: imbecile.
Fits: in half the cases.

2. Hydrocephalus

Skull: large and distended, overhangs the eyes.

Developmental defects: hare-lip, spina bifida, club-foot, cranial and other nerve palsies.

Varying degree of mental defect.

3. Amaurotic family idiocy

Characteristics: familial occurrence; predilection for Jewish race;

Signs: normality at birth; disease commences between four and ten months; optic atrophy and every kind of neurological disturbance; 'cherry red spot' seen on retina.

Course: progressive degeneration to idiocy and death.

4. Epiloia

Signs: sebaceous adenoma on face and back; congenital tumours of various viscera; epilepsy; progressive mental deterioration; paralysis.

5. Mongolism.

Skull: rounded.

Eyes: oblique.

Hands: thick, short, tapering fingers, absence of palmar pattern, incurved little finger.

Tongue: large—deep transverse fissures.

Palate: high and arched.

Feet: cleft between great and other toes.

Mentality: moderately severe defect. Imbecile class. Behaviour generally good. Fondness for colours and music.

6. Progressive lenticular degeneration (Wilson's disease)

Onset after ten.

Involuntary choreiform movements and tremor.

Muscular atrophy.

Difficulty in speaking and swallowing.

Progressive mental and physical deterioration.

Cirrhosis of the liver.

Degeneration of parts of the corpus striatum on both sides.

7. Encephalitis periaxialis diffusa (Schilder's disease)

Progressive mental deterioration; spastic paralyses; cortical blindness (due to disease of brain and not of the eyes); epileptiform fits.

8. Traumatic group. This type of amentia is said to be dependent upon intracranial birth injuries because of:

a. Over-powerful uterine contractions.

b. precipitate labour.

c. Difficult instrumental delivery.

All these factors may result in subdural haemorrhage. Although mental retardation does not necessarily ensue, some degree of emotional instability is nearly always present as in Little's disease which combines some degree of defect with a double hemiplegia. There are enormous variations from idiocy to normality. Epilepsy worsens the outlook.

9. Inflammatory amentia. The use of the sulphonamides and antibiotics lessens the incidence of mental deficiency following meningitis. When

it does occur it is due to the sealing off of the apertures by which the cerebrospinal fluid drains out of the brain. When this happens, hydrocephalus occurs with blindness and other neurological complications leading eventually to dementia. Encephalitis lethargica in children is often followed by behaviour disorders, sleep disturbances, Parkinsonism, tics, choreo-athetosis, endocrine disorders, delinquency, violence, paralytic and other convulsive residua.

10. Syphilitic amentia. Syphilis acts in two ways:

a. It impairs the potentiality of the germ plasm giving rise to primary defect.

b. It results in congenital syphilis of which the following signs are characteristic:

Wasting (marasmus); 'snuffles' produced by chronic nasal catarrh; skin eruptions; enlargement of liver and spleen; mental retardation.

Later:

Painless effusions into the knee joint; iritis; interstitial keratitis (inflammation of the cornea); tibial periostitis; nasal destruction; Hutchinson's ('peg-top') and Moon's teeth; syphilitic 'wig', a term applied to the characteristic 'shock-headed' appearance in congenital syphilis. The hair appears to stand on end.

The Wassermann reaction in the blood is positive. Neurological signs make the outlook very much worse. If such lesions are absent some progress may be obtained with adequate training.

11. Epileptic amentia. Epileptic amentia may be classified under three headings of which i and iii have already been described.

i. Primary amentia complicated by epilepsy.

ii. Epilepsy causing amentia.

iii. Gross cerebral lesions with epilepsy and amentia.

Theory. Inherited cortical instability—fits may then be precipitated by such disabilities as fevers, teething and dyspepsia.

Characteristics. Varying degrees of mental deficiency; major or minor epilepsy or both; fewer stigmata than in primary amentia; irritability; bad temper; violence and intractability.

Course. Towards profound dementia.

Prognosis. Bad.

12. Cretinism—mental defect depending upon absence or insufficiency of the thyroid gland. Cretinism may complicate primary amentia or may be the cause thereof.

Historical. The child is normal at birth but shows well established signs of the disease before one year. All epochs are markedly delayed.

Clinically. Bloated appearance; lethargy; puffiness of features with umbilical hernia; scanty hair on scalp and eyebrows; delayed ossification of bones; impairment of all intellectual processes, with mental defect varying from idiocy to mild feeble-mindedness.

13. AMENTIA DUE TO DEPRIVATION OF THE SENSES

Mental defect slight. No stigmata. Deafness or blindness does not necessarily result in permanent defect in spite of closure of one or other sensory channel of experience. Careful training from infancy onwards obviates the grosser forms of retardation. If carried out in all cases it is probable that even the mild defect would be prevented.

14. NUTRITIONAL AMENTIA

It appears unlikely that permanent defect may result from inadequate feeding.

15. PHENYLKETONURIA

The subjects of this form of subnormality are low-grade defectives. They excrete a substance called phenylpyruvic acid in their urine. The reason for this is the lack of an enzyme in their tissues which is capable of acting on phenylalanine, a substance normally present. This deficiency leads to impairment of oxidation or even destruction of cerebral and other neurons.

There are treatment possibilities inasmuch as if diagnosed early enough, a diet low in phenylalanine gives results which show promise.

The disease itself is controlled from the hereditary point of view by a recessive gene. One fact elicited is that quite often the parents of such a child are cousins.

Note. Psychoses may be superimposed upon mental deficiency. These psychoses whilst resembling the mature forms, are simple in nature. Depression, excitement, delusions and hallucinations may be noted.

A number of high-grade defectives develop compensatory paranoid states. Schizophrenic disorders are not uncommon. Terminal dementia usually supervenes upon epileptic psychotic complications of amentia.

Treatment. It must be re-emphasized that there are many stable defectives in the community who, within the limited scope of their intelligence, carry out many humdrum and menial tasks in a satisfactory manner. In other words, they are only academically defective. There is therefore no reason why they should not be permitted to marry and reproduce.

Treatment is essential for those who are socially defective, for the helpless, the dependent, and for aments whose conduct is such that they cannot be permitted to exist in a normal community but must be specially supervised.

For the lower grade aments, certain types of high-grade subnormals and the morally defective, compulsory admission under the Mental Health Bill may become necessary. Such defectives must perforce be segregated in hospitals and colonies. With skilled handling, much im-

provement in conduct and habits can be brought about. In a number of cases, occupational training results in the arousal of interest and in the development of potential manual skill in various forms. Other patients can be taught to carry out the simpler kinds of routine task essential to the ordered administration of a colony. These include farm and laundry work, routine cleaning and elementary 'fetching and carrying'.

Where psychosis is superimposed upon subnormality, the usual course pursued is compulsory admission under the Mental Health Bill.

Cretinism requires special consideration. Treatment, if commenced sufficiently early, may bring about an astonishing amount of improvement. Where, however, such hypothyroidism is merely associated with primary amentia there is a danger that a placid and slumbrous idiot may be transformed by thyroid administration into a dangerous, restless and destructive creature. The prognosis must therefore be guarded in all children presenting thyroid deficiency.

Syphilitic amentia responds poorly or not at all to specific treatment. Malarial therapy too has proved singularly unsuccessful in cases of juvenile general paralysis.

Epileptic amentia can be modified to some extent with the use of analeptics including bromides, phenobarbitone and Epanutin. Nevertheless, the course is one of inevitable progress towards dementia.

It is self-evident that the intellectually retarded child is handicapped from the very outset. It is much more likely to respond with maladjustments to the various external problems with which it may be confronted.

Treatment must be directed accordingly to:

i. Adjusting the child to its environment so that no more should be expected of it than it is capable of exhibiting.

ii. The breaking down of parental resentments and hostilities, with the object of obtaining their co-operation as regards treatment.

iii. The provision of psychotherapy for the parents if neurotic and themselves maladjusted.

iv. To providing such educational facilities as are commensurate with the child's abilities as ascertained by verbal and practical intelligence testing. (Special schools.)

v. The removal to boarding school of a special type where the home situation is adverse and not amenable to satisfactory manipulation.

CHAPTER XVI

MANAGEMENT IN HOSPITAL

Nurses should be acquainted with the more important aspects of the mental health laws relating to admissions to and discharges from hospital. Since relegation to an institution sometimes necessitates temporary, or in isolated cases, permanent deprivation of freedom, it must be surrounded by safeguards so as to ensure that the liberty of the subject is not disturbed even inadvertently. The legal machinery in use until recently has now been swept away and the new laws are embodied in the Mental Health Act, 1959, which came into force on 1st November 1960. This piece of legislation goes far to satisfy the desire of psychiatrists that mental disturbances should be governed in the main by clinical rather than legal considerations.

Although no doubt every effort will be made to encourage patients to enter hospital on an informal basis, some will still have to be admitted compulsorily and it is for this minority of individuals that the new machinery has been devised. A uniformity of procedure has been instituted consolidating and simplifying all previous measures.

It is of interest to consider first the major administrative alterations:

1. There are no longer any specially designated hospitals for the reception of cases of mental illness. Any hospital may admit such sick folk. The future, then, will see a vast increase in the number of psychiatric units established in general hospitals.

2. Applications for admission must be made to the 'Managers', the name now given to the Hospital Management Committee.

3. Each patient is assigned to a consultant psychiatrist who thereafter becomes the 'Responsible Medical Officer'.

4. The Board of Control has been dissolved and passes into history. Its vigilance, useful in its day, is no longer required.

5. The Justice of Peace takes no more part in the compulsory detention procedure which is now essentially clinical. The J.P. therefore vanishes from the scene.

6. New and final courts of appeal against detention in hospital have been set up. They are called Mental Health Tribunals, and one has been established for each Regional Hospital Board. Each consists of a minimum of three persons: a psychiatrist, a lawyer and an informed layman. Rules have been promulgated as to when a patient may appeal to such bodies.

7. Under the old laws, the help of the Duly Authorized Officer was

invoked to act as an intermediary between the patient and hospital. This officer, appointed by the Local Authority, carries out much the same functions but is now called the Mental Welfare Officer and the scope of his duties has been enlarged.

8. For the sake of simplicity of working, mental deficiency and mental illness have been brought together. The term 'mental deficiency' has been abolished and 'subnormality' substituted. A new group has been added, namely, psychopathic disorder. It is generally accepted nowadays that although psychopathy is difficult to define, it covers a mass of emotional and behavioural disorders significant in themselves but distinct from the other groups. The modern classification which must therefore be used on all documents dealing with compulsory admissions now reads as follows:

a. Mental illness.

b. Subnormality (which includes feeble-mindedness and high-grade mental defectiveness).

c. Severe subnormality (which includes defectiveness previously known as imbecility and idiocy).

d. Psychopathic disorder.

METHODS OF ADMISSION UNDER PART IV OF THE ACT

a. Patients may be admitted informally

No documents of any sort are required, as has been the practice in general hospitals.

b. Emergencies are covered by:

(i) **Section 29.** This is used in cases of urgent necessity to avoid undesirable delay. Application may be made by:

a. Any relative.

b. Mental Welfare Officer.

One medical recommendation must be made, by a doctor, preferably one who knows the patient. This Section is valid for seventy-two hours only unless a second medical recommendation for observation or treatment is made.

(ii) **Section 30.** This covers a patient already in hospital who needs to be further detained. Application may be made by:

a. Nearest relative.

b. Mental Welfare Officer.

A recommendation must be made by the doctor in charge of the case. Again, this Section is valid for three days only and, if further detention is necessary, a second medical statement is required.

c. Observation

Section 25. Application may be made by:

a. Nearest relative.
b. Mental Welfare Officer.

Two medical recommendations must be made, jointly or separately, one of which must be made by a doctor specially approved by the Local Authority. They must state that the patient is suffering from mental disorder warranting detention for observation:

1. For the protection of himself/herself.
2. For the protection of others.

This Section holds good for twenty-eight days and may be followed, if necessary, by an application for treatment.

d. Treatment

Section 26. This is used where treatment is essential and the illness likely to be prolonged. The patient must be declared as suffering from:

1. Mental illness or severe subnormality.
2. If under twenty-one, from subnormality or psychopathic disorder.

Application must be made by:

a. Nearest relative.
b. Mental Welfare Officer, who must consult the nearest relative unless this might involve unreasonable delay.

Two medical recommendations are required, one of which may be given by a doctor on the staff of the hospital to which the patient is being admitted. One of the recommendations must be made by an approved practitioner.

The documents must describe the nature of the illness and also give reasons why compulsory detention is necessary, i.e. why the patient cannot be treated on an informal basis, or at a day hospital or out-patient clinic.

e. Guardianship

Section 33. Instead of being admitted to hospital, a patient may be placed in the care of a guardian. In such cases the same documents must be used as described under Section 26.

ADMISSIONS UNDER PART V OF THE ACT

This part of the Act deals with individuals who have been charged with a variety of offences committed as the result of mental disorder.

1. **Section 60.** This gives powers to Courts to make an 'hospital order' in respect of offenders, i.e. to send people into hospital for treatment on the evidence of two doctors, one of whom must be approved, that hospital treatment is necessary.

2. **Section 65.** This empowers higher Courts, but not Magistrates' Courts, to make a similar hospital order but with restrictions as to discharge.

ADMISSIONS UNDER PART IX OF THE ACT

The only Section here which need concern the student is 136 which empowers any police constable to remove a person who appears to be suffering from mental disorder to a public place of safety. The duration of this form of detention cannot exceed seventy-two hours within which time further action must be taken under Sections 25 or 26 if necessary.

In summary, the most commonly employed forms of admission are from experience shown to be Sections 25, 26 and 29. Less frequently Sections 136, 60, 65 and 30 are encountered in approximately this order.

DISCHARGE OF PATIENTS

Section 47. a. Discharge can be effected by the nearest relative who gives the hospital seventy-two hours' notice in writing. There is no special form to fill in. This method of discharge may be negatived if the Responsible Medical Officer issues a statement (on Form 12) to the effect that the patient may be a danger to himself or others. The relative may then appeal to a Mental Health Tribunal within twenty-eight days.

b. Discharge may be effected by not less than three members of a Regional Board of Management Committee.

c. A Mental Health Review Tribunal may order the discharge of any patient.

d. Normally the Responsible Medical Officer orders discharge as soon as the patient is sufficiently well.

MISCELLANEOUS PROVISIONS

Patients admitted under Section 60 via the Courts may be discharged under Section 47 in the ordinary way. If a restriction order exists (Section 65) neither the patient nor his nearest relative may apply to the Mental Health Review Tribunal, but the Home Secretary may refer the case to this body at any time. The Responsible Medical Officer or the Managers may seek the Home Secretary's consent to discharge.

It should be noted that under Section 25 the nearest relative cannot discharge the patient. Release is generally effected by the responsible doctor. In general, the doctor can discharge any patient either completely or to informal status from any detention order other than that made under Section 65.

The new laws also make provision for removing the 'nearest relative' who is behaving irresponsibly and ignoring medical advice concerning the patient. An application can be made to the appropriate County Court to have this person displaced and a more co-operative member of the family installed as the 'nearest relative' for the purposes of the law.

LEAVE OF ABSENCE

Leave may be granted for any period up to six months. After this period has expired, the patient cannot be recalled to hospital. Absence from hospital constitutes a pleasant break from the regime and is of value in testing the reactions of patients to home circumstances. It is also a useful mode of restoring patients to domestic surroundings.

ESCAPE

In the case of subnormal or psychopathic patients, recapture may be effected within six months. Mentally ill and severely subnormal individuals may be taken back to hospital within twenty-eight days.

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It will have been observed from the foregoing that although in appearance complex, the new laws really simplify hospital administration considerably. Experience in the admission wards soon renders the student familiar with the new documents and the admission procedure.

RECEPTION OF NEW PATIENTS

Much depends upon how a new patient is received into hospital. He may have been tricked into 'going quietly' by lying references to a prospective sojourn in a nursing or convalescent home. As one patient tersely put it, 'I was told I was going into a home in the country, and I find myself in a lunatic asylum instead.' He, quite rightly, cherishes a grievance and naturally tends to distrust those who receive him for fear of further deceptions. The inducements dangled before him often succeed but are extraordinarily unhelpful to those who have to nurse him. Tactful management is therefore necessary to soothe and coax him into a more amenable frame of mind.

On admission the patient is carefully examined by the doctor and inspected for marks, bruises, injuries, fractured ribs, rashes, ringworm, pediculi and signs of infectious disease. These, if found, must be noted down at once. The temperature, pulse and respiration rates are then taken. As a rule, if he has been transferred from another institution he will be certified as free from infection. Voluntary and private patients not having passed through the observation ward filter must be specially inspected. The presence of infectious disease necessitates isolation and disinfection of the skin, hair and clothing. Everything that the patient has brought with him including clothing, money and other possessions must be listed at once. Knives, scissors, matches, rings, artificial teeth, drugs and medicines must be removed and locked away. If there is evidence of dysentery, typhoid or tuberculosis, special cards to this effect

are issued by the duty medical officer. Similarly, if a patient proclaims his intention to escape, this fact is specially noted. Most importantly, evidence of suicidal tendencies is recorded on a separate Suicide Caution Card which is read and signed by all who have charge of the patient.

With the medical officer's permission the patient is then given a bath, the usual precautions being observed. These include constant supervision and special care with paralysed, epileptic and otherwise disabled patients. The bath should not contain more than six inches of water and its temperature must not exceed 100° F. Cold water should always be drawn first. Clean night-clothing should then be provided and the patient put to bed. Private and certain types of voluntary patients may be permitted to wear their own pyjamas or nightdresses.

The first few days in hospital are devoted to routine history taking and various investigations. In addition to charting the temperature, pulse and respiration rates, the urine is tested and the blood and cerebrospinal fluid examined. Records should also be kept of the appetite, weight, menstruation, bladder and bowel activity. The conduct and behaviour of each patient both by day and by night are set out in ward journals. Well-kept accounts in ward diaries are of the utmost value to the doctor whose opportunities of making prolonged contacts with his patients are infinitely fewer than those of the nurse.

After the diagnosis has been made it must be the constant care of the nursing staff to carry out the doctor's orders explicitly. To this end the general health of the patient must be maintained by regularity of life, good food in adequate quantity, sufficiency of sleep, fresh air and enough exercise to support the circulation and muscular tone. So-called tonics other than appetizers (simple bitters) are of very little value. Vitamin deficiency if suspected should be corrected by proper dietetic measures together with synthetic vitamin preparations.

INSOMNIA

The causes of sleeplessness are many and varied. It is quite impossible to give an exhaustive list but they may be classified as:

a. Environmental.

b. Physical.

c. Psychological.

a. External causes of insomnia include strange surroundings, hard beds, stuffy or cold bedrooms, too few or too many bedclothes, traffic, bird and animal noises, bright lights, ticking or striking clocks, other unusual sounds and a whole host of minor disturbances. Those in good physical and mental health can sleep on the proverbial 'clothes-line', but more delicate, sensitive and 'highly strung' individuals may be worried almost to distraction by these extraneous factors.

b. Bodily illness is a prominent cause of sleeplessness. It includes fevers, heart and lung trouble, pain, nausea, colic, dyspepsia, flatulence

diarrhoea and frequency of micturition. Other physical causes of difficulty in sleeping comprise excessive smoking, too much tea and coffee drinking and overtiredness. Alcohol in small doses sometimes results in mild excitement sufficient to interfere with sleep. Benzedrine if given after 5 p.m. may cause absolute insomnia. Whilst most patients respond with drowsiness to a warm bath, others are stimulated to wakefulness. The inversion of the sleep rhythm by encephalitis lethargica is to be especially noted.

c. Over-excitement, emotional disturbances, anxiety, late hours and mental overwork are liable to produce wakefulness. Some folk take their troubles to bed with them and ruminate during the long hours of the night. Neurotics of the anxiety class are often troubled by nightmares so that they are eventually afraid to go to sleep. And the sleep rhythm, once disturbed, is difficult to restore. Again, insomnia may be an hysterical manifestation or it may be caused by hallucinatory experiences, deliria and acute manic or schizophrenic excitement. Depressives are often so overwhelmed by misery that sleep becomes impossible.

On the whole, most psychoneurotics complain that they take a long time getting off to sleep but once asleep, continue for longer or shorter periods. Such rest is declared, however, to be unrefreshing. Other folk suffer from internocturnal insomnia, i.e. they get off to sleep easily enough but wake very early, after which they remain fully alert.

It is true to say that most people sleep more than they think they do. Nevertheless, it is wise to accept the dictum that sleep is not satisfactory until the patient says he has slept well.

Treatment of insomnia. Mention has already been made of sedation in connection with severe nervous disturbances. In the simpler conditions of disturbed rest at night much can be done to promote sound sleep before resorting to drugs. Obviously it is essential to adjust the surroundings. Some external factors can be eliminated, others modified. Hot water bottles and extra bedclothes can be provided. Similarly, stuffiness and excessive warmth can be corrected by suitable methods of ventilation. Public striking clocks are an abomination at any time but it is possible to become accustomed to them. Other extraneous noises can be dealt with by a vigilant night-nurse.

As regards bodily ailments, it is necessary to treat physical ills, alleviate pain and relieve alimentary upsets. Smoking must be restricted to a reasonable amount and tea and coffee should not be drunk late at night. Advice on general lines as to orderly and healthy modes of living may give favourable results. If warm baths and hot drinks promote drowsiness, these should be prescribed. Alcohol is forbidden except in senile disorders.

Psychological insomnia may respond to dietary manipulation such as light meals for those who suffer from nocturnal hunger, to removal of minor external irritants, and of course, to psychotherapy and reassurance. There are many other minutiae which cannot be detailed but which

can be dealt with by the exercise of intelligence and common sense. If all other measures fail then recourse must be had to hypnotics. It is unwise to wait too long before administering sedative medicines, for the psychological value of sound sleep even if artificially induced is immense. Another direction in which the nurse can assist the patient is in emphasizing the harmlessness of the drugs prescribed and discounting the risks of habituation or addiction.

Deliria and psychotic excitement will be diminished by physical measures, but it is more than probable that sedatives will be required at once.

Finally, nurses should record accurately the quantity and quality of sleep together with any incidents such as restlessness, nightmares, sleep-walking and 'answering the voices'.

REPORTS

To summarize, a daily record should be kept of the following points derived from observation of the patients:

The amount and quality of sleep.

The temperature, pulse and respiration rates in cases of physical illness.

Bowel and bladder activity.

Employability.

Mental symptoms and conduct disturbances.

Epileptic fits.

Patients should be weighed at weekly intervals and the weights noted on charts. Menstruation records should be similarly kept.

Such detailed information gives a complete progress picture of each patient at a glance and is of great service to the physician in charge.

RE-EDUCATION

As soon as patients are accessible mentally, instruction should commence in the daily routine habits.

These include regularity of bladder and bowel functioning, the use of the toothbrush, the care of the hair, skin and clothing, and proper table manners. For women in particular proper cosmetic attention promotes a feeling of well-being. The knowledge that physically attractive qualities are being retained has a tonic value. It helps to restore confidence and self-assurance. To this end some of the most modern hospitals have installed 'beauty' parlours which have more than justified their trouble and expense.

Finally, the state hospital should endeavour to provide colourful and attractive clothes which fit. Better still, those who are well enough should be encouraged to wear their own clothing.

OCCUPATION

On the whole, women react better to loss of freedom than men. In consequence, female patients adjust themselves more readily to ward work and domestic tasks. Men, on the other hand, deprived of their clubs, public-houses and other meeting places, are inclined at first to be fractious. They resent the enforced detention and tend to sit about and smoke. Their clothing is less colourful and their wards less decorative. Moreover, the atmosphere is often rendered mephitic by the fumes of burning shag, paper and other substances exuding from malodorous pipes. However, both sexes are prone to fall into a slough of despondency. It is therefore incumbent upon nurses to stir the women to activity and to dissuade male patients from an inert and nicotinic existence by discovering and implementing their interests.

All large mental hospitals are nowadays properly equipped for handicrafts which are pursued under the supervision of skilled occupational therapists with psychiatric training. They are assisted by nurses interested in any particular sphere of such activities. The value of occupational therapy has been conclusively demonstrated. It provides interests for the more acutely sick, helps to exteriorize solitary depressives and helps to withdraw them from gloomy self-absorption. Paranoid patients are diverted from their delusional systems and excited folk dissipate their over-activity through useful channels. Schizophrenics in particular are prevented from slipping back into their 'private worlds'. The onset of dementia is retarded.

In addition to work in the wards, formalized occupation centres are usually provided. There are many and varied tasks from the simplest domestic jobs to the more complicated kinds of knitting, sewing, weaving, embroidery, rug-making, pottery and raffia. For the men, provision is made for farm work, and shops are available for the manufacture of useful articles such as leather bags, brooms, brushes, toys and wooden articles of all kinds. Nowadays, larger or smaller 'factory' units are being evolved with the co-operation of local industry to introduce not only the manufacture of toys but of other commercial materials such as cartons, motor-car parts and other mechanical structures. Many patients become interested in these possibilities which may help to facilitate their path back to industry or gainful occupation. Elsewhere, on a more aesthetic plane, art classes are popular and prove to have not only occupational but recreational possibilities. Sometimes the pictures painted or the drawings made have not only artistic but diagnostic value and help physicians to obtain deeper and almost analytical insight into particular ways of mental functioning. On a more earthy plane, kitchen units and cookery classes help inadequate housewives who have failed in various aspects of their domestic lives. Instruction in shorthand and typing is again of value and most occupational centres make provision for teaching and practice of this kind.

Occupational therapy must be distinguished from drudgery. Naturally there are menial tasks which appeal to certain types of patients and which may be permitted them. Each patient, however, is a law unto himself and no sweeping generalizations can be made as to the most suitable type of occupation. Some are attracted to bright colours. Others like purely mechanical work. As far as possible individual attention gives the best results; for the teaching of interesting work is designed to call forth hitherto unrealized and uncultivated aptitudes.

Successful occupational therapy engenders a feeling of successful accomplishment which in its turn arouses self-satisfaction, and that most essential quality, self-confidence. The amount of work done is far less important than the alleviation of monotonous hospital routine, particularly for those destined for permanent institutional life. In hospitals wherein the majority of patients are employed, the casualty rate is the smallest, impulsive outbursts the fewest and noisiness the least.

Therefore, if only from an administrative point of view, full occupation should be vigorously encouraged, quite apart from the pyschotherapeutic value which is in itself considerable.

RECREATION

In addition to organized work, provision is made in all hospitals for recreation and entertainment. Wards are equipped with games such as cards, chess, draughts, dominoes and billiards. Darts and dartboards are being introduced not only into convalescent wards but into those previously regarded as chronically disturbed or turbulent. Nurses can assist by taking an active part in such games and even arranging tournaments. Any special abilities in music should be encouraged and the formation of a musical appreciation group is an asset. Within administrative limits patients may be allowed access to musical instruments. Pianos, gramophones and radio all add to the amenities and are very acceptable.

Television requires special mention because of its two aspects, one, which whilst not adverse, yet requires supervision, and the other, definitely beneficial. Constant passive and indiscrimate viewing is unsatisfactory and should be discouraged. On the other hand, it is a fact that certain 'live' documentary programmes do bring reality to the very withdrawn schizophrenic, and it can be observed on occasion that a distinct increase in liveliness takes place.

In summary, television is now an integral part of the life within an hospital community and all progressive institutions have by now installed a set in every ward. There is indeed scope for group viewing of special programmes.

As regards other forms of recreation, all hospitals of any size are adequately catered for as regards cinemas and stage performances. Patients should be persuaded to attend as often as possible. In addition

they should be encouraged to participate actively in concert parties, plays and dances. Such facilities have more than a recreational value. They encourage social feelings, self-respect, self-confidence and widening interests. Quite often, some patients will be found to have the qualities of leadership and they should be incorporated in schemes for the establishment of social clubs, officered and directed by the patients themselves.

Out-of-doors organized physical training, cricket, football, tennis, basketball and field sports are of considerable value to those fit enough to take part in them. Apathetic patients and schizophrenics with poor circulation are improved in health because of fresh air and exercise. Further, competitive games arouse interest and help to stimulate the inert into activity.

It is also possible to arrange escorted country walks, car rides and expeditions to the seaside and beauty spots. Holidays of up to fourteen days can be arranged through the agency of the Mental After Care Association and by other means and these are of distinct value. Such recreational outlets as have been described are possible for most patients with the exception of cases of gross dementia and severe epilepsy. Habitual runaways must unfortunately also be excluded.

PRIVILEGE

Hospital privilege allows of considerable liberty under prescribed conditions. Reliable patients are at first permitted the freedom of the grounds within certain not particularly restricted bounds. Such facilities minimize the irksome restrictions imposed by locked doors where these exist. In many cases privilege can be extended to include the nearest town which may be visited after 'working hours'. Naturally, patients are forbidden to go into public houses or buy medicines, but otherwise they enjoy maximal liberty.

The privilege system is a useful addition to treatment and serves to indicate that detention in hospital in no way resembles imprisonment. It is also a valuable method of estimating returning confidence, stability, self-assurance and self-control. Reports on the way in which patients employ their privilege are therefore of psychiatric value.

TRANSFER OF PATIENTS

It sometimes becomes necessary to transfer patients from one hospital to another. If still psychotic they must be carefully supervised, the journey being best accomplished by ambulance, the requisite number of nurses being provided. Most hospitals employ a private car for this purpose. In other cases, transfer can be arranged by public service vehicles. All patients must be inspected beforehand for marks, bruises and injuries. In addition to the documents and certificates which accom-

pany them, a statement regarding their mental and physical health is also supplied. Bathing and dressing in clean clothing are necessary before transfer.

REHABILITATION

The new Mental Health Act tends to orientate treatment away from the hospital towards increasing community care. Therefore, as has already been mentioned, the scope of the Mental Welfare Officer has been widened to take a larger share in after-care and follow-up work. Into this field have also come local authority health visitors who in the future will be incorporated into a comprehensive scheme of pre-care, hospitalization, after-care and support.

THE DAY HOSPITAL

A number of patients who are not too disturbed can attend a day hospital between the hours of approximately 9 a.m. until 5 p.m. Subsequently they can return to their homes. They are thus not subjected to the disruptive influence which admission to hospital may bring about.

Every variety of treatment can be given including medicine, E.C.T., individual and group therapy, whilst occupation and recreation are also inserted into the programme. The day hospital thus can subserve many useful therapeutic functions including relieving to some extent the heavy and ever increasing load on the parent institution.

CHAPTER XVII

SOME SPECIAL NURSING METHODS

By the time the nurse has commenced her study of neuropsychiatry she will have become familiar with most of the special procedures required in nursing. However, with the multiplication of modes of mental treatment there are a number of prerequisites with which she should be thoroughly acquainted. These include diagnostic and therapeutic instruments so prepared as to be readily available.

The diagnostic tray. For a complete physical examination the following instruments are required:

1. Stethoscope. This should be put out although most doctors carry their own.
2. Percussion hammer. This is a rubber-covered instrument used for tapping tendons in order to elicit reflexes. Usually, the handle tapers to a blunt point used for stroking the soles of the feet in order to test the plantar responses.
3. Sphygmomanometer. For estimating blood pressure.
4. Ophthalmoscope. For examination of optic discs.
5. Electric torch. To test the pupil reflexes. To examine the mouth and throat.
6. Tongue depressor.
7. Pins to test pain sensibility.
8. Cotton wool to investigate light touch.
9. A tuning fork to estimate vibration sense.
10. Bottles containing strong smelling liquids such as oil of cloves to test the sense of smell.
11. Bottles containing lemon juice, tincture of gentian, salt and sugar for testing the sense of taste. In this respect it is noteworthy that even minor head injuries often abolish the senses of taste and smell, two sensory mechanisms closely linked together.
12. Dividers to estimate tactile discrimination.

Aspiration of blood. The blood Wassermann reaction is carried out as a routine in all mental and nervous disorders. Additionally, it sometimes becomes necessary to perform Widal tests for typhoid, or blood analyses to estimate the blood urea content, blood phosphate or blood calcium.

The following pieces of apparatus should be arranged in an orderly fashion on a tray:

1. Sterile towels.
2. Tourniquet.

3. Kidney bowl containing a 10 cc. syringe sterilized and wrapped in gauze. A selection of large bore intravenous needles.
4. Sterile gauze for dressings.
5. Sterile cotton wool.
6. A vessel containing spirit or other antiseptic.
7. Adhesive tape or bandages.
8. A jar containing the required number of sterile test tubes. These should be labelled with the patient's name and ward and should stand upon a layer of cotton wool placed in the base of the jar to prevent accidental breakage.

The patient's arm rests comfortably upon a pillow covered by a mackintosh and a sterile towel. A tourniquet is applied at the upper third of the arm. Alternating clenching and relaxation of the fist will encourage engorgement of the veins at the bend of the elbow. The skin of this area is thoroughly cleaned with spirit, and a needle, affixed to a 10 cc. syringe is then introduced into the most prominent vein. As the plunger of the syringe is withdrawn, blood will enter to the required amount. Disengaging the tourniquet will allow the veins to collapse. This part of the technique must be carried out before removal of the needle so as to prevent exudation of blood with consequent haematoma formation. The puncture area is again swabbed with spirit after which a dressing is applied and kept in place either by strapping or by bandaging. Whilst the nurse is dealing with the puncture the blood is transferred from the syringe to the test-tube. To ensure that residual blood does not clot in the syringe and needle, both should be cleared by the repeated aspiration and expulsion of water.

If fluid blood is required rather than serum, the test-tubes should contain crystals of potassium oxalate. Shaken up vigorously with blood, oxalates prevent clotting by combining with the calcium salts therein.

Intravenous injection. A tray should be set out as for aspiration omitting the test tubes. In addition, sterile vessels, sterile distilled water, ampoules containing the medicaments to be used, and files must be provided.

Intravenous medication permits of rapid introduction of remedial drugs into the circulation for use in emergencies or when the quickest possible effects are required.

The following preparations are in common use:

1. Mercury, bismuth, salvarsan, tryparsamide. These drugs are issued in ampoules complete with manufacturers' instructions which must be scrupulously followed. Mercury and bismuth are used directly from the containers whereas tryparsamide and salvarsan, which are put up in powder form, require to be dissolved in distilled sterile water. Solutions if not absolutely clear must be rejected. The usual dose of tryparsamide is 1–2 gm. Salvarsan (arsphenamine) is given in gradually increasing amounts beginning with ·3 gm. and rising to maximum of ·9 gm. The usual course consists of six injections. All are used in the treatment

of syphilis, tryparsamide being restricted to neurosyphilis. Mercury, bismuth and salvarsan produce severe local reactions, ulceration and even sloughing if allowed to escape under the skin. Great care is taken therefore when injecting these substances intravenously to avoid this accident.

2. Strophanthin and digitalin are sometimes given in cases of urgent cardiac weakness.

3. Cardiazol is given in small doses as a cardiac stimulant and in larger amounts to produce therapeutic convulsions.

4. Typhoid vaccine, pyrifer and other bacterial emulsions are sometimes used to produce attacks of fever in chronic organic nervous diseases.

5. Hypertonic saline in 15 per cent solution (50–100 cc.) may be administered to reduce cerebral congestion.

6. Normal saline can be given in this manner to replace fluid loss or to encourage the washing out of toxins from the tissues.

7. Pentothal and similar drugs are injected intravenously using a special technique for the purposes of narco-analysis. Repression lifts during the induced drowsy disinhibited state allowing easier access to the mind for the purposes of removing acute anxiety, recovering lost memories and relieving hysterical paralyses, stammer and other functional disabilities. The patient reclines on a couch in the semi-darkness and is informed that he is about to receive an injection which will make him sleepy. Pentothal is then injected into a vein at the bend of the elbow quite slowly at the rate of ·1 gr. per minute, the patient being asked to count backwards from 100. Just before sleep is produced the injection ceases. The usual dose required is 2·5–5 gr. It is during this drowsy release state that psychotherapeutic measures are applied.

Intramuscular injection. The intramuscular route is used for moderately rapid absorption. Thus, liver extract, quinine, insulin, mercury, bismuth, collosal sulphur and staphylococcal toxoid can all be injected intramuscularly to produce a more prolonged effect than if given directly into the blood-stream.

Intramuscular injection involves no special technique other than ordinary aseptic care. A sterile syringe of the appropriate size and a long intramuscular needle are required. The skin over the buttock is sterilized with spirit and a site chosen one hand's breadth below the iliac crest and between the two superior iliac spines. Or if preferred the outer side of the thigh may be similarly prepared about one hand's breadth below the greater trochanter. The medicament to be injected is withdrawn from its container which may be a glass ampoule or a rubber-capped bottle. If the latter is employed the cap must be cleaned with spirit. The needle is thrust deeply into the muscles, and the plunger slightly withdrawn to ensure that no blood has been aspirated from a punctured vein; for this necessitates removal of the needle and its insertion elsewhere with a repetition of the test. Otherwise, the drug can be injected and the puncture site sealed off with a collodion dressing.

Lumbar puncture. Lumbar puncture amounts to a minor surgical operation so that strict asepsis and cleanliness of all the apparatus used is essential. To facilitate the procedure good lighting must be provided. The operator should have at hand a trolley upon which are placed a rubber sheet, a lumbar puncture tray and a drum containing sterile towels, gauze and cotton wool swabs. The tray should contain a selection of lumbar puncture needles, a 5 cc. syringe and hypodermic needles or, better still, a special dental syringe arranged to carry a tube of 1 per cent Novocain. These are preferably sterilized by means of dry heat. In addition, a sterile vessel containing spirit should be provided. The rest of the apparatus comprises at least two dry sterile test tubes plugged with cotton wool and labelled with the patient's name, ward and date, a roll of adhesive tape and a bottle of collodion solution. If the cerebrospinal fluid is likely to be purulent a pus receiver should be available. An ethyl chloride spray should be present if preferred for anaesthetizing the skin. Finally, if it is desired to ascertain the spinal fluid pressure a water manometer should be to hand.

As a rule the operation is carried out whilst the patient is lying on one or other side, whichever is more convenient. Some medical men prefer the patient to be sitting up. Whichever attitude is prescribed a prerequisite of successful puncture is that the head should be well flexed on the chest and the knees well drawn up. This posture produces maximum flexion of the spine ensuring thereby maximum opening up of the intervertebral spaces. The rubber sheet is covered by a towel and placed beneath the body. Sterile towels cover the patient with the exception of the lumbar area. This district is then carefully cleaned with spirit. The third or fourth interspace is selected and anaesthetized with Novocain or ethyl chloride after which a lumbar puncture needle is inserted in the middle line. Withdrawal of the stilette allows cerebrospinal fluid to flow out at the rate of one drop per second under normal conditions. The first few drops are collected in a test tube but are usually rejected because the fluid may contain blood from the skin puncture. The presence of blood vitiates the laboratory tests. A second sterile test-tube is then substituted and fluid is withdrawn to the extent of 1 or 2 cc. This amount should not normally be exceeded in order to avoid subsequent very severe headache and possibly vomiting. The stilette is then replaced and the needle removed and the puncture wound sealed with a sterile dressing, after which the patient is turned on his back, his pillows are removed and the foot of the bed elevated on blocks. This last procedure prevents leakage of cerebrospinal fluid through the puncture aperture in the spinal coverings (theca). If headache should develop, and paradoxically enough it often occurs in those whose C.S.F. is normal, it may be relieved by aspirin in full doses and an intramuscular injection of Pituitrin 1 cc.

Lumbar puncture is conducted for the following purposes:

a. In certain organic nervous diseases there is a general rise of cerebrospinal fluid pressure within the subarachnoid space. The pressure can be

measured by means of a manometer attached to the lumbar puncture needle.

b. Antimeningococcal and other sera may be given by the intrathecal route. To this end rather more cerebrospinal fluid must be withdrawn then the amount of serum injected. The foot of the bed should be tilted so that the serum can run down and permeate the length of the cord. It should be warmed to blood-heat before introduction.

c. To obtain cerebrospinal fluid for:

i. Chemical analysis—including sugar; chlorides; protein—increased in cerebral diseases such as tumours and neurosyphilis; colloidal gold test.

ii. Wassermann and Kahn reactions in syphilis.

iii. Bacteriology and white cells—in the various forms of meningitis and syphilis. Acute infections result in the migration of numbers of white corpuscles into the fluid.

d. To relieve increased intracranial tension. This must be done with great care, and not at all with subtentorial tumours of the brain, i.e. tumours lying in the cerebellar district below the membrane which separates the cerebellum from the cerebrum. In such cases sudden release of cerebrospinal fluid may cause the medulla to become crushed down into the foramen magnum with instantaneous death.

e. Encephalography implies the injection of air into the ventricular spaces of the brain for the purpose of photographing them by means of X-rays. Normally, an antero-posterior X-ray picture of the skull shows a butterfly pattern in the centre of the skull which represents the ventricles. Cerebral tumours push the ventricles aside and this displacement is clearly shown.

A lumbar puncture is performed in the ordinary way after which the patient assumes a sitting posture. For each 10 cc. of cerebrospinal fluid removed 10 cc. of air are inserted up to a maximum of 100 cc. X-ray pictures are then taken. The procedure is not unattended with risk and the patient suffers considerably afterwards, the prominent symptoms being severe headache and vomiting.

Lipiodol injections. Lipiodol is opaque to X-rays and is used in the diagnosis of spinal cord tumours. It is an iodized poppy seed oil injected either into the suboccipital arachnoid space (cisterna magna) and allowed to run down the cord, or is introduced via a lumbar puncture and allowed to run in the opposite direction. If a tumour, meningitis or protruded intervertebral disc (as in sciatica), is present, the Lipiodol will be arrested at the level of the obstruction, which can then be detected by X-rays.

Ventriculography is a diagnostic method similar in purpose to encephalography except that air is introduced directly into the cerebral ventricles via a small hole made in the skull.

Electro-encephalography is a method of picking up the minute electrical currents which are aroused by cerebration. They are conveyed from elec-

trodes placed on selected portions of the scalp to a valve amplifier and thence to a special piece of apparatus called a cathode tube. These magnified currents make tracings which can be recorded and examined. Abnormally slow waves and special types of records (E.E.G.) are found in cerebral tumour, severe head injury, epilepsy, psychopathic personality and other brain diseases. In some cases, where a brain tumour has penetrated to the cortex an exact localization can be made. An enormous field of investigation has thus been opened up. The recovery from head injuries can be studied by this means. An epileptic tendency may be brought out by voluntary over-breathing which produces a mild alkalosis. This blood change as already described, increases cortical instability which can then be detected by means of an E.E.G.

Physiotherapy. Physiotherapy includes the use of mechanical agents to rehabilitate the sick, to revive muscular tone, and in general to restore physical fitness. Many of the methods in use have no real application in the care of the mentally disordered. Some forms of baths (hydrotherapy) are, however, of some value.

The continuous bath. The prolonged bath is of considerable service in allaying restlessness and excitement. The technique of its application has already been described.

Other baths. Foam and shower baths together with their modifications are of mildly tonic value but can be dispensed with.

Massage. Massage by improving the general and local circulation produces a feeling of well-being. It is of use in the neuroses for its tonic effect but can in no way supplant psychotherapy. In neurological diseases it is of great service in restoring partially paralysed muscles.

Fibrositic conditions respond to deep massage, and since fibrositis is so often associated with neurosis, the treatment is both of physical and psychological value.

Electricity. There are many forms of electrotherapy in common use and every neurological department is properly equipped with suitable apparatus.

a. Continuous or galvanic current is of particular service in paralyses of upper motor neuron origin. Its effects are both electrolytic and thermal.

b. Faradic or interrupted current has only a limited application. It is useful for estimating the liveliness of muscles paralysed by lower motor neuron disorders. Hysterical paralyses in those intellectually uncooperative may yield to Faradism plus suggestion.

c. Diathermy, medium or short wave, is a form of electrical treatment used to produce penetration of deep tissues by heat. It is very useful in fibrositic conditions. Caution must be observed in its employment to avoid electrical burns which if produced heal with great difficulty.

Heat. Heat may be generated in special heating cabinets or in simpler form by means of electric lamps (radiant heat). 'Baking' by such means produces hyperaemia of the heated areas and acts as a sort of fomenta-

tion by bringing blood with its antibodies and other defences to the affected part. It produces copious sweating which helps to remove toxins from the circulation. The only precaution necessary is the careful cooling off of the patient and removal of perspiration to prevent him from catching cold.

Infra-red rays. An infra-red lamp has more penetrating power than radiant heat and is therefore a means of applying gentle but deeper thermal treatment to painful and inflamed areas.

Ultra-violet light. Ultra-violet light is sometimes called artificial sunlight. Like sunshine it produces vitamin D in the tissues by its action on skin surfaces. It is obtained by passing electric currents through mercury in a special form of lamp. Its effect is to produce a general erythema on the exposed skin surfaces closely resembling sun tan. Care must be taken in its application, for like sunburn the effects are not at once apparent. It is usual to commence with 2–3 minutes at a distance of three feet from the lamp, gradually increasing the time of exposure until the desired result is obtained. Tinted glasses or goggles should be worn as a precaution against the deleterious effects of ultra-violet light on the optic nerve.

It has been suggested that ultra-violet light is bactericidal and that it may help to clear up conditions such as colds, sinusitis and furunculosis. As to its general tonic value, there is some doubt as it is held in some quarters that its psychological value is probably of as much importance or even more than its physical effects.

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