The hygiene of mind / by T.S. Clouston ... With ten illustrations.

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T. S. CLOUSTON

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BY

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PREFACE

HOW Science can benefit Life is the greatest practical problem of modern civilisation. It is now being solved in a thousand ways. Whether this treatise on *The Hygiene of Mind* will in the least aid in its solution remains to be seen. Health is now in the air. How the mind of man can be strengthened, widened, and made a more efficient instrument through the application of modern scientific and physiological knowledge is a question of intense interest. I well know how presumptuous a thing it will seem to some persons to suggest that modern Science may succeed in doing what all the great philosophers, moralists, and religious teachers of the past have been trying to do for six thousand years. The justification of that suggestion is that evolution, physiology, psychology, and modern preventive medicine have now placed knowledge at our disposal which none of those great men of old had access to. If the scientific view that Mind has been evolved, like all else in the world, through the long ages of the past and has slowly reached its present stage through fixed laws is true, then it assuredly follows that it may still further grow and reach stages it has not yet attained through the operation of the same laws. The exclusively metaphysical view of Mind has so taken possession of the world that it will die hard. The wisdom and experience of the ages, with their axioms, rules, and assumptions as to how Mind should be educated and

treated must, in this later time, at least receive a scientific interpretation in so far as they are true. No one can look into the problems treated of in this book and the literature of the subject without being deeply impressed by the way in which modern scientific conclusions about health of body and mind have often been anticipated by the wise men of the pre-scientific era. It is not generally realised that a necessity is laid on modern Science to bring morals, conduct, and even religion, under fixed laws and to harmonise them with the reign of law everywhere apparent in the universe. It is now a universally accepted fact that the body is capable of improvement by the application of hygienic rules, and that thereby the life of man and his happiness are bettered. It is also proved by physiology that mental action is absolutely co-related with brain action, and it therefore does not admit of doubt that the mind may also be bettered through brain and bodily hygiene. To put into popular language some of the known facts thus far ascertained and to extend the conclusions from those facts in regard to mental betterment through physiological, psychological, and medical means is the object of this book. Its aim is practical, and by that standard only it should be judged. The chief excuses for its many faults and omissions must be the novelty and the difficulties of the subject, the imperfection of our knowledge and the incomplete equipment of the author.

THE HYGIENE OF MIND

CHAPTER I

THE HYGIENE OF MIND—THE PROBLEM

HEALTH Science, or "preventive medicine," arose in the latter half of the nineteenth century. It has done wonders in its fifty years of existence in saving life, improving health, increasing happiness, and educating public opinion in regard to hygiene. A lowered death-rate only expresses a small part of what has been accomplished. The sufferings of the living have been decreased to an incalculable degree, and the race of the future is to be a better one than that of the past. The *mens sana* was always associated with the *corpus sanum*, but of old, and indeed up to very recent times, the sound mind was always held to be "in" the sound body rather than "of" it. The views of the physiologist, the psychologist, and the doctor have changed on that point. They now absolutely refuse to admit the possibility of a healthy mind in an unsound body, or at all events in an unsound brain, just as the electricians would refuse to admit that a steady electric current could be produced by an imperfect dynamo. No doubt an unsound mind and an unsound brain may appear to co-exist with what popularly would be called

"good bodily health," but that is a misapprehension. Whatever Mental Hygiene is it cannot be dissociated from soundness of brain. The solidarity of brain and mind is an axiom of modern medicine. A man may have a sound heart with a bad liver, but he cannot have an unsound heart and a good circulation. To preserve health and to prevent disease are the objects of the great modern science and art of preventive medicine. Hygiene is the short term to express this science and art. Unsoundness, inefficiency, or weakness of mind may have to do with factors which ordinary preventive medicine has hitherto only touched lightly. Such factors are modes of education, social customs, human feelings, passions, morals, and religion. The man who writes about preventive medicine in the ordinary sense must know something of physics, chemistry, physiology, medicine, bacteriology, and laboratory work. The man who writes about Mental Hygiene must, in addition, have a special acquaintance with brain structure and function, and must take into special account mental evolution, heredity, psychology, ethics, education, sociology, and the religious instincts. It implies also a special study of mental disease and derangements and the modes of dealing with them. Perhaps even more than a study of fully developed mental disease, it needs a knowledge of those innumerable mental eccentricities, stupidities, lethargies, impracticabilities, losses of control, obsessions, impulses, asocialisms, perversions of feeling, morbid laziness, and all such mental and moral abnormalities as fall short of actual insanity. It therefore requires special qualifications. Who is sufficient for these things? I certainly do not feel myself to be so. Our data for an entirely satisfactory treatise on Mental Hygiene do not at present exist. Our knowledge is, as yet, immature in regard to many of the sciences on which such a treatise must be based. Thoroughly to know the

human brain and how it works would imply a comprehension of the very highest, most difficult, and most complicated facts in organic nature. Its mechanism and its energies are as yet only in process of being studied. It is the driving wheel of human history, the apex of the vast evolutional pyramid of life whose basis consists of the swarming millions of microbes in which life began. Such perfect knowledge would imply a going back for millions of years of life. The human brain is not only the apex but the evident aim of the whole evolutional process. To ask if it is of importance that every means should be used to keep this marvellous organ healthy and efficient for its mental work would indeed be a cynical inquiry. The only possible objection to any attempt made to treat of the hygiene of mind is that the problem is as yet too difficult for the full application of the methods of modern science. The conditions which would absolutely ensure mental and brain health are infinitely complicated and are as yet largely impossible of attainment. It may be said that an organ whose essence and purpose is to respond and react to every force in nature—many persons would say to supernatural influences as well—must be so subtle in its working as to defy most of the ordinary hygienic measures at present known to us. The prescriptions of the modern preventive physician would be too simple to effect the end in view. Yet it is certain that we do now know enough to enable us to strengthen mental life and prevent mental failure and deterioration to a large extent.

If he would apply his knowledge to the lives of men, the mental hygienist must, in the first place, assume that man is a "bit of nature," and that the brain and its highest function of mind work through natural laws as sure and invariable as the law of gravitation. Our ignorance or incomplete knowledge of many of those laws

should not be held as an excuse for complete inaction. Some good should certainly come out of every practical attempt to work the brain on right lines, to point out the causes of brain and mind failures, and to anticipate some of the effects of evil heredity, bad environments, and disease. Nearly all attempts to explain the causes of human ill-health and to lay down rules for its prevention and cure have been at first met with popular neglect and even derision. The laws and conditions of health, mental and bodily, are but faintly realised by the mass of mankind It will not credit that health rests on law. Ignorance commonly sits in the scorner's chair. Human nature is never so selfish as when, feeling itself happy and in good health, it sees efforts to prevent disease which it does not understand or sympathise with. This human nature weakness we often see exhibited in our popular literature and newspapers when health subjects are treated of. Microbes are commonly enough used to point a jest, and precautions against disease are frequently treated as if they were only suitable for amusing hypochondriacs and fools. No doubt to a certain extent the pendulum sometimes swings to the other side, a blind credulity taking the place of a blind scepticism. The sensational triumphs of modern surgery, which Lister has brought about by a study of the microbic enemies of mankind, the good effects of anti-serums and the abolition of malaria by killing mosquitoes are often looked on as miraculous tales of the supernatural rather than as the result of scientific study. The former sceptics are often inclined to believe every improved wonder of healing chronicled by the ubiquitous reporter and to swallow any nostrum that the quack or the enthusiast recommends. In no department of medicine have quackery, duplicity, and unreasoning credulousness found so sure a field as where the mental action of the brain is disturbed. The history of the occult arts, of mesmerism, of "faith

healing," and of "Christian science" abound in illustrations of human credulity. Rational Mental Hygiene must rest solely on a sound physiological conception of the true relation of the brain and mind to each other and to the rest of the human organism. It must suspect all hygienic or other procedure that leaves the brain out of account. It must be distrustful of all conclusions that rest only on subjective experience, not backed by objective facts capable of proof. Reliable evidence is difficult to obtain. Fact and fancy are often so inextricably mixed up in the human mind, and are so difficult to disentangle that it is no wonder the one is taken for the other. A really scientific and reasoning state of mind usually needs so much training to acquire that it is necessarily rare. Human imagination is so active and subtle and needs so little basis of fact that it riots in the obscure and the wonderful. Medicine requires so much intellectual clearness and honesty in its study and in its practice that it is not surprising that its history is full of fallacies and immature generalisations. Mental Hygiene must assume as its basis that mind, in its every faculty and exhibition, implies and requires accompanying brain action. Whether we have to deal with reasoning or emotion, memory or will, appetite, passion, or instinct, whether exhibited in normal or abnormal forms—for every one of them brain activity is the essential basis. Consciousness itself, partial or entire, can never otherwise exist, in this world at least. "No brain, no mind" must be an unquestioned axiom to the student and practitioner of Mental Hygiene. All this is so contrary to a certain uneducated human instinct and appears to be so at variance with certain metaphysical and religious assumptions as to the entity and essential independence of mind, personality, and soul, that it is no wonder the scientific view has great difficulty in being popularly realised.

A treatise on Mental Hygiene might be written by the religious teacher, the moralist, the sociologist, the educationalist or the parent, each from his own point of view. From each of these we might learn much, but the modern physiologist or physician would almost certainly have to refuse to accept or to modify many of their conclusions, as not being founded on scientific data. This would not be the result of any mere "materialistic" assumption. The scepticism of a physicist who refused to accept generalisations that were founded on the study of energy alone without relation to its sources, its transformations, or its necessary relation to matter, would be perfectly justified by scientific methods. Such a man would believe in heat as the source of energy, but he would also believe that it had, as the necessary condition of its existence, a relation to the molecular or electric changes in matter. For this he would only receive approbation from his fellow-scientists, and the public would probably accept his conclusions unquestioningly. They would accept the fact that he knew about this branch of science, and was able to judge and decide on questions relating to it. They would not set up any opinion of their own in regard to it. They would not invent such a nickname for him as "materialist." The physiologist believes in the transcendental qualities and special attributes of mind as firmly as does the metaphysician. He knows that it stands apart from and above all other energies. He may even agree with Spencer that its special connection with organisation is "unthinkable," but he also knows that Lord Kelvin, the greatest living physicist, says the same thing about the precise nature of the connection of heat, light, and electricity with matter as Spencer does in regard to mind and organisation. It is sufficient as a scientific fact in both cases that the connection is absolute, that it follows fixed laws which can be studied by the methods of modern science.

The evolution of mind can be traced in living beings from the earthworm up through the lower to the higher animals and then at last to its highest exhibition in man. Science sees no break in the chain. The facts relating to sensation, the prelude of mind, having as its material instrument a specialised organic tissue, the nervous system, the fact that mind arose in its first simple beginnings out of sensation, that it becomes connected in its earliest stages with muscular movements, and that mind, sensation, and movement slowly, in the evolutionary process, became integrated and enlarged from a lower to a higher stage as the nervous system becomes specialised and more highly developed—such facts are just as surely proved as any physical phenomena. They are the basis of physiology, of medicine, and of the hygiene of mind. The further study of nerve and mind gives the great hope of health and happiness and even of still further evolution for the human species. Its practical importance to the future of mankind becomes thus incalculable. No study of physics and no mechanical invention can approach it in importance.

The practical and the true view of a science of Mental Hygiene may therefore be thus shortly stated. The study of the physiological processes of the body, so far as these affect the mental functions of the brain, must be its basis. All the organs of the body, so far as they have special relation to the brain, must also be taken into account. The more we know of bodily processes, be they nutritive or dynamical, the more we study the organism, the surer will be our conclusions. The brain must be assumed to be not only the most important organ in the body, but its essential organ, for the sake of which all else exists. It is, in fact, the microcosm of the whole organism, its centre and its master. It receives help from every other organ, but it also largely controls the working

of each. By its mental action alone it can hurry the heart's beat or slow its pace ; it can make the skin shrivel or flush, it can quicken or stop the digestion, it can stop or change the character of all the secretions, it can arrest or improve the general nutrition of the body. Every organ and every vital process is represented in the structure of the brain by special "centres" and groups of cells that have a direct relation with such organs and processes, and through which they are controlled. This fact of itself gives the widest range to the study of Mental Hygiene. To do the brain good, to accentuate its mental action, to avoid influences that would hurt it, is the aim of our science. That implies not only a knowledge of the brain but of the functions and work of all the other organs which are, as it were, its satellites. Their diseases and weaknesses must be taken into account in its hygiene. Its own special mechanism and its own marvellous working, whose difficulties of investigation have hitherto, in many respects, defied the patience and ingenious researches of multitudes of the keenest investigators, must be taken into account, so far as they are known. The conditions and the substances that conduce to its vigorous nutrition and to its healthy action must be attended to, while the things that impede and injure its proper working must be avoided. How it grows and how its functions are slowly perfected during the perilous years of childhood, youth and adolescence, from birth to the age of twenty-five, and what the enemies of that marvellous developmental process are, must be ascertained and taken into account. How hereditary influences act for good or evil, during the developmental period, forms a most important, but as yet a very obscure, study relating to our problem. Can such heredity, if evil, be antagonised or counteracted? if good, can it be helped? are questions of the last importance to the mental hygienist. There is reason to suppose that

the effects of heredity towards strength and weakness are exhibited in the brain more than in any other organ. The special diseases and disorders that affect the growing brain need to be known and fought against. The onset of the reproductive period of life and all that it implies, bodily, mentally, and morally, for health, pleasure, and work, form momentous problems for the individual and the race. The mind and brain management of this period of life, if we knew how to carry it out successfully, might alter the fate of millions of men and women. How educational methods, religious influences, moral sanctions, the right control of passions, the scientific forming of the growing mind may be carried out, has to be inquired into. Dr. Ballantyne would no doubt say that the intra-uterine or pre-natal period of brain life needs some care and attention. Certainly the mental condition of the pregnant woman is notoriously, in many cases, apt to be peculiar and unstable, requiring hygienic and medical attention. The middle period of life, between the ages of twenty-five and forty-five, with its efforts, its worries, its responsibilities and work, is subject to many upsets, preventable and unpreventable. Brain strength and efficiency make all the difference between success and failure, between productive citizenship and dependence, between good and bad fatherhood and motherhood, between the ability to provide good and bad conditions of up-bringing for children. The period of decadence, retrogression, and old age, between forty-five and death, is one when, specially in its later stages, the brain cells are undergoing gradual shrinkage, and consequently the power of energy is diminishing and the joys of life are lessening in intensity. During this period there is, in many cases, a special necessity for such hygienic measures as tend to make the process of mental decay gradual and quiet instead of taking on an abnormal and explosive energy which the brain cannot safely

tolerate. The waning nerve power needs to be used up with discretion. The diminished recuperative energy of this period must also be taken into account. A happy and comfortable old age is quite possible; indeed, it seems to be becoming the rule rather than the exception among our comfortably-off classes, and stands in very sharp contrast to the unhappy and irritable old age which is neither a comfort to itself nor to others.

Among the most practical of all the questions in Mental Hygiene are the two following: By what means can we detect the preludes and beginnings of brain and mental abnormality and exhaustion? Can we adopt any measures in those early stages for the counteraction and eradication of such abnormalities? To answer those, and so to help humanity in its need, implies a knowledge of the whole facts of brain development and of the laws which regulate that development. The beginnings of evil are always the most difficult to detect. Advanced evils are easy enough to diagnose. A bad brain and mental habit, if not corrected early, becomes evident enough after it has been thoroughly established. Looking to the variety of human nature and the normal range which is seen in every family and every community of men it is by no means easy to say definitely when the road which leads to abnormality has been entered. It is desirable to avoid false alarms or such undue introspection and self-centredness as would lead to hypochondria. Slight and commencing danger must neither be underrated nor overrated. *Obsta principiis* is, however, the most valuable motto in all effectual Mental Hygiene.

Few evils can be effectually counteracted except their causes are ascertained. Now the possible causes of mental and brain ill-health are legion. Heredity in every degree, bad education in many forms, and evil environments of innumerable sorts go towards its causation. Causes that

will act on one brain and constitution unfavourably may have no effect on another. Nay, it is well known that a cause of weakness in one person will be a cause of strength in another. One young man mixes much with society and his mind is brightened and stimulated ; another does the same and his mental power is dissipated, while his attention is withdrawn permanently from serious study. One young woman takes to athletics with her brothers and develops the strength of her womanhood ; another does the same and becomes a disagreeable tomboy. If we could clearly ascertain first what are the general causes of mental ill-being and inefficiency, and could then find out how those causes individually and in conjunction act on the multiform kinds of human constitutions, we should have solved half the problem of Mental Hygiene.

Some mental qualities are of so much more importance than others for a successful and happy life that one branch of Mental Hygiene consists in studying where strength lies and where weakness is exhibited in every individual child. The faculties are developed, as we shall see, in a definite order. Speech, sensitiveness, conscience, sex feelings, the religious instincts, may all appear either too soon or too late in a child where the brain is abnormal and the heredity is not good. The natural order of development is departed from in any individual to his very great danger. The faculties and powers are developed in relation to each other and in relation to the needs of life and of the whole organism in a normal child. This order and this relationship need, therefore, to be known before we can detect that anything is amiss. It would seem to be the object of some systems of education and upbringing to interfere with Nature's methods and to fight against her beneficent laws.

I have by no means thus exhausted the scope and

objects of Mental Hygiene, but have merely taken prominent illustrations of its work and aims. Sound and strong mind is unquestionably the greatest asset of mankind. There is, unfortunately, a general feeling of fatality in the public mind about it. It is now admitted that the bodily health and condition of a nation may be improved, but it is assumed most wrongly that its mental state and strength is a fixed quantity that cannot be altered. To rouse discontent and promote inquiry on the subject would be a great gain. It would lead to knowledge and to effort. The problem would be assumed to be solvable. The first stage of process would be reached.

CHAPTER II

THE MIND MACHINERY IN THE BRAIN

MENTAL energy of all kinds, mind in every shape, needs a mechanism through which it can manifest itself, in this world at least. That mechanism is found in perfection in the human brain and is of extraordinary complication and delicacy. The brain may be said to have four chief functions. The first is that of motion. It presides over and stimulates all the voluntary muscular movements of the body, regulating their force and co-ordinating in their working the different groups of muscles needed to perform them. The muscles of the legs and arms and body do not move on their own initiative, they need nerve currents from the brain to set them going. The apparatus for this in the brain is necessarily in close relationship to the sensory and mental apparatus. Mind and muscular movement have the closest connection with each other, acting and reacting on each other. The second brain capacity is that which gives the power of feeling or sensation. Different organs and tissues of the body have this power of feeling in very different degrees. Some, like the skin of the face and fingers, have it in great intensity; others, like the hair and nails and cartilages, have no feeling at all. The mechanism through which it arises is also closely allied to the mechanism of the mind. All mind was slowly evolved out of sensation, looking to the evolution of the lowly

animal life of millions of years ago, up to man. Sensation is closely related to motion, there being a form of movement called reflex, where an impression being made on a sensory nerve a muscular movement results therefrom, without any will being exercised or mental action of any kind. Sensation is specialised in the organs of the senses, the eye, the ear, the smell, the taste, and the muscular sense. Those have the closest of all the sensory relations to mind. Without them mind could not be developed at all, and their deficiency or disease always affects it adversely. The third great function of the brain is that of nutrition; through this its own nourishment and that of the rest of the body is regulated. Every bodily organ or tissue has an innate power of extracting nourishment from the blood, altering its chemical constitution, and building it up as part of itself, but this nutritive process needs regulation by the brain, without which it would be irregular and unrelational. As part of this great nutritive process the brain regulates the distribution of blood by the arteries and capillaries. Those blood-carrying tubes are made larger or smaller by nervous impulses from the brain and the nerve centres. Much or little blood is thus supplied to the bodily organs. How mind affects this function is well seen in blushing, when the whole of the blood capillaries in the face are suddenly enlarged. The general tone of the walls of the blood-vessels is steadily kept up from the brain. We can give certain medicines which act on the brain and increase this tone, so improving the nutrition of the body. The fourth function of the brain, its highest and most important, is that of mental action. The largest part of the human brain, the most delicate and the most complicated portion, is devoted to this all-important function. All these functions of the brain are connected with each other in the most definite way. One without the other would be imperfect.

Working, as they do, harmoniously together, they form by far the most perfect mechanism known in nature.

The actual physical machinery that does the work of the brain consists of cells, fibres, blood-vessels, drainage apparatus, and a connective substance which holds these

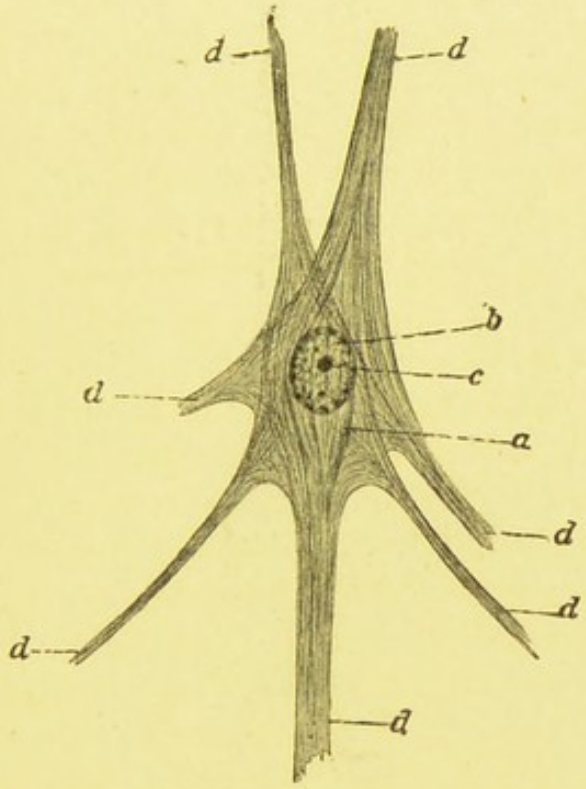

FIG. 1.—A NORMAL BRAIN CELL OF LARGE SIZE.

a. Body of cell with innumerable minute fibres passing through it. *b*. Its nucleus. *c*. Its nucleolus. *d*. The outgoing and incoming fibres through which it is related to other cells, to the spinal cord, and to the nerves of the body.

all together in their proper places and prevents them being displaced or injured by such physical shocks as are implied in walking, jumping, or coming in contact with hard substances. The cells are the most important and the most wonderful of these. They have each an exquisite internal structure which it has taken fifty years of

hard and ingenious work by physiologists to discover, and we do not know it fully yet (see fig. 1). The brain has to be first hardened by chemical agents and sliced into the thinnest shreds, stained with different coloured pigments

FIG. 2.—A LARGE BRAIN CELL PREPARED BY A DIFFERENT PROCESS—THE "NISSL METHOD"—FROM THE ONE SHOWN IN FIG. 1.

There are many methods of such preparation and staining, each bringing out the different parts and characteristics of the cell This one shows the cell full of material for potential work, "chromatic granules," such as a young man or woman in good health and after rest and sleep should have. *a*. Chromatic granules. *b*. Outgoing and incoming fibres.

and then examined by microscopes magnifying a thousand diameters to see the internal structure of the cell. Each cell has the power of taking up from the blood and storing within it the nerve substance for its proper

nourishment. A nerve cell, after rest and sleep, can be seen to contain this substance (see fig. 2). An empty nerve cell, after a hard day's work or thinking, or in certain states of exhaustion and disease, can be seen to have much less of this nutritive pabulum (see fig. 3). Every

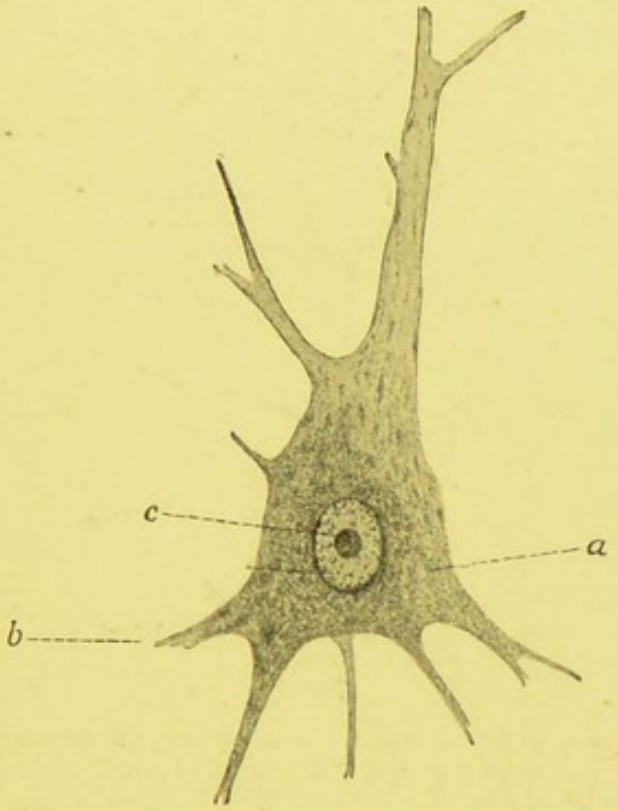

FIG. 3.—A LARGE BRAIN CELL PREPARED BY THE SAME METHOD AS FIG. 2,

Showing that the material for potential work, "chromatic granules," exists in very small quantity. This diminution of chromatic material is found after exhaustive conditions and great overwork. *a*. Pale chromatic granules. *b*. Outgoing and incoming fibres. *c*. Nucleus.

cell has connected with it and forming a part of it, like the legs of a spider, a series of minute fibres or processes (see fig. 4). Some of those are for the purpose of communicating with the other cells near it, while one main process of each large cell passes right out of the brain to the spinal

cord and the other parts of the body (fig. 4 *c*). The nearest analogy to the working of a nerve cell is a small electric battery. This has first to be supplied with chemicals. Those are gradually used up through the transformation of

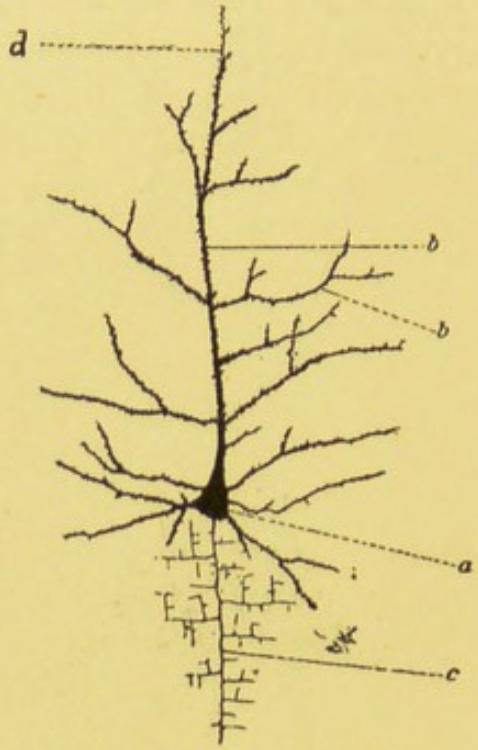

FIG. 4.—A BRAIN CELL AS SEEN AFTER PREPARATION BY THE "GOLGI METHOD."

This shows its outline only, but brings out its branches—"dendrites"—and "axis cylinder," or the fibre that passes down from the cell into the spinal cord and nerves of the body, so enabling the cell to transmit its energy to the most distant parts of the body. The branches are seen to be covered with innumerable small knob-like projections, the "gemmules." *a*. The cell. *b*. Its branches or dendrites. *c*. The "axis cylinder" and its processes. *d*. The "gemmules."

potential into active energy, and so the electric force is generated. The electric current so created is then transmitted through the copper wires that are attached to the battery. The cell, through its internal action, evolves nerve force and sends it out through its attached fibres as the

battery evolves electricity and sends it out. Mind may be regarded as the highest form of nerve force. It is not "created" in the brain but it is absolutely conditioned by that organ. These cells do not work each for itself and by itself, they are associated together in groups of hundreds or thousands, as the case may be (see fig. 5), those groups doing the combined work of the brain. Different groups have different kinds of work assigned to them. Some have motion, some have sensation, some have nutrition, and some have mind, while many forms of mind, *e.g.*, inhibition, has special tracts of brain to carry it on. Every group, while it does its own work, is related to and combined with others, influencing them and being influenced for the purpose of producing a harmonious effect. The impressions conveyed to each from the body and the outer world beyond the body leave a fixed registration. This process is one of the many brain marvels which we are yet quite unable fully to understand. But it is just as certain that the impressions received from the skin and from the eye and from the ear and from the taste and smell are imprinted on those cells and laid up there as it is that the types leave an imprint of the letters and words on the pages of a printed book. Those printed impressions upon the cells can be revived and seen and heard by the mental consciousness, just as a printed book can be opened and seen and read by its owner. There is this difference, amongst others, between the two—that no book has so many words and ideas contained within it as one human brain has, let us say, at the age of forty. As we have the power of opening a book and reading its contents, so every human being can revive the sights and the sounds and the sensations he has previously experienced.

Those brain cells are of very different sizes. It is one of the largest of them that is represented in the picture

(fig. 1). The number of them is absolutely inconceivable. I asked my friend, Dr. Ford Robertson, who devotes his whole life to the study of the brain, to compute the average

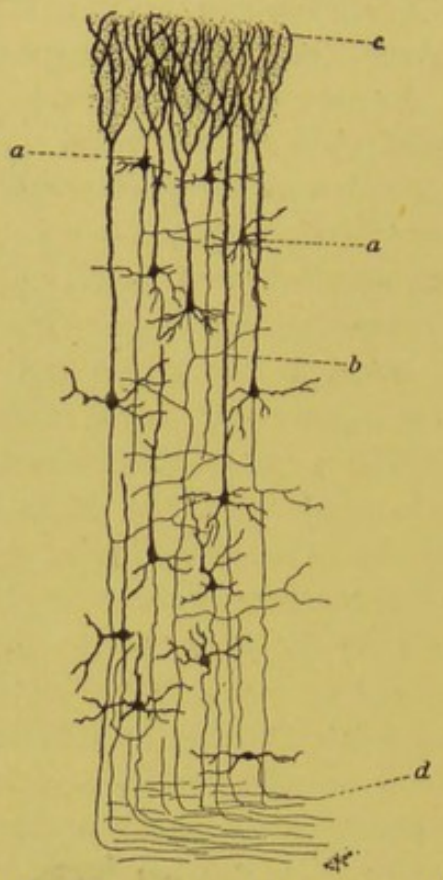

FIG. 5.—THIS SHOWS HOW THE CELLS ARE ASSOCIATED TOGETHER IN GROUPS IN THE BRAIN, EACH CELL MEMBER OF THE GROUP WORKING WITH THE OTHERS. ("GOLGI METHOD" OF PREPARATION.)

a. Cells. *b*. Branches ("dendrites"). *c*. Method in which the branches are associated at the surface of the brain, enabling all the other groups to receive impressions from this group. *d*. The "axis cylinders" passing from the cells through the brain, forming part of its "white substance," and then down to the spinal cord and to every sensitive and muscular part of the body.

number of cells in a human brain. He estimates that they reach the astounding figure of three thousand millions. No human mind, it is said, can take in the

idea of a million units. It is not wonderful, therefore, that we have difficulty in even imagining the mechanism and the working of a human brain. If all the telegraph batteries in the world with all their communicating wires were thrown together and worked in relationship to each other, it would be a mechanism not to compare with the human brain in complexity and number of individual units. A man with great thinking power has far more cells than a stupid man, and an idiot has few and badly formed cells (fig. 6 *c*).

The fibres connected with those brain cells connect every unit and every group with each other and also connect them all with every organ and part of the human body. If a toe or a finger is touched, at once the brain feels it through the sensory cell and the impression is then instantaneously analysed by the mental cells as to whether it is a touch, or heat or cold. The spinal cord is a prolongation of the brain down the spine and has functions of its own, all relating to motion and sensation, but it has no direct relationship to mind. The brain cells that subserve mental action form the greater part of the mass of the brain convolutions, and they mostly lie outside of and above the other cells. Those cells are not perfect in their form and structure and connection till long after birth. At birth the cells are small (see fig. 6 *b*). Each then contains only a little "protoplasm," and its fibres of connection with other cells are few and imperfect compared with the fully developed brain. On the process of their slow and gradual development and the formation of the connections of cell with cell and groups of cells with groups of cells by means of new strands of fibres depend the development of the mental processes of thought, feeling, and will. During this most subtle and marvellous growth of the mind machinery, the influences of right or wrong environment and conditions

are all important for good or evil. It is then that a scientific Mental Hygiene should come in to avert evil and help right development in certain cases.

The brain requires and has an enormous blood supply. The large arteries come into the brain from different points, and at its base are connected in a circle, so that if one is accidently blocked there are others to take its place. When those arteries split up and become

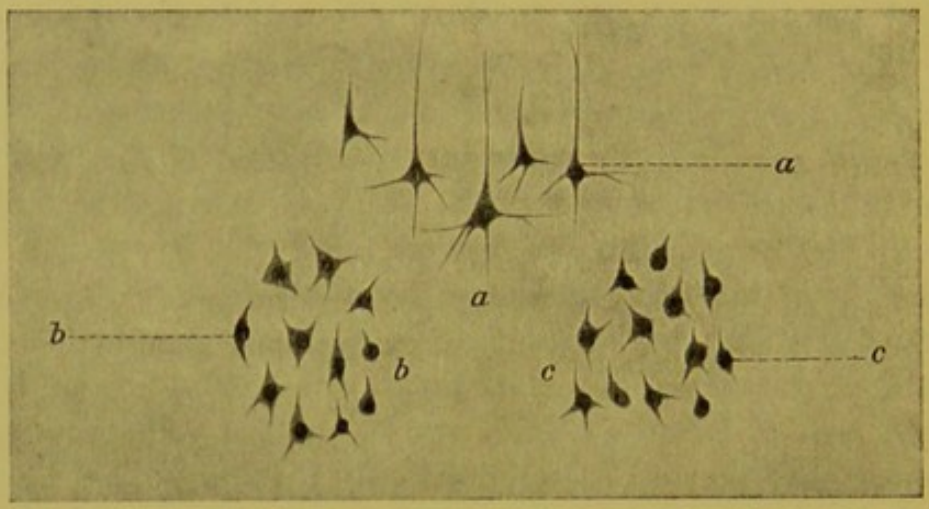

FIG. 6.—THREE GROUPS OF BRAIN CELLS.

One (*a*) showing the normal appearance of the cells in a grown man or woman; the next (*b*) showing their undeveloped state in a newly-born child, with normal nucleus but small cell contents and few short processes; and the third (*c*) showing the cells arrested in their development in an idiot of 20, those being in much the same state as in the newly-born child. The brain cells have not grown and the mind has not developed.

"arterioles" they spread out in all directions round and through the brain. When the arterioles split up and become capillaries those pass to the cells in innumerable directions. Each cell has a capillary near enough to enable it to absorb from the blood the nourishment that it needs (see fig. 7 *b*). As showing the great importance of the cells, they are found to have five or six times as many capillaries in every square

inch as the fibres. This means that they use up that proportion of the blood. It is perfectly clear from this alone that the cells are there to produce the chief energies of the organ, while the fibres merely conduct that energy from one place to another, just as in telegraphy the battery evolves the electricity and needs constant renewing

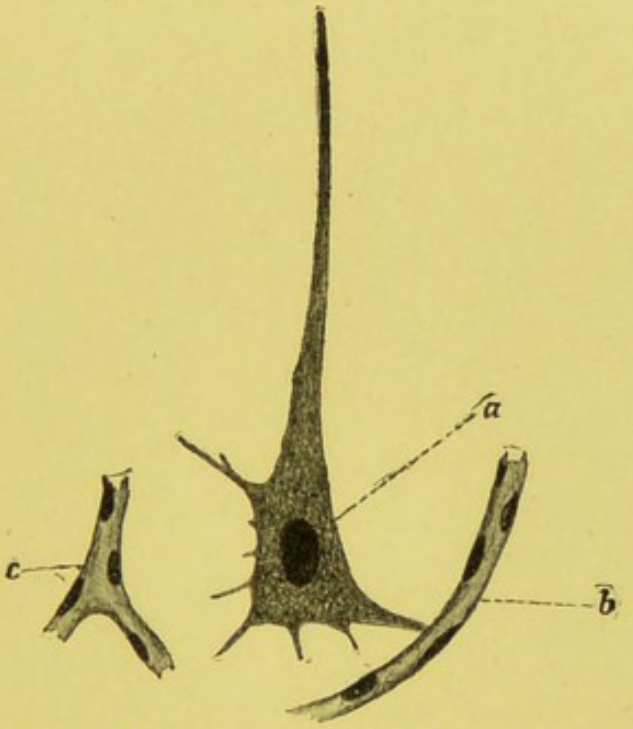

FIG. 7.—SHOWS HOW A BRAIN CELL GETS ITS SUPPLY OF BLOOD FROM A CAPILLARY BLOOD-VESSEL LYING IN CONTACT WITH OR VERY NEAR IT.

a. Cell. *b*. Its capillary blood tube. *c*. Another capillary. The brain cells need for their proper mental working a very large supply of pure blood. This is how they get it.

while the copper wire merely sends it on to another place and needs little care. The capillaries of the brain are not only more numerous but they are smaller in size and their walls are thinner than those of any other tissue. This means that the chemical and physical processes through which the nourishing part of the

blood passes from the vessels into the cells need to be done more quickly than anywhere else. The demand for blood in abundance is more urgent than elsewhere.

The packing and supporting tissue of the brain, called the "neuroglia," consists of small cells quite different

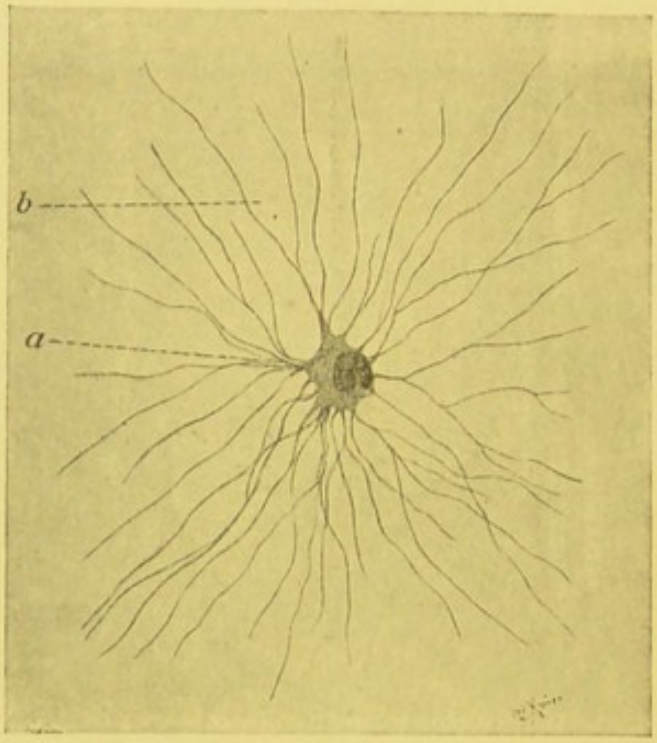

FIG. 8.—A CELL OF THE PACKING AND BINDING MATERIAL OF THE BRAIN, THE "NEUROGLIA."

By means of those innumerable fine fibrils which are fixed to the blood-vessels a strong network is formed for the cells where they lie free from the risks of injury. Those fibrils act as guy-ropes to the capillaries and small vessels. A strong framework is thus given to the brain.

in appearance from the brain cells, each sending out innumerable fibres of the most extraordinary fineness (fig. 8). Each cell in this way has multitudes of supporters. The capillaries, too, are held in their proper places by those guy-ropes. As everybody knows, the

brain is encased and protected outside by a strong, bony envelope, the skull. No other organ has such a complete protection.

The brain has also an elaborate drainage system through which its waste products are instantly removed. If they are not taken away thoroughly, the cells are poisoned and act more slowly. The mental processes then become slow, confused, and distorted.

Mental Hygiene must take account of the working of every part and constituent of this most delicate and intricate mechanism. Derangement in any part of it, will derange or diminish mental force. Non-development will arrest mind growth. Improper blood will alter mind, imperfect drainage will confuse mind, and mechanical shocks will kill mind.

CHAPTER III

HOW THE BRAIN MECHANISM WORKS IN REGARD TO MIND

THE mode of working, or the physiology of the brain, is probably the most difficult study in all nature. It includes chemical processes, physical processes, vital processes, and mental processes of astounding complexity. Scientists do not, as yet, pretend to have solved one-tenth of the mysteries of brain-working. The human mind is quite capable of conceiving how an impression made on a nerve of the skin can be transmitted through a sensory nerve up to the brain, and when that stimulus reaches the brain cells that they may be set into action and transmit another kind of stimulus down through a motor nerve to a muscle so that we have "reflex" movements resulting therefrom. The analogy of pressing a button and so turning on an electric current to move a lever in a mechanism and setting wheels in motion enables us to understand in some degree this nerve process; but when we try to imagine what takes place when the impression is consciously *felt* in the brain we fail to understand it through any analogy with any other known process. We realise that we have entered a region of knowledge entirely different from chemistry, physics, or physiology. The leap from those sciences to mind and consciousness is one over a chasm with, as yet, no bottom.

Spencer's gradation hypothesis from molecular action to sensation and then to mental working was but a shot in the dark. We only know that mental action is evolved and conditioned in all sorts of ways by physical agencies acting on the organ of mind. But let us first look at what rouses muscular movement. The cells of the brain which preside over it originate and regulate the force which causes the muscles to move, just as an electric car moves quickly or slowly according to the strength of the current. All cells require constant recharging with the source of the energy that they are so constantly giving out. This means that there are in each of them two processes going on. The one is that of taking from the blood the source of such energy, converting this into nerve material, which, as we have seen, is laid up in the cell (fig. 2.) The coal has to be made on the spot and stored handy for use. Each cell is, in short, a powerful chemical factory. We call this process that of *anabolism*, or building up. The second process, that of *katabolism*, is that of using the material thus laid up in the cells. If one thinks for a moment how we use this motor force we see how subtle must be its action. We want to lift a pin, and the cells send down a very minute amount of stimulus indeed to the finger muscles. We want to lift a hundredweight, and a perfect flood of the same energy is sent down to the arms. We want to play the piano, and there are hundreds of cell groups that must send out regulated stimuli to the scores of muscles that are to be employed and co-ordinated.

Mind-cell Stimuli.—A primary fact to be recognised about those cells which are the vehicle of mind is this—they undergo almost all their development during childhood from stimuli coming from without the brain. When a child is born its brain is absolutely mindless. The cells have infinite possibilities and potentialities. What sets them going on their marvellous course of future action?

It is undoubtedly the impressions and stimuli which they are constantly receiving from the eyes, the ears, the touch, the taste, and the smell. There is another series of constant impressions from within the body, but outside of the brain, that are thus reaching the cells from the senses, and those are from the muscles. In addition to those the working of the heart and lungs and the other organs are all felt by and stimulate the brain cells. In addition, each cell and each group of cells is laying up not only the nourishment—the coal supplies of which we have spoken—but it is constantly registering through a subtle series of molecular changes the stimuli of which I have spoken. The colour and qualities of objects and their nearness or distance, the different kinds of sounds and tones are all printed on the brain as on a book. The processes of subjective thought, apart from sense impressions, are also registered. This process is all the time helping to develop the actual physical structure of the cells of the growing brain. The writing is there, and by a more wonderful process still than anything we have yet contemplated it can be read and brought before consciousness at any time during the whole of the rest of life. This constitutes the process of memory, without which no intelligence could be developed and no process of imagination could take place. Every kind of mental activity and every kind of feeling needs and uses up the brain energy of the cells. To think, we need plenty of healthy blood supplied to the cells. To make that healthy blood we need abundance of fresh air supplied to the lungs and a vigorous heart to pump it up to the brain. When we think or feel it can be demonstrated that the brain becomes redder and more full of blood than when we are not thinking or feeling, and when we cease to feel or think actively or are fatigued it is pale. To think and feel properly should mean to act rightly as a physiological

corollary. Brain cells must be ever vigorous in action, and this vigour can only be attained through the many years of steady stimulation from the senses and through the power of memory to recall the impressions of those stimuli. The phonograph offers a distant analogy of some of the brain processes. We first have the voice and its modulation into words. We then need the electric wire to convey the energy. We then need the phonographic plate—that is, the brain cell—to receive the impression through its appropriate mechanism. We then have those plates put aside for future use. They require to be arranged and assorted so that each may be got at when needed, and when so needed they are put again into active use. What piles of phonographic plates lie assorted in every human brain! No one can think of this process which I have tried so imperfectly to describe without saying to himself, "How enormous must be the importance of having those processes and their machinery rightly provided for and properly attended to!" Two of the most instructive studies in mental development through sensory and mental stimuli are to be found in the biographies of Laura Bridgman and Helen Keller. Both girls lost the senses of hearing and sight and the faculty of speech early in life. They both from this cause remained for years in a condition of virtual idiocy through brain arrestment. The only sense available for their development was that of touch. By a marvellous process of teaching, devised in the case of Bridgman by Dr. Howe, of Boston, touch was made to take the place of the other lost senses, and they both became intelligent members of society. They were restored to the enjoyment of intellect, emotion, imagination, inhibition, morals, and the social contact of their fellows. They both reached a high degree of happiness. They both attained keenly intellectual and emotional lives. Their stories are the romance of Mental Hygiene.

Brain and Mental Attributes and Faculties.—I shall now shortly describe some of the fundamental brain attributes that are relevant to Mental Hygiene. One of the most important of these is what may be called the *necessity to energise*—that is to say, the brain cells generally and the mental mechanism particularly is of such a nature and constitution that it cannot absolutely rest—at least during waking hours. There is a necessity for them to act in some way, and this action necessarily produces mental action. No doubt they may act slowly or with great rapidity. The engine may go at five miles an hour or it may be pushed to go at a hundred, but go it must—it cannot stand still. Different brains have different capacities of energising, both in regard to speed and force. This continuous action implies continuous repair. There must be a delicate adjustment between what I have referred to as the anabolic or reparatory force and the katabolic or dynamical output. Blood is needed, air is needed, and the right kinds of stimuli are needed. If wrong or improper stimuli are applied the energising will be perverted or too continuously active in regard to its sensory and emotional qualities. Mental cells have only limited periods during which the highest kind of activity can persist. Few men can feel intense joy or sorrow or suffer intense pain for very long without a dulling process setting in. That means that the cells are exhausted and the brain is ceasing to be able to feel keenly. It may be asked, "Do all those millions of cells act at once?" It is certain that they do not. Nature has provided, in the first place, probably fifty times the number of cells that are required for the brain's activity at one time. The different groups of cells have different functions, and those groups are put in action according to the faculty or function that is in action. When a man is thinking over the memory of past events and scenes in his life one group of cells is called into

action; when he is devising plans for the future another group. When those memories are called up before consciousness we call it *representation;* when the original pictures are actually seen by the eye or heard by the ear and reach consciousness we call it *presentation.* During presentation the record is made in the brain. This takes a little time. If the time of presentation is too short an imperfect record is made. If the same presentation is made again and again it deepens the record. This is ever to be kept in mind by the mental hygienist. Repeat and deepen the presentation of all good and pleasant things and thoughts. Representation is a fainter process than presentation, but its vividness differs enormously in different people.

Trying to remember a bit of scenery or a face, many people have the power of what is called "visualising," that is, they actually see before them the object that they had previously seen. When a man feels, a different set of cells are put into action. When a man wills, another still different set of cells are employed. When any of those mental operations are accompanied by muscular movements, there is, as it were, a projection downwards of stimuli to the motor centres. The brain looks within as well as without, and records its own thoughts and feelings just as it registers the impressions of outward objects. The subjective and the objective are not different in the essential conditions of their registration and remembrance. It is the same brain process through which both are accomplished.

Sleep.—The process of repair and the complete physiological rest which the brain cells absolutely need, are provided for by the marvellous brain function of sleep. What precisely happens and what causes the cessation of consciousness, the suspension of thinking and feeling and the stoppage of muscular action in sleep is not accurately

known, but it is known that activity of the brain cells is then chiefly confined to absorbing their proper nourishment from the blood and so laying up a stock of energy for use during the waking hours. This needs less blood and less oxygen than katabolic activity, for the brain is then pale. We know that the mental powers are not absolutely suspended at all times during sleep. The process of dreaming, that close analogue to delirium and insanity, shows that there is then a kind of automatic and disordered mental activity. The pictures that have been laid up come out casually in grotesque groups and unrelated sequences. The phonographic plates are taken out at random. No Mental Hygiene that does not take account of the sleep process can be a complete one.

Brain and Mental Reactiveness.—There is an all-pervading and most subtle quality of the brain which may be called its *reactiveness*, which distinguishes it, at least, in degree and kind from all other organs. What is meant by brain reactiveness is that when stimuli are applied of various kinds they rouse energy, mental or otherwise, corresponding in kind and degree to the stimulation applied. It sympathises, as it were, with favourable forces that impinge on it, and it antagonises others that are unfavourable. Plants react to light, air, heat, moisture, and soil only. The lower kinds of animals, such as fish or frogs, react to a few more environments than plants, and the higher animals react to many more than such cold-blooded creatures. In man's brain there is a reactiveness to almost every force and stimulus in nature. No doubt some of the means of communication with the outer world, chiefly the organs of sense, are not so acute in man as those of some of the higher animals. We do not smell like the dog, nor do we see like the eagle. It is doubtful if we possess some of the sense capacities of birds and certain wild animals as to weather, atmosphere, and

orientation. But the range and the effects of all our sense impressions taken together are infinitely larger and more subtle than those of the highest animal. The range of an animal's reaction to its sense impressions is mostly limited to food, sex, and self-preservation. Our sense impressions, on the contrary, have the power of calling up memory images of vast extent, of rousing imagination, of stimulating thought, and of powerfully acting on volition. The chief sources of human brain reactions are light, sound, colour, smell, taste, touch, air, heat, cold, electricity, music, harmony, the beautiful, the terrible, the sublime, and our fellow-men in life or in their books. Brain reaction also results from impressions and stimuli from within the body and the brain itself. The subtle but continuous influences on brain and mental action of the healthy or unhealthy working of the skin, the lungs, the heart, and stomach, are causing continuous reactions. The influences of sex and reproduction are specially powerful and affect morality or immorality, action or inaction, affection or hatred. The effect of want of food on human brains has often been to stir up revolutions. It was not ideas only that caused the French Revolution. The starvation and the bodily miseries of the common people powerfully contributed to it and affected its character. The quality of the blood has the power of producing reactions of all sorts in the brain cells which it is nourishing. Brain reaction, if excessive, may take the form of loss of self-control, delirium, or insanity. In mental disease, the reactiveness of the brain so affected is often completely altered, so that heat and cold may produce no effects, hunger may not stimulate efforts to get food, and sex no impulses to satisfy its cravings. The sight of those nearest and dearest may not produce happiness or any effect whatever; or the reactions in such cases may be completely perverted from their normal conditions, so that in the instances quoted

the presence of those nearest and dearest to a patient may simply aggravate the morbid pain. But it would need a treatise to exhaust what could be said on this all-important brain and mental quality.

Brain and Mental Resistiveness.—Another brain and mental quality of great importance in Mental Hygiene is what may be called *resistiveness.* This means that a brain with a high degree of this quality will not suffer from such injurious stimuli and environments as would destroy one with a low degree of this quality. A high degree of this quality, together with the possession of surplus energy—and often it is the possession of such energy that gives resistiveness—forms a strong brain that lives long. It is now known to modern science that life of every sort, and human life particularly, is surrounded by innumerable microscopic living enemies to its existence. On the power of defence against those enemies, its health and its existence depend. The chief of those enemies to life and health are swarms of microbes which we constantly breathe in the air and swallow in our food. Nature has provided a most elaborate process for our defence against them. The blood contains millions of microscopic particles called "leucocytes," whose purpose is to swallow and antagonise such enemies. The harmful microbes produce the toxin, or poison; the guardian leucocytes at once produce the anti-toxin, or antidote. The latest studies in mental medicine show that probably many mental diseases and many conditions of mental disturbance, short of actual insanity, such as lethargy, irritability, inability for work, and depression are of microbic origin. Part of the work of hygiene, bodily and mental, is, according to modern science, to strengthen nature's vital defences and so increase this resistiveness. Many symptoms of disease, which are themselves often put down as actual disease, such as inflammation, cough and fever, are nature's

processes of resisting disease and death. To be able to resist the early symptoms of depression and painful emotion, excitement, and loss of control, would be to avert attacks of mental disturbance in many cases. Looked at from the ethical point of view, conduct might thereby be improved, immorality might be avoided, and sweetness and light let into our lives. But for such resistiveness many of our race would become so unhappy that they would die, and our slum population would become so fierce that they certainly would steal and murder more than they do. Many of our social customs are so inharmonious with healthy life, and many of the things we use are so destructive to resistiveness that it is no wonder our people suffer so largely from ill-health, mental and bodily. Of all the articles largely used by mankind, probably alcohol in excess, as we shall see, has the power of diminishing resistiveness to disease to a greater degree than anything else used by our modern urban populations.[1] But regarding that and the effects of other such agents as tobacco, opium, tea, and other poisons from without or from within, I shall have more to say in detail afterwards. Take the following example of the way in which mental and moral resistiveness may be broken down. A strong man of high principle became ill, and a relative who was his nurse put such pressure on him that he made a will, leaving her all his money, and so doing gross injustice to his other relatives equally nearly connected with him, and of whom he was equally fond. The moment this cause of the breaking down of his resistive power was removed he altered his will and did justice to his relations. "Lead us not into temptation" is another way of putting "Increase our mental resistiveness." Normal resistiveness usually goes

[1] [Alcohol has lately been shown to paralyse the guardian leucocytes of the blood: *cf.* Prof. Metchnikoff's Harben Lectures, 1906. *Editor's Note.*]

with sound health, vigorous muscular power, and exercise in the fresh air. A man in this condition will resist the effects of cold, of pain or injury, and, if hurt, will heal more quickly than a man in a lower condition of health, in addition to being able to resist mental evil influences. When a man or a woman is said to "break down" it is usually a case of diminished brain resistiveness. This quality is closely related to will power and moral capacity.

We doctors meet with curious examples of brain resistiveness produced by disease against certain drugs. I have known many cases of acute mental disease who could take and be the better for poisonous doses of sedatives and sleep-producing medicines, while the strongest purgatives will sometimes not act on their bowels nor the most active sudorifics produce perspiration in them.

Brain and Mental Solidarity.—The brain, though composed of many parts and centres, representing many functions, has at the same time a *solidarity*, or oneness of function, which must always be taken into account by the mental hygienist. No single function can be overdone, and no one part can be injured or suffer disease without every part suffering more or less in consequence. "And whether one member suffer all the members suffer with it," is good physiology and correct psychology. Exhaustion of one function always weakens the others more or less. Mosso has clearly proved that fatigue of mind, through mental exertion, diminishes the power of walking and writing somewhat; while excessive muscular exercise is incompatible with the best thinking or the highest volition. Solidarity and localisation both exist in the brain, but not in a complete form. One conditions the other.

The Hierarchy in the Brain.—The various portions of the brain which represent different functions and capacities, the different nerve centres and the different mental powers and faculties are related to each other as higher or lower

according to their importance. There is, in fact, a hierarchy in the brain, each part of which has a different authority. It is made up like a regiment with the colonel, major, captain and the rank and file, as Hughlings Jackson puts it. Certain portions of the brain exist, not, as it were, to do special work of their own, but to stimulate or to inhibit the work of other centres. Those "inhibitory centres" of muscular movement, of nutrition, and of nerve action represent the mental and the moral qualities of control, such qualities being of the highest rank in the hierarchy. Mental inhibition is the colonel-in-chief of the brain hierarchy. There is a power of high importance in Mental Hygiene, and that is the action of mind on mind. I do not mean that this can take place except through the brain, the senses, or the corporeal presence of the person who so acts and is acted on. As yet there is no scientific proof of the mental action of one person on another who is at a distance, the so-called "telepathy" or pure transmitted will power without any bodily presence. But that one human being acts on and influences others for good or evil through the exercise of mind force, sympathy, antipathy, and will power is an unquestioned fact in psychology.

Differences in Brain.—There are enormous innate differences between the brain and mental power of different individuals. To compare the lower sort of savages with the man of genius in a civilised country is to compare things that have almost nothing in common—at least when looked at superficially. The power of a superior brain in force, in intensity, subtlety of action, in acquisition and productiveness is often a hundred times that of the average man. Taking one faculty—that of memory—there have been many instances of such prodigious power in this faculty, that it seems miraculous when compared with that of ordinary men. This innate difference of different

human brains is a thing to be taken into account by the hygienist. It would be a perfectly futile and useless task to attempt to make one brain like another. Unfortunately many modern educational theorists seem to go on the principle that every boy could be made into a Darwin or a Parr if only pains enough were taken with him. Every human brain has from the beginning, through heredity and innate capacity, fixed limits of power in all directions, beyond which no efforts, no teaching, and no favourable environment will make it any stronger or more powerful. Fifty years of exercise will not make the blacksmith's arm stronger than it is after the first year of exercise. It may be laid down as an axiom in Mental Hygiene that it is far better not to approach the limits of power of any part of the brain than to push exertion up to those limits. Nature generally provides much reserve power in every organ, more than is needed for everyday use. She is prodigal of capacity in a healthy organism, but one is never sure where the weak points may come in. Especially we are often ignorant of the transmitted weaknesses by heredity until it is too late. It is doubtful if any child is born in a civilised country without some inherited brain and mental weaknesses of some sort or in some degree. There are many cases where, through a certain precociousness of development, a child seems to have certain faculties in great strength but where the brain basis of those faculties seems to give out early, and in reality they show themselves weak instead of strong in the long run. I have known a child with an extraordinary memory at eight who at fifteen could scarcely remember anything at all. To push education or acquirement, mental or muscular, beyond the capacities originally provided by nature is to do certain harm.

Brain and Mental Habit.—It is one of the innate

qualities of every tissue and every organ in the body that when any vital action is done, any vital process gone through, it is easier to do it the second time, and the continuous exercise of it makes its performance more and more easy. This fact is of enormous importance in Mind Hygiene. The combination of action of one group of brain cells with another group becomes easier every time it is done. This physiological *doctrine of habit* especially applies to the working of the muscles and of the brain. During the developmental period of the brain up to twenty-five this is especially provided for, and is of especial importance. There are habits of movement, habits of sensation, habits of nutrition, and habits of mind, all depending on the same law. Every one knows that the movements needed to play the piano are at first difficult and tiresome, but that by constant practice a habit is formed so that those movements become automatic, needing no thinking, and involving no mental fatigue. Robert Houdin in early life, by constant practice, could keep four balls in the air at once, and he could do this while reading a book ; thirty years after he could only keep up three. Go higher in brain functions, and take an example from its most important function of all—that of inhibition. A child, at first, tries to grasp anything that is bright or sweet. When control is frequently exercised and taught it becomes quite easy for it to refrain from taking any object, however tempting. To think out a simple mathematical problem is to most people hard at first, but the brain habit of exercising the judgment in this particular way is soon strengthened, so that it becomes quite easy. There are, of course, limits to habit acquisition, but without it the brain would be a most inefficient organ. If everything we did and thought were as difficult as the first time we practised it, mankind could have made no progress from the lowest savagery ; indeed, it is very questionable if

man could have lived in the world at all. Habit acquisition is closely allied to memory when both are looked at physiologically. It may, in fact, be called a brain memory. Different mental and muscular centres form associations by constant use together, and those associations remain as a permanent mechanism in the organ. To avoid bad brain combinations is specially important. In the young child it has been proved scientifically by Fechner that new strands of fibres are formed continually and new connections made between different groups of cells, as the new mental processes go on from the simple to the complex. Develop and encourage right brain-cell connections and action is the hygienist's rule, "form good habits" is the immemorial motto of the parent, the teacher, and the moralist: they are the same thing put differently.

Mental Faculties, Instincts, Appetites, Vitalities, and Organic Necessities.—It is only necessary here to refer to the metaphysical assortments of purely mental action, otherwise called mental faculties. Standing as the basis and conjunction of them all is consciousness, or the *ego*. The metaphysician holds the mind to be one and indivisible. This is so far true psychologically and physiologically. The innate solidarity of action of the whole brain, of which I have spoken, is its physiological correlative. Then come feeling, perception and emotion, ideation and judgment, volition and inhibition, power of attention, representation and imagination, association of ideas, the moral faculties, the religious instincts, and, lastly, that faculty which renders them all possible—memory. Next comes that faculty which chiefly ties together body and mind in mankind, viz., speech. Then we have the instincts which provide for the life and the continuance of the species, viz., love of life and desire to reproduce, the instinctive love and care of offspring being closely related to the latter. The gregarious and social instincts

form an essential part of the life, and of the evolution of man and of the higher animals. The appetites for food and drink, and air and light, combine bodily and mental aspects. It may be said that every tissue and every organ hungers for appropriate nourishment as an organic and vital necessity. If any one of them does not receive such nourishment, there is produced and revealed to consciousness what may be called an organic unhappiness and craving. There is not one of those faculties and instincts that does not need to be taken into account, more or less, in any system of Mental Hygiene.

Speech.—The study of no faculty of the brain is more interesting or more important than that of speech. It is an attribute of man alone, though there are in the lower animals sounds and gestures which are its humble representatives. Speech implies muscular movements, motor nerves, the sense of hearing, and the exercise of the mental volition. Most students of mind, even those who do not base their conclusions on physiology, have concluded that the existence of speech is of such essential importance in the evolution of mind that no abstract ideas could have been attained without it. Thinking without speech would be of the most primitive and simple kind. In its higher development in the best brains of civilised mankind, it is able to give outward expression to the most abstract ideas and the intensest feelings of man. Looking at its physiological and anatomical basis the large groups of nerve cells, which form the "speech centres," are localised in the left side of the brain. When these are destroyed by disease or accident in any man he ceases to be able to express himself in articulate, appropriate speech, and becomes "aphasic." When such disease is extensive, and affects the centres of hearing and sight, the patient not only cannot speak, but he does not understand

the import of words spoken by others, nor of words seen in the pages of a printed book. He cannot write, and he does not understand writing. The speech groups of cells are connected above by their fibres with the higher mind centres, and below with the motor centres of the tongue, the mouth, and the throat. When we consider that there may be laid up in the molecular constitution of those cells thousands of symbols or words, and that through those words the centres have to express the intensest human feeling or the most subtle human knowledge, we can in that way realise the marvellous delicacy and scope of this piece of machinery. When we also consider that in the newly born child speech does not exist, and that its machinery is in an absolutely nascent condition, that during its slow development in the growing child speech may take on any form, from the rude phonation of the barbarian to the intricate inflection of the Chinese language, with its 43,000 characters, there is evidently scope for scientific processes of speech-teaching and speech hygiene. The mind centres express themselves in purely physical ways through speech, and the speech centres react in purely physical ways on the feelings and the ideas of the mind centres. Speech, in its making, is the most wonderful combination of mind action and muscular action to be found in nature. It is an easy thing to allow any child to speak harshly, carelessly, and unintelligibly. It is not a difficult task to teach the intelligent brain and vocal organs of a civilised child to speak in a clear, precise, and pleasurable way. Infinite attention has been paid to the vocalisation of the singer. Comparatively small efforts have been made, in a scientific way, to render the speech of the educated man and woman harmonious and fully expressive. No mind can be said to be well trained where the speaking apparatus has been neglected.

CHAPTER IV

GENERAL PRINCIPLES, ESSENTIALS, AND IDEALS OF MENTAL HYGIENE

BEFORE entering on the special applications of Mental Hygiene to the ages and conditions of life, I desire, in this Chapter, to lay down certain principles of universal application. This is necessary, in order to give a solidarity to the whole subject and to render repetitions as few as possible.

Food and Appetite.—Mental Hygiene must have, as its basis, the proper nourishment of the body and the making of good blood. The first matter to be considered, when one treats of food, is appetite. That is the mental correlative of food. The appetite is generally impaired in both mental and bodily weakness and disease. The want of appetite, or a perverted appetite, means that the processes of tissue metabolism and chemical change and waste which are going on in every organ, and, as we have seen, go on so rapidly in the brain, are disordered in some way. In a healthy organism building up and wasting are simultaneous and compensatory. Wastage is always in the process of being counteracted, and the appetite is, or ought to be, the mental signal that the organism needs more fuel. In youth, and in health and strength, the appetite for food is a periodic and recurrent sensation, which itself gives pleasure. To a certain extent it is under the

control of habit, but the man or the woman or the child who is not hungry at least twice in the twenty-four hours cannot be said to be in a normal condition. Almost the first thing that a doctor asks in regard to any patient is, "How is the appetite?" and if he receives in reply that it is bad or absent, it at once suggests the questions, "What organ is not doing its duty? What vital process is incompletely performed? Are the residual chemical products of tissue waste not being properly eliminated? Are the nerve centres of nutrition doing their work? Is there any higher mental inhibition, which is arresting this primary proof of health? Is the patient mentally happy? and if not, why?" It is a mere truism to say that appetite may be completely and at once arrested by a strong mental process, especially if that is of a disagreeable kind. The appetite may be impaired either by a want of proper digestion of the food in the stomach, by an improper digestion further down in the bowels, by an imperfect elimination from the lower bowel, or by an imperfect action of some other parts of the digestive apparatus, such as the liver or pancreas. Any one or all those things have to be taken into account by the physician who wishes to restore the appetite. The appetite may also be impaired through the imperfect performance of the subtler processes of the blood formation or the nutrition of the tissues themselves. The study of the composition and quality of the blood has made great progress of recent years. The more it is studied the more complicated and the more important it is found to be to the body in general, and to the brain and mental working in particular. It consists of a nutritive fluid, in which float a large number of cells of different appearance, and with different functions. The most numerous of these, the red corpuscles, carry oxygen to the tissues of the various organs of the body, without which they cannot work, it being especially necessary to the brain activity. When those

corpuscles lessen in number we have the condition called anæmia, or bloodlessness, which is a common accompaniment of many forms of brain disorders and of mental disturbances. When there is an infection of the system through injurious microbes, the leucocytes become enormously increased for the purpose of fighting and destroying these microbes. There are certain forms of mental disorder where this increase of leucocytes, called "leucocytosis," is a very important symptom. The blood ought to be carefully examined in all conditions where there is mental languor, irritability, or marked excitement.

Air.—An abundant supply of pure air to the brain, through the blood, is essential to its working. The lassitude of the occupants of an overcrowded church, the inattention of the scholars in an ill-ventilated school, the irritability, the headaches, the feeling of organic discomfort of the persons who live in ill-aired rooms, are all danger signals and cries for more oxygen by the brain.

Other Needs.—There are certain other physical essentials to mental health. Light, colour, heat, muscular exercise, housing, right employment, mental and bodily, are all of the greatest importance. As we have seen, the brain registers every impression made on it from within or without. If the impressions are those of discomfort, gloom, darkness, and ugliness, those things being inharmonious to the constitution and working of the brain do harm and tend to set up a bad habit, which we should stop as soon as possible. The sight of the sea smiling in the sunshine is, for instance, a healing agency and nerve tonic of the most powerful kind. Many persons run down in nervous health, and convalescents from all diseases find nothing so healing as such agencies. To live in a gloomy house, with dull, ugly wall-papers, and no sunshine entering into the living-rooms, may produce in their inhabitants want of appetite, bad nutrition, and mental depression. All those

agencies, therefore, enter into Mental Hygiene. To make the environment favourable, tonic and bracing should be the first consideration. Reduce organic discomfort, produce organic pleasure. Take a large and physiological view of the brain and mind condition in every case.

Strengthen the Defences.—I have spoken of the brain quality of resistiveness. To fortifiy this is an essential condition of keeping the brain and mind strong and in good working order. To strengthen all the defences, is indeed one of the most important considerations in our science.

Education in a General Sense.—I shall treat of education in the technical sense when I come to speak of childhood and youth, but, taking education in its larger sense, as comprising all the influences which affect the mind and body of a child, it is incalculably important as a hygienic measure. The mother, in the early stages of her child's life, through her natural instincts, cannot help realising very fully that the baby has a body as well as a mind. The technical educationalist is very apt indeed to forget this. In a certain sense, the amount that a child learns during its first years before ever it goes under the schoolmaster nearly equals all the rest of its education put together. This is essentially the formative period in the life of the brain cells. They are shooting out their dendrites (fibres) in all directions, and what is being written on them—that is, the impressions they are receiving—may last for the lifetime. The cells which receive the impressions of the mother's smile are thereby acquiring a source of perennial joy and health. During the whole of the educative period the mental qualities of imitation, acquisition, attention, memory, and imagination, have to be very carefully built up on right lines and practised in right directions. Above all, the inhibitory or controlling processes need to be judiciously strengthened and developed. They are the

physical equivalent and correlative of self-control and morality in the after-life. A right study and care of those basal attributes of mind may make all the difference to the life of the individual. The feeling and emotional function of the cells will take care of themselves. Many evolutionists tell us that the child's natural moral qualities are those of the savage and the lower animals; that envy, selfishness, greed, cruelty, and egotism are rampant in its constitution. The modern scientist seems to have little belief in the innate goodness of the human infant. That, he says, has to be acquired, and the evil qualities have to be antagonised. The child has to pass through, as a life experience, the savage and selfish phases of its remote ancestor before evolution and natural selection strengthened the good qualities and civilised life made them possible in practice. If the theory of evolution is right, it is no wonder that the doctrine of original sin was a very essential part of ecclesiastical belief. As a Christian doctrine it is somewhat hard to believe that it is a fact which harmonises with the idea of a wise and beneficent Father of all ordering all things aright. No one, however, who has had to do with children, and studied their natures, but must admit that both the evolutionist and the Churchman have many facts to back up their theories. It is very clear that there is room for the Mental Hygienist, working on scientific and psychological lines which certainly include ethics in their scope. He has a great field before him in the early years of a child's life. It is to be remembered, however, that good qualities, as well as evil, are hereditary. Some children are angelic through heredity, and all have some of the angel as well as of the demon in them. The good and the bad are largely determined by law.

Innate Differences in Brain Capacity and Qualities.—All children have much in common, but they also show

enormous differences all along the mental lines. Those differences are clearly innate, and in many cases radical. I shall presently have to refer to the investigations of the scientists and psychologists in regard to the normal order of the development of faculties and functions in the human brain. At present I have to emphasise it as a principle in the study and practice of the Mental Hygiene of the child, that the differences, as well as the resemblances, must be studied and taken into account. It is certain that all weak points cannot be strengthened, that the brain of the ordinary child can never be made quite like the brain of a child who is to turn out a genius; but, on the other hand, weak points are capable of being strengthened in many cases by judicious care and effort. Everybody has known the cases of children brought up by a judicious mother or nurse to be changed remarkably in character and conduct as the result of an almost unconscious study on that mother's part of her children's brain and mental constitution. By working on the affections, by rewards and punishments, by gentle pressure and subtle tact and trickery, by insistence that took no discouragement—such mothers have added to the world's happiness and to human efficiency. Especially are such difficulties as I am now speaking of to be found in families of nervous parents. I fear I must add to nervous parents many of those of marked intellectual force, and especially of keen sensibility and of intense religious instinct, though not reckoned "nervous" at all by the world at large. The children of families in which insanity and drunkenness have been common need especial care in their education. It seems as though, in the slow evolution of the human brain and the natural selection of the higher qualities of that organ, that the risks of failure and the need of well-directed effort become greater. The finer the instrument, the more it seems liable to go out of tune; and this tendency is

most markedly seen in the children of families "of distinction." To have got a human brain of very high quality, and especially to have got a family each member of which has such a brain, implies a previously severe process of selection during evolution. The average and the bad had been, perhaps, unduly eliminated in the process.

Social Instincts.—The social instincts of the human being, of which I shall have much to say, are greatly important in the formative stages of the human brain. That they must be taken into account in any system of Mental Hygiene goes without saying. It is certain that their basis appears in the cells of the brain at a very early period of life. A right training of the social instincts is beyond any doubt one of the most important means of securing happiness to the individual and order to Society. It is no wonder that at the present time the science of sociology is rising to great importance. The child's or the youth's relation to others, his affection for others, and his altruistic practices, all go to the making of society, citizenship, and patriotism in the race. A man cannot be said to be healthy mentally whose social instincts are poor or perverted. When a man is becoming disordered in mind, commonly one of the very first symptoms is the diminution of his social instincts. Notoriously the insane are a-social. The social instinct is one of the highly educable parts of the constitution of a human being.

Sex Study.—The hygienic study of the relations between the sexes, and the male and the female characteristics, is one that cannot be neglected without harm. I shall afterwards have to dwell on this aspect of Mental Hygiene. Here I merely lay down the principle that this part of the study of the human brain and mind is one that may be fruitful of the highest practical results, and that it admits, to a much larger extent than has hitherto been realised, of a popular treatment, on scien-

tific lines, which would steer a happy mean between a too great attention and a deplorable ignorance.

The Ideals of Mental Hygiene.—Every science must have an ideal as its goal, and every effort to benefit humanity must have this before it as its chief incentive and inspiration. It does not matter much whether the ideal is attainable or not so long as it is there. The ideals of Mental Hygiene are, in the first place, a happy childhood with the brain functions and the mental faculties unfolding in their natural order. Such a brain should be receptive in the highest degree to the innumerable stimuli that are rushing into it every moment from the senses. It should be neither too sensitive nor too obtuse. Every stimulus of a natural kind should produce pleasure. The power of acquisition should be great and should need little systematic teaching. So should glee, play, nascent capacities for work, imitativeness in all directions, instinctive reverence for father and mother as the personified deities of authority, keen social faculty, exhibited chiefly in the cravings for the presence of brothers and sisters, the inhibitory faculty, absent at first, gradually but very slowly growing into a habit, love of animals, delight in sunshine. Symbolism is markedly present. All the tastes and appetites should be natural, and even the a-social barbaric instincts of selfishness with some cruelty and destructiveness should be present in only normal amount. Such should be the ideal child in mind and brain up to seven years of age.

The next stage is the school age from 7 to 15. Then comes the perfecting of the instinctive habit of co-ordinating muscles and mind together so that the hands can do what things the mind directs, and the body can exert itself without effort, with grace and with force. The educative process at school, if conducted on proper lines, should not cause real discomfort. Acquisition of all sorts, especially by the

memory, should be easy. Bad example should not make indelible impressions. The superstructures of conscience, duty, and religion are laid, but with no troublesome reasoning about them. Play and air are craved for as necessities. The feeling of honour in playing games or in screening a schoolfellow is acquired. Vague realisations come in towards the end of the period that duty, self-restraint, and altruism are an essential part of life.

Then comes the period of adolescence, between 15 and 25. This stage is the crux of life. The acquisitions then made are critical in the extreme, and often final. The real love of right, hatred of wrong, duty, conscience, religion, become solid and effective in forming "character." Far-away ravishing glimpses of poetic feeling, pleasurable altruism, citizenship and patriotism, show themselves in the earlier stages, and give direction to life at the later. The capacity to feel pleasure reaches its greatest intensity. The sex relations are built up on safe and natural lines, controlled by certain instinctive natural delicacies, by morality and religion. An ever-increasing power of inhibition rises up during this period, until its exercise becomes a formed habit and even a pleasure. Music, literature, and art, imaginative works of all sorts mix themselves up with sex feelings, so that the two help to form the emotional nature. An abounding capacity to work, with real joy in work, is acquired. Love between the sexes is capable of assuming an all-dominating influence.

Manhood and womanhood from 25 to 55 assume strength, beauty, power of command, originality of purpose, ambition, and a larger sense of what life means. In short, the efficient instruments of doing the world's work are created. Fatherhood and motherhood soften and sweeten life.

The retrogressive period of life, after 50, should mean

restfulness, philosophy, wisdom, charity, philanthropy. Strong exertion of mind or body is not craved for as in the earlier period. There should be no irritability, no senile selfishness, and a large consideration for others should be exhibited. Poetry, love tales, and sex have ceased to set the brain on fire. The brain cells are diminishing in number, lessening in size, and not capable of the same output; but this process should be a very gradual and almost an imperceptible one. Lots of work may be done if it is done quietly. The failure of memory and activity should come slowly and give no pain. The process of dying should be calmly regarded and accepted as simply a fact of nature like the process of birth. There should be an instinctive reliance on the greater energy of the young in return for the reverence which is paid by it.

Nature is so prodigal in her gifts of resistiveness and recuperative energy, and her attempts to attain her ideals are so strong, that in some instances a man with an apparently bad heredity, a bad education, and bad environments will largely attain them. This is the great hope for the handicapped in life. Nature, though mostly red in tooth and claw, yet is ever capable of organic mercifulness. She steadily works out her two great tendencies—the one to end a bad and tainted stock, and the other to go back to the average type. The aim of Mental Hygiene, and of all hygiene, is to help the saving and to restrict the deteriorating tendency. When an instructed and philanthropic Glasgow public authority drafts off 100 scrofulous, sickly and starved children of the slums to share the home-life of Highland farms, it is found that a surprising percentage of them react to the better environments and turn out sturdy and useful men and women. Nature is not so unkindly a stepmother if we have the wit to humour her.

CHAPTER V

HEREDITY, TEMPERAMENT, AND SOCIAL INSTINCTS

THE study of heredity is admittedly one of the most difficult branches of science. It has been tackled by some of our greatest modern scientists, including Darwin himself, who put forward a theory of his own. Weismann, Lamarck, and Mendel are also among its greatest exponents. To read some of the views of the writers on heredity one might almost suppose that it was entirely a theoretical matter referring to scientific doctrine. The plain, and so far intelligible, old doctrine that "like produces like" has been so obscured by theories as to the precise way in which ancestral likenesses and qualities are transmitted, that the whole subject has become unduly complicated. The first thing to be kept in mind is this—that confusion and doubt have not arisen because of any uncertainty that like always does and always will produce like under the same conditions. Biologists are all agreed that when we go down to the beginnings of life, to the unicellular organisms, each individual consisting of one cell containing its own protoplasm, and with no relationship to any other cell except by casual contact, those organisms will, under the same temperature and in the same media of air and chemical surroundings, always produce the same kind of cell. But even in those most primitive examples of life, the environment or condition cannot be always the

same, and minute differences do arise which scientists call "variations." The existence of variations is at the root of the doctrine of evolution. Out of such variations and their progeny have arisen the higher forms of life, and those most fitted to live by special adaptation to their environment. Can such variations be caused by changes of environment? is one of the burning questions of science. It is now held by most biologists that in the case of those low unicellular organisms, that such variations may be caused by changes of environment, and that the variations so produced are capable of transmitting their special characters to their descendants. When the same doctrines are applied to human beings the conditions are found to be so enormously complex that it is doubtful if the laws in regard to heredity which apply to the unicellular organism are also applicable to the human organism which possesses thousands of different forms of cells attached to each other, influencing each other, and together forming a living organism, with a wonderful solidarity in its general working.

The importance of those questions to man is at once realised when we consider that on their solution depend such practical issues as the following: Are the mental faculties of man, as developed by civilisation, by morality, by religions, and by a highly complex social system, capable of being transmitted hereditarily to successive generations, or have they all to be taught from the beginning to each child? Are the effects of bad food, vitiated air, excess of alcohol, and the use of various poisons—all these being admittedly hurtful to the individual—are they capable of being transmitted to descendants and so setting up what may strictly be called a degenerative process in the race? The great controversy in regard to heredity now ranges round the following three questions. Are the effects of environment

on the individual, be they good or bad, capable of hereditary transmission to descendants? or is such transmission strictly confined to qualities, good or bad, that have been inherited from the parents? or is there such a combination of both influences possible that inherited character chiefly, but environmental influences also in some degrees and ways, also influence descendants, and become heritable? The extreme advocates of the non-transmissibility of any environmental effects in man are represented by Dr. Archdall Reid, whose book on the *Principles of Heredity* has lately appeared. He has the highest opinion of the study of heredity in its results, both on its students and on human life, disease, and society. He says: "It seems to me that no kind of study can be made to bear intellectual fruit of nearly such value as the study of heredity. It lies at the root of every science and every study connected with life, from botany and zoology to medicine, sociology, or pedagogy. Who knows it not knows not life except in its superficial aspects."

"He may be a student of philosophy, or a worker in biological science, but in these days, when heredity enters so much into philosophy and links together so many biological sciences, he cannot be a very effective thinker or worker."

"It furnishes a master-key to the more tremendous events of history, and it is our only hope against disasters that loom great and terrible in the near future. It goes deep down to the springs of human life and thought and conduct, and explains why some nations are inheriting the earth and the fruits thereof, while others are dying physically or mentally. The philanthropist must know something of this science, or he will grope in the dark. The statesman must know something of it, or he may labour in vain. Transcending all else in importance is the educational value of heredity.

No nation in which a knowledge of it was widespread could possibly be stupid or brutal." If there is any truth whatever in those strong opinions by Reid, then undoubtedly heredity must play a great part in Mental Hygiene, being the hygiene of the highest of all the cells—the higher brain cells. On those brain cells act the highest and the subtlest of all forms of environment, viz., those of emotion, of passion, and of beauty. No one can deny that the worst effects on the individual of certain unfavourable environments, such as bad social conditions and alcohol, are on the brain. If the securing of good environment will not only benefit the individual, which no one can deny, but will also improve posterity through the transmission of their beneficial effects, then indeed we have an argument for improved human environments which is irresistible.

All the recent scientific authors have come to the agreement that the body generally does not directly transmit environmental effects to posterity. This is done through what is in reality an infinitesimal part of, or, as the latest theorists would say, attachment to the body, the germ cells. It may be accepted that if the effects of environment are transmitted to descendants, this is done through those germ cells, just as the ancestral qualities are so transmitted. Those who argue against such transmission very naturally say that the evils of most bad environments act on the body and not on the germ cell. In what way can they then be transmissible? The latest theory of heredity is that put forward by Dr. Beard, of Edinburgh. It would be quite impossible for me to give anything like a full detail of that theory in the space at my disposal. It is so full of technical terms and implies such a profound knowledge of physiological and biological sciences that it is difficult even to lay down its principles so that they shall be popularly understood. But

one may say that the leading idea of Dr. Beard's theory is that the germ cells in all the higher animals are a direct continuation of the original primal single-cell organism. He talks of those cells being so distinct from the rest of the body, even from the embryo in utero, that they only pass a part of their lives within the body. There is, in fact, a direct continuity of such germ cells, as germ cells, apart from the rest of the body from the lowest animal up to the highest, and from the first and lowest of savage men up to the highest. An enthusiastic follower of Beard—Dr. Ford Robertson—traverses Dr. Archdall Reid's position and denies his proposition that "inborn characters are known to be transmissible from parent to offspring." Dr. Robertson says: "This teaching can no longer be regarded as accurate. Offspring, as far as can at present be determined, inherit no character whatever from their parents. Offspring are merely the realisation of the developmental potentialities of converged ancestral lines of germ cells. The distinction between inborn and acquired characters has really no justification in modern scientific fact. The definition given by Dr. Reid will not bear scrutiny." Then, too, Dr. Robertson further says: "In regard to ontogenetic evolution" (that is the development of the individual), "I would add that, although there is no inheritance of parental characters, there is an inheritance of environmental influences, to which, indeed, all that is of any importance in human ontogenetic evolution is directly due. Cut out of man's environment what Professor Karl Pearson terms 'the tradition of acquired modifications,' and his ontogenetic evolution will proceed no further than that of the brute. All the acquirements of literature, art, science, social customs, etc., form an environment to which man's inherent potentialities of development are capable of responding." When original authorities and students of heredity thus disagree in the very essence of their doctrine,

the intelligent lay public may well be pardoned for applying ordinary common sense to the subject, and physicians of large practical experience may be forgiven if they adhere to the generally accepted theory that a bad, ill-nourished mother and a drunken father will produce between them a bad progeny, which progeny again will, in spite of any amount of favourable environment, often produce a very doubtful stock. As Dr. Robertson says: "Germ cells require to be nourished like other cells. The laws which govern their nutrition cannot be different from those that govern the nutrition of the somatic cells (those of the body) which have arisen from a germ cell. Professor Cossar Ewart, as the result of practical experiments in hereditary characters, says that the germ cells are liable to be influenced by fever and other forms of diseases that for the time being diminish the vitality of the parents." Dr. Robertson quotes Sevatico-Estense, who mentions the case of a healthy woman married to a drunkard. She had five weakly children, all of whom died in infancy. By a second husband of sober habits she had two perfectly healthy children. The connection through heredity of such brain diseases as idiocy, imbecility, and insanity, with excess of alcohol, is very strong indeed. Dr. Reid, in opposition to this, says "that if alcohol injuriously affected the germs the effects would accumulate generation after generation till the race became extinct." Dr. Robertson replies: "This does not in the least follow, for the contribution from other ancestral lines of germ cells may counteract the tendencies to genetic variation produced by chronic alcoholic poisoning."

One of Dr. Reid's fundamental positions is that disease agencies, poisons, and certain deleterious influences tend, by destroying the weak, the intemperate, and the vicious, to leave a remainder which has acquired an immunity against such destructive agencies. Logically

his hygienic rule would be—"Let the weak and unfit come to an end." Dr. Ford Robertson vigorously argues that disease is a cause of human evolution through destruction of the weak only in a very limited sense. He says: "Dr. Archdall Reid asserts that diseases of parents do not affect in any way, neither for good nor for evil, offspring subsequently born, at any rate through inheritance, properly so called, that 'temperance reform is impossible from the biological standpoint,' that 'temperance reformers have failed because they have entered into a contest with Nature' and that 'every scheme for the promotion of temperance which depends for success on the abolition or diminution of the alcoholic supply, is in effect a scheme for the promotion of drunkenness.' He simply shows, it seems to me, that he has wholly misunderstood the biological significance of disease." Dr. Reid says "that the craving for alcohol is an instinctive special inborn character." Dr. Robertson contests this and says that it is "a mere specific habit." Dr. Robertson's conclusions, in regard to the bad effects of alcohol, both personal and hereditary, are the following: "My study of the question forces me to the conclusion that the effects of alcoholic intemperance upon the people of this country are much more grave and far-reaching than has generally been suspected. Most people have seen with any degree of clearness only its more immediate effects. The influence it has upon the race has only been dimly suspected by a few, and they have been derided as ignorant and unscientific. The evidence of science is, I maintain, entirely on their side."

It was right that I should have quoted the opinions of those recent writers on heredity, in its more medical and practical relations, if only to show that this important subject is still in the process of investigation and that as yet there is much doubt as to whether such definite laws

can be laid down in regard to its nature as would be accepted by all scientific and medical men. I shall have occasion to refer to "atavism," or the passing over several generations of undoubted hereditary characters. We are all agreed in regard to one important conclusion as to heredity, that is, the fact that hereditary defects may occur in two forms—the one is that of definite provable changes from the normal structure and functions of the human body, such as the small brain and defective mind in many forms of idiocy and epileptic affections in early life and the paralytic affections of infancy. The other is that defects may occur which are not visible in early life or provable either in bodily structure or functional process, being then only tendencies and potentialities. The latter are as real facts as the former though not at certain times in the life of the individual demonstrable. Examples of them are seen in tendencies to mental disease and liability to certain forms of paralysis in individuals who at one time seemed to be quite healthy and free from defect. Such are of the greatest interest to the hygienist because in many of them the actual defect of disease is brought out by exciting causes, which may, in many cases, be avoided or counteracted. That is one of the greatest fields that exists for the future preventive and hygienic physician. If defects of heredity were all irremediable the future of humanity would be a dark one. I have no sort of doubt, as the result of my experience of forty years of the medical study of disordered and undeveloped mind, that heredity comes in as a causal agent in a greater degree than in any other disease. I cannot doubt, therefore, that in the whole process of development of the brain cell, which is the vehicle of mind, whether in its strong points or in its weak points or in its liability to disease, heredity is the dominating factor. On a man's ancestors it mostly

depends whether he is to be a fool, a genius, or a madman, or whether he is to be a success or failure in life. This is not in the least inconsistent with the fact that the brain cell and its function of mind is also more amenable to the effects of environment or education—good or bad —than any other cell in the human body. The two facts are not contradictory but complementary. They both are proofs of the high attributes of the highest bit of organized matter in Nature. They imply the profound influence heredity plays in Mental Hygiene. A bad nervous heredity means mental unresistiveness to the causes of mental weakness and ill-health. The margin of security is less. While a man who has a good heredity may with impunity take many liberties in the way he uses his brain, this is not safe if he has a bad heredity.

There are modes of upbringing, of education, and of conduct in life that should be avoided where a man is handicapped by a bad heredity. There are special precautions and attention to physiological law which would save the minds of many men with a bad heredity from passing into inefficiency and actual disease. While heredity implies a potentiality towards good or evil it commonly needs a special exciting cause or combination of causes to bring out visible effects. It is a fate which may be averted by knowledge and the practice of law. Take the excessive use of alcohol as an example—the father and mother of a boy have indulged in it before and during his life *in utero*, he has been poisoned *in embryo*, they have both acquired an uncontrollable craving for it, the boy has thereby acquired a weak constitution, probably neurotic in its character, and his development of body and mind has not been perfect. Few students of heredity would say that he had necessarily acquired the special craving for alcohol from his parents. All that is affirmed is that his power of mental inhibition would

probably be weak and his defences generally below par. The reserve stock of energy and resistance which every really healthy organism possesses is weaker in him. He would not be able to withstand social temptations, and alcohol would have a quicker and worse effect on him than on his parents. He would sooner acquire a stronger craving for it than they had. But, on the other hand, if his health in childhood and youth were specially attended to, and his body and brain thereby strengthened, if his education were made a specially suitable one, if he selected an open-air occupation, if he took no alcohol, if during adolescence especially he were guarded from severe temptation, all these influences would be likely so to strengthen his mental inhibition and antagonise his heredity that he would not fall into the alcoholic condition, and might even procreate mentally healthy children. Nature's law of striving to attain her ideal would have a chance of coming in. Everything, of course, depends on the strength of the evil heredity. Any environmental influence which weakens the constitution of the parents or poisons their blood and tissues, undoubtedly in some degree unfits them for parentage. It is a safe working hypothesis, apart from any theories of heredity, to assume that bad environments, mental and bodily, on parents will have a bad and reducing influence on children. Medical instinct and experience, as well as the common sense of mankind, strongly go in support of such an inference. The scientists are equally divided in theory as to whether personal influences can become heritable. To take precautions is therefore the part of wisdom. They do good apart from any theoretical views; their neglect may do infinite harm to unborn generations.

The following may be laid down as the chief rules of Mental Hygiene in its relation to heredity.

1. Carefully ascertain all the facts as to the hereditary

defects and tendencies, especially in regard to the brain and nervous system of ancestry and near relations, be they good or bad.

2. Face up those facts in an honest and truthful way, both to yourself and the doctor whom you consult. To conceal or to minimise them is both cowardly and foolish.

3. In forming conclusions and in laying down rules of practice always make considerable allowance for our ignorance of hereditary law, for errors, for atavism, and for Nature's two tendencies to destroy the very unfit and to hark back to the ideal.

4. You are entitled to the benefit of the doubt.

5. If there are hereditary facts endeavour carefully to estimate their strength and import. Some such facts are strong and unmistakable, others are slight and of small import.

6. Where the heredity is bad let a careful examination be made into the bodily form, functions, and mental faculties to ascertain if there are in any of them existing defects that can be seen and proved. Are the size and shape of the head normal? Are the ears, eyes, and facial features symmetrical or irregular? Are the muscular action, the gestures, and the attitudes of the body normal? Are the reactiveness and sensitiveness of the brain too high or too low? Is there any precocity or backwardness of brain and mental function? Are the moral feelings and social instincts changed? Are there any peculiarities or idiosyncrasies in the person examined? Are all the sense organs normal in action? The results of such an examination may give valuable hygienic indications.

7. Supposing there are no visible hereditary defects of form or faculty, there still may be deadly lurking tendencies to mental evils. I have seen many young persons of almost ideal physical characteristics who

became subject to attacks of nervousness or insanity that were clearly hereditary in character, or who entirely failed in aptitude for doing their work, or who became vicious from obviously psychological peculiarities, or who became weaklings or nuisances to society from brain defects.

8. It may be held as certain that bad environments, bad education, bad food, bad air, unsuitable occupation, mental shocks and stress, the effects of disease, unsuitable marriages will all bring out latent tendencies towards mental inefficiency or disease. Many of these could have been avoided or counteracted if sufficient knowledge of hereditary risks had been acquired at early enough periods in the lives of the persons affected.

9. It must be kept in mind that hereditary defects act as "weakeners of the defences," through which mankind resists disease and death. Many of the so-called bad symptoms and evil effects of disease really result from Nature's attempts to counteract and heal. Physiologists and physicians now know that we chiefly die, not from disease, but because our defences against the innumerable enemies of our lives have become weakened. "Strengthen the defences" has therefore become a prime motto of the hygienist. To over-press and to over-educate the brain of a child in whose family insanity or neurasthenia exists may be to diminish its defences and to bring on such diseases, which by other modes of education, or the want of it, might have been avoided.

10. The following are some of the general rules, by the application of which bad mental and nervous heredity may be counteracted. Feed and strengthen the body by every possible means during childhood and onwards. Do not over-stimulate, or over-educate, or over-press the brain. Retard rather than stimulate the development of its higher functions. Let them lie fallow. They

will appear in time in a stronger and healthier form for this process. Watch most carefully the periods of puberty and adolescence. Select occupations that are outdoor, routine, unexciting, and generally wholesome. Observe heedfully the moral, the social, and the religious influences to which such an individual is subjected. Avoid the risk, as far as may be, of bad example. Do not be tempted by early acquirements, quickness, and talent to think that there is, on that account, no risk of hereditary evils. Very much the contrary is often the case.

Temperament.—From the earliest times men have observed that certain bodily and certain mental characteristics are apt to go together. Observations on this point were formulated and classified in Greek times, and formed their "Doctrine of Temperaments." Hippocrates, the father of medicine, who lived 400 B.C., gave a description of the combination of mental disposition and bodily appearance in the gods and the heroes of antiquity. He applied those inferences to the medicine of the age. He and others of the fathers of medicine observed the difference between one man and another in size and shape, in colour and constitution, in modes of action and reaction, in temper and disposition, in thinking and feeling. They saw and published their observations that the diseases to which one kind of person was subject were different in many ways from those of another, and that the treatment they needed was often very different. Those differences they assorted as "Temperaments." They were certainly not correct in their details, but their principles were founded on scientific facts. Many of their temperaments had a basis in nature, and many of their generalisations are true at the present day. Very often they assigned wrong reasons and theories in explanation of the different temperaments, because neither physiology nor psychology was then sufficiently advanced for true inferences to be

made. They described four temperaments—the sanguine, the phlegmatic, the bilious, and the melancholic. Every human being had one of these or a combination of them. Since the times of Hippocrates and Galen, 105 distinct treatises have been written on temperament. The late Professor Laycock, of Edinburgh, was one of the greatest modern authorities on temperament. He was able to adduce the then latest physiological discoveries, the symptoms of his patients' diseases, the facts to be found in the biographies of distinguished men and women, and the looks and actions of his friends in support of his theories. No doubt he was in many ways inexact according to the latest scientific methods, and there is still much vagueness in the doctrine of temperaments. Laycock gave enormous prominence to what he called "the neurotic temperament" and diathesis, and in that he has been followed by most modern authorities. He was, in fact, the father of that great modern department of medicine now called "Neurology." No study of Mental Hygiene can now be effective without reference to this branch of medicine. Galton's *Enquiry into Human Faculty and its Development* is a laborious investigation on truly scientific lines to settle some of the cognate questions which lie at the root of the doctrine of temperaments. The general "make up" of a man, the shape of his head, the appearance of his eyes, the mobility of his features, the texture of his hair and skin, and his kind of movement, are taken into account in the conclusion that the man is of the "neurotic temperament." The nervous temperament has now taken its place instead of the melancholic of Hippocrates. The man of this temperament is in body small, shapely, tending towards a dark complexion, thin skin, with delicate features, a well-shaped head, a quick, bright, restless eye; in figure small and wiry, nervous, highly strung and sensitive, feeling pain keenly and

tolerating it badly, subject to dyspepsia and insomnia. His muscles are incessantly active. He is quick in mind and body, imaginative, keen, sensitive, ever alert, fine in the grain, subtle, fond of intellectual work, not always resolute in decision because he sees there are two sides to every question, often artistic in feeling, ambitious, and with an ill-concealed contempt for fools. When run down, this man is "ill to do with." When he grows old he gets thin, dyspeptic, irritable, and often neuralgic. The diseases he is specially subject to are nervous and mental. Every other disease he suffers from is coloured and affected by his temperament. In him the brain and mind are dominant above all others. There can be no doubt that the hurry and competition of modern life in cities, with its newspapers and telegrams and little time for resting, tend towards the development of this temperament. Men who have it can make their muscles and their bodies work by an effort of will to harmful excess. They create and follow ideals. No one can travel in America and not see that this is the prevailing temperament of the city man in that country. *Punch's* gesticulating Frenchman is one type of this temperament; Rousseau, Nelson, and Dickens were fine examples of it in its strength. This temperament has its special temptations. Alcohol and sedative drugs are two of them. He drinks, not steadily and for social reasons, but for the sake of the effect of the drink on the brain. He is apt when he takes to drink to become an uncontrollable dipsomaniac. This temperament should unquestionably be recognised and fittingly conditioned in early life by the parent and the teacher as to diet, sleep, work, fresh air, and rest. Nature's tendency to keep the nervous child thin should be overcome by specially fattening foods. A tendency to excitability in the temperament should be counteracted by lessened animal food, no alcoholic stimulants, as little tobacco as may be, and strict limits to social excitement.

The hygiene of the other temperaments relates more to body than to mind, and therefore I need say little about them here. The child of the sanguine needs repression and control. He is apt to be rheumatic and gouty and to suffer from diseases of the heart and arteries. It is often combined with some mixture of the nervous temperament. The combination makes the men who do the world's hardest and best work, who follow adventure and discovery and build up new empires. The men of the phlegmatic and bilious temperaments take to study, to routine modes of life; are thinkers, schemers, and agnostics. An excess of any temperament tends to certain definite diseases, and thus becomes what is called by Laycock a "Diathesis."

Social Instincts.—It is a truism to say that the social instincts, which are an innate part of brain life, lie at the root of the family and the community. They are met with far down in the animal scale, even below the vertebrates. Ants and bees live in communities with a complex organisation, the work of the individual being largely subserved to the advantage of the community. Among vertebrate animals, gregariousness was the first evidence of social instinct. There is said to be only one vertebrate animal where the social instinct is so absent that even the male and the female live apart. It may be said generally that gregariousness and what is implied in it have enormously increased the intelligence and the beneficent instincts of animals. It has led to all sorts of ways of subserving the love of life and efforts for its protection, which form the primary instinct of living beings. It is closely allied to the instinct of reproducing the species and providing for the wants of the young, which is the second strongest instinct. Animals which have become domesticated and associated with men acquire social instincts often in a remarkable degree. Among primitive men the limits of the social instinct seem to have been the family.

Every one beyond that was out of the pale and usually an enemy. The more civilised man has become, the more complex and the more important have his social instincts become. It may be said that any individual who is destitute of them is in a pathological condition. In many diseases the social instincts become paralysed. This finds its acme in disorders of the mind, in which a-socialism is perhaps the most distinguishing feature. The insane can seldom combine for any purpose. In many of the chronic and incurable insane there seems to be a complete paralysis of those instincts, so that the individual has ceased to have any need or desire for the presence or the society of his fellow-creatures. The vice of selfishness is intimately associated with a congenital or an acquired loss of the social instincts. The virtue of benevolence represents a transformation of this instinct into a virtue. Citizenship and patriotism represent the social instincts expanded, idealised, and applied for the happiness and life of large communities of men and women. In the healthy child the social instinct is very early and very intensely developed, so that it may become as strong a bond of union between two or more children as it is ever capable of being in after-life.

At the school age it is one of the strongest elements of life, and one of the most powerful adjuncts in the development of mind and body at that period. In adolescence it should assume, if normally developed and rightly guided, a higher tone and a loftier sphere. It should then be definitely allied with the emotions, the morals, and religion. There are very few individuals at that time of life in whom it does not require some regulation. In the female sex it may then become overmastering, and pass beyond the bounds of reason. As between two persons, or small groups of persons, it may lead to a selfish and unsocial exclusiveness of the other members of the family or community. When

combined with maternal affection, it may become one of the intensest of feelings and the strongest incentive to action of any human quality. Its existence in communities has naturally led to all sorts of useful customs, has promoted good manners, and has created much of the law and order of civilisation. Its artificial restriction has led to caste and to class distinctions. In the intense reactions and enthusiasms of the greatest human cataclysm of modern times, the French Revolution, the social instinct asserted itself as one of the three great watchwords of "Liberty, Equality, and Fraternity." "Socialism" is a revival of the social instinct which at present is leading to much legislation and effort to counteract the effects of the political economy and the *laisser faire* of last century. The earnest study of this instinct during adolescence, and its scientific culture on right lines, would do much to mould society on a happier basis, and to do away with many of the terrible difficulties of modern life in cities. It is, of course, connected in the closest way with love between the sexes, and with the amenities and joys of marriage in family life. If the instinct is put under rational regulation in those spheres, there would be a better chance of its taking right forms in community life. It is capable, during adolescence, of leading to intense enthusiasms and strong efforts for the bettering of the whole community. For its management during adolescence one needs to cultivate it where it shows deficiency by providing suitable social intercourse. At this period it is commonly so strong, however, that regulation, rather than direct encouragement, has to be practised. Shyness does not always imply a deficient social instinct, but rather a deficient aptitude for showing it externally. The former life of the Scottish University student sadly lacked social opportunity and encouragement. The consequences were apt to be a lonely, self-satisfied, bookish, professional

man, gawky in manner, without tact and without polish. "Iron sharpeneth iron, so a man the countenance of his friend," was forgotten in those times; but the establishment of University Unions and Societies, as well as the efforts of the inhabitants of Scottish University towns to give the student the benefit of family and social life, are largely remedying the effects of life in lodgings, among our students. In the English Universities the fascinations of associated college life certainly led to an exaggeration of the social instincts, with its idleness, lack of academic earnestness and waste of precious time. The happy mean during adolescence between the old solitariness of the Scottish student and the social dissipation of the English University man would seem best to follow nature's laws and society's needs. In the case of the young woman, the difference is indeed exceeding great between the a-social life of the solitary school teacher or the hard student away from home, and that of the society young woman who is out at dances every day of the week. It is much worse for a young woman not to have her social instincts ministered to than for a young man. Her cravings for social amenities are stronger and her deprivation of them more hurtful. Many sorts of self-denial come natural to a young woman, and some of them do her much good; but this is not the case with the deprivation of right social intercourse. The strain of too much of it is, however, apt to injure her and to cause nervousness, depression, and anæmia. I believe the bloodlessness so common now in our domestic servants is largely owing to their want of natural family and social life. To many adolescents with a nervous heredity or a tendency to that thinness which leads to consumption, want of proper social intercourse may certainly mean hysteria, mental disorders, neurasthenia, or even death. Many young women who take to study, to nursing, and to social work are so intense and so

conscientious that they absolutely require the antidote of a certain amount of pleasant social intercourse.

Love-making. — Closely connected with the social instincts, but having in addition a far intenser emotional basis, comes love between the sexes. This is founded on as radical a quality as heredity or temperament, and is a necessary outcome of the social and reproductive instincts. Adolescence is unquestionably the time of life when this arises and often overmasters every other feeling and every duty in life, but it is confined to no period of life, especially in woman. In its greatest intensity, indeed, it may leave nothing in life, for the time being, but itself. It may absorb all the thinking, overset all the reasoning, supersede all other feelings, turn in one direction all the will power, and dominate the whole conduct. All-absorbing as it may thus appear, I believe that the love-making and the engagements to marry of adolescents, until the later part of the epoch, are essentially shallow and ephemeral. They represent the first outburst, in a spasmodic form, of a force which afterwards acquires real strength, and which is then capable of giving a real direction to the future of the world. In adolescence it lacks depth, responsibility and prevision. Few broken hearts or spoiled lives result from the love-making of early adolescence. My belief is that no young man should form an engagement to marry till his beard is grown, and that no young woman should say "yes" to a proposal of marriage until her form is womanly and her physical strength established. The falling in love and the disappointments connected therewith during early adolescence often lead to hysteria, to attacks of depression, and changes in character and conduct. In such cases there is usually hereditary nervousness or weakness of some sort. The really healthy, plump girl, and the strong, athletic young man commonly fall in love in some sort, or think they do,

during early adolescence, without doing themselves much harm. As to the making of suitable marriages, with some degree of reason and prevision coming into this momentous matter, we scientists were warned off the ground and our advice scouted as utterly impracticable by the general opinion of society. There is no doubt a great deal in this view as human nature is constituted, but I am glad to think that we are not so much out of it in all cases, as is generally assumed. My experience is that nowadays science is so influencing even those "about to marry"—many of them having already fallen in love—that they listen to, and even follow, its dictates in this matter. There is now a universal opinion among doctors of experience that the elimination of mental disease, and of many forms of drunkenness and nervous weakness must chiefly depend on the suitable mating and non-mating of the young men and women of to-day and the future. I can say very definitely, as the result of my own experience, that the proposed marriages that have been given up for such reasons, and the actual marriages that have taken place as the result of health and hereditary considerations, have resulted in greater happiness and a higher self-respect than where prudence and science were thrown to the winds and impulse alone followed. "What has posterity done for me?" was the question, not of a cynic only, but of a thoughtless enemy of his kind. The man who feels no responsibility for the future of his own possible progeny, and of the race, is indeed a man wanting in the higher reason and the altruistic principle. I say, with a deep sense of responsibility and as the result of much experience, that before this, the most important step in most lives, is taken, the inquiries by each of the parties to the life contract, by their parents and their doctors, as to heredity, temperament, and health, cannot be too carefully made. I have seen examples of the wreck of life's happiness and success of the most

painful kind, from the lack of such investigations. Speaking generally, the neurotic constitution should not marry the neurotic, although there is an undoubted affinity that leads directly to this. The quick temper should marry the phlegmatic, the calm should marry the impulsive, the very intellectual and æsthetic should marry the practical and common sense. But let it be understood that I am in no way advocating in the slightest degree any marriage union where no true affection exists. After all, emotion must be the dominant note in this all-important event of life. But this emotion is only a means to an end, which is the continuance of the species. I am constantly asked the question, "Should I marry, my mother being insane?" "Should I marry a girl of a family in which mental disease is very common?" A deep responsibility rests on the doctor who has to answer such questions. The laws of the hereditary transmission of disease are as yet far from being definitely settled. In no individual can we be quite sure that the children will be insane, even if one or both parents have actually suffered from that disease, far less if there is a mere hereditary tendency thereto. The law of atavism may bring it on in a man who has had four generations of apparently sound ancestors. Good environments, and favourable conditions may, as we have seen in some cases, antagonise bad heredity. Opposite temperaments in parents may result in healthy children, even if those temperaments were exaggerated pathologically. All those favourable facts we must honestly admit and bring before our prospective brides and bridegrooms who come to us for advice. Yet we must with equal honesty and sense of responsibility point out the awful prospect of increasing the direst and most hereditary disease which can afflict mankind.

CHAPTER VI

CERTAIN IMPORTANT CONSIDERATIONS RELATING TO MIND, MORALS, AND WILL THAT HAVE A DIRECT CONNECTION WITH HYGIENE OF MIND.

Mind and Morals v. *Brain.*—It may be said, and no doubt will be said, by many who read this book, that however strongly it may be proved, even up to the hilt, that the brain is the organ of mind, yet that mind, looked at as mind, morals as morals, apart from brain or body, form the most important view of man's life and Mental Hygiene. They will say that a motive is the chief mental and moral force and can only appeal to mind, and that man's whole life is regulated by motives, good and bad. They will say that consciousness and the ego are so instinctively regarded as the ultimate thing in man, that it is vain to go to a secondary cause, such as brain mechanism and brain working, to explain mental action and moral conduct. They will say that no matter what are the facts as to the slow evolution of mind, what we have to do with is man as he exists with his enormous and varied power of thinking, feeling, and volition. They will ask if it is not a primary instinct in all men to attach responsibility to a man's mental action as it takes practical form in conduct? They will say that it is entirely against common sense to blame a man's brain for doing wrong and not doing right. They will say that the great moralists, the great religionists, and

the wise men of past ages among all highly developed peoples could not have been entirely wrong when they regarded mind alone and took no practical notice of the mind machinery in the brain. They will ask if Jesus Christ, Buddha, Mahomet, Zeno, Epictetus, and Marcus Aurelius did not know their work as great human moral teachers and reformers when they took so little notice of the connection of mind and conduct with the working of the human brain; most of them not only taking no notice of the place of the body in relation to mind, but taking pains to say it must be "kept under," and even holding it in contempt. The supernatural aspect of all religions will be adduced as showing that the Deity acts directly on the human mind without the intervention of any physical intermediary. How else, will it be asked, could any revelation from the Almighty or any possession by the Holy Ghost or by the evil one be imagined? They look on the views of the modern physiological psychologist and physician as being "wrong" in a moral and religious sense and call it "materialism" and "fatalism." The "spiritualist" and the "telepathist," the "theosophist," and the "Christian Science" devotees will adduce proofs abundantly satisfactory to themselves that mind can be manifested and influenced apart from brain and the senses. Above all, the moralist will ask if those doctrines do not imply such a conditioning of man's "Free Will" as to impair his responsibility to God and the law, and to degrade him from the proud position of lord of himself and of creation? There is, no doubt, much force in those considerations, and they cannot be lightly put aside. The real reply to all those objections is that everything in man and in the world is governed by fixed laws, and the supreme duty of science is to find out what those laws are, and when ascertained to hold to them irrespective of any objections whatever. If it is the case that all modern investi-

gations done on scientific lines and tested by scientific proofs point to the conclusion that in this world mind is only manifested through brain as its vehicle, and is absolutely conditioned in its every form and manifestation by brain action, we must accept the fact and its consequences. It does not in the least follow from this conclusion that the mental energy so conditioned by organisation does not work by laws and on lines applicable to itself. It does not follow that the mental force does not condition the working of the brain as well as being conditioned by that working. It does not imply that mind evolved from one brain cannot act on mind evolved in another brain, though this must always be done through the senses. It in no way implies that one mind cannot be developed and educated through the efforts of another mind. Even the metaphysician does not claim that the will is free in an absolute sense. When the man with the freest and the strongest will is in an apoplexy or a fever, or is under the influence of a brain poison like alcohol, it is an evident and incontestable scientific fact that his will is no longer free. Why, therefore, may not imperfections in brain organisation and working interfere with freedom of volition and conduct? To the scientist, thinking on scientific and biological lines, it does not seem an inscrutable mystery that a man and a woman between them can create ten new minds. To the man who reasons on metaphysical lines, without reference to organisation, thinking only of the *ego*, this new creation of ten minds is simply a miracle which no one can either explain or even imagine. Mind and organisation must meantime be regarded as a dualism, organisation being the factor which can be most easily got at and influenced by hygienic means. It is capable of absolute proof that improved mind results from bettered brain. We are slowly groping by study and experiment after the processes through which this can be

done. We recognise also that bad brain can be bettered and developed by purely mental processes, and we are groping and experimenting in regard to that mighty problem too. The scientist is perfectly willing to accept man's responsibility in so far as it can be proved to be a fact, but he maintains that responsibility is conditioned by all sorts of agencies affecting the brain. Many of the great philosophers of old and many of its religionists fully admitted the limited responsibility of man. St. Paul, though evidently most unwilling to admit this, yet was obliged to say, "The good that I would I do not: but the evil which I would not, that I do." On any theory, however, that of the metaphysician or of the modern scientist, the brain must be held to be the organ of supreme importance in regard to mind, and there will be little practical difference of opinion as to the importance of hygienic measures in mental improvement, especially in the earlier and formative stages of life.

The ordinary instincts of the metaphysician, the religionist, the moralist, and the educationalist have as yet, no doubt, been strongly in the direction of cultivating mind and morals apart from their organ, the brain. Men naturally point to the great philosophers, the powerful moral teachers, and the great scholars, and the heroes of old who were trained, quite irrespective of any brain knowledge. They point to the average man of the present day, and say he is a fairly good specimen of humanity developed and educated under the old system. Some of them would say if a man's mind cannot develop through mental stimuli, his body taking care of itself, it cannot be worth much. The reply to this reasoning on the part of the modern scientist I have so far anticipated. The main fact is that the mind does not exist at birth because the mental part of the brain does not exist in any organised way for effective working. The

mind grows as the brain grows and the quality of the mind has a direct relation to the quality and mode of working of the brain. Those objectors to the scientific view do not seem to take into account that the great nations of antiquity have nearly all lost in mental power and have either faded away or become degenerate and have lost their virile strength in modern times. Science says that she sees no reason for this except that those nations broke the laws of Nature through ignorance in the way they lived. Science has a fervid hope that by the application of her laws to the lives of mankind, no such degeneration and decay need take place. Modern science believes that many precious lives that would have done much for the world have been lost through early preventable death or bad training and through want of mental and bodily hygiene. Take, for instance, the misery of Carlyle, the suicide of Chatterton, and the early death of Keats from consumption. Mind and brain form a dualism and both require to be taken into account equally in our system of education and in our modes of life. Many bodily processes, as we have seen, can be stimulated by mental action, while it is certain that mental action can be either promoted or interfered with by unfavourable bodily conditions. Electricity can only be produced by physical agencies, but, on the other hand, when produced, it can act on matter in all sorts of ways. No one now talks of any antagonism between electricity as one of the forms of energy and the coal and the dynamo through which that energy is created and manifests itself.

The extent to which the will and the power of inhibition can control morbid mental action and promote counteractive healthy exercises of mind and body.—The want of the power of self-control is so very common a thing amongst mankind, in respect to many matters that it may be regarded as the normal condition of our species. The perfect capacity

of self-control in all directions and at all times is rather the ideal state at which we aim than the real condition of any of us. The men and the women who have attained a state of inhibitory perfection have been few and far between, and even in regard to them it may be said that they would have lost their self-control if they had been exposed to sufficient temptation or irritation. But while a perfect mental inhibition may not be attainable, there is a certain amount of this power in all directions which is expected of all sane citizens. The highest aim of Mental Hygiene should be to increase the power of mental inhibition amongst all men and women. Control is the basis of all law and the cement of every social system among men and women, without which it would go to pieces. I am to speak of the gradual development of this great power in the child, the schoolboy, and the adolescent. Sufficient power of self-control should be the essence and test of sanity. The higher inhibition can perhaps be understood best by looking at its simpler exhibitions. Grown people can control by an effort of will in many cases such morbid bodily acts as coughing or vomiting. In children it is different. If you place a bright and tempting toy before a child of two years it will be instantly appropriated. Place cold water before a sane man dying of thirst and he will drink it without any power of doing otherwise. Many persons have naturally a small supply of this power or it has not been cultivated in them in youth, so that it takes a small occasion for them to lose it. Exhaustion, mental or bodily, illness or any bodily weakness has the effect on such people of paralysing their power of self-control. They will be angels or demons just as they are fresh or tired. Some persons have it in such large degree that they have the fatal power of keeping themselves at work or at dissipation till their stock of resistiveness is entirely

exhausted and they completely "break down" in their power of self-control. Woe to the man who uses up too often his surplus stock of brain inhibition! In certain neurotic people there is often a loss of self-control in regard to certain acts. Dr. Johnson had to touch each lamp-post as he passed it. If he did not do so he was unhappy and went back to do this useless and irrational act. Plenty of such people "have the feeling" that they cannot answer letters, that they cannot walk, that they cannot meet their friends, &c. In certain exceptional cases, persons constituted thus, have obscure impulses towards killing, towards destructiveness, towards dishonest appropriation of property. Possibly many of those tendencies are transmitted qualities of our far-off barbaric progenitors—reversions, in fact, to an earlier stage of human evolution. As I have said, the modern authorities in physiology and psychology now believe that there are in the brain masses of cells whose duty it is to inhibit or control the action of other parts of the brain. The question is a most important one in Mental Hygiene. Can those inhibitory centres be so developed in youth and so cultivated in mature life that they can act as antagonists to what is morbid? Can they, in fact, be used as directly curative agencies against tendencies towards foolish and hurtful impulses? If this is so, and we could cultivate this power, it would be an educational discovery the most valuable yet made by humanity. I lately saw a lady who had consulted me frequently from her youth upwards. She came of a family in which nervousness, insanity, talent, and genius had all been found. She was herself clever and artistic, and had to earn her own livelihood by art and teaching. She was subject to certain foolish impulses, morbid trains of thought, and even explosive action. From the beginning I saw that she had strong inhibitory power. This I encouraged her

to exercise and to practise constantly and especially in regard to those tendencies which I considered morbid. Along with this I impressed on her that she must look after her general health, keep herself "fit" by plenty of fresh air, exercise, amusement, and suitable social intercourse. She had done so with such admirable effect that for many years she had been able to work hard at her profession, to earn a good income, and vastly to improve in her power of controlling what was morbid in her. In an interesting conversation I had with her in our last interview she expressed herself very strongly that this had "saved" her from unhappiness, inefficiency in her work, and possibly from mental breakdown. I believe that in this opinion she was correct, and I put her down as an example of what a strong inhibitory power, properly exercised, can do for a human life. I saw a gentleman lately, occupying an important position, who told me that he had been subject at times for most of his life to a feeling of morbid shyness, to obsessions, to feelings of unworthiness and incapacity, to religious dread and to actual vicious conduct. He had a strong power of will, and he said that by exercising that vigorously he could switch his mind off into other directions when it tended to run into such morbid grooves, and that thereby he had led a moderately happy and a useful life. When I was making some excuses for his having those obsessions on account of the nervous character of his constitution, he stopped me and said, "Now, for God's sake, Doctor, don't say I can't help those things! If you do, I shall certainly go wrong. My one hope is that you should encourage me to think that through the exercise of my will power I can stop and overcome them."

Those are examples of Mental Hygiene exercised in the highest region of the brain and under considerable difficulties. I do not say that such power of inhibition

belongs to every one, or can be exercised in all circumstances. On the contrary, I know that, unfortunately, tendencies towards morbid feeling, morbid thinking, and morbid acting are often accompanied by a morbid diminution in the inhibitory power as well. This antidote for their disease does not exist in some people. But the existence of such a power of inhibition as will act thus hygienically can never be known till it is tried, and the possibility of its increase and growth can never be estimated until right means have been practised. A persistent trial is really the only practical rule for all such cases. To overcome obsessions and delusional beliefs by volitional effort it is far better to make that effort in the direction of thinking of other subjects or of doing some work that has nothing to do with the obsession than to "reason it out" and make efforts of will directly in the teeth of it. Evade it rather than stand up to it, should be the rule for most cases. Turn into a side road rather than meet your enemy in the face on his line of communication. Switch your mind on to a loop line and let your foe pass by.

CHAPTER VII

THE EMOTIONS AND THEIR MUSCULAR EXPRESSION—THE HYGIENE OF THE EMOTIONS

THE outward expression of mind is provided for by two great powers—that of speech, of which I have treated, and that of facial and eye expression. In addition, gesture comes in, but in a very secondary way. The order of development of the different emotions and passions I shall refer to. The importance of emotion, as a part of a child's life, cannot be overestimated. Darwin, in his great work on *The Expression of the Emotions*, laid a sound foundation for all subsequent work on the subject. As the different emotions arise in the child, there is, provided by Nature, a series of muscles in the face and eyes to give them outward expression. As an index of how the subjective feelings are coming into existence it is essential to study those muscles. They are a wonderful group. Each one is very small in size, but it has an enormous number of nerve fibres coming from the brain to set it in motion. There are, including those of the eye, twenty-five of them on each side of the face (Fig. 9 *a*). They surround the mouth, they cover part of the nose, they surround the orbit, and they exist in the brow and cheeks. Along with those, we must take into account the small muscles of the larynx, which produce sound and regulate tone. The eye also has its own muscular apparatus round it and

inside it. The number and bulk of the nerves of motion which put into action and control those "mind muscles," which altogether would weigh an ounce or two, is greater and more bulky than the nerves which move the muscles

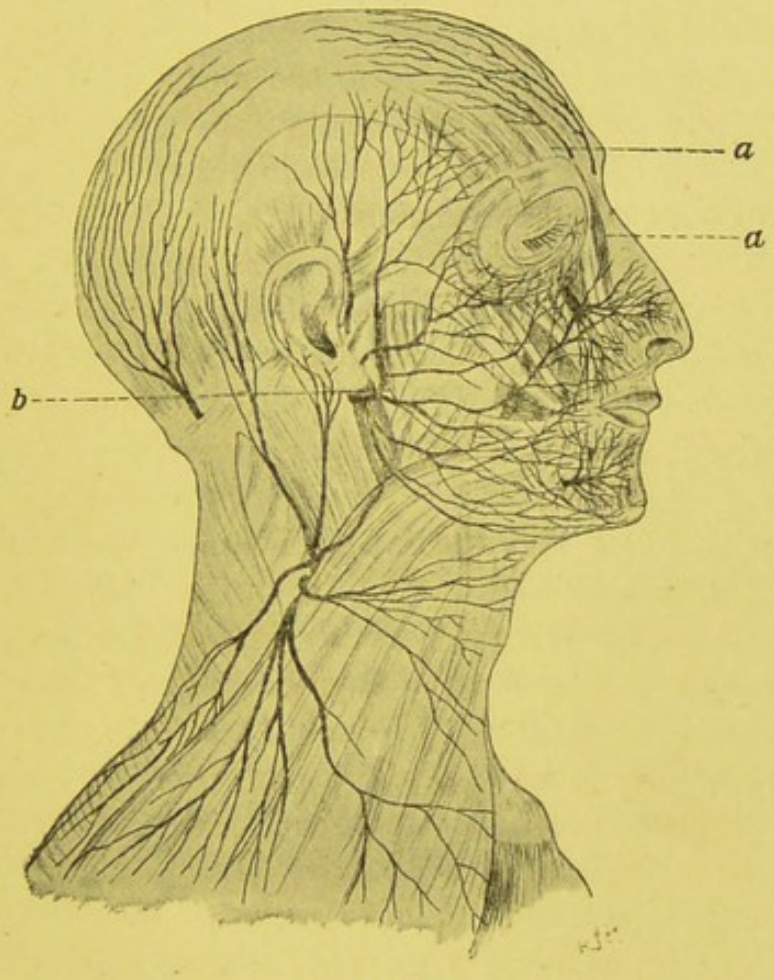

FIG. 9.—THIS SHOWS THE MUSCLES OF EXPRESSION—OF WHICH THERE ARE FIFTY—IN THE FACE AND EYE, THE "MIND MUSCLES," AND THEIR VERY ABUNDANT NERVE SUPPLY.

The muscles are shaded, the nerves are black. *a*. The muscles. *b*. The nerves.

of the arm, which would weigh several pounds. Those motor nerves of expression arise directly in the brain, are connected immediately with the mental part of the brain, and they pass from it at once to those muscles (Fig. 9 *b*).

The marvellous part of their working is that they must all work the one with the other; in short, the power of co-ordination—a co-ordination which must be so perfect, so subtly conducted and so quick, that every tone of feeling and every passion in their every degree must be capable of being expressed by them. They form the great mind objective, as opposed to the mind subjective, which is provided for in the brain itself. Every one knows that in a young child there is no such thing as any power of control over those expressions of feeling. When a feeling is experienced by the subjective mind it is at once with "hair-trigger" velocity seen in the eye and face. When pain is felt, the muscles round the eyes and the muscles in the brow contract, the muscles round the mouth are put into working and the voice muscles are set in motion, so that crying results. The eye muscles act, so that the eye becomes duller in expression. The secretion from the tear glands is formed and pours forth. All those groups act with each other and for the same end. When a child laughs, as it should be doing frequently, those muscles again all act; but how differently! It takes years before those muscles come to act with perfection. During childhood they are all being constantly exercised and put in training. Mental Hygiene is necessarily connected with their action, because, through them, the state of the child's mind can be accurately gauged. What mother does not experience one of the keenest delights of life when she sees her child's first smile? In some children their development is arrested and they do not appear in perfection for years after the normal time. A child that at two years old cannot laugh heartily, does not weep readily, and whose face looks dull and immobile, is not in a normal condition. No one can study the facial expression of the children of the very poor and the children who are suffering from rickets and scrofula

without being impressed with the deficiency in facial expression which they exhibit. They are in ill-health and need hygiene and medical care. When restored to health their muscles of mental expression gradually learn to indicate their emotions and passions. Face and eye expression becomes thus one of the chief means of diagnosing mental lack of development. In insanity the face and eye expression is also one essential means of ascertaining the mental condition. In fact, through those mind muscles largely we come to know the mental state, the intelligence, the passions, and the organic comfort or discomfort of health and disease respectively.

The muscular apparatus which I have been describing chiefly gives beauty to the face. The child that is not beautiful in some way is in a condition of retarded development of mind or body or of disease. It forms an index of how the mental centres of the brain are progressing. In idiotic and imbecile children the face has little power of expression, and the child is in most cases forbidding in appearance. Most forms of mental disease destroy beauty and attractiveness. While laying down those principles which apply in ninety-nine cases out of a hundred, there are undoubtedly a few exceptions where Nature plays a deceptive trick, and you have either bright and normal mental action with a postponement of the development and action of the face muscles, or you have an arrested, idiotic brain and some cases of insanity with much play of feature and undoubted beauty of expression. There is much scientific truth and meaning in the human craving for beauty, and admiration of it when it is seen. That craving and that admiration were not implanted in human nature for nothing. They represent the universal desire for health and, traced further back still, they represent the love of life, that primary necessity of all living things from the highest to the lowest, through which

life is protected and preserved. Without such an instinctive love of beauty there can be no doubt that life would lose half its joys. In later periods of life beauty has, of course, the closest connection with the reproductive instinct.

In addition to the face muscles, however, there should be slowly developed in the child an increasing co-ordination of all the muscles of the body, so that gracefulness, harmony of movement, power to work effectively the muscles of the hands, of the arms, and of the legs, posture and gesture being thus effectively carried on. This, too, needs close observation in the development of the child. A very awkward child is an unnatural organism not uncommonly abnormal to some degree in mind. Something has gone wrong, either in its brain or spinal cord. The motor centres have not become normally co-ordinated with each other, so as to work in unison and harmony.

The Hygiene of the Emotions.—The conduct of mankind is chiefly governed by the emotions, instincts, and impulses. Spencer traces all human action to the desire for pleasure in a large and philosophical sense of that term. If this is so, then the education and the hygiene of the emotions and impulses must be of the very highest importance in the life of each individual man and woman and in the life of society. Emotion is a higher mental action than sensation, but the one commonly arises out of the other, looked at from the purely mental point of view. What emotion is has been the subject of the closest study by all students of mind. The latest theory in regard to the faculty is that of James, and it is one which lends itself to the hygienic idea more than any other. He believes, contrary to what is the old and natural way of looking at emotion, that it is not felt first by the mind, which then causes bodily changes and symptoms. "My theory," he says, "on the contrary, is that the bodily

changes follow directly the perception of the exciting fact, and that our feeling of the same changes as they occur *is* the emotion. Common sense says, We lose our fortune, are sorry and weep; we meet a bear, are frightened, and run; we are insulted by a rival, are angry, and strike. The hypothesis here to be defended says that this order of sequence is incorrect; that the one mental state is not immediately induced by the other, that the bodily manifestation must first be interposed between, and that the more rational statement is that we feel sorry because we cry, angry because we strike, afraid because we tremble and not that we cry, strike or tremble because we are sorry, angry, or fearful, as the case may be." He says "that every one of the bodily changes, whatsoever it be, is felt acutely or obscurely the moment it occurs." He argues very strongly in favour of this view and that it is not a materialistic view of mind at all. He says: "If our theory be true, a necessary corollary of it ought to be this—that any voluntary and cold-blooded arousal of the so-called manifestation of especial emotion should give us the emotion itself. Everybody knows how panic is increased by fright and how the giving way to the symptoms of grief or anger increase those passions themselves. In rage, it is notorious how we work ourselves up to a climax by repeated outbreaks of expression. Refuse to express the passion, and it dies. Count ten before venting your anger, and its occasion seems ridiculous. Whistling to keep up courage is no mere figure of speech. On the other hand, sit all day in a moping posture, sigh and reply to everything in a dismal voice, and your melancholy lingers. There is no more valuable precept in moral education than this—as all who have experience know—if we wish to cure undesirable emotional tendency in ourselves we must assiduously, and in the first instance cold-bloodedly, go through the *outward movements*

of those contrary dispositions which we prefer to cultivate. The reward of persistency will infallibly come in the fading out of anger or depression and the advent of real cheerfulness and kindliness in their stead. Smooth the brow, brighten the eye, contract the dorsal rather than the ventral aspect of the frame and speak in a major key, pass the genial compliment and your heart must be frigid indeed if it does not gradually thaw."

Ribot says, enlarging James's illustrations: "In fear, suppress the palpitation of the heart, the hurrying breath, the trembling limbs, the widening muscles, the peculiar state of the viscera; in anger, the heaving of the chest, the congestion of the face, the dilatation of the nostrils, the clenching of the teeth, the *staccato* voice, the impulsive tendencies; in sorrow, get rid of tears, sighs, sobs, sorrow, anguish—what will remain? a purely intellectual state, pale, colourless, cold. A disembodied emotion is a non-existent one." There have been many objections on the part of the psychologists and the physiologists to James's theory, but still its hygienic suggestions remain. We know that emotion, or at all events its expression, can be enormously repressed in ordinary children by teaching, persuasion, and by rewards and punishments. It is undoubtedly the aim of the English public schoolboy to repress emotion, to "take things coolly." We all know how the practice of this leads to a certain "public-school manner" in those boys. Our race has the reputation on the Continent of coolness and *sang froid* when the passions of surprise or fear would naturally exhibit themselves outwardly in other races. This, of course, implies prolonged volitional efforts and a habit thus formed. It will naturally be asked, Are such efforts possible to every child and to every grown-up man and woman? If so, what purpose do they serve? Are they not unnatural? If they diminish the painful emotions do

they not also tend to lessen the delights that are got out of pleasurable emotions? Take a child; most things seem to give it pleasure, and those pleasures it learns to express by the muscular action of smiling and cooing and laughter and shouting. This is all before the will-power and self-control are developed. It is, as it were, automatic and natural. Beginning with this as our basis, this tendency to pleasure, to vivid muscular expression of emotion, are we deliberately to set ourselves by hygiene and education to exercise control over it? I say yes. Gradually acquire control over it, but not with the view of repressing or killing it out. A great principle to be observed should be, during emotional development in early life, to connect pleasurable feelings with self-control and duty. Every good deed done, every evil one repressed should receive approbation and so give pleasure, and it is right that this should happen. Nature undoubtedly implants an inner consciousness of satisfaction when good is done or self-control exercised or evil avoided. It is absolutely wrong to attempt altogether to repress this or to blame it. Far better indeed to have a little innocent boastfulness and visible self-approbation. Painful emotions should be connected in the mind with breaking Nature's laws and with immorality. Crime and badness of all sorts should be looked on, not merely as breaking human and moral law, but as going contrary to the great order of Nature under which we live. The number of the emotions, pleasurable and painful, is so great that it would be useless to attempt to go over them and ticket them with names. It is, however, undoubted that if no hygiene were exercised in regard to emotional development and its expression and action in youth, family life would be somewhat intolerable and society anything but soothing. The noisy, too demonstrative, obstreperous boy or man may be enjoying himself hugely, but he does not minister thereby to the enjoyment of

others. Altruism has to come in as one of the great hygienic considerations in emotional life and its expression. It must be firmly implanted in the mind of every child that its special pleasures must not cause pain or annoyance to others. This of itself is a strong hygienic measure in regard to the expression of emotions. This principle coming in where there are many children in the family is the reason why they are so much more apt to be agreeable than where there is only one child. In schools and old-fashioned houses, as a general rule, the riotous expression of their emotions in the young is most severely handled by their teachers and elders with good enough effect, taking the system as a whole. Woman, being more emotional than man, needs, no doubt, more careful hygiene, but we would not have our women, young or old, unemotional or undemonstrative. We merely want control to the extent of the comfort and happiness of others. In modern times there is no doubt that youthful emotion is far more expressed than was allowed in family and in school life in the olden times. Possibly, a happy mean between the two methods would be the right one.

CHAPTER VIII

THE MENTAL HYGIENE OF BODILY DISEASE

THERE are few bodily diseases but what are accompanied by some mental change that is, in many cases, characteristic of and special to the condition. It is a very high condition indeed, of practical philosophy to get through ordinary work and the common troubles of life with patience, equanimity, and some degree of cheerfulness, but it implies far more than philosophy to go through a fever, an attack of bronchitis, or a severe bout of influenza without flinching in mind or becoming irritable or desponding. That needs a sound brain well trained and well treated, not being often possible even then. The common talk is that it is done through the influence of mind over body, of soul over matter. That does not quite express the truth. If the disease consists of a microbe or a poison which affects the brain especially, then no mental culture and no moral discipline will sustain a man's equanimity, for the organ of his equanimity is directly put out of gear. You might as well expect a watch with a pinch of dust among its wheels to keep time. It might be the finest instrument ever made by watchmaker, but under those circumstances it certainly will not do its work. Bodily disease is so common and so various in character that it is of enormous importance to diminish its mental effects where that is

possible. There is a power which some men attain called 'detachment," which helps greatly in this matter. It is, perhaps, the highest embodiment of the Stoic philosophy in its best period as exhibited and laid down by Marcus Aurelius. He says, "Efface impression, stay impulse, quench inclination, be master of your inner self," and again, "In the inner self and the freehold of mind, no other may contravene. Fire cannot touch it, nor steel, nor tyrant, nor slander, nor any other thing, so long as it abides poised as a sphere, self-orbed." And again, "Pain is either an evil for the body—and, if so, let the body state its case—or for the soul, but the soul can maintain its own unclouded calm and refuse to view it as evil." Yet I have seen the most philosophic men irritable when they had a toothache, depressed when the liver was not working well, irresolute when feverish, and full of delusions when the brain was touched by the microbe of general paralysis. It is well known to physicians that persons labouring under heart disease are very apt indeed to suffer from vague fears and dreads that cannot be explained in any other way than by the reflex effect on the mental part of the brain when this great organ is in a condition of disease. The heart has always been put down as the seat of the emotions. It is certainly not so, but it is equally certain that the emotions specially affect the heart's action and that certain emotions are "felt" in the region of the heart. It has become part of literature to talk of "the heart" in opposition to "the head." There is really no such opposition, but, on the contrary, the closest connection. To say that a man's head is weak but that his heart is all right, when translated into physiological language means that a man's intellectual centres in the brain are not strong while his emotional centres are extra well developed and sensitive. It is curious that the heart should have been selected of all the internal organs as

possessing a mental function while in reality a man's mental condition depends quite as much on his stomach as his heart. The stomach, when not doing its work well, breeds all sorts of partially digested substances which act as poisons to the brain and the rest of the body. For the most part, those poisons cause vague feelings of distress, produce irritability, diminish the social instincts, and result in more or less depression of mind. Melancholy people constantly have a sinking feeling in the region of the stomach which seems to lower the whole vitality and enjoyment of life. It is an organic sense of ill-being which colours the mental life. The "precordial anxiety" of the older medical authors was really felt over the stomach and not the heart at all. The stomach and the alimentary tract, having as their function to supply the chemical substances which are absolutely necessary for the continuance of life, are naturally largely represented in the brain where the love of life, the primary instinct, resides. The stomach and the alimentary apparatus may be and are constantly disturbed from the brain, and, on the other hand, the brain is constantly upset from the stomach. Every one has experienced the fact of a keen appetite being suddenly abolished, and even of indigestion suddenly set up, by disagreeable mental emotions or distractions. On the other hand, few people but have had the experience of a perfectly happy day being suddenly made miserable by eating a bad dinner. The Mental Hygiene of the stomach is therefore obviously suggested by those considerations. Do not engage in hard mental work immediately after food, and when there is a feeling of irritability and organic distress look to the stomach and try and improve its working. I would urge in mitigation of many of the defects of this book that it has mostly been written at the end of busy days and too soon after late dinners. The liver was credited by the older medical authors such

as Hippocrates, with all the depression and hypochondria that they had to treat. The "black bile"—I may say that all bile is more or less black—was put down as the cause of such complaints. It was then treated by severe doses of the purgative, hellebore. Curiously enough, one of the latest and most successful treatments for some mental complaints consists in the use of strong purgatives and antiseptics which seem to remove and counteract the poisons generated in the alimentary tract.

It is well known that the different kinds of fevers and infectious diseases produce different mental effects. The delirium of typhoid fever is different from that of typhus, and the delirium of acute inflammation is different from that of scarlatina. The poison of malaria is apt to induce distinct forms of mental disorder. Many poisons, such as opium, aconite, and Indian hemp, produce forms of mental conditions peculiar to each. It is one of the first points we investigate in any case of mental disturbance whether the internal organs and functions are in good working order or not, and whether there are any poisons circulating in the blood, and so affecting the brain. This "Toxæmic Theory" of mental disease is gaining ground every year.

Closely connected with the Mental Hygiene of disease are the facts which go to show that many diseases may be improved or cured through mental influences. John Hunter, a great surgeon and one of the most scientific and practical-minded men, said: "As the state of the mind is capable of producing a disease, another state of the mind effects a cure." The illustrations of this in the history of medicine are abundant. The doctor who neglects the mental condition of his patient in his treatment of him, no matter what the disease may be, is not a philosophical man and commonly is not a successful physician. The history of mesmerism and hypnotism is crowded

with "cures" of disease, all of which may be traced to the influence of the higher brain on the whole nutrition of the rest of the body. Powerful mental attention is directed towards the disordered function and a powerful expectation of cure is thus roused. Especially in certain disordered nervous conditions, the accentuated suggestion and the rousing of action in other parts of the brain will dissipate disease. Unfortunately, mesmeric and hypnotic cures are notoriously haphazard and scientifically unreliable. They depend too much on the individuality of the particular physician and the patient, so that they cannot be subjected to definite rules. Especially the disorders of sensation have come under the curative influence of favourable mental conditions. An Italian doctor, Gerbi, stated that by using an insect squeezed between his fingers and then applied to aching teeth, he had been able to cure 401 cases out of 629. Long ago Sir Benjamin Brodie recorded a case of severe neuralgia which had prevented his patient from walking for years and which he had failed to cure by ordinary medical means. The patient happened to have a spiritual instructor of strong character and great faith, who in the name of the Saviour solemnly and earnestly told her that she should get up and walk, which she did at once. Many cases of defective action of the muscles and what are called "motor neuroses" have been apparently cured by strong mental influences. Epilepsy and palsies of many kinds have been thus removed. Sir Humphry Davy tells that he was taking the temperature of a man apparently suffering from paralysis by putting a thermometer under his tongue, and the patient, believing that this was an occult and effective mode of treatment, got up and walked and said he was cured when the thermometer was removed. All such cases, however, have been functional nervous disorders and not cases of

real organic disease. By the effect of mental attention, certain diseases of impaired nutrition, from warts up to internal tumours, from scurvy to dropsy, have unquestionably been cured by mental influences. This is perfectly explicable from what we know of the relation of the brain to the blood supply of the body. Through this "vaso-motor" brain function it can shut off or give an extra supply of blood to almost any part of the body if the proper stimulus is applied, and thus cure diseases which are due to an excess or too scanty a supply of blood to any particular part. Imagination, expectation, faith, hope, joy, fear, suggestion may all cure certain diseases. But for instances of this and a full treatment of the subject I refer my readers to my late friend Dr. Hack Tuke's charming book on *The Influence of Mind on the Body*. The most successful physicians have been men with great personal influence on their patients, this influence tending towards a firm faith in the remedies prescribed. Many such doctors have had that mental "magnetism" which tells so strongly, not only in medicine but in every relation of life. Such beliefs act as nerve tonics, and set the mental part of the brain into active exercise. This brings extra blood to it. The brain then acts on the rest of the body with every part of which it has relations, and thus we have the physiological apparatus for the mind cures of bodily disease. Quite lately there has been published a book by a Swiss physician, Paul Dubois, on the *Psychic Treatment of Nervous Disorders*. He seems to be a man of a strong, simple mind, vigorous insistent will, and a great belief in himself and his measures. He takes into account both the physiology and the psychology of the brain in those measures, and he frames his hygiene and his treatment accordingly. He thinks that in every nervous disorder there is a mental element; and in this he is

not far wrong. He does not for a moment pretend that he cures all his cases. He begins by impressing the patient with the conviction of cure, and then he tries to make the general conditions of cure favourable. He does not despise rest, isolation, and very strict dietary rules. He recognises the influence of mind on the bowels as well as on the heart. He banishes hypnotic medicines to procure sleep. He cures constipation by mental and dietetic measures alone. He devotes much attention to what he calls the education and strengthening of the will. In short, Dubois pushes almost to an extreme Mental Hygiene and mental means of cure—I say to an extreme—because there are many people who are intensely desirous of being cured in such ways, who have unbounded faith in certain men and in measures that have an element of mystery and wonder in them, but such people are usually very disappointed and depressed when they fail to recover after such methods have been fairly tried.

Apart from any wonder-working measures and apart from men of special gifts there is a Mental Hygiene of bodily disease that can be applied on strictly scientific lines and by the application of which mental suffering may be diminished and disease averted.

The effects of many diseases are damaging to the brain and mind without producing technical mental disturbance. The memory is often greatly impaired after severe attacks of fever. The self-control is often much diminished after severe or prolonged illness. Notoriously, illness makes many people self-centred, exacting, unreasonable and forgetful of the comforts of others. The ego is disagreeably apparent while the altruism which had previously been learned and practised is forgotten. When the heart or kidneys, the lungs or the stomach, not to speak of the brain, have suffered from disease, it is often a long

time before the effects are completely got rid of. This means often a poisoning of the blood and of the mind centres by deleterious products or a starvation of them by insufficient or badly made blood. In regard to all these things a Mental Hygiene and a re-education has to be done after the patient is convalescent, and it is marvellous the recuperative power of Nature in this respect even up to old age. The patient can do very much himself to hasten this process of restoration by adopting rational rules of Mental Hygiene.

There are many infections and poisons that impair the mental working, and should be specially taken account of. A medical friend lately consulted me about his feeling nervous, depressed, fanciful, self-centred, and unable to do his work and enjoy his life. I saw him a year after, and he said he had found out what was wrong. The drainage of his house had been bad, and he had thus been breathing sewer gas. When that was put right, all the worst of his symptoms disappeared, and he became cheerful and quite fit for work again. It is a well-known fact that the disease of the glands in the throats of children, called adenoids, renders them stupid, lethargic, and partially unfit for school work. The surgical removal of the adenoids commonly produces at once a mental brightening as well as a general improvement in health. The poison of malaria has often a markedly disturbing mental effect. Some people are active and happy in one climate and depressed and languid in others. An intelligent lady once told me that sleeping with open windows had quite dissipated a mental state of nervousness and discomfort which she had suffered from for a long time. Change of occupation will sometimes change the mental feelings greatly. A change of diet also has often a marked mental effect.

CHAPTER IX

THE HYGIENE OF MANNERS, PLAY, WORK, AND FATIGUE

Manners.—The psychology of manners is a difficult subject, yet the importance of good manners has been recognised from the earliest times. Good manners are of the East rather than of the West, but Greece soon picked them up, as she did everything else that was good. No one can read Plato's *Republic* without being impressed by the politeness of the disputants to each other. The educated classes in Greece at that time were evidently persons of good manners. Every one must have remarked on the good manners of the ancient Patriarchs as depicted in the Old Testament. The axiom of William of Wykeham that "Manners maketh Man" has been accepted as wise and truthful by the whole English race everywhere. The "softening of manners" has always been put down as one of the most desirable results of civilisation. Among modern nations, the Japanese seem to have attained the highest success in the cultivation of good manners, so that among them politeness has become hereditary and is practised by them all, from the youngest child to the oldest man. If manners maketh man, it must be remembered, however, that manners have themselves to be made. In most barbarous nations politeness, courtesy, and manners are little known. Among children

of our own nation it cannot be said that manners are necessarily a part of their hereditary equipment. They need to be taught. Their importance in Mental Hygiene is twofold—first, the influence of the good or bad manners of one child on another, and second, the influence of the constant practice and habit of good manners on the mind of the child who practises them. Without denying that among the educated classes, children come naturally and by heredity by a certain tendency towards good manners and polite behaviour, yet it is certain that there are such children whose manners do need forming and who, if they habitually see rudeness of manner, will imitate it. Like morality in children, manners are chiefly the result of example, but being a more concrete and outward thing, they are more capable of being established by dogmatic teaching as well. This cannot be begun too young. There is no risk of any kind in teaching good manners. If rightly taught, and the reasons assigned to even very young children, it can have no effect but a good one on their Mental Hygiene. Good manners should imply altruism and a consideration for the feelings of others. To begin with, they are always a repression of the disagreeable in self. They also imply the exercise of the imagination, which is a faculty strong in young children. They lead to good habits of mind as well as good habits of body. They are a part of the discipline which is legitimate in childhood—a discipline which the child who is fine in the grain instinctively realises to be reasonable at even an early age. Good manners are also connected with the feeling of reverence for the old, the good, and the respected. The practice of them leads to so much evident commendation and approval from others that the child's self-respect and pleasure in life are increased. The practice of them also leads to the satisfaction of the child's love

of approbation in a legitimate way. No one who goes into an Infants' school and watches the children playing but must see that the rude, boisterous children are also apt to be cruel and inconsiderate. Looked at by the physiologist, he sees that such children are forming a bad brain and muscular habit which will not be easy to be got rid of after it has been instituted in the brain cells.

Good manners have a muscular side, being connected with the pleasant use of the voice and body with the harmonious action of the muscles of the face. When children are ill, they are apt to forget their good manners. It is a great pity that it is not part of our educational process, from the Infants' school to the University to teach good manners. This is especially necessary in free and democratic communities. The sweetening of life that would thereby result is certainly one aim of a true Hygiene of Mind.

Play.—Play is a natural instinct in the young of all vertebrate animals. It assumes an endless variety of forms, but in some shape or other it is always there. It needs no teaching to appear, and therefore I call it an instinct and not an acquired character. It is most vigorously carried out by the strongest and the most robust. It has no immediate object in providing food or in protecting from danger, and yet it is evidently of the very highest importance in the development of strength and energy. Play is the real work of children. Froebel, a German schoolmaster, was the first to bring out its significance and its necessity in education. It is always associated with pleasure in a very high degree. It is commonly done in the air and sunshine. It is by far the surest index of organic health. It begins soon after free voluntary motion. It is so craved for, and its effects are so manifestly beneficial, that there can be

no question at all that it is an organic necessity. We do not know how the young of the mole play, but if we knew sufficient of the life-history of that dweller in darkness it is certain that we should find play in some form just as in every other animal. No surer index of ill-health or ill-condition exists in a young animal than an indisposition to play. "No play no health" is a true axiom for the child.

Looking to man, play begins in babyhood, is a prime factor of well-being all through childhood and the school age, does not cease at adolescence, and among the healthy, who have their wants fully supplied without too hard work, it extends almost to the end of life. It becomes very closely related early in life to the saving graces of fun and humour. It is intimately connected with the great educative faculty of imitation. A child "plays at" every action and every piece of work that it sees others do. Physiologically, play means to a child exercise of the muscles, improved circulation of blood, inhalation of oxygen, better digestion and appetite, stimulation of all the glandular system, pleasant impressions on the senses and brain, a happy emotional condition and the acquisition of much knowledge that will be very useful in after-life. It becomes organised into games which do so much for the growing body and brain, as well as for the developing mind. It is a very social gift, because children always tend to play with each other rather than alone. A child who has the chance of playing with other children, and does not take advantage of this opportunity, is in a more or less abnormal condition. Play is literally the prologue and the preparation for the serious work of life. It is the most apt illustration of that "necessity to energise" which I have referred to as one of the organic necessities of the brain. Though thus natural and irrepressible, play can be greatly encouraged by wise

parents and teachers so as to become a part of education, physical, mental, and moral. It is capable of direction and organisation greatly to the advantage of the child. Play that implies destruction of useful articles and beautiful objects, or that involves hardships or cruelty to younger or weaker children or animals, can be and should be discouraged, and so great moral lessons of tenderness and unselfishness can be taught. It can be used to improve the faculty of observation very early in life. To play at gardening, to play at baking, to play at dressing dolls may all be made educative in a high degree. Play is the great stimulant to the imagination in childhood. It is indeed doubtful if a healthy faculty of imagination could be created in its first stages except through play. The play world is, as every one knows, perfectly real to the child. This gives it a dignity and importance in the child's estimation. The talk of children is largely of play. The schoolboy and girl long for the time when lessons are over, in order to rehearse their play experiences. Adolescents talk of little nowadays except football, cricket, and hockey. Many grown men, similarly, golf all the week in many cases, and talk about their exploits on Sunday. It is quite certain, however, that play and the love of it can be overdone at all ages except early childhood. When so overdone it dissipates mental energy that should go to the serious work of life, and it gives a tone of frivolity to the later ages of life of which work should be the key-note. It consumes time which could be better spent in more serious pursuits. It lowers the intellectual tone and the seriousness of life. It leaves less time for reading and thought. Morally, it often tends towards selfishness and self-indulgence. During adolescence, especially among the wealthier classes in Great Britain and America, it is now distinctly limiting the output of useful human

energy in those countries by being overdone. Play is, no doubt, a preparation for life, but it is far from being the only preparation. Excessive play and amusement bring their own punishment, for the young man and woman who thus fill up their time become sated and stale. The period of life in which high ideals of duty, increase of knowledge, a keen interest in literature, and habits of self-denial should be cultivated, may become, through excessive addiction to play and games, a barren and even mischievous epoch. The proper regulation of this play instinct is therefore a mental hygienic of immense importance. Fully to enjoy its pleasures and advantages it must, after the period of childhood, be intermittent and alternated with work. Though "all work and no play makes Jack a dull boy," all play and no work makes him an empty one. No play is so enjoyed as the month of it by the student or the professional or business man who has worked hard for the previous eleven months. Nature allocates her enjoyments largely as rewards for work done. No play-pleasure is so intense as the satisfaction felt at the end of a piece of good work done well.

For many years I have advocated playgrounds for our city children at all costs as being a necessity of life for them. Most cities have now parks and open spaces, but these cannot be used by many young children. There are few things more pathetic than a walk through the artisan quarters of a city on a fine Saturday afternoon or Sunday. All the small children are out and all are at play, but with only the streets and a chance contractor's bit of building ground to play in. An Act of Parliament making a playground compulsory for every block of houses containing five hundred children, at the cost of the landowner, would not seem an inequitable statute. Mrs. Humphry Ward's "Play Centres" are a hygienic measure of the most admirable kind, and full of promise.

The Hygiene of Work.—Those essential brain qualities or instincts which I have described as "the necessity to energise," and the desire to live, are the physiological bases of work, as well as play. Good work is got through the stimulus and by the regulation of those faculties. The philosophy of work consists in its necessity. The brain cell cannot in health cease to be active, except to a partial extent during sleep. It must transform its contents into energy of some sort. There must be some output of mind from the mind cell and of motor stimulus from the motor cell. The proper selection of work for the particular brain to do, and its regulation on physiological principles, is the basis of the hygiene of employment. For health, for happiness, and for efficiency, right work rightly done is the most important matter in any man's or woman's life. Nature abhors idleness as she does a vacuum. There is no more momentous question than the selection of the work to be undertaken in the early history of a life. In every civilised and properly organised community there is fortunately a great variety of employment for brain and muscle, and we know there is a great variety of talent in men. How can the congenial and suitable be brought together? How to choose at the proper time of life, how to educate for the special work to be done, how to regulate the amount for which the particular man or woman's brain and body is fitted, when to leave off when the capacity for work is failing, how to judge when disease or weakness demands a temporary cessation of work, and how to change employment so as to make it restful when such change is needed, are some of the most urgent problems of every reasonable existence. To solve them rightly there is needed not only ordinary wisdom and common sense, but in many cases very special knowledge of health, bodily and mental, fitness and temperament. I trust that in the

future the medical profession will be able to aid the world in this matter more than it has done or been called on to do in the past. If to its present knowledge of physiology and health laws it would add somewhat more of practical psychology, of heredity, so strongly advocated by Dr. Archdall Reid, and of "human constitution" in the large sense of that term, a lack in our social life would be filled. The public and the State are entitled to look to it for some help in this matter which would be on the lines of the most recent development of medicine. To prevent being better than to cure, to get out of every man and woman what they can best give to the Commonwealth, to improve the race and to advance a step or two towards an ideal social fabric, are aims worthy of the most advancing of the scientific professions. On the other hand, work can unquestionably be made curative in many cases. Work under wrong and unhealthy conditions is, on the other hand, to body and mind, one of the great mental dangers of our modern urban life.

No doubt it will be said by many people that I am preaching a Utopia, that natural leanings and social and money circumstances must chiefly guide young people in the choice of occupation, that natural selection in some form will come in here, as elsewhere in nature, that few are really quite free in their choice of occupation, that most really great men took naturally to their special work, that special fitness is mostly latent at the early ages of life, and finally that there is commonly an adaptability to take to and in some cases to excel in occupations which are not the very best fitted for the special capacity of each individual. Those considerations are all so far true and to the point, but they are counsels of pessimism, haphazard or *laisser faire*, which do not tend towards the best that may be done for humanity or society. To follow them would not be to take advantage of what modern science can offer

towards the good of mankind. They are unscientific, not only from the health but from the sociological point of view. They do not make the best of things in this world. The standard on which they are founded is low and unprogressive. They do not tend towards a further evolution for man. They are opposed to a higher civilisation. As a matter of fact there are few parents who do not exercise a choice in regard to the selection of an occupation for their children. They often feel the need of guidance in this and ask for it. Among the more educated and richer classes the cry of "What shall we do with our sons and daughters?" is an urgent one. The great considerations which will help the doctor and the parent of the future in choosing an occupation for the young are health, defects, aptitudes, special leanings, opportunities, powers of resistance, bodily and mental conformation, tendencies mental and bodily to special risks and temptations and special mental, moral or bodily strong or weak points. In regard to health the family doctor could certainly help if he could obtain a good history of hereditary tendencies. He would warn off and encourage many young men and women away from certain trades and professions and give indications towards others. A narrow-chested young man or woman with a family tendency to consumption would not be sent into sedentary or indoor occupations. A lad of nervous constitution and heredity would not be set to pass competitive examinations in youth and made into a speculator afterwards. There are manifest indications in many of our city-brought-up boys and girls that they need to go back to Nature and lead country lives as farmers, surveyors, colonists, ranchers, or as sailors. It is simply marvellous what men and women may be made out of such material by the right sort of food, environment, and work. How much disappointment would be saved if the nervous young woman with no

staying power or backbone could be prevented from going into nursing and medicine! For the neurotic, more especially, the choice of an occupation counteractive to their diathesis is important. I am persuaded, from my own experience, that if this was more frequently done much neurasthenia, nervous "break-downs," misery and mental disease might be saved. There are so many young people with manifest defects of intellect, of adaptability, of sympathy, of character, of manners, of firmness of purpose, of organising power, and of observation that the teacher and the doctor would be fools indeed if they could not help in choice of work. The natural partiality of affection of parents would thus be corrected by the real facts of science. If the well off would only accept facts about their children they would not strive so unreasonably, as they often do, to keep them in the same conventional social class as they are themselves, but would often make them into artisans, farmers, colonists, and clerks. What regrets might not thus be saved! Because a boy has been good at cricket and football should suggest not eminence in a profession but hard muscular work as his life's career. Some boys and girls have so little inhibition against temptation that it is mere madness to place them in occupations where severe control is needed to keep them right. No doubt English parents of the better classes have in a way been fortunate in having "the Church" as a convenient opening for the unspecialised. But that fact largely explains many of the Church's spiritual failures. Bodily habits and conformation often give wonderfully correct indications. The boy with big, effective hands, who can use tools early, is destined by Nature for engineering. There was often little doubt even from bodily indications among my fellow-students as to who were to take to surgery and who to medicine. It may be said with much truth that the parents who have sent

their children from home and committed their whole training and education to the teachers in a public school from the age of nine onwards can know so little of their special aptitudes and defects that they are often unable to select a suitable occupation to fit their abilities. And equally the teachers in the Board schools are now so specialised in their work and know so little of the pupil's individuality that they cannot help as much as they might do in this matter. The greatest difficulty in making choice of an occupation for a boy or girl early in life, as the majority of our population have to do, is that no reliable indications of special aptitude are always then to be seen. On this point the practical physiology and heredity of the future may be expected to come in. Science may give indications where common observation fails—indications which may be invisible except to the trained insight.

It would be an interesting sociological inquiry to ascertain in modern society the real proportion of square men and women who have got into round holes and *vice versâ*. I have been looking over the list of my friends and acquaintances, and I think one may safely say that at least 20 per cent. have failed to find the work for which they were most fitted.

Occupation has a marked effect in moulding the mental and moral character, be it suitable or unsuitable. The mind and manners of the clergyman, the lawyer, the business man, the domestic servant, the citizen, the policeman, the soldier and the sailor, are all more or less distinctive. Surely no occupation and training was ever so effectual in obliterating every suggestion of originality and self-reliance out of the barracks or off the battlefield as that of the British soldier of the time before the Boer war. His original thinking power was nil and his sphere of action most restricted. That was why the employer of

labour so specially shunned him when, after his discharge, he came asking "for a job." Yet many such men came back from South Africa alert and resourceful after their experience there. They had to be resourceful there or die.

But in the choice of human occupations, as in the choice of husbands and wives, the sphere of science will for long be limited. Nature settles many cases by strong leanings that will sooner or later be obeyed. Opportunity will not be denied in other cases, no matter what Nature says. Necessity limits the choice of occupation in perhaps the greater number of our people. Ambition will always try to set Nature at defiance. Ignorance and conservatism will complacently go on their stupid way, not seeing or hearing the voice of science. Knowledge must steadily work towards the better way for humanity in this as in all other things.

Fatigue.—Professor Mosso, of Turin, has lately written a most instructive little book on *Fatigue*, mental and bodily.[1] He has endeavoured, according to the methods of modern science, to measure and to record, in many accurate and most ingenious ways, the amount and kinds of fatigue to which human mind and muscle may be subjected. In this treatise I cannot refer much to his researches on muscular fatigue, except in so far as they serve to indicate mental fatigue. He fully recognises and proves, in various unexpected ways, the physical law of conservation of energy in nervous action. He shows that in fatigue there are very subtle brain-poisons produced in the blood, and changes in the temperature and in the muscles in consequence. He points out that headaches and nervous exhaustion are often the result of such poisons produced by over-brain work or over-muscular work. He shows that there are some people who can

[1] This has been admirably translated into English, and is published by Messrs. Swan Sonnenschein & Co. [EDITOR'S NOTE].

work their muscles or their brains and minds separately, but who cannot do both at the same time. He gives vivid examples of the physical effects of University examinations among the students. He shows that by the reflex action of disease elsewhere, the functions of the brain and mind may be retarded or interfered with. This may happen from such a simple disease as adenoid tumours in the throat. He shows that many unhealthy occupations, implying excessive labour or stress, will upset the mental working. The power of attention, he points out, may be specially affected by conditions of fatigue, and that modern "nervousness" probably results in some measure from the too great activity of the brain in modern life. He directs attention to the fact that consciousness, sensitiveness, memory, and reasoning power may all suffer from the results of fatigue. He gives most interesting examples as the result of the examination of his friends among the professors as to how their lectures and work affect their minds. His instances in regard to the effects of darkness and light, as to the relationship of over-strain and bad artistic work are full of suggestiveness. Wherever it was possible, he showed those results of fatigue by a graphic method. His diagrams are in themselves vivid pictures of what fatigue can do.

CHAPTER X

CHILDHOOD, FROM BIRTH TO 7 YEARS

The Order of Development of Brain and Faculty. The Hygiene and the Special Mental Risks of this Period.

I HAVE spoken of the ideals for mind and brain. How can those ideals be helped on in childhood? What sort of environment will best aid in their attainment? Those are questions of enormous importance to society, to the State, and more especially to the parent. Every increase of our knowledge in regard to them will, in the end, help to build up better practice. The first piece of important knowledge to be inquired into and to be used practically on many occasions is as to the heredity of the child. Were its parents healthy? If it has not a clean bill of health in regard to its ascertainable ancestry—and what child has the good fortune to possess that in our modern civilised society?—then the particular weak points must be ascertained. The boy is apt to take his chief features of brain and mind from the mother's side, the girl from the father's. Inquiries must not be limited to the parents, the brothers and sisters, and the uncles and aunts, but must be made in regard to the grandparents and their brothers and sisters. The first and second cousins too must be taken into account. The chief weak points to be inquired into are whether there was any

mental disease, nervousness, epilepsy, idiocy, uncontrollable drunkenness, consumption, gout, rheumatism, marked eccentricity, hysteria, silliness, paralysis, want of force of character or vice. The strong points in hereditary history should be inquired into as well as the weak ones. Longevity, size, muscular power, mental energy, originality, sound morals, self-control, are all most desirable characteristics in ancestry. Strong artistic and literary instincts—the artistic temperament, in short—may be both a great danger and an enormous gain. In any case its existence should be considered and taken into account. As yet our power of counteracting a very bad heredity is limited, but it can do no harm, but good, to know that it exists and to face it up. Thereby some of the dangers can be avoided and some of the temptations escaped. It may be said generally that the child with a strongly nervous heredity or mental taint in ancestry should be fed on milk, farinaceous diet and fruits, certainly up to 7, and largely up to 25. It should be kept fat. Its faculty development should be repressed rather than stimulated. Undue excitement of all kinds should be avoided. It should live much in the fresh air. The winds of heaven not only cure consumption, they strengthen the nerves and promote nutrition at all ages. The evil conditions to be looked for are—convulsions when teething, night terrors, stammering, backwardness of speech, eye defects, and special liability to a high temperature from very slight catarrhal or other causes of fever. I have found that one child will become delirious during an ordinary attack of catarrh with a temperature of 99°, and that another will not become so at 104°. The first was a nervous child; and this indication of nervousness should be kept in mind by the mother and the family doctor. A strongly nervous heredity, too, may result in idiocy and imbecility. If an observable idiotic condition of head and intellect is seen

soon after birth then there is no help for it but patience, submission to God's will, and infinite, but almost fruitless care, with the school for idiots to be looked forward to. Much may often be seen by a skilled observer in the formation and shape of the head, the facial and eye expression, the symmetry of the features, the shape and setting of the ears, as well as the normal formation of the body and the easy, graceful use of the muscles. Marked abnormalities in these respects are nowadays called "stigmata of degeneration." They are Nature's bad marks. Each one of them indicates some little defect in the brain-structure and working, but this may not affect the mental centres. Nature, within limits, is not always uniform, nor consistent, nor harmonious. Many a poor face and eye have a really good mental vehicle behind them, many an unlovely countenance has a fine mind at the back of it. Nature often appears to play tricks on us because we are as yet not fully acquainted with her laws.

The brain of a child at birth weighs 13·8 ounces, and at maturity 49·5. It increases between two and three-fold in weight during the first year of life, and rapidly attains almost its full weight at 8 years of age, though the body has only grown during that time a third of its adult weight. As we shall presently see, its mental functions are nil at birth, and most incomplete at 8. Therefore the brain may be said to have in childhood large substance but incomplete structure and immature function. It is in somewhat the same condition as a cotton mill in the course of construction, when its thousands of wheels and spindles and delicate machinery are made in the rough but have not yet a working connection with each other. The process of development in childhood is like that of the engineer who is gradually putting them in their places and fitting them to work in relation to each other. As we shall see, it is not till the age of 25 that the whole com-

plicated and inter-dependent brain machinery is completed in its functions and can do its work in a perfect manner.

Order of Development.—It is most important to know and notice the order of development of the faculties of brain and mind. It is one of the most astonishing facts to my mind, that until Darwin's time, with his marvellous power of seeing everything, his scientific instincts and power of coming to conclusions from his facts, the order of development of the faculties of childhood had never really been described in any systematic way, and this notwithstanding the very closest observation of children by loving and anxious mothers. Was there ever any fact in a child's development and conduct too small for a mother's notice or too unimportant to excite her interest? Her observation of what takes place in her child is not a thing of toil but of intense pleasure. If all the observations of all the men of science since the beginning of the world were put together, the sum of them would not amount to a millionth part of the attention that the mothers of the world have given to their children. The rapture of a man of science when he makes a new discovery is a tame thing compared to the mother's joy when she sees her baby's first smile. It might have been thought that we should have had nothing to learn about the development of children. As a matter of fact, we had everything to learn, from the scientific point of view, until Darwin took it up. The fathers and mothers had no doubt observed, the educationalists had dogmatised, the philosophers had speculated, and the religionists had theorised about the infant, but nobody had "set it down in order." The child's deformities had been put down to the mother seeing something disagreeable when she was pregnant. Its faults had been put down to original sin. Its nervousness had been attributed to bad milk. Publicists and statesmen did not concern themselves with the early

making of their people. Nature was supposed to take the entire charge of the development of children up to the ages when the schoolmaster and the policeman took them up. She made them big and small, wise and foolish specimens, irrespective of human intervention, natural law, or the conditions under which they grew. Even yet, when science is pervading the community, ask any ten intelligent mothers who have each had six children, how many pounds they gained in weight each year up to seven, or how many inches in height they had grown, the chances are that only one or two will be able to give anything like correct answers. Ask them, further, the ages at which their children showed observation, power of attention, memory, imitativeness, anger, or fear, and the certainty is that one will get few scientifically correct replies. I should back any enthusiastic dog fancier to give a far more exact account of the development of his bull-pup and the coming out of the qualities of courage and fidelity during the first year of its existence.

Since Darwin's time there have been hosts of child students and many good books on the subject have been written, but his observations stand true at the present day and marvellously cover the ground. He assumes, and we must always assume it as the great fact in development, that it is the brain which is the dominant organ ruling the course of progress of mind and body and transmitting hereditary qualities far more than any other organ. It may be looked on as practically the child, all the other organs and members being subservient to it. The appearance of its cells at babyhood as compared with maturity I have represented in Fig. 6 *a* and *b* (p. 22). We believe that the child has a mind apart from its body, yet it is quite certain that without the body it could not think or see or hear or feel or speak, and we should have no real knowledge of its mind at all. Where the brain grows

rightly the mind develops naturally. Where the brain ceases to grow, or is arrested in its growth by some disease *in utero*, or some ancestral condition, the mind also ceases to develop, and we have idiocy resulting. If any of the organs of the senses, such as the eye or ear, or their centres in the brain, are absent or damaged at birth, we have a slow and mostly imperfect development. If the two dominant senses, sight and hearing, and the faculty of speech are absent, then we have the conditions of Laura Bridgman and Helen Keller. These girls were in such a condition that it needed an infinite amount of patience, skill, and science to educate them through the one sense of touch. If that had not been done they would have been in a mental state so backward as to be equivalent to idiocy. If there were many such children in the world they could not, as a matter of fact, be educated at all, and would remain "idiots by deprivation of the senses." At birth the child cries and moves and sucks and appears to feel pain as a mere automaton. Certain things, however, it does as well as it will ever do. It breathes, its heart beats, and the nourishment of its organs goes faster than at 25. The two first mental states that are developed in the child are a feeling of discomfort or ill-being when bodily or external conditions are out of harmony with its existence, and a feeling of well-being when those are favourable to it. Those two feelings it shares with the lowest of the animal creation.

Definite sensations of special pleasures through the senses are next seen. Food gives pleasure, and the person who gives the food is associated with this so that the emotions of attachment and love are observed. A child begins in a faint way to smile when it is about 45 days old. Its mind muscles then assume purposive action. (See Fig. 9, p. 85). This is the first muscular expression of pleasure. Its earliest exhibition of humour and amusement appears

in about 3 months. The vowel sounds of speech begin to be made at about the same period. Imitation and curiosity, the great educative faculties of young children, appear about the fifth or sixth month. From that time they may be said to spend their whole time in making physical experiments. Anger can be exhibited at about 10 weeks, while violent passion may come on at 4 months. There is no evidence that a child can distinguish one person from another until it is 4 months old, in spite of the strong and delightful belief of all mothers that their babies know them whenever they open their eyes. Sympathy is shown at 6 months old. Jealousy, the green-eyed monster, first appears at 15 months of age. Anything that can be called reason is only seen after 100 days have elapsed. Darwin's child smiled at his own image in a mirror at $4\frac{1}{2}$ months old, and found out, by observation and reason, at $6\frac{1}{2}$ months, that it was merely an image and not a real person. Next he saw his father through a plate-glass window. Through a reasoning process he naturally enough concluded that this was also a mere image, and treated it accordingly with contempt and neglect.

A child at about 4 months old or so will not do over again many times an act through which it has suffered pain. Showing the contrast between man and one of the lower fishes, a grown-up pike dashed his head and stunned himself repeatedly for three whole months against a glass partition which separated him from some minnows, and then, after thus painfully learning that he could not attack them with impunity, when they were placed in the aquarium with him he starved himself in a persistent and senseless manner and made no attempt to eat them up. The first signs of moral qualities, sense of right and wrong, inhibition, took place in Darwin's boy at the age of 13 months.

Darwin says that he educated his child in morals solely

by working on his good feelings, and that the boy soon became as truthful, open, and tender as any one could desire, although at 2½ years he had shown "carefully planned deceit." No doubt the great naturalist was right in eliminating mere intellectual teaching and dogmatic education from the moral teaching of the child, but I think he omitted a very serious element in the up-building of his moral nature. That was the power of imitation, without which, I would say, that no constraining power of the feelings would entirely succeed. In moral education the knowing of right from wrong should always be associated in the child's mind with the doing of it by everybody with whom he comes in contact. No doubt up to 7 morals are more of an automatic, imitative habit, than of a real conscience. I have seen many examples of quick, nervous children being so permeated with notions of right and wrong through a constant insistence on them by anxious parents, that a sort of precocious and hyper-æsthetic conscience was created and moral ideas were constantly attached to non-moral acts. Such children I have known to be made acutely miserable by the idea that they had committed a serious wrong in taking too much jam for tea, with the superadded religious idea that there was great possibility of going to hell in consequence, if they died soon.

Any attempt to forestall Nature in developing that or any other of the higher mental or moral qualities is apt to be afterwards followed by paralysis of the qualities, thus fostered by a forcing-house treatment. There is no doubt that the moral sense has a hereditary basis. While all children have a certain tendency to deceitfulness and to do furtively what they have been told not to do, this is developed in some of them to an enormously greater extent than others. The children of the habitually criminal classes, of drunken parents, and of some of the

insane, I have known to be hereditarily devoid of any sense of right and wrong. They seemed to take to deceit as a young wild duck takes to water. The children of gipsies, tinkers, and tramps are notoriously ill to train in habits of truthfulness and honesty. This defect has become in them virtually a diseased condition. There are in the history of Reformatory efforts, however, many examples of a re-creation of a sense of duty in such children, if put under right influences early enough, and if their environment has been of the right sort. This success has been most evident where the individual at the head of the school had placed himself or herself in immediate personal daily contact with such children and had that moral enthusiasm and magnetism of character which is given to some people. Moral action is intimately associated with the inhibitory or controlling centres in the brain of which I have spoken, and with their action. There is a real analogy between the two acts of voluntarily stopping a troublesome cough for a time and that of not appropriating a forbidden piece of food by a child. There is in both cases an act of inhibition—the lower being controlled by the higher. It is of great importance, then, not only for the muscles but for the morals, that inhibition should be cultivated as soon as its centres are developed in the brain. It is observed that after the first year most children exhibit signs of mental inhibition or control over their actions from some motive or other. Darwin found that some of the passions which have a strong moral relationship, such as jealousy, are very early developed.

The last point in a child to be developed is the general force of volition or will-power, to act as an independent being, the *ego*, as it were, asserting its power as a mental faculty. After the first year in a normal brain this develops very rapidly and goes on maturing till full manhood or womanhood is reached. It is no doubt the faculty

above all others which makes one man great as compared with another. All men have it in some degree. The wills of some men are so masterful that, like those of Alexander and Napoleon, they subdue the world. It is one of the most difficult of all the parts of its education to treat this will-power in a child. We all want it to be made strong, but if it is cultivated for its mere strength, without reference to moral or altruistic considerations, we may be rearing a curse to humanity, the incarnation of Milton's word picture of the devil. On the other hand, if we try to repress it too strongly and successfully, the man or the woman may become a mere plastic cypher in the world, and so of little use. There is an old Scotch expression constantly used by the fathers and mothers of past generations in that country, of "breaking a child's will," though it was not really meant that the will to do good should be broken but the will to do evil. In trying to do this, however, the roughest methods of parental authority were used, often in a ruthless and essentially cowardly manner. The strong pressed the weak too hard, and many a man and woman have been thus rendered incurably facile or incurably deceitful. Really to "break the will" would be a device of the devil and would deprive the individual of his very highest faculty. Individual force of character and power for good are, of course, dependent on the strength of will.

There are certain faculties, curiously enough, that even in the child of 6 are stronger than in the grown-up man. Those are notably imitativeness, curiosity, a desire to make those about them laugh, and efforts to please those about them at all costs. The nutritive power in a child is stronger than in a man. It grows the first year of its existence far more in proportion to its weight than in any subsequent year of life. The brain grows far more in the first seven years of life than afterwards—in fact, as

we have seen, it nearly completes its full weight then. It does not, of course, develop in its working power at this rate.

The attempts to stimulate the religious instinct in a child before 7 are, in my judgment, of a largely artificial character. Children are then psychologically unable to take in the abstract ideas of God and religious doctrine, but it is a very different matter, I would say, if we substitute the simple feeling of reverence for the good and for a religious life. The one is much less complex than the other, and will eventually proceed by slow but sure stages of development into the other. The one is the basal instinct on which the other has gradually reared itself in the course of the evolution of mankind. I would urge on all parents to try to create in their children a feeling of reverence for the old, for the good people whom they meet with, and for the great powers of Nature. I believe it would be easy to implant in children's minds a feeling of reverence for the sun, for beautiful scenery, for the sea and its majesty, for animals, for flowers and for grass. Such Nature-worship follows in the history of mankind on the mere superstitious fears of the primitive man, and if the child of to-day has to pass in body and mind through the same stages as its remote ancestry did in its gradual evolution, as is largely the case, it seems a natural thing for it to travel the same road in the growth of the religious instinct.

Speech Development.—The faculty of speech is, as I have already said, the most interesting and astonishing combination of a mental and bodily problem in existence. Its progress is surrounded by many pitfalls. It is highly under the influence of training, though it also owes much to hereditary aptitudes. Many physiologists and psychologists, not to speak of philologists, have studied this faculty of recent years. This is not the place to refer

to the evolutionary aspect of speech and to the fact that all modern speech, all modern languages, can be traced up to about a hundred roots. Speech begins by simple tones and gestures, expressive of feelings. Those exist among animals. Among low savages there are no abstract ideas at all and no words to express them, the whole number of actual words used by some tribes low in the scale of humanity only amounting to a few hundreds. Among African bushmen and Hottentots there is evidence of the survival of an inarticulate system of sign-making. Taine first studied carefully and on scientific principles the rising up of the faculty of speech in one of his children. A child can cry and make a noise from the moment of its birth, but this is merely a mindless bit of automatism. It first makes vowel sounds only. At 3 months many such sounds are made, but they have no meaning. It is simply practising its vocal organs as it practises its muscles by constant movements of its hands and legs. Consonants of the simpler kind are gradually added to the vowel sounds, and the child produces a series of simple cries almost as though it were talking a foreign language. The use of this gives great pleasure to the infant and the pleasure causes a constant repetition of this incoherent speech. At 12 months, only the materials of language have been learned. Children attach meanings to words uttered by others before they attach any meaning to words uttered by themselves. From 12 to 18 months is the period when the first rudiments of real speech can be expressed by the average child. Its articulation is poor at first. The number of words are very few, and many single words do duty for a great many meanings. Thus the "Bow" means to most children not only the dog but all animals whatever at first. There is a striking diversity in different children as to the time when speech appears. One child may really "talk" at 15 months.

The speech faculty of girls is usually more quickly developed than that of boys. Another child equally intelligent, muscular, and in other respects as far forward, may not be able to speak till after it is two years old. I have seen remarkable examples of what I call postponed faculty —and few faculties are postponed longer than that of speech in a few cases. I know a girl who only began to speak at 8 years of age. By the age of 10 she could talk fluently. The postponement of speech is, however, in some cases a very serious indication of the arrestment of general brain faculty and of mental imbecility. I think far more could be done than is done by mothers and school teachers to make speech more articulate and more expressive than it often is. It is not only that we would thus acquire a more perfect vehicle for our ideas, but speech, like all muscular actions, reacts back on the higher centres of the brain and we should have keener feelings and more intelligence, resulting from the mere fact of better speech.

When we pass from the region of the normal to that of the abnormal we have, through brain defect and the explosive irregular outbursts of motor energy sent down by the brain to the vocal organs, the sources of much defective speech, from the lisp, so common at first with many children, up to the stammer which may make life almost unendurable to him who is afflicted by it, and to them who hear it. The effort required to speak is enormously different in different people, according to the perfection and size of their speech centres in the brain. It does not follow that a highly developed speech faculty always goes with a highly developed mental faculty, though undoubtedly the two should go together. Every evident speech defect or difficulty should be at once noticed, and the doctor called in at its earliest stages. There are now many methods of greatly improving the

speech vice of stammering, even when it has assumed very bad forms, but it is much more easily treated at the beginning than when the brain centres have settled into this bad habit. Speech defects and difficulties are commonly accompaniments of idiocy and imbecility, and the chief means of coming to a conclusion whether one of those conditions of mental defect exist in a child.

Risks and Warnings.—Let us now consider some of the abnormal conditions which should be recognised, and many of which require attention or treatment. The brain of a child, receiving, as it does, millions of impressions and stimuli may be too reactive or it may not be reactive enough. When too reactive the faculties tend to be developed too soon, and in that case, not having sufficient power of resistiveness, the brain cells from being unduly stimulated are apt to become explosive. Such children start unduly at noises or sounds; they are too unduly excitable and emotional, they have fits of crying, screaming, and restlessness. The brain, in short, wants stability of action. If in a grown-up man or woman the "mind" cannot be dissociated from the brain, in a child they are still less dissociable. In a child the whole organism may be looked on as having a more distinct solidarity, the one organ to the other, than even in the grown-up man. In the child before 7 the body must be thought of first, the mind comes last, and, speaking generally, if the body is then properly treated the mind will largely take care of itself, in anything like a good environment. Education, in any technical sense, is then of really little importance, and the attempt to apply it often does harm. I believe that if children did not go to school before 7 it would make no difference in their future lives, as far as mere education is concerned. In short, the hygiene of the mind is then mostly the hygiene of the body. There are certain mental symp-

toms which, in a child, are undoubted danger-signals. If a child ever shows depression or mental pain, then there is certainly something wrong, some organ is disordered, the child is being poisoned by bad food or bad air, or some irritation is going on in its bodily processes. Studying the patients in the Edinburgh Hospital for Sick Children and making inquiries of the nurses, I found that in the delirium of fever most children exhibit a happy delirium, except in a few cases where there were injuries to sensitive parts of the body, such as take place in severe burns. The night delirium of such children was full of fears, terrible imaginary sights, and screaming as if in pain.

Looking still to the danger-signals, does the child grow and gain in weight at the normal rate? If it does not, then you will find that the brain and mind are puny as well as the body. More fresh air, more suitable food, and a careful examination to see if there is any disease, such as tuberculosis, are then urgently needed. There is a series of muscular symptoms of disease very common in childhood. The chief of those are convulsions, general all over the body, or local muscular spasms occurring in the arms or legs or about the face or head. Very closely allied to such conditions are undue restlessness, jerkiness, fidgetiness, slight St. Vitus' Dance, and hysterical conditions of emotional explosion. Muscular tricks and bad muscular habits, such as making faces, sucking thumbs, &c., are common enough in children, but are usually easily remediable if attended to. There are other conditions of a contrary nature but still marking disease, where you have stupidity, lethargy, slowness of movement, a diminution of sociableness, a lessening of the normal desire to please and a general lassitude of mind. Among the poorer classes the terrible condition called rickets, that arises from bad nourishment and

deficient fresh air, is very common, and it affects the mind as well as the body. Undue nervousness and irritability in children always indicate that the doctor is needed, and that the conditions of life should be changed. Coldness of the hands and feet, with a bad circulation, are symptoms that should always be attended to.

Many children are subject to vague fears in the dark, which are often in words expressed by dread of the devil or hell. Such children are of the unduly nervous and unhealthily imaginative sort.

A child is so much all self that it seems ridiculous to talk of creating and educating it up to an unselfish state of mind. For most children there are no "others" in the world in the early stages of its life who have to be thought of or pleased or considered. Altruism and unselfishness are best taught by the association of a number of children together in the life of a family. The question of the use of rewards and punishments for developing good conduct in a child is one that needs much delicacy and discrimination. For a child to behave properly and stop screaming because it is going to get a sweetmeat can only be defended on the principle that you are thereby strengthening a good habit. Punishment in some form is absolutely necessary in the upbringing and hygiene of most children. It is getting out of fashion, nowadays, to apply this by making the child suffer bodily pain. It is rather used by depriving the child of something that it desires. Both forms of punishment are, I believe, applicable in a reasonable way and in a modified degree to different children with different constitutions and tempers. It should never be forgotten that in the early stages of a child's life, action follows sense impressions or feelings in an instant, "reflexly," without hesitancy, without reflection. It

is hair-trigger in its suddenness just as in animals. This must be kept in mind always before deciding whether any form of punishment is required. Children's actions are largely thus automatic. It would be as ridiculous and wrong to punish a child for such actions as to condemn your gun for going off when the trigger is pulled.

In regard to one thing I can speak with absolute certainty, and with no reservations, in regard to the bringing-up of children. It is that system, order, and punctuality should always be the rule of their lives. It should apply to play, meals, sleep, exercise, and such employment as children can do. For all children this orderliness is best. For many children of a nervous type and of an artistic temperament it may be their salvation in after-life to have acquired such habits of order. In reality, such habits should be regarded as in essence a part of the moral training of the child. For the children of our professional and educated classes who have had the advantages of education for many generations, and who are apt, therefore, to have become "fine in the grain" and rather nervous, orderly lives from youth to age may be the sheet-anchor of their health and happiness. It should never be forgotten that the nature of a child, as of a man or woman, is complex, not simple. No mere simple prescriptions and rules, however wise they look, will be applicable to all children.

The temperaments of children should be carefully studied. They appear early. There are two great forms of tempera ment which appear soon in some children. There is the nervous child, where the brain is somewhat over-developed, but especially where it is unstable in its action, where sensitiveness is too great, where reactiveness is also exaggerated, and in whom passion and emotion are too exaggeratedly or too easily expressed. Such children

are often difficult to manage, are wayward, disobedient, and subject to gusts of apparently causeless passion and sulkiness; they are subject also to whims and groundless fears; they are fidgety, restless, and deficient in the elements of control; they are usually thin, often capricious about food, and they are subject to nervous ailments, such as chorea and convulsions.

The other temperament is seen in the phlegmatic, stupid child, unreactive, insensitive, slow in imitativeness, wanting in keen emotion. Such children are apt to be fat and awkward, and they tend to sleep overmuch; loud noises do not disturb them, they suffer pain with much equanimity, and the muscular expressions of their affections and passions are deficient.

Sleep.—Childhood sleep is the great healer of most defects that are remediable in a child, the divine restorer, the sovereign calmer. In the early stages of its life, up to its third year, one may safely lay down the rule—let it sleep as long as it will and encourage sleep in every way. I need scarcely say that the sleep habit should be made regular and punctual as to time. A sleepless child is always a nervous child, and is mostly an unhealthy one. As we have seen, during sleep the process of building up the cells of the brain goes on. Now in a child there is not only the wear and tear of brain action to be provided for, but also the steady growth of every cell, the formation of connection between different groups of cells by means of fibres. The electric batteries have to be daily made bigger and the copper wires to be increased and brought to many more stations. A child's brain, too, is apt to receive far more stimuli from the senses than can be written on its miniature brain. We require to provide that the evil effects of such stimuli shall be repaired and lessened through prolonged sleep. Each page should only take on the impressions of a few types at a time. If we applied

more the printing would be blurred. The kind of sleep of every child needs to be studied. Some children sleep much more soundly than others, and are more difficult to awake. Temporary sleeplessness in a child means undue nervousness or disease. Nothing can be more troublesome or exhausting to the mother or nurse than a continually sleepless child. I have known idiotic children who, instead of going to sleep in the darkness, began to scream and became restless every night. The tricks of putting their children to sleep by the mothers of different nations have been very different, and in some cases very extraordinary. The cradle, the swing, perfect rest, rocking in the mother's arms, and many more have been in vogue. I believe it is best not to accustom the child to anything except a crib in a dark room. The doctor has often to be called in for sleeplessness, and he can sometimes help to restore the habit when it has been broken, by medicines and other measures.

CHAPTER XI

BOYHOOD AND GIRLHOOD—BETWEEN 7 AND 15

THE psychology of boyhood and girlhood has had many students. Not only have we had the classical pictures of *Tom Brown's School Days* and *Stalky and Co.*, but many Societies for the special object of child-study, those applying to early adolescence as well, and we have books innumerable "suitable" for boys and girls to read. They all naturally endeavour to suit themselves to the mind of the period and to put things in such a way that boys and girls shall be interested in them. If schoolboys and schoolgirls of the educated classes are not what they should be, it is certainly not for want of ideals placed before them. Every sort of adventure, every kind of "lesson," and every sort of predicament, good and bad, can be found in these books for boys and girls. Codes of public school life, the ethics of the boarding-house and the traditions of games so far regulate the lives of the scholars of this class. For the other and vaster classes who are taught in Board schools, there has been a singular deficiency of fiction or literature of an ideal nature. The man who could write another *Tom Brown's School Days*, where the scene is laid in an average Board school, would make the parent, the teacher, the scholar, and the State greatly his debtor. To touch with the light of fancy and romance, and so to inform with a high sense of

duty, the five millions of our school children by means of a suitable literature—would indeed be a work that no genius need be ashamed to attempt. The practical effect of such a book would be worth thousands of sermons and tens of thousands of school lessons. Humanity even at that age will form its ideals, and the true ideal of a Board school boy or Board school girl has yet to be created. I trust that we shall soon see this enormous desideratum in our literature supplied. Authors innumerable have gone to the common life of the people for incident, for sentiment and for heroism, and they have found them there abundantly. It cannot be that in the lives of the children of those peasant heroes of literature there can be no ideals worth study and depiction.

Looked at from the combined points of view of brain and mind, the school age is first of all that of the higher co-ordination of mind and muscle. It is represented in the brain, not by actual growth in bulk and weight, but by the establishment of an infinite working connection of millions of fibres of mind cells already formed but requiring full development with motor cells also lying ready to be used. (See fig. 5, p. 20.) No doubt in the child before 7 this process has been already well begun, but it has not reached the stage where the mind wills and the brain at once at its bidding carries out accurate and complicated bodily movements of every sort. The muscles are rapidly developing, but they would be of little service if they were not connected indissolubly and for the whole of the rest of life with the mental apparatus, through which thinking, feeling, and willing are performed. A child of 8 cannot use effectively any instrument. But I have seen a boy of 15 in Cairo using, in obedience to his will, every finger of his two hands, every muscle of his arms and the toes of one foot, with such accurate co-ordination that he was producing,

with the aid of a turning lathe, the most delicate balls and spindles to form beautiful meshrebiya work. He was turning it out with extraordinary speed and making as much money as the best hand in the manufactory. Each element of the complicated scheme in wood that he was constructing was like every other. The balls were of the same shape and size, holes were made of the same bore and depth, and the pins were made so accurately that they fitted, each into its socket, without any further dressing. Now this complicated process, needing skill and absolute accuracy, he had taught his muscles to perform in obedience to mental effort between the ages of 10 and 15. It is only at this period that the foundation of such co-ordination can be so perfectly acquired. This illustration shows what I mean by the co-ordination of mind and muscle at this period. It illustrates also how heredity comes in at this age. The Cairo boy was of a family and guild which for generations had done nothing but make meshrebiya work. A special aptitude had been created in their mental and motor nerve cells which had become hereditary, so that the training of this boy had been far easier for this work than that of ordinary children.

The ordinary co-ordinations between different groups of muscles, all being trained to do their work by the brain, do not often in this country assume the form I have referred to, but they are here equally real and equally important for the effective future life of our boys and girls. They take the form of being able to run and walk well, to sew and knit, to use tools, of being taught to write well, to speak clearly, with proper accent and emphasis laid on each word and sentence. Anyone hearing a deaf and dumb boy or girl who has been taught to read or speak will better realise how much the ordinary schoolboy and girl have learned in the way of using the fine muscles of the larynx, of the

tongue, and of the mouth, all to act together and in harmony, to produce the intonation of pleasant speech and reading. So with writing. We all know how long a time it commonly takes to produce a beautiful handwriting. The achievement of the Cairo boy seemed to me more wonderful than that the English boy should be taught to speak and read and write, but in reality it was not so remarkable and delicate a process. Each little knob and pin of the meshrebiya work was scarcely as fine an example of nerve and muscle co-ordination as the recitation, with fluency and feeling, of a piece of English poetry, such as our well-taught boys and girls can easily do at 15, or than a well-written letter. The brain basis for these accomplishments exists in the shape of groups of cells, gathered in "centres" for the hands, the feet, and the voice muscles. There is, in fact, for writing, a special portion of the brain convolutions, which, if injured or deficient, no writing is possible. Then the whole carriage of the body, the power to play games, to leap and walk and run, and to express the feelings through the face and eye muscles, are all perfected at this period. A man or woman would be a poor, awkward, "feckless," and ineffective machine, but for the muscular co-ordinations learned during this period of life. Slowly acquired but delicately and constantly practised, they become a brain habit, and easy of performance afterwards. The right learning of these co-ordinations is the surest foundation of a hygiene of mind, and the strongest aid to mental health in the future lives of the schoolboy and girl.

The second great characteristic of the school age is allied to co-ordination. It consists of ceaseless muscular activity. This is why children at that age must have games, will shout and cry and scream, and are never at rest. To grow, muscles must be exercised, and to develop, the brain must be kept at work. To watch the

dispersal of the scholars from a Board school is a great lesson to the mental hygienist. During the school-hours a somewhat unnatural inhibition has been enforced. The moment the outer door is opened it seems as if the safety valves were suddenly blown out, and noise and romping are indulged in without control of any kind. The cause of this is that the necessity to energise existing in the brain and the muscles, of which I have spoken, having been repressed for a time, must burst forth, while the inhibitory centres cease for the time to act. This is not only a physiological necessity, but it is the greatest factor of progress in the development of those children. I have already spoken of the hygiene of play.

The third great characteristic of the school age is its unreasoning fearlessness of consequences. Hughes, in *Tom Brown's School Days*, says that between 11 and 12 is "the most reckless age of British youth." In this I agree with him. The natural effects of certain conduct are not realised, and are therefore not acted on. Fear is one of Nature's great protective agencies. To rouse this faculty is, no doubt, the psychological explanation of the system of corporal punishments which prevailed so extensively in former times in all educational systems. Among many ancient peoples, such as the Spartans and the Romans, this was carried to such an excess that it became cruelty and tyranny. There is no doubt that if we turned out the scholars of an average school into an uninhabited island, and they tried to live the life of an ordinary community without the control of their elders, they would be most cruel to each other, serious accidents of all kinds would occur, they would set fire to their houses, they would eat up all their available food at once without the fear of starvation on the morrow, and their conduct would be reckless in the extreme.

The fourth characteristic of the period is its want of

power of origination. The schoolboy imitates but does not originate. Few new ideas occur to him. His plans are all founded on what he has seen or read about. In this respect he is in the condition of a low barbaric tribe. No real progress would be possible in a society with this deficiency.

The next characteristic of the period, which is allied to the last we have spoken of, is that of a cast-iron conservatism, strong, deep, unreasoning, stupid, often cruel, and unalterable till the period of life is past. Whatever a boy or girl sees others do, whatever school tradition is handed down, is imitated, stuck to, and regarded as a sacred rule of their lives. If a game is played one way, the idea that it may be improved is scouted, and its originator held to be an idiot. Where children live at home this is modified to some extent by their intercourse with parents and elder brothers and sisters, but in communities of boys and girls, as at the great public schools and large boarding-houses, this conservatism is absolute. It is, no doubt, one of the disadvantages of those institutions that this trait of character is apt to be passed on from the typical schoolboy age of which I am treating into the adolescent period of the higher classes and college life, when origination and "thinking for oneself" is possible. It thus becomes a repressive and retarding condition with them. It is one of the characteristics of the American and Colonial youngsters that the freer life enables them to shake off this habit of mind very soon after puberty. They learn to discard the schoolboy and schoolgirl cast-iron fixedness of ideas and customs, and to act for themselves more spontaneously. Individuality and resource are much earlier developed in those more free and more natural communities than among us. Hughes says, "Boys follow one another in herds like sheep. They hate thinking, and have rarely any settled principles." I agree with the first

part of the sentence but not with the last, for they have the most settled principle of conservatism in the highest degree, and it leads to a universal and everyday practice. This conservatism of the schoolboy and schoolgirl is so strong and so marked that it must have a really beneficent end for the period of life in which it occurs. It punishes severely every departure from tradition, it sets its face against "blabbing" and tale-bearing, it tolerates and says nothing about bullying and cruelty. All this I look on as being the inchoate stage and the precursor of settled principles of action, and the resolute following of what is right, with the equally resolute avoidance of the wrong, which form the strongest element in the mental constitution of the late adolescent and the man of the right sort. It is an outcome of heredity which tends towards certain fixed beliefs and modes of action. Those codes are acted on till the reasoning power and the imagination have fully developed, before their rightness or wrongness, or expediency or their applicability is questioned and reasoned out. Every human being passes through this stage of physiological conservatism twice, the first during boyhood and the second in old age. Both, no doubt, are dependent on certain fixed laws of the development and the retrogression of the human brain. Both serve good purposes in a settled and civilised society.

The next distinctive characteristic of boys and girls, especially boys, is the extraordinary part which a spirit of adventure and romance plays in their lives, affecting their imagination chiefly, but also their conduct. There is no end to the castles in the air which boys and girls build. They play at life—another life than their daily routine of humdrum domesticity and school work—and for the time being this play is as real to them and far more pleasurable than if the events had been

real. The fancy is very lively at this period. It cannot quite be called imagination, because imagination is creative. The boy's play-life is always founded on reading or hearing tales of adventure. We know that there is absolutely no limit to a boy's capacity for devouring *Robinson Crusoe*, Ballantyne, and Marryat. Unfortunately, no such classics for our girls exist. Lessons to many boys are simply disagreeable interludes between the times spent in vivid fancies which run riot and give unbounded pleasure. The imaginary adventures are mostly quixotic, foolhardy, and largely ridiculous. No doubt this state of mind is a highly educative one, if it is kept by work and discipline under reasonable control. It lays the foundation of the life, real and ideal, of the future in many cases. Even when the boy proceeds to build real castles in a solitary wood, when he launches his boat and imagines he is sailing to distant and delightful lands, even when he actually runs off to sea, such acts are often the preludes to overcoming practical difficulties in his future life, and to doing real deeds of daring. The schoolgirl's fancies are apt to have a different setting. She thinks herself a queen clad in most gorgeous robes. She imagines herself a lady of title with a splendid castle for a home, and servants innumerable to obey her commands. Lurking through the whole there is nascent wifehood, motherhood, and hero-worship. Her dolls are, in the early part of school-life at least, endowed with life and faculty. They help to materialise many of her fancies. They are her children, they are her companions, and she is seldom without an ideal knight-errant to get her out of difficulties, and to pay her an admiring worship. On this ideal characteristic should be built up at school a practical education for future real motherhood, by teaching the care of children,

their needs, their dressing and feeding, their exercise, and play.

The next characteristic of boyhood and girlhood at the school age is a curious combination of frankness and reserve. A thoughtless person might imagine that a boy and girl—especially the girl—kept nothing to themselves; they are so outspoken, so talkative, and often so unconventional in speech. No doubt it is this which gives the impression of freshness in the lives of school children to older people, and makes them really useful and delightful to their elders. Among themselves this frankness is, of course, more marked than when with their seniors, but such frankness has a limit, especially among boys. Touch certain things and they shut up like an oyster. I quite agree with Kipling when he says that the "reserve of a boy is tenfold deeper than the reserve of a maid." This is entirely a natural brain characteristic, not the result of reason, not of the fear of consequences, and not even of being laughed at, although this last has something to do with the reserve of boys and girls. At the back of their minds there are things which are vague and awful, which they do not talk about. Deep religious ideas, certain matters between the sexes, and certain things of high romance and sentiment they will not talk of. When "Stalky and Co." formed a cadet corps, there was mixed up with the drill and the rifles the high ideas of serving their country in heroic ways, and when the fat, oily M.P. came and addressed them in the most commonplace words which instinctively vulgarised their sentiment, and when he at last reached the anti-climax by unfolding the Union Jack, they all felt most uncomfortable, somewhat outraged, and entirely unresponsive. The only charitable explanation that occurred to them was, "Perhaps he was drunk!"

The humour of boyhood and girlhood is peculiar to the period. It takes the form of fun rather than what can be called either wit or humour. It is constantly practised, usually at the expense of their fellows, in the shape of practical jokes or rough, inconsiderate speeches, which would be very cruel in the case of grown-up people. Pleasure and joy in life is longed for in boyhood and girlhood as an absolute necessity. It may, no doubt, be overdone, but to take it away from that period of life would be both a cruelty and a wrong. Joy and pleasure are the best tonics of the period.

The faculty of inhibition, in all its departments, over muscle and over conduct, is at this period of life imperfect and fluid. The moral character is only in the process of making. Conduct is regulated by rules, traditions, and the fear of punishment. How such punishments should be carried out is a difficult matter to say. No general rule, I believe, can be laid down. It depends on the social class, and on the nervous or non-nervous temperament of the boy or girl. If actual punishments causing pain cannot be used—and in nervous children they should not be used to any extent—then there remain the resources of deprivation of indulgences or setting tasks; but surely no more cunning device for making lessons abhorrent was ever devised than connecting them with punishments for ill-doing. For many boys and some girls there can be no doubt that short, sharp application of means which cause temporary but harmless bodily pain, is the best form of punishment. Children are in the evolutionary stage of savage man, and among all savages, and even among Eastern peoples, the stick, the whip, or some form of bodily punishment is universal, and it seems fairly effective for securing order and preventing the smaller

crimes. The quality of the motive must be suited to the mental capacity of the individual to be acted on. The end must be attained somehow.

There is one faculty of very different development in different boys and girls which is of very great importance—the simple one of learning to use their senses efficiently, and of registering what those senses tell them. The faculty of observation, in short, is one in which many school-children are singularly deficient—most of them, in fact. It is a faculty which is easily strengthened in most cases if suitable means are systematically employed. The development of it usually gives much pleasure. It comes naturally enough to most of them to observe what they see or what they hear, and to come and relate it in definite descriptive words. This is probably one of the best foundations of all education. The girl or the boy who has been taught to observe accurately, and to describe what has been seen or heard or tasted or smelt, has a great advantage over others who have not had the faculty of attention and observation thus educated. It is simply marvellous how many grown people will contrive not to see a thing, even though it is "before their eyes," if the faculty of attention has not been educated in them. This power of observation is the first thing needed for most successful work. It is not only good in itself, but by suggestion and association of ideas it stimulates the intellect and power of reasoning. Its presence may make all the difference between success and failure in life, between effectiveness and non-effectiveness in work.

This is naturally a very social age of life. The boy or girl who is not social is not healthy. If they have not the opportunity of mixing with other boys and girls they readily take to older people, and in that way satisfy the cravings of their social instincts. How those instincts are

ministered to at this period of life may make all the difference in the life of the future. The moral aphorisms current among all people in all civilised ages about the effects of bad company, "that evil communications corrupt good manners," and that the boy or girl is known by his or her associates, are all perfectly true. The social life of boyhood or girlhood can be so managed in many cases that the affection in that way created, and the good example shown, may almost antagonise "original sin." Wise parents know this well and do all they can in all sorts of skilful ways to carry it out. I used often to say to my friends that our garden was worth £500 a year to our children. In it they received their boy and girl friends—those whom we thought were good companions—and they played to their hearts' content under the very eyes of their mother. We made few inquiries as to how the flowers were trodden down or why the branches of the trees were sometimes broken off. It remains one of my most pleasant memories of life to people the garden with those noisy and happy social child parties. Regulation, not repression, should be the motto with parents and teachers for the social education of boys and girls.

There are certain characteristics of boyhood which are largely evil. Cruelty is one of those. I fear that most boys are more or less cruel and heartless in many ways. The way in which the fags were bullied in the English public schools in old times, the way in which a bad-tempered dog or a frightened cat will be pelted with stones, the real joy of cat and rat-hunting to a boy, the way in which most boys will abuse and strike and call evil names another boy who is soft or rather weak-minded or peculiar in appearance or dress, are all unmistakably of the evil one. The acuteness and the ingenuity that boys and girls exhibit in finding out the weak points of their schoolfellows, and the ruthless way in which those weak points are exposed and

irritated is certainly of evil both to the persecutor and the persecuted. Boys' pets are commonly enough treated with much good-humoured kindness, but also with much unconscious cruelty. The hardness of boys' hearts in certain circumstances points to there being at this stage of life an element of unevolved barbarism in them. This tendency to cruelty, to unthinking hurt of the feelings of other boys and girls can undoubtedly be considerably modified by careful teaching, especially by taking as illustrations the hardships and sufferings thus inflicted on fellow-scholars or on animals.

The schoolboy and the schoolgirl should be well fed on a not too stimulating diet, should live very largely indeed in the sunshine and fresh air, should have plenty of open windows in their schools and in their bedrooms, and should have a very large amount of sleep—more than is often given in many homes and schools: ten hours for the age of 8, nine and a half to ten at 14, and I should put down nine and a half hours thereafter as not being too much sleep for the average schoolboy or schoolgirl. Unquestionably the ideal mode of education for both sexes, were all parents wise and firm and intelligent, and had they plenty of time and opportunity to devote to their children's up-bringing, would be home-life with day-school teaching. This at all events for the multitude, but with many exceptions where boarding-school or public school life would be for the best. The "knocking about" which all boys and girls at boarding-schools and public schools have to undergo has two sides to it. If one wants to realise the utter misery which a sensitive and highly intelligent boy may suffer through life at a public school, read the life of the poet Cowper. No one will convince me that the accumulated wisdom which the parents have acquired, and the family ties and amenities of home-life are not one of the best educative influences. I have no

doubt whatever that the general intelligence of the educated classes in England has suffered greatly through so many of its boys and girls having lived a monastic life away from home for most of their time. It is always to me pathetic to consider the way in which the boys at Rugby were influenced so much for good by Dr. Arnold, when I think that hundreds of those boys must have had parents at home almost as wise as Dr. Arnold, quite as good in the example of their lives and far more interested in them. Education plus affection exhibited in daily life must surely be a better thing than education minus affection and minus intense personal interest. The widely held assumption of English parents that their duty has ceased and that of the schoolmaster begins when their children reach 8 or 9 years of age, seems to me an essentially selfish notion. It implies an incomplete conception of fatherhood and motherhood.

The boy or girl during the school life should always be plump, hard in the muscles, free from headache, cheerful, and should sleep well. The average growth from 8 to 15 for a boy should be from 2 to 4 lbs. a year. A girl should gain a little less weight during those ages.

Girls are undoubtedly more tender in constitution than boys at this period. They tend more to become thin. They do not eat their food so regularly. If of a nervous constitution, they are apt to show some of the tendencies to nervous diseases which I have mentioned, and they have not the same strong organic craving for ceaseless exercise and unlimited appetite which the healthy boy exhibits. I refer chiefly to town-bred girls and to daughters of educated people. To go into a country village and into a country school the girls are, as a general rule, at that age as rosy and robust as the boys, and in their play they are often as vigorously rough and noisy. This seems to show that where the physical conditions and environment

are absolutely good the girls grow and thrive as well as boys during this period of life.

One will very naturally be asked by many parents and by all teachers—What about discipline, restriction, and steady habits of work, punctuality, rule, order, and obedience at this period of life? I am in favour of every one of them as hygienic agents, but not pushed to unnatural and unphysiological degrees. All those should be made into habits of life, and habits of life are not formed at once, but through repeated practice and steady but kindly and tactful pressure. The machinery for the practice of all these is being slowly formed and built up in the brain, and you do not expect such a piece of vital machinery to come out ready-made. It needs forming, fitting, polishing, and the effect of use to make it go properly and to do its work effectively.

I should certainly be asked by most parents and teachers in this country—What about religion? I cannot express too strong an opinion that religious tenet and religious sanction should be taught in the most careful way to the schoolboy. Better still, religious example should be exhibited in daily life by those in association with our scholars. But it should be taught in a way suitable to the apprehension of the brain that receives it. The facts about religion must be taught as other facts are. They will come in by and by in life to very great advantage, but it would be useless to expect that real religious feeling, in the highest sense of the word, can be experienced at the school age. The brain has not then acquired the religious instinct in anything like a full degree. It would really be an unnatural thing to see schoolboys and schoolgirls religious in the largest acceptation of the word. If religious facts and truths are taught, and if they strengthen and give sanction to moral habits, truthfulness, and the simpler virtues of

school life, and arouse the feeling of reverence, that is all that can reasonably be expected at this age.

The making of manners, of which I have spoken in treating of child life, must be most assiduously followed during the school period of life. Good manners, as I have said, are not only agreeable to those near and beneficial for those round the scholars, but they react with powerful effect on the moral character and disposition of the boy or girl who practises them. I am strongly of opinion that the teaching of manners should be a part, and a very important part, of school life. Women teachers are naturally better for this part of school work than men. I have often been impressed with the difference of the children's manners in different schools, through care or the want of it in the different teachers. To see a number of schoolgirls in rude health but with good manners is indeed a pleasure. Boys are more difficult to teach in this respect. Naturally imitating the rude behaviour of their fathers, they need extra care and attention in this matter. They are very apt indeed to look on good manners as an index of softness of character and the want of manliness. Their ideals tend towards action and effort rather than to pleasant ways of saying and doing things. No doubt, the further north we go in the British Islands the less cultivation there is of good manners as a bit of life. One ought, perhaps, to except from this the Highlands and the islands of Scotland, where the pure Celtic and Scandinavian tradition is undoubtedly towards politeness.

One great risk of the school age is from over-pressure by hard and unsympathetic teachers striving to acquire personal credit or to earn as large Government grants as possible. If schools are ill-ventilated, stuffy, and either too hot or too cold, over-pressure tells much more against the health of the scholars than if they are sanitary. If the

work of the day is ill-regulated with too long spells of attention in one direction and no interludes of play and fresh air with opportunities for the ebullition of high animal spirits and muscular work, the chances of the ill-effects of over-pressure are greater. In *Stalky and Co.* a boy who had been over-pressed was described as having "been hammered till he was nearly an idiot." Any want of orderliness and system in teaching and school work adds greatly to the risk of over-pressure, and forms a very bad training for the scholars.

Backwardness.—There is no practical risk of mental disease during the school age, but it is at that time that "backwardness" is first markedly observed. This means in most cases a badly constituted, unreactive, unreceptive brain, either from heredity or from very bad conditions of childhood, such as insufficient food, bad air, cruel usage, insufficient exercise, or irrational over-pressure. There are certain backward children who will necessarily be backward all their lives on account of the constitution of their brain cells. (See fig. 6, chap. ii. p. 22.) There are others in whom the backwardness is merely postponement in development of faculty. This latter backwardness is often of such a character that it looks like laziness and moral perversity. A few such boys and girls in a school or class are no doubt very trying to the teacher, and often the condition is misunderstood, with the result that great cruelty results from corporal punishments, deprivations, and insulting recrimination. The backward boy or girl suffers greatly also from the unthinking and cruel conduct of fellow-scholars. They are always the butt of the school, and much ingenuity of torture is exercised towards them. The condition does not amount to idiocy or congenital imbecility, but it is often of the same nature. Most really backward children should not be taught in classes with the average scholars, but

should be taught apart, and their individual peculiarities studied. In London and some of the larger English cities special schools and special systems of education for backward children have been most properly instituted. Many such children have certain strong points capable of cultivation, with weak receptiveness along most of the line. They often show peculiarities in the form of the head and facial expression, their features not being symmetrical, and their movements awkward and generally lacking beauty and bodily presence. Those defects are now often called by medical writers "stigmata of degeneration." The presence of a degenerative process during development, leading to a large amount of bad stock in any people, is of enormous importance. It is attracting much attention nowadays, and has been the subject of two Royal Commissions.

Games.—The great risk of a want of proper system of games, gymnastics, and physical training during school life is that the scholars suffer in speech, in writing, and in the muscular exercise of the legs, arms, and body, and that the great process of co-ordination between mind and muscle of which I have spoken is not properly carried out. The consequences are a permanent lack of such co-ordination, with its results of awkwardness in gesture and manners, inharmonious, unpleasant speech, bad handwriting, and coarse needlework. "Handiness" if not developed at this period is very difficult to attain afterwards. The effect on the face and eye is that of a want of muscular sympathy and often positive ugliness. To attain anything like the physiological ideal of beauty and muscular harmony there must be constant and co-ordinate practice of the "mental muscles" of the face and eye during this period of life. There is great difference of opinion between the two schools of heredity as to whether such defects and marks of degeneration are

transmissible hereditarily to future generations or whether they are simply confined to the generation that exhibits them. The school of heredity which asserts that acquired peculiarities are transmissible to posterity naturally fears that the race will suffer from the effects of such defective training during the school age. The school which asserts that no acquired peculiarities can or will be transmitted as naturally says that the next generation will be all right if proper training is applied to its individual members at the proper time. No doubt both doctrines are applicable to the awkwardnesses of the school age. In some cases they are undoubtedly hereditary, while in other cases they are as certainly "acquired" through want of proper training at the proper time.

Beer.—There exists a practice in many of the great English public schools and also in many homes even of our better-off classes to give beer as a part of the diet of schoolboys. This arose when beer was more universal as an article of ordinary diet than it is now, and before the effects of alcohol on the brain had been scientifically studied. I unhesitatingly condemn this practice out and out as being bad for the growing brain at this period and attended by many future dangers. Beer is not really a food in any proper sense, and it is certainly an unsuitable stimulant for this stage of life. It creates a taste for stronger liquors too. Tobacco, in the shape of cigarette smoking, is bad enough, but it is usually done surreptitiously, and not among the respectable classes encouraged. In many American States there is a law against smoking before 16 or 17. I would say there is more need for a law against alcohol in any form before that age. It shows how little the universal opinion of the medical profession, who know most about it, is able to overcome the old and bad traditions, that any school could give beer

as a part of a dietary for boys at the beginning of the twentieth century. I do not believe in too much stimulating animal food for this period of life. I would give every boy and girl at least one glass of new milk every day, in addition to the ordinary meals. To many of them I would give two or three glasses. Milk is the article I should be inclined to give *ad libitum.* If fruit were attainable I should say the same about it. While my own children were growing up there was a dish of oranges and apples always on the sideboard, and no questions asked as to their consumption.

I have spoken of sleep in childhood and its importance (p. 131). During the school age it is almost, but not perhaps quite, of the same consequence. There are, of course, individual peculiarities and idiosyncrasies, where the time—9½ hours—I have recommended is too much or too little; but that should be the average. We should have less weediness of growth, less nervousness, less tendency to hysteria and insanity in future life if this rule were followed.[1]

Diseases and Deficiencies of this Period.—The nervous diseases and deficiencies of this period of life almost all affect the co-ordinating power of mind and muscle. St. Vitus' Dance, epilepsy, asthma, sleep-walking, and several forms of squint and eye disease are apt to appear then. In idiocy the speech centres are incapable of development, and so speech is absent and cannot be cultivated. In the congenitally weak-minded and among backward and feeble-minded children speech defects and general co-ordination defects are very marked. In such persons the mind cells and the motor cells are defective, while the strands of

[1] In regard to the general health of our great public schools, I cannot do better than to recommend a perusal of Dr. Dukes' exhaustive treatise on *Health at School*, where the details of that momentous subject are entered minutely into. No parent can read it without profit and instruction.

fibres connecting the two are too few in number, so that a clear, pleasant speech and proper intonation cannot be acquired, while the writing is unformed, the movements of the body are awkward, the gestures are grotesque, and the face and eye muscles do not express properly mind and feeling. There is often found a postponement of development of the co-ordinating faculties. We see some schoolboys and girls who are poor in speech and awkward in movement and expressionless in face up to 10 or 11 or 12, and then there comes a sudden rush of development of those capacities, so that by 15 or 16 they have acquired them to almost a normal extent.

CHAPTER XII

ADOLESCENCE, BETWEEN 15 AND 25

THE period of life of which I am now to treat is the most important in life in its relation to the hygiene of mind. When one considers the enormous differences in the brain and mental life of the same human being in the different periods of life, it does not seem wonderful that each should need somewhat different principles and practice of Mental Hygiene. It would be very wonderful indeed, and somewhat incredible, if the brain and mind of a child of which we have spoken, whose chief characteristics are active growth, intense imitativeness in all directions, great inquisitiveness, quick, uncontrolled, unthinking response to stimuli, and marked immatureness in all its functions—if this period of life were subject to the same hygienic rules as that of the adolescent, after sex has asserted itself and manhood or womanhood is nearly reached. The prevailing activities of the two periods are entirely different; the one is chiefly trophic or nutritive, and the other is dynamical and developmental. Up to puberty there had been vast tracts of brain tissue which had never been put into active use at all. They had merely been undergoing the process of preparation for use. The enormous new development of the affective faculties, the new ideas dependent on those, the new interests in life, the new desires and organic cravings

rising into a different and far higher region of imaginative and æsthetic life, all show that a fresh chapter in brain and mind life has been opened. With this new normal development of a higher life comes a special liability to previous kinds of abnormality in brain and mind, abnormality that may extend in character from a slight eccentricity up to an acute attack of mental derangement. There is, of course, no absolutely fixed line or short period marking the two eras of school life and adolescence. No exact age can be fixed, but for practical purposes we may say that the school age mind ends at 15 and that the adolescent period extends from 15 to 25. There is, naturally, much in common between the end of the school age and the first years of adolescence. The similarity of general mental lines between individuals of the same and of opposite sexes which characterises childhood and the early school ages now diminishes. Real sex differences of form and mind rapidly develop themselves. Those are accompanied by differences in every set of muscles, in every bone, in every internal organ and especially in the brain and its higher functions. In the man, after that time, the development is more in the direction of energising, thinking, discovering, ruling and ambition, while in the woman the direction is towards feeling, altruism, the protective instincts, sympathising, nursing, mothering, gaining approbation, and accentuation of the religious instincts. Looking to the brain itself, it scarcely gains at all in weight and bulk during the adolescent period, but in function it transforms itself from a lower to a higher plane in an extraordinary degree. It is during this period that the brain first exhibits some of its strongest hereditary tendencies. While such mental factors in human life as conduct and character are being consolidated, as they now are, it is no wonder that hereditary qualities for good or evil in different persons make all the difference between success

and failure in life, even when the conditions and the environment are the same. It is then more especially that a man or a woman has to yield to the " tyranny of organisation," and but for Nature's two tendencies of which I have spoken, that of reproducing the normal and the favourable—in short, of natural selection—being then in most men and women stronger than that of killing off the unfit, humanity would have a poor time of it in after-life and in future times. Several authors, applying the ideas and facts of human adolescence to the history of the race, have described the Greek period as being the adolescence of mankind. The subject is now attracting enormous attention by psychologists and students of human nature. Stanley Hall has recently written two exhaustive volumes on the study of adolescence in all its relations. During adolescence in the woman the developmental process is still more important than in the man, for she then has to acquire the strength and other qualifications to reproduce the race. Hygiene is therefore of even greater importance to her than to the man. In the educated classes the higher sort of education only begins at adolescence, and goes on during the greater part of its duration. The principles and practice of such education are all-important to the woman's life. The doctors and the physiologists generally have not been satisfied with the principles on which the modern, higher education of young women has been conducted. They complain that hygiene, physical and mental, has not been the dominant note that it should have been. They feel that in their position as the priests of the body and the special guardians of the physical and mental qualities of the race, they are bound to oppose strenuously every kind and mode of education that in any way lessens the capability of women for healthy maternity and for the production of future generations of men and women, strong, mentally and physically. To think for a moment

of Nature carrying out her process of the slow evolution of life from the lower ever to the higher, and that up to this point she has advanced, through a stringent natural selection and the elimination of the unfit in all ages, until she has reached modern woman, the goddess, the ideal of beauty, the highest source and embodiment of happiness—to think of this is firmly to resolve that neither the schoolmaster nor any one else must be allowed to upset Nature's ends and counteract her designs. I have already referred to the fact that Nature only produces her energies in strictly limited quantities, and that through the solidarity of the brain and of the whole organism, you cannot overpress or develop one organ or function without the risk of stealing energy from other organs and functions. If we set out at the beginning of adolescence to make every woman a Senior Wrangler and every man a Hercules, we stand a very good chance of turning out poor mothers and fools. I am not setting health and motherhood as being opposed to the higher intellectual pursuits if they are rightly gone about, and I am not arguing that such pursuits are necessarily incompatible with the higher principles of mental and physical hygiene. My thesis is not "Health and Ignorance" unconditionally. I am merely endeavouring to follow Nature in distinguishing between what is primary and essential to the race from what is, on the whole, not primary and non-essential. I would not say a word against the "higher education" of women if it is consistent with health of body, brain, and mind. I would merely emphasise the fact that this higher education has often been carried on at the peril of losing something higher still. It must be made compatible with the motherhood of the race. Woman's eager nature and greater conscientiousness during adolescence lead her on to take too much out of herself when she is being educated at many of our higher schools and at our universities. At

that age she is not apt to realise her highest mission in life. The game seems so fascinating that the losses are not counted. Physiological hygiene and common sense have stepped in lately with much effect in diminishing cramming, over-pressure, competitive examinations, and overtime work in our higher schools for girls, and it was not too soon. If the American educational ideals of 40 years ago had been carried out, there would have been needed, for the continuance of the race in that country, an incursion into lands where educational theories were unknown and where another rape of the Sabines was possible. American physicians used to say that there were some schools in Boston that turned out young ladies so highly educated that every spare atom of their fat was consumed by the brain cells that subserve the functions of Mind. They told us that when those young women did marry they seldom had more than one or two children, that the primary curse of child-bearing was apt to be very hard on them and that they could not nurse their offspring from their own breasts. The energy that was needed for the race had been used up for the individual.

Looked at from a mental point of view, it can scarcely be denied by any one that the later years of adolescence from 18 to 25 are far more important than the first from 15 to 18. For years after puberty there is still much of the boy and girl mind. For this reason I find it difficult to give a description that will fit both periods. The girl at this time grows faster than the boy, both in body and in mind ; and while I have taken 25 as being a reasonable average for the end of the period in both sexes, there is no doubt that many women attain full maturity in mind and body a year or two before that age. The mental change that takes place from 18 to 25 refers to higher functions and, I think, is more interesting psychologically than that which occurs between 15 and 18. It is at this later

period of adolescence that, for the man, life first begins to look serious, both from the emotional side and in action. It is only then that childish things are really put away. For the first time literature, in its higher sense, is fully appreciated. Poetry now becomes a passion—at least certain kinds of poetry. The very highest kind of all literature, however, is reserved for the manhood period after the completion of adolescence. The kind of novel that is enjoyed is always a good test of the mental and emotional development. The boy, as we have seen, enjoys Ballantyne, *Robinson Crusoe*, and Marryat; the early adolescent takes to Scott and Dickens; and later adolescents appreciate Tennyson and George Eliot; while for the fully grown man Shakespeare, Thackeray, and the Bible are the most fitting mental nourishment. Go into a university and watch the demeanour of the first and fifth year's men. There seems to be a great gulf fixed between them. The fifth year's man treats his junior not as a mere boy, but as a different and inferior species. Watch the two in the presence of the opposite sex. In the one case you see mere shyness that soon breaks out into rollicking fun. In the other there is real sexual egoism, that most painful pleasure which consists of the half-conscious feeling that every person of the one sex is an object of the most intense interest to every person of the opposite sex of the same age. The events and possibilities of the future are reflected in vague and dreamlike emotions and longings. They have much pleasure in them, but not a little, too, of seriousness and difficulty as adolescence advances. The man feels instinctively that he has now entered a new country, the face of which he does not know, but yet that is full of the possibility of happiness to him. He has a craving for action. Ambition stirs him down to the innermost recesses of his nature, bringing out all his powers of body and mind. Longfellow's youth who

vaguely cried "Excelsior!" was evidently at this stage of life. The reasoning faculty first gets full backbone at this period. The emotional nature instinctively shows a leaning towards the other sex that may quite swallow up all other emotions. Love between the sexes towards the end of adolescence is the intensest and the most unreasoning of human passions. The sense of right and wrong and of duty becomes an active principle, dominating the conduct. "Character" in the full sense is then crystallised. There are yearnings after an ideal and an intense scorn and hatred of evil. The purposes of life are then shaped. The impressions and the resolutions then formed affect the tenor of a man's or a woman's life, as a general rule, more than at any other age.

As Meredith puts it, "At the period when the young savage grows into higher influences the faculty of worship is foremost in him. At this period Jesuits will stamp the future of their changeling flocks: and all who bring up youth by a system and watch it know that it is the malleable moment." A little further on the same acute student of human nature describes another phase in his hero, Richard Feveril: "Richard gave up his companions, servile or antagonistic; he relinquished the material world to young Ralph and retired into himself, where he was going to be lord of kingdoms: where Beauty was his handmaid, and History his minister, and Time his ancient harper, and sweet Romance his bride, where he walked in a realm vaster and more gorgeous than the great Orient peopled with the heroes that have been."

Thackeray, in *Pendennis*, draws with a master hand the different psychological eras of the adolescent and the phases of emotion and intellect that follow each other in due order as do the leaf and flower and fruit.

It is in the female sex that the period of adolescence has attracted most attention, especially among those most

acute psychological students and delineators of character, the better novelists of the day. Art in its higher form has devoted itself to the depiction of the beauty of complete adolescence. No artist ever painted and no sculptor ever modelled a Venus before that time of life. Before that the love-making, the engagements to marry, and the broken hearts of women are not apt to be very serious affairs. At, and soon after that time, they become the cataclysms of a woman's life. Two pictures of adolescence have appeared in our recent literature, one of normal adolescence and the other of a pathological variety. The one is to be found in the "Gwendolen Harleth" of George Eliot's novel of *Daniel Deronda*, the other is "Lady Kitty" of Mrs. Humphry Ward's *Marriage of William Ashe*. Both rank among the acute and subtle studies of human nature. Looking first at Gwendolen Harleth, we see "she was powerfully swayed in feeling and action by the presence of a person of the opposite sex whom she had never seen before. She played, not because she liked it or wished to win, but because he was looking on." The subjective egoism tending towards objective dualism, the resolute action from pure instinct, the setting at defiance of calculation and reason, the want of any definite desire to marry, while all her conduct tended towards proposals, the selfishness as regards her relations, even her mother, and the intense craving to be admired, form a vivid picture of the mentality of adolescence. Witness her state of mind when Grandcourt first appears. "When he did arrive no consciousness was more acute to the fact than hers, although she steadily avoided looking towards any point where he was likely to be. There should be not the slightest shifting of angles to betray that it was of any consequence to her whether 'the much-talked-of Mr. Mallinger Grandcourt' presented himself or not, and all the while the certainty that he was there made a distinct

thread in her consciousness." The knowledge that comes "by instinct" to a young woman is thus described: "Gwendolen knew certain differences in the characters with which she was concerned, as birds know climate and weather." The sentimentality of this period of life is well illustrated when Gwendolen says, "I never saw a married woman who had her own way." "What should you like to do?" said Rex, quite guilelessly and in real anxiety—he was an adolescent, early in the period. "Oh, I don't know—go to the North Pole or ride steeplechases or go to be a Queen in the East like Lady Hester Stanhope," said Gwendolen lightly. "You don't mean you would never be married?" "No, I didn't say that. Only when I marry I should not do as other women do." The strong religious instinct contending with the egoism is thus brought out: "What she knowingly recognised and would have been glad for others to have been unaware of was that liability of hers to spiritual dread. Solitude in any wide sense impressed her with an undefined feeling of immeasurable existence aloof from her, in the midst of which she was helplessly incapable of asserting herself." The selfishness and craving for notice of the period is thus hit off: "I like to differ from everybody; I think it is stupid to agree." She meant to do what was pleasant to herself in a striking manner, or rather whatever she could do so as to strike others with admiration, and get in that way a more ardent sense of living, more pleasant to her fancy.

Mrs. Humphry Ward's "Lady Kitty" forms a far less pleasant but to a doctor a still more interesting picture. She had a bad heredity, a bad example in her mother, and a bad boarding-school life in France. She was intense, brilliant, artistic, and dramatic in the highest degree, and her social talents were overmastering to every one on whom she exercised them. She fascinated

and completely dominated one of the coolest-headed and typical of Englishmen, and when he married her she treated him in the most cruel and abominable way. As she truly described herself, "Of course I'm a vixen!" But as thought of by her friend the charitable and impressionable old Dean, "What a radiant and ethereal beauty!" "When the evil spirit was out of her she was all ethereal tenderness, sadness, and remorse. In this state she was one of the most exquisite of human beings, with words, tone, and gestures of a heavenly softness and languor." She allowed herself to be fascinated by another man than her husband, because he was adventurous, unprincipled, and poetic. Even her maternal affection for her partially idiotic, paralysed boy—a true hereditary example of a son of such a mother and an example of Nature's law of bringing a bad stock to an end—was spasmodic and unreliable. To be noticed, to be admired, to be talked about, to excite scandal, to punish her rivals and enemies was the breath of her life. No good principle really influenced her for long; no religious feeling restrained her, and no fear of consequences prevented her from doing the most dastardly act that any wife could do to a most devoted husband. Yet after her fall "she is consumed with remorse night and day." The whole picture is perfectly true, but is that of a pathological mind. "Lady Kitty's" brain was constituted differently from that of the healthy adolescent girl. She was the victim of her heredity, her training, and her organisation. Few people have the wisdom to say in excuse for such a woman, as her mother-in-law did to her husband, "We will remember her bringing-up and her inheritance." Brought up under a better system of mental and moral hygiene, she would, no doubt, have been less interesting, but she need not have made such a wreck of her life.

In history and fiction few women have taken to the

higher learning with avidity during their adolescence. Shakespeare's women are certainly not of the learned kind, though learned women abounded in his time. Their youthful years were not taken up in getting book-learning exclusively. Their emotional nature was not dried up by the strain of intellectual work in youth. Their constitutions were not then spoiled by study. They had fair faces and womanly forms and warm affections and mother wit and keen discernment and vigorous reasoning, but nothing that we would call learning in one of them. Portia, who acted the most learned part of all Shakespeare's women, vehemently described herself as

"An unlessoned girl, unschooled, unpractised."

One of the strangest things in recent literature is this—that our most learned and most philosophical novelist of the nineteenth century, George Eliot, in all her host of female characters, never created a really learned woman like herself. Dorothea in *Middlemarch* had all the makings of the successful omnivorous young women students of the present day, intellectual, hyper-conscientious—as such young women so often are to their cost. "Her mind was theoretic and yearned after some lofty conception of the world. She was enamoured of intensity and greatness." She was self-sacrificing to a fault, she was open, ardent and not in the least self-admiring; yet Dorothea was not highly educated in the modern sense. Perhaps a modern educationalist would say that this was the reason why poor Dorothea made such a mess of it and threw herself away, first, on a selfish, shallow old pedant whom she took for a great scholar, and then on the least interesting fellow in the book. Romola was in a sense a learned woman, brought up in the midst of books and in the atmosphere of culture, yet she took to love-making, marriage, self-denial, charity and religion,

and discarded her books the moment her duty in them was done. She had no innate love of book-learning. She found no guide in it in her difficulties. It was no solace to her in disappointment. It was no resource when everything else had failed. It had not taken hold of her nature because it was not on the great lines on which her nature was built up. She and her father were as much alike as a man and a woman could be, yet to him his books were a perpetual joy all his life, to her their study had been a self-denial all through. We all know what Thackeray's women were—shallow, affectionate, and domestic, and little more, except when he created Becky Sharp, the worst woman in nineteenth century fiction. But whatever young woman is or is not, she has the power to fascinate young men. Hamlet and Ophelia, Adam Bede and Hetty, Lydgate and Rosamund, Deronda and Gwendolen, Romeo and Juliet—it is all the same story. But it may be said all this was wrong, the result of yielding to unlearned Nature's lowest affinities, and that many of those matches turned out badly both for the men and the women. If they had mated suitably, the world would have been better and they themselves happier. The physiologist and the modern psychologist will not rashly preach that Nature's affinities are wrong any more than they believe that the appetite is not on the whole the best guide as to the kind and amount of food that is good for us. When they find in Nature a marked masculine and feminine type of body and of mind, those types diverging strongly during the era of adolescence, each type with a different ideal, they conclude that the same type of education should not prevail for both sexes in this momentous era. This deduction seems to be backed up by natural fact, by the opinion of men of genius and by the evidence of history.

Many bodily changes take place during adolescence.

In the man the type is towards the Apollo, in the woman towards the Venus. The tastes for food and drink often change. Bread and butter and sweets no longer satisfy. Stronger and more stimulating foods are craved for. The carriage and walk change. For a man, football, tennis, cricket, and active exercise become a necessity. For a woman such exercises are less insistent. In both sexes sleep should be sound and long, fresh air should be craved for, and the craving should be abundantly satisfied.

We physicians find that the whole period is one of momentous importance for the health and happiness of the future life. The risks to body and mind are then, in many cases, very great indeed. We count it a fearful risk to run, not merely that actual disease should be brought on, but that a girl, capable of being developed into a healthy, useful, good and happy woman, if Nature's laws are obeyed, should, by unhygienic conditions or misdirected education, grow into a maimed, distorted, bad, and therefore unhappy, woman, who cannot get out of the life she has only to live once all that it is capable of yielding to her. If the process of development is seriously interfered with or not completed rightly it is missed for life. Whatever is done then is final. Whatever is left undone is for good and all. If a woman is not well formed at 25, the chances are she will never be so. If she is not healthy then, there is a risk she will not attain perfect health afterwards. No acquirements, no knowledge, no intellectual pleasure can possibly make up for health in her after-life. There is an organic happiness that goes only with the harmoniously constituted body and mind; without that organic happiness life is scarcely worth living. Cheerfulness is one of the best outward signs of this health, and what man, especially what woman, has not missed her vocation in the world who is not cheerful? There is no time or place of organic repent-

ance provided by Nature for some of the sins of the parent and the schoolmaster. What is the use of culture if it is to end with the present generation? The actual list of bodily and mental distortions, defects, and diseases that may arise during adolescence is manifold. There may be mere arrest of growth and deficient nourishment of the body. The man or the woman, in this case, is stunted and thin for life. Nature may develop on lines away from her ideals. Instead of beauty there may be ugliness, instead of harmony and grace of movement there may be awkwardness, instead of staying power, brain and muscle may be too easily pumped out. The digestion may not work well, and who that has read Carlyle's description of his own tortures will think lightly of indigestion? It almost always affects the mental condition and the cheerfulness. There may be a sort of physiological laziness and lassitude, in which exertion, bodily or mental, is not merely not a pleasure, but a distress. There may arise actual disease, such as epilepsy, asthma, anæmia, hysteria, neuralgia, nervous exhaustion, sick headaches, neurasthenia, and other ills to which this time of life may become heir, if the heredity to evil has been strong or Nature's laws have been broken and hygienic rules of life set aside. Mental and moral conditions, also, of the adolescent with a bad heredity and unfavourably conditioned, may depart from the normal, the higher brain function of mind only being then affected, leaving the body apparently "healthy." Bad temper and foolish, impulsive action, craving for drink and stimulating drugs, perversion of the moral sense and volition, perverted instincts, unfounded aversion to relatives, deficient or changed social instincts, are all seen during this period. Dissipation in every form may be yielded to, coming in bursts like a disease. Family unhappiness of all sorts naturally follows such adolescent mental changes.

The most grievous of all diseases—that of mental disorder—may, and often does, occur towards the end of the adolescent period. The transitory periods of depression to which I have alluded seem to have been very common indeed at this period of the life of many men of genius. Such appear in the biographies of Goethe, Carlyle, Cowper, Thackeray, Tennyson, and very many others; even such men of philosophic type of mind as Hume and J. Stuart Mill being so affected. Suicide was often contemplated at the very time when those men should have been fullest of life. Carlyle's most vivid description of his own feelings, when he suffered from "Stygian darkness, spectre haunted," can never be forgotten by any one who has read it and knows its meaning. I would impress on physicians and the public that this is indeed a "critical" period of life. In other cases the mental disturbance takes the form of periodically recurring attacks of elevation of mind, unsettledness, and excitement, rather than of depression. I have called those types of mental disorder "Adolescent Insanity." Frequently the more serious of those bodily and mental disturbances are preceded by lesser ailments, which may be the danger-signals of more severe disturbances coming on, if they are not attended to. Such danger-signals often appear as headaches, sleeplessness, falling off in flesh, "queer" and uncomfortable sensations in the head, irritability or general feeling of "not being up to the mark."

There is a fact of importance that should be taken notice of in any book on Mental Hygiene. It is this—that you may use up by an undue pressure at one time of life the energy that ought to have been spread out over long periods. This is especially the case in adolescence. Through such over-exertion in study or games, too heavy a drain is made on futurity, and such persons wear out early or grow old too soon. There is another consideration which I believe to

be important. One generation may, by living at high pressure, and thereby disregarding hygienic laws, exhaust and use up more than its share of the ancestral energy transmitted to it. It may draw a bill on posterity and not hand on to the next generation enough to pay it. I believe many of us are now having the benefit of the calm, lazy lives of our forefathers of past generations who stored up energy for us. We, in this too strenuous generation, are using it up. It has often happened in the history of the world, that families who for generations have exhibited no special qualities, blaze out into bursts of greatness for a time and then die out—like the two Pitts and Gladstone. This is seen among peoples as well as in families. The Mongols under Genghis Khan, the Turks when they overpowered the south-east of Europe, the Arabs when they conquered Spain, and the Spaniards when they overran America, all seem to be examples of this law. How often do we see a quiet country family, the members of which for generations have led quiet, humdrum lives, suddenly produce one or two great men and then relapse into obscurity again.

Lesser Mental and Moral Changes and Perversities of Adolescence.—The lesser mental and moral changes and perversities to which adolescents of both sexes are subject are specially worthy of attention, because they are so often neglected, so often misconstrued, and therefore no proper efforts are made to counteract them. The subjects of such changes have usually more or less hereditary tendency towards nervousness. They come of nervous families or of stocks in which drunkenness, eccentricity, genius, or insanity have appeared. The most common and, in my judgment, the most important mental change is that of a tendency towards depression of mind. It may consist simply of low spirits at times, especially in the mornings, and pessimistic views of life, which are quite unnatural for

that period of life. Often the subjects of this depression are troubled with headaches and have neuralgic tendencies. The sleep is often neither so long nor so sound as it should be. The mental depression of which I am speaking is really more or less marked mental pain. It is strictly equivalent to neuralgic bodily pain, so far as the functions of the brain are concerned. It is apt to be periodic in its occurrence. The sufferers from it are usually too thin. They often have peculiarities in regard to food, not being able to take certain things that would be very good for them, such as milk and fatty foods. Study or work of any kind cannot be properly engaged in while the depression lasts. Work is no longer a pleasure, as it should be. The social instincts are diminished. Friends are not so welcome. Games are not gone at with zest. The eye, the countenance, and the walking often show a lack of nerve and muscular energy. The appetite and the digestion are not so good while the condition lasts. What should be realised about this is, that although it may be slight, although the sufferers may be able to pull themselves together with an effort, yet it is unnatural—it is first cousin to actual disease. In many cases it may be helped greatly by proper tonics, medical measures, rest, changes of scene and air and other means. In other cases there is a lethargy or stupidity, so that the young woman or lad ceases to care for, or to show intelligent curiosity in anything. There is no actual mental pain or depression. In other cases it takes the form of an a-social condition at this, which should be one of the most social of all ages. The social instincts seem, for the time being, to be almost paralysed. In other cases there are causeless changes in the emotional nature. There is a felt aversion to, or suspicion of, father, mother, sister, brother or friends, for which no reasonable cause can be assigned. There may be an entire disregard of the feelings of relations. In other

cases, again, there is a general "incompatibility" of temper developed, irritability in social intercourse, so that the sufferer "gets on" with no one, is cantankerous and suspicious, even quarrelling with friends, and making enemies everywhere. Or, again, the adolescent period may be invaded by impracticable and foolish scheming, projects wanting in common sense being continually hatched. Stupid plans are formed and odd purposes carried out, which astonish friends, who remark, "I did not think So-and-so was such a fool." Occasionally, again, a frothy, sentimental sort of religionism develops. It is usually emotional, often of the aggressive, uncharitable —"I'm a good man; you're of the devil" type, and is unassociated with doing the plain, homely duties of life in a routine, satisfactory way. Occasionally the moral sense is invaded and the self-control lost, so that we have sudden immoralities contrary to the tenor of the former life. Perverted trains of thought seem to seize hold of the mind and affect the conduct. Such changes often cause great misery in families. Their real nature is commonly misunderstood and their kinship to actual disease is not often suspected. The subjects of them are blamed and scolded instead of being medically treated. As illustrations of those conditions, I once saw a young man, about the end of the adolescent period, whose mother had been nervous and his father healthy. He was of average ability, he led a fairly good life, but he began to leave his work for days without any reason except that he said he could not possibly go on with it. Then he began to stay in bed half the day and did little or nothing the other half. Such "laziness" had not been his habit previously. Spells of it came on periodically. He could talk quite rationally, and he sometimes bewailed his condition. Outward pressure on him to do work when in this state simply caused pain and irritation. He would take two hours to his bath and dress-

ing. He could not sit down to a meal regularly. His bodily health and condition were not satisfactory. He always felt better in the fresh air, and through sending him to the country, where he lived an outdoor life, and had a good deal of exercise, plenty of milk with nerve tonics, he came round in about a year or so and resumed his ordinary healthy condition. I knew a young lady who, up to 14, had been as ordinary children, but who since that age had been the despair of her teachers and the distress of her mother. Quite clever, intelligent, and not given to gross vice of any sort, she had exhausted all the arts by which disobedience, lying, perversity of every kind and outrageous unconventionality of dress and conduct could break her parents' hearts. She seemed to be without affection, except towards tramps, animals, and oddities. She always professed sympathy with the bad, the low, and the unfortunate. Respectability was an unpardonable offence to her. She was most ingenious in her ways of shocking her parents and her friends by her words and actions. Yet she was well read, she could pass muster amongst strangers as a clever, interesting, and original girl. She at last married a robust but respectable clodhopper, entirely out of her social sphere. She had children, and became a happy and careful mother and a frugal farmer's wife, but she never regained her affection for her parents or her relations. She was an example of "reversion" to a lower type.

Occasionally such changes as I have described take the form of a craving for drink or drugs. Their effects are intensely pleasant to such persons whose inhibition is weak. It is a curious fact, not well known, that almost all the most hopeless drunkards, those called "dipsomaniacs," begin their excesses in the adolescent period of life. This uncontrollable craving for drink is often seen in members of nervous families. No higher

motive will arrest it. Honour, truthfulness, and self-respect are lost. Taken altogether, such cases are very incurable. At present the law gives us no means of dealing with them by early restriction and treatment, as we can with disease. As showing that this period of life has to do with the condition, and that it is of the nature of disease, the cases that recover usually do so between 25 and 30. There are other persons who at this time of life take to lying, and do all kinds of criminal acts, some going even the length of murder. Criminal statistics show that most first convictions of crime are between the ages of 16 and 21. I long ago described this "adolescent criminality" as one phase of the nervous liabilities of this period of life.

CHAPTER XIII

ADOLESCENCE (*continued*)

Hygienic and Preventive Facts and Measures.—I would begin my remarks about prevention and direct hygienic measures in adolescence by saying that there are many individual men, such as I have described, in whom the evil states of body and mind are inevitable and from the beginning quite incurable. Nature has thus set her seal on them as being of the "unfit." Such are all the idiots and congenitally feeble-minded, most of the epileptics, many of the adolescent insane, and a certain proportion of the lesser mental distortions. In many of those classes their brains pass rapidly into a condition which renders them a burden to society and a care and responsibility to their relations. Such have always a strong nervous or insane heredity. A fate is thus laid on a man or a family against which there is no striving. But taking a large view of the subject, we see that while there are degrees of taint in all such cases, our first duty is to try and estimate its strength. It may be an irresistible force, or it may be a very minor tendency which can be counteracted and its effects overcome. The greatest problem of life is being solved during adolescence. The mind and brain are striving after perfection, and heredity is undoubtedly the most important factor that affects those subtle developmental processes. The first thing a rational

parent, a wise doctor, and a reasonable advanced adolescent himself should do, is to look the question of heredity fair in the face and try to find out all the facts about it. It should never be forgotten that there is a good heredity as well as a bad, and that even when a bad heredity exists in some department of brain or mind, there may be good heredity in other respects which may largely counteract the bad. In spite of Galton's brave and scientific effort to make every family of education keep accurate family histories as to its bodily and mental qualities, his far-seeing advice has not been taken to any extent. A scientific sociology would dictate that hereditary defects, mental diseases, and nervous defects should be intimated and registered as infectious diseases now are. That may come some day, but meantime some reliable and useful information can usually be got in regard to the history of most families, if trouble is taken. Truthfulness is seldom practised in admitting facts about bad heredity, or mental diseases, or defects. We have to inquire as to the history during life and the causes of death of the grandparents, the parents, the uncles and aunts and cousins. If we could go further back still, it might be useful in some cases, for there is a curious law of "atavism," through which peculiarities, mental and bodily, good and bad, prevailing in progenitors, may pass over a generation or two and appear in grandchildren and great-grandchildren. For instance, I lately ascertained in regard to one of my patients that there were several other cousins and second cousins insane. The family came from a secluded district, and I had the help of a very intelligent and interested relative in ascertaining the facts as to the family history. I found that for three previous generations there was an absolutely clean bill of health, as regards the graver nervous diseases, in all but one slightly eccentric weak-minded grand-uncle, who did not marry. But in the

great-great-grandfather's family there had been several cases of suicidal melancholia, which was the disease the insane great-great-grandchildren suffered from. Here was a stream which had been replenished by four new streams through marriage. The patients affected had received a special tendency to mental disease, which had lain dormant, as a mere potentiality, but yet had been existent as a something, and had been transmitted by three generations of nervously sound people. Even the scientific imagination fails to grasp in any definite way what such a series of facts really means. The only explanation that at first occurred to me was that the environment and circumstances of my patient had changed from that of her country Highland ancestry. She had had no trials or special difficulties, but she had become a city woman. The weak point, however, of this explanation of mine is, that her cousins who had also become insane had been subjected to no such change of environment. We must probably assume that there are but few, if any, absolutely healthy families, each member with the *corpus sanum in corpore sano*, and no one of them with any tendency whatsoever towards any hereditary disease. I would impress on every one who consults a doctor on such a matter, first honestly and thoroughly to inquire into the heredity of the patient and thus to bring the facts candidly under the doctor's notice. There is a strong human nature tendency to do otherwise and to minimise the facts, or to shut one's eyes, or to deny them. The same rule should apply to the preliminary inquiries when marriages are thought about. It is a crime then to conceal bad heredity, which I have often seen lead to much unhappiness and recrimination, and to the avoidable propagation of a bad human stock. As yet there is little "health-conscience" among mankind in this matter.

A very striking fact it is, that we all, as living organisms,

may thus carry within us tendencies, instead of actual observable features, mere potentialities, instead of facts. There is much need to find out about those ancestors and connections of ours, whether by temperament they were nervous or phlegmatic, what sort of dispositions they had, whether they were moral or immoral, drunken or sober, whether they were unstable or wanting in balance, or solid and reliable, whether clever or stupid, whether they were explosive in mental or nervous action, whether they were steady-going and unexcitable, and whether they had or had not an average control in speech and action. We have to ask what diseases they suffered from? whether any of them had had asthma, sick headaches, convulsions, epilepsy or neuralgia? how far mental disorder had prevailed among them? We must ask about their tendencies to consumption and rheumatism and gout, whether many of the children had been liable to die early in life, or whether longevity had been generally prevalent? There is a fact in disease which must be kept in mind in making such inquiries, that there exists an interchangeability between different diseases in different generations. A gouty father may have a melancholic son; an insane father may have children subject to neurasthenia, to epilepsy, or to become tubercular.

We must next look, with the help of such skilled advice as we can get, at the conformation of the body and of the head of the adolescent, at his upper palate to see if it is round arched, or Gothic in shape, at his nutrition and at the way the bodily functions are performed. We must ask how the instincts, the appetites, and the mental faculties are unfolding themselves during the period. Is the great function of inhibition keeping well to the front of every other faculty during development? If not, there is undoubtedly a danger. Control is the regulator of the higher faculties, and should precede them in time of first

appearance. Does higher motive come in the regulation of life and overcome lower motive? Is there educability in method, punctuality and order in life? Is the higher kind of veracity developing itself? Do the natural desires towards social intercourse, towards the other sex, dominate the conduct, or can they be controlled at will? Are there any idiosyncrasies of mind or body? How are the religious instincts progressing? Are they invariably associated with duty and with right states of emotion? Are all the social instincts healthy? Are ideals of purity, honour, and righteousness being slowly built up as pillars in the fabric of life? Are the poetic and artistic feelings keen or absent? Are the imaginations of the earth earthy, or are they inspired by high ideals of beauty and love? Many of those questions suggest their own answers in the way of prevention, or, as we doctors say, prophylaxis. We must first see that the body in all its parts and functions has a healthy environment and lays a good foundation thereby for the higher brain action. There must be supplied a great abundance of fresh air, by night and by day. Of that there cannot be too much during growth and development. The more oxygen that is breathed by the lungs the redder will be the blood corpuscles, and the more of them will be produced in the bone marrow and the blood glands. Thus the brain will be rightly stimulated to do its work. Adolescents cannot do without fresh air, even if at later periods of life it may be safely scrimped. The muscles and the heart and the blood-vessels must all be strengthened by exercise. There is no antidote to many forms of nervousness equal to an abundance of air and exercise. As to food, it should, of course, be in amount what is needed to repair waste; but I am convinced, and most of the medical profession are coming to this belief, that most of the comfortable

classes and many of the higher-paid artisan classes in Great Britain eat too much at all periods of life except childhood. I believe that they also do not always select the best food to eat. I am satisfied that, speaking generally, Americans, English people, and Colonials eat too much butcher meat. To see the quantity of beef that a public-school boy of 16 or 17 will daily consume is, in my judgment, to condemn the amount. It must never be forgotten that every particle of food that has to be dealt with by the stomach and the digestive apparatus, more than is really required to supply growth and repair, has to undergo a series of complicated chemical changes, all requiring an output of energy from the organs and vital forces. This means waste of precious force which should have been reserved for really useful work and growth. The chemical changes, the metabolism, may be imperfect and its products may be poisonous, thus causing an auto-poisoning of the system. It is to be admitted that Nature does generally provide an excess of energy, more than is needed for the daily service of healthy organs; but she can be overpressed, and is, in this matter, constantly overpressed in the classes of which I have spoken. This over-pressure, if it is practised at all, should not be a constant daily thing. Nature only provides for intermittent excesses. Such over-feeding tends towards periodic sluggishness of the higher brain working. One cannot think when the force that ought to have gone towards thinking is being used up by the over-pressed digestive organs, or when the brain is being poisoned by toxins from imperfectly digested or unassimilated food. It tends also towards the development of a certain kind of nervousness in those of a neurotic constitution. It leads to a premature development of the reproductive and sexual instincts before their higher control is established. It lays the foundation of rheumatism, gout, and kidney disease. The stomach

and the appetite, through getting into a bad habit, come to demand more than the body and the brain need. I believe that a healthier diet for adolescents would be more milk, more cereals, more fruit, more sugar, and more vegetables, with less animal food. The Japanese showed us how work and fighting can be done on what we call "low diet." I expect their system will soon become the fashion, and be followed by us. The scientific gymnastics of the present day—such as the Swedish system—which are in many ways scientific, supplement ordinary games, exercise, and sports. No doubt, during the boy period, between 7 and 15, the co-ordination of mind and muscle, ordinarily called the training of the muscles, has mostly taken place, but it must be kept up by constant practice; and there are higher and finer developments of this co-ordination, such as performing on musical instruments, fine handiwork, the graces of deportment and gesture, using the voice in singing, and the muscular expression of the emotions generally, which have to be perfected during adolescence. This perfection can only be attained by the steady practice of those co-ordinations. In regard to the use of such things as tea, coffee, tobacco, and alcohol in any form, which are not strictly foods, the greatest care should be taken not to use any of them in any degree that can be called excess during the period. In fact, young men should not begin to smoke nor to use alcohol until their beards are grown if they strictly obey the law of Nature and follow her lead, while no young woman should then or afterwards drink, or smoke, or swear, or take to strong tea. The brain cells, during this precious period of development should not be constantly stimulated by anything that cannot properly be considered as food. It may be that the majority of adolescents of a race that was perfectly healthy and lived in the country could take an excess of beef and a certain amount of tea, tobacco, and beer with

impunity; but it is certain that the descendants of the city-born, those of nervous constitution, those with a tendency towards insanity, consumption, and actual nervous diseases, should avoid those things if their lives are to be as healthy and useful and happy as is possible, and if their children are to be free from nervousness.

Competitions.—One of the practices now much in vogue in the higher schools and in colleges is that of the competition of one scholar with another through the "examination system." Sometimes this competition is terrific. It becomes so keen as to put every girl who is in the foremost rank in a fever heat of emulation before the examination. It suits the schoolmaster very well, because it is a great stimulus to work. He is not always as interested as he might be in the health or the special nervous constitution of his girls. He does not regard them from the physiological or hereditary point of view. He does not know that the mother of one of his scholars died of consumption, that the father of another was insane, that neuralgia was hereditary in the family of a third, while another had convulsions as a baby. His training has not taught him to know or to notice the meaning of narrow chests, the absence of fat, quick, jerky movements, headaches, want of appetite and disinclination to bodily exercise. It is the most nervous, excitable, and highly strung girls who throw themselves into the school and college competition most keenly, and they, of course, are just those most liable to be injured by it. Girls take a personal animus more than lads, and do not take a beating so quietly. The whole thing takes greater hold on them, and is more real. When I used to lecture to a class of girl medical students it was almost pathetic and a little amusing to me to see the desperate anxiety that all exhibited to take down everything I said. Their looks were earnest, their attitude expectant, and their minds

appreciative. I should have been better pleased had they paid somewhat less attention when the subject treated of was not very important nor specially interesting. Young women at adolescence are apt to have in large degree the feminine power of taking it out of themselves more than they are able to bear for long. Now when this power is called up for months for such a purpose as a college education, with many competitions throughout its course, the body not having attained its full size and shape and still growing, the brain and faculties only maturing, it should not be surprising if the result is disastrous towards the end of adolescence. Womanhood is apt after such an education to be entered with a handicap. There is too little joyous feeling bubbling over in life. The sources of vital energy in the brain have not been replenished sufficiently by outdoor recreations, fresh air, and the right kind of food. Blood has not been formed in sufficient amount. Nature has not got the material nor the force to build up the form towards the fair woman's ideal, and therefore personal beauty and grace of movement have not been attained to the extent that might have been. A store of latent energy, sufficient for future use, should have been laid up all this time, for woman's special work, for motherhood, and for the race of the future. Mind cannot grow except by growth and development of brain. Brain will not grow except through proper environment and conditions. The muscles will not harden but by having plenty of blood and exercise. The fat, that most essential concomitant of female beauty during adolescence, will not form in the proper way unless the blood is rich. Fat is to the body what fun is to the mind, an indicator of spare power.

The average height for the lad in the well-fed classes at 15 is 60½ inches. By 25 he should be 67 inches. The average height of the girl should be at 15 about 61 inches.

At 25 she should be about 63 inches. During that period of 10 years, the boy should have gained at least 14 lbs. in weight and the girl 12 lbs. That growth in height and weight does not take place all at once. For the girl there is a spurt shortly after 15. For the boy there is apt to be a spurt later on. Now height and weight are most important expressions of energy, of growth, and the best index of health. They show that nutrition is going on normally or is being interfered with. If it is so interfered with then every rule of hygiene demands that the reason for this should be ascertained. Those seem gross bodily facts. Some one may ask, What have they to do with Mental Hygiene? Normal body growth usually means normal brain development, and normal brain development means healthy-mindedness. If we could, as a matter of fact, keep our lads and girls healthy in body, to a large extent the brain and mind would take care of themselves. Once fully formed as a woman, she can then stand much. She is capable of taking up any *rôle* that falls to her, whether it be teacher, daughter, or mother. Whether she is an actual mother or not, she is infinitely the better for having the full capacity of motherhood.

To me it seems inexcusable that simple lessons in hygiene are not given in all schools, and more advanced lessons in this science given in every higher school and university. What great public school for boys and girls has a special teacher of health, whose instruction all must attend? The money and the time given to teaching music to scholars with no ear, and classics to unclassical minds, would be infinitely better spent in physiological and health instruction suitable and interesting to all if rightly taught and illustrated.

Sleep during Adolescence.—Dr. Dukes, of Rugby, in his *Health at School*, has in regard to the amount of sleep needed by early adolescents spoken most weighty words

as the result of his great experience and keen observation. Dr. Acland has written strongly in a similar sense. Recently the heads of the medical profession have considered it their duty to make a serious pronouncement as to the amount of sleep needed by the schoolboy and schoolgirl during early adolescence, and as to the insufficiency of the hours of sleep allowed at most of our public schools. The whole profession of medicine is at one on this point. I have already spoken of what sleep means to the brain cells and as to the necessity of sufficient sleep at the earlier ages of life. I can only say now that during early adolescence, and even up to the age of 20 or so, the time for sleep should not be less than from 9½ to 10 hours. This especially applies to all youths doing brain work.

Sex Difficulties during Adolescence.—I shall devote a special chapter to sex hygiene, more especially in its mental aspects throughout life, but I cannot omit here to emphasise the fact that the hygiene of the sex question is one of the most important that has to be faced during adolescence, especially during its earlier stages. It is most difficult, it is often urgently pressing, and in many individuals it is paramount. If early adolescence can be got through without the breaking of the laws of Nature and morals in regard to sexual conduct and impulse a tremendous risk has been avoided. The management and the control of the sexual instinct at that age is, perhaps, the most urgent question during the whole life in the case of many persons of both sexes, but more especially in the case of lads. The risks are not only bodily but intensely mental and moral. An instinct of overpowering force is let loose by Nature in many youths before its natural controller, inhibition, physical and moral, has acquired the strength necessary to check its unnatural ebullitions. An unbroken horse has to be managed by a weak and an

inexperienced rider. Nature's innate gift of modesty, her organic repugnances, the moral feelings of right and wrong, the strong instinct of manliness and womanliness and the power of religious teaching are all needed in a high degree to act as controllers, and they all fail often enough. When emotion, imagination, and strong animal impulse are all one side it needs a strong rein to curb them. What I have been urging as to proper diet, much exercise, games and steady occupation all point towards the right solution of the developing sex question as much as to keeping up of the general health. The magnetic force of a strong man's influence, such as that of Arnold at Rugby, no doubt is a powerful force for good, but that cannot be got every day. I am in favour of plain speaking by the family doctor as one means of safe enlightenment and as a deterrent influence. He alone has the physiological knowledge to speak with scientific authority. He has not the diffidence of the parent in talking of such matters, and the boy prejudices against the teacher do not exist in his case.

Regulated and natural social intercourse between the sexes, especially in the shape of family life, is one of the most powerful outlets and regulators of sex impulses. There lies one great danger of the monastic life of public schools. A lad who loves home and is much at home is far safer than one who sees little of real home life. Mother and sisters and young lady friends of the right sort fill up a gap and satisfy a natural social craving that tends to the expulsion of the gross and animal. Sex cravings are transformed into social feelings. The "expulsive power of a great affection" comes in as a powerful hygienic force. A subconscious shame and reasonableness as to baser impulses arise in a strong and natural way and act as powerful inhibitors. Control is much easier because the direction of thought and emotion is carried into other channels.

The Moral Sense during the Period.—The moral sense has, like every other mental faculty, a brain basis. In the lowest animals there is very little moral faculty to be observed. No doubt, when animals become gregarious, there are certain necessary relationships of one individual to another which gradually appear, as evolution proceeds, until we reach the moral faculty in the human being. Taking the dog, as having the closest association with man of any animal, and being intelligent and imitative in a remarkable degree, he has an unquestionable sense of right and wrong. There is an enormous difference in this development in different dogs. Some are always endeavouring to do the right thing after they have been taught, while others will be constantly disobeying the law of right and wrong and clearly realise when they break it. I have now a very intelligent well-bred Gordon setter who strives with all his might to carry out his own simple ethical code of steadiness on his birds and obeying the whistle, and when he breaks it his look of guilt and penitence is pathetic to a degree. When a puppy is present he will not eat his meal, however hungry he may be, till the youngster has had his fill and stops eating. In the child of two there is little manifestation of moral sense. There is no feeling of the "ought" in it and small sense of guilt on account of any breach of law or custom. From that time its rudiments begin to appear. During childhood and the schoolboy time of life, nothing is so constantly reiterated as what ought to be done and what to be avoided, what is right and what is wrong. This constant teaching, with the examples of doing right and avoiding wrong in its parents and teachers, has a great effect, no doubt, in the creation of the moral sense. There arises a feeling of duty, but it is during later adolescence that this feeling assumes a large and dominating position and becomes associated with the emotions, with the intellect with the will and

with the religious instincts. This, however, implies a moral heredity and a brain with the innate capacity to take up this great function. I have known many children and many boys and girls at the school age who never could be made to *feel* that there was a compulsion on them to do right things. They had, in fact, no brain basis for the moral sense. They were moral idiots, and very troublesome members of a family. I knew a little boy of ten who was always trying to put the cat in the fire and who dropped his mother's watch coolly down a well. He grew up at adolescence to be a very troublesome young man indeed, requiring never-ceasing watching, and by that time it was fully recognised by his parents that he was not "responsible." He was sharp enough intellectually and acquired school learning fairly well. I have known other cases where the on-coming of the moral sense was merely delayed. After puberty they acquired the faculty for the first time. It is a well-known fact that many of the children of the criminal classes and of drunkards and of the insane are practically without a sense of right and wrong. This lack had become hereditary in the class from which they sprung. Punishments do little good in such cases. Exhortations are lost on them and even good moral example is not instinctively imitated.

In regard to the development of the moral faculties by teaching, it may be summed up in this—"Obey the Ten Commandments." The moral sense, as we have seen, began its cultivation in early childhood, and receives a very strong impetus during boyhood, but it is during adolescence that the faculty of inhibition, which represents the moral sense, is fully developed and becomes a dominant part of life. Example is, no doubt, a powerful agent in its building up. Literature of the right sort becomes an extraordinary stimulus also. I do not mean treatises on ethics or homilies on conduct, such as were chiefly believed

in during the eighteenth century. I rather mean good biography, poetry and fiction. Fiction, like alcohol, has, however, its dangers. It must be a real literature, and exhibit art in its composition. There are, of course, plenty of good examples, but I need go no further than Scott's novels as rising to the standard I have indicated. Those novels, combined with a reasonable number of the more modern psychological novels of character rather than of incident, and good biography, are the safe mental and moral literary diet of the adolescent. To establish a conscience, to cultivate self-control, to make the sense of duty dominant in life, to give the idea that law and rules must be obeyed, to create a sense of discipline, is the very highest and most important duty of the teacher and parent during adolescence. All this is closely allied to the religious sense of sin, but it is not the same. No doubt example, the following the lead of others, the inner feeling of pleasure when right is done and temptation overcome, all tend to build up the moral faculty. There is formed, in the developing condition of the adolescent, an ideal—even a passion—for beauty. The imagination comes in and protects from wrong courses by creating pictures of the real beauty of right conduct and of the unattractiveness of law-breaking. There is a moral enthusiasm roused at this time of life in favour of right and against wrong. The daily habit of doing the one and avoiding the other writes itself on the brain cells and their action, and becomes a permanent record. This moral sense attaches itself to actions of benevolence, justice, and self-denial, on the one hand, as things to be imitated, and to meanness, untruthfulness, jealousy, evil passions and anger as things to be avoided. No doubt the punishment and the disapproval of the evil, with the approval of the good, help in the process of conscience-making. It certainly does not do to begin

too early in life a too stringent process of creating this sense until the brain basis is there and the power of inhibition exists. Especially is it desirable not to create a false moral standard. To try and make a child believe that taking too much jam is really a wrong act, that hitting its still younger brother when in a passion is a very dreadful thing—all this tends to establish a precocious ethical standard that often is very hurtful as life goes on. I have sometimes noticed a precocious sense of right and wrong to be followed during adolescence by a sort of paralysis of the faculty. A healthy young man or woman, well exercised, is always apt to have a healthier sense of right and wrong, and virtue is easier of practice than in the nervous, thin, or hyper-æsthetic person. A sane conscience is part of a sane mind, and on the whole goes with a sound body. In many persons acting by instinct is swift, easy, and pleasant. Such persons are usually of the artistic temperament. The knowledge of right and wrong in them may be quite well developed, but action from instinct is so strong that the moral brake cannot be put on in time. It is in such persons that the cultivation of the moral sense during adolescence should be very assiduously attended to, for it is often their weak point. They always try to do what is easy and pleasant, and for them to do right, if it is not pleasant, is specially irksome. It is most important that in them a definite moral ideal should be formed, that the imagination should be brought in, and that the altruistic faculty should be exercised. Some such persons are so intensely instinctive that motives, in a rational way, have little power over them. Wrong action soon becomes a brain habit, and the sense of right and wrong becomes callous and unreactive. In certain departures from mental health, such as occur in melancholia, the sense of right and wrong becomes hyper-æsthetic, so causing a torture to its owner. In other

conditions of mental disease the moral sense is the first faculty to be lost. No doubt, in the course of human evolution, a high moral sense was the last to be evolved, and in the dissolution of the higher mental power, which is the essence of insanity, it is the first to be lost. We have cases of mental disorder with high intellectual power, but no moral control; this we call "moral insanity."

The Religious Instinct in Adolescence.—James has, for the first time, at least in ordinary English literature, given us a scientific study and analysis of the religious instincts, their expressions and their psychological meanings and relations. I believe that his study is on the whole a true one, and it is certainly very instructive. This is not the place to follow the evolution of religious instinct and religious practice, from its first dawning among primitive man, up to its elaborate manifestations in our modern civilised communities. That it is a universal and a most powerful determinant in human life is undeniable. That it really arises in the individual in a definite and almost complete form in adolescence is, I think, absolutely manifest, both from a study of physiological psychology and from a study of the history of religion itself. There is no instinct more radical in man, but, on the other hand, there is no instinct so cultivable and so capable of being moulded into different forms by dogma, by tradition, by example, and by strong emotional feelings. The religious instinct has a very obvious and close relationship to emotion, to imagination, to morals, to æsthetic feelings, to the social instincts, and to sex. The feelings of reverence and of awe and the consciousness of the infinite in man are vague but most powerful parts of his nature. They are subject to law, even if that law is difficult of formulation.

All normal religion is a highly emotional stimulus. It is a means of education in many ways; it is the only pure

ideal that half the world has access to. It has proved an intellectual stimulus, and has roused a metaphysical frame of mind in some of the most vigorous nations, such as the Germans and Scotch. It leads to refinement of life more than any other agency. It stimulates benevolent and altruistic feelings and practical efforts above all other human instrumentalities. It fights gross vice and immorality. It reaches the poorer intellects as much, or even more, than the highly cultivated. The faith which is its essence has "removed mountains" and "turned the world upside down," will take no refusal and see no obstacle that it cannot surmount. It seizes on the higher part of man, and condemns, perhaps unduly, his lower part. It "giveth life" to multitudes who were mere animals before it came into their lives. It rouses hopes that never die. It affords examples to lure men on to better lives. It and art are the only great spiritual forces. It feeds imagination and may stiffen self-control. If all this be true, then to treat of the Hygiene of Mind without including a consideration of the religious instinct and its effects would be to omit one of its most powerful factors.

The chief hygienic idea in regard to the religious instinct is that it should be tied indissolubly to duty. Without this association its effect on life and character is apt to be small, and it may, in many cases, be even harmful. The religious instinct should take its due place and order in the natural developmental scheme of adolescence. Let it be cultivated, but always in association with control. Eliminate from it egotism, obtrusion, frothiness, hallucination, and sex ideas. To give its sanction to the moral sense, to do acts of altruistic benevolence, to accept the Judgment-Day text, "I was sick, and ye visited me; I was naked, and ye clothed me," St. James's definition, "To visit the fatherless and widows in their affliction," and the prophet's definition "To do justly, to

love mercy and to walk humbly with thy God," would seem to be the rational outcome of all the great religions in the world. No doubt the practice of humility and of self-denial are, and should be, specially connected with the religious instinct. All religions have been characterised, especially during adolescence, by special crises, conversions, excitements, ecstasies, fervours, revivals, vivid symbolism and mysticism. Such emotional intensities are not to be thought lightly of or scoffed at. It is according to psychological law that any instinct may burst forth suddenly after lying in a latent form. They may vivify and give an entirely new turn to life and conduct.

Some of these phenomena are, however, closely allied, or are very easily connected with mere selfish feelings of pleasure, and with the natural enthusiasms of the female sex in youth. They readily lend themselves to the ecstasies of ordinary love between the sexes, and they may develop selfishness in a high but very subtle way. From the point of view of the Hygiene of Mind, they all need most careful looking after, and in some cases require discouragement and repression. Such emotional intensities are dangerous to the highly nervous, the intensely imaginative, the unstable, the explosive in mind, and the essentially unreasonable in mind, because they tend towards the pathological in such persons, while it is in them that they are most apt to appear. In such persons they unquestionably may lead to mental disorder, to selfish religious sectarianism, and even to vice, natural and unnatural. It is natural that the expression of the religious instincts should call in the aid of music, beauty, and symbolism, but there is always the risk that those things should minister simply to the emotions and to selfishness, and should divorce the instinct from duty. The great aim of the religionist, if he takes Mental

Hygiene into account, it seems to me, should be to make the religious instinct a habit of life rather than an occasional pleasure, so to leaven society with it that it should not be the exclusive possession of a few, and that thus its great powers over the individual man and body politic shall be naturally handed down from generation to generation instead of being a personal affair of spurts and spasms. A reasoning basis should surely run through all its dogmas and practices. The apparent antagonism of some of its formulas to natural law should now, when science has assumed so great a position in human life, be minimised as far as that is consistent with its essential substance and its practical application to the needs of human nature. The unessential accretions which surrounded all religions in the superstitious and unscientific times of the past should be gradually got rid of as human nature will bear it. The spiritual comforts and consolations which it offers to the weak, the needy, and the dying are sufficiently real to stand on their own merits without being paraded as reasons why the strong and the healthy, who do the world's work, should be called irreligious and materialistic if they refuse to swallow the dogmas of old superstitions and exploded beliefs. Let the religious instinct, in short, be treated like any other part of the psychology of man, as being subject to law and compatible with reason. That will not weaken its sanctions or lower its ideals, and will not lessen its consolatory power. No scientist can admit that right faith can be inconsistent with or contrary to right reason. Man cannot live without religion ; therefore it is the more important to avoid its counterfeits and to lay its foundations on health of body and soundness of mind. It is far too precious a support to a good life to rest on any false or pathological basis—at least, if we look on religion as an important means of Mental Hygiene, these views are sound.

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Balance of the Mental Faculties.—As I have so frequently had to say, the mental faculties, the appetites and instincts and bodily powers all have a normal and mutual relation which, as a hygienic measure during adolescence, should be assiduously cultivated. There exists an average mental balance between the different faculties without which a man or woman is morbid or unsafe. If from natural causes or by educational pushing a man has high intelligence without much will, or keen emotion without much inhibition, or overmastering will power without the moral sense, or vivid imagination without common sense, or intense social instincts without much conscience, or fervid religious instinct without much sense of duty or altruism, the results will be bad for society and for such unbalanced and one-sided persons themselves. At all events, if there were too many such one-sided people in any society or State, the steadiness and harmony of a progressive civilisation would be impaired and endangered. Many of the bad laws, of the evil customs of society, the religious persecutions, the fanaticisms, the oppressions, the cruelties, the sectarianism, the fruitless social efforts and the crimes of men and nations have resulted from unbalanced mental conditions. There can be no doubt that the greatest comfort in life is attained by the individual through this balance. It naturally leads to a calm and philosophical conduct of life; it saves the waste of mental and emotional energy; it guards against frothy religionism, hurtful spurts of emotionalism, and the fanatic temper. It helps its owner to see the true relationships of life, and to look to the end of a course of action from its beginning. No doubt natural brain qualities and temperament chiefly determine the capacity to attain brain balance, but very much can be done by teaching, by following good example, and by personal effort. The tendency nowadays is to run into

mental specialism, to yield to enthusiasms, and to show originality by taking up fads. Life is like a juggler keeping up six balls at once in the air—none of them must be neglected. Balance of faculty is certainly one of the important aims of a true Hygiene of Mind, and it can best be attained during adolescence.

Every kind of nervousness and mental instability tends towards a want of balance of faculty. True sanity is largely tested by the presence of this quality. Nothing is more striking than the examples of such want of balance in states of partial mental disease. I have now a patient who is learned beyond most savants, even in many specialisms. He is well read beyond most men. He is liked by all his friends. He talks in a most interesting way on most subjects; his judgment is sound on almost all matters outside himself. No one in one interview could say he was even partially insane. Yet his conduct of life has been utterly disastrous. He has no true affection for his wife and children, and has neglected them in the most scandalous way. He cannot keep an engagement or pay a debt. He cannot help drinking to excess if he has the chance, though when kept out of temptation he has no craving for alcohol. His personal want of order and untidiness is indescribable. His intellectual power is, in fact, overdeveloped at the expense of his emotions and inhibition. He has no sense of responsibility, no regrets for wrong-doing—indeed, is "never in the wrong." Such examples of what I describe as unbalanced faculty are common enough if looked for. They could, many of them at least, have been saved from this by right mental hygienic training during adolescence.

The process of adaptation to new environments in all living beings is always accompanied by many individual failures. It seems to me that many of the nervous diseases of adolescents are examples of this law. Brains of ancestral

primitive constitution that would have stood well enough the simple life of a primitive age break down in the effort to adapt themselves to the conditions of our modern and complex civilisation.