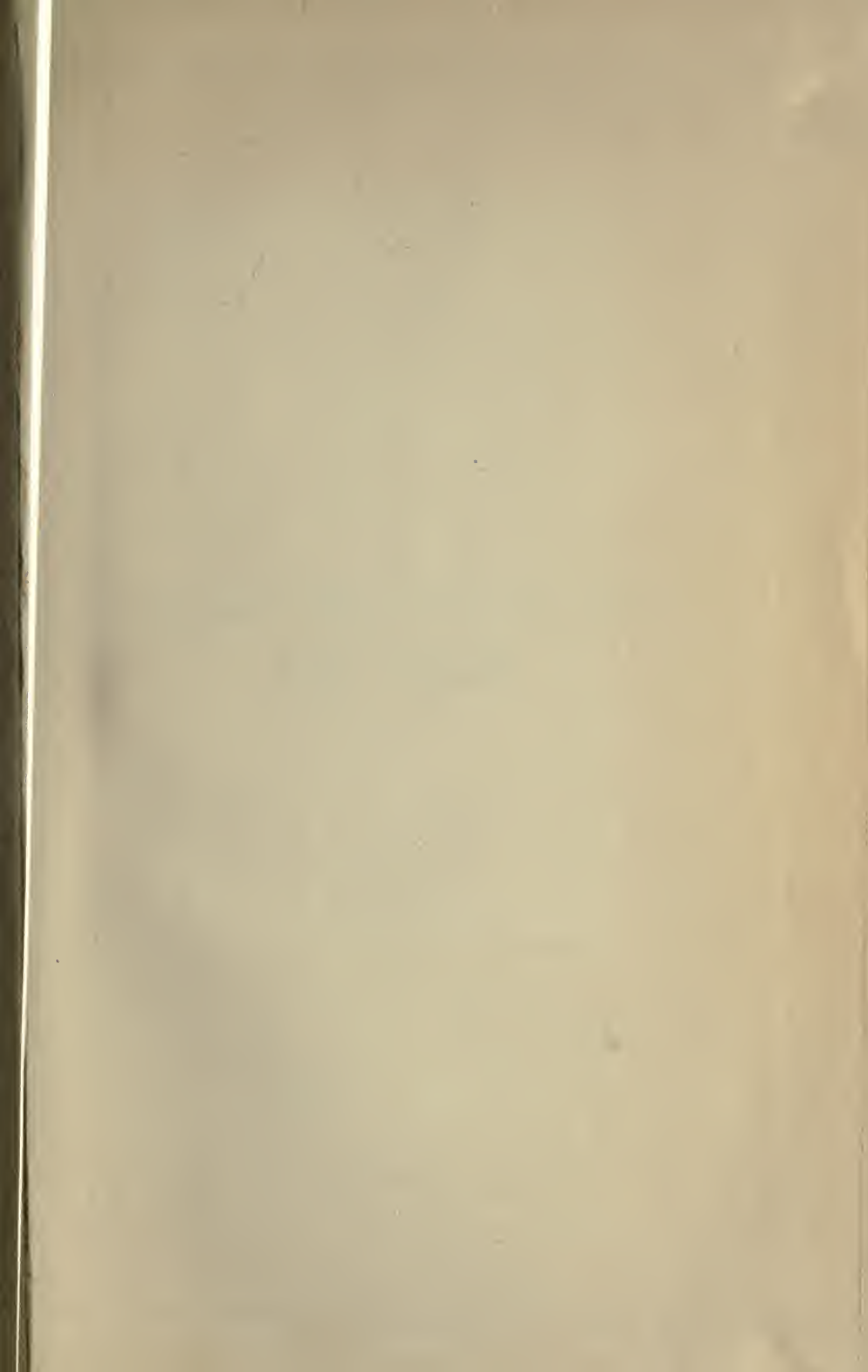
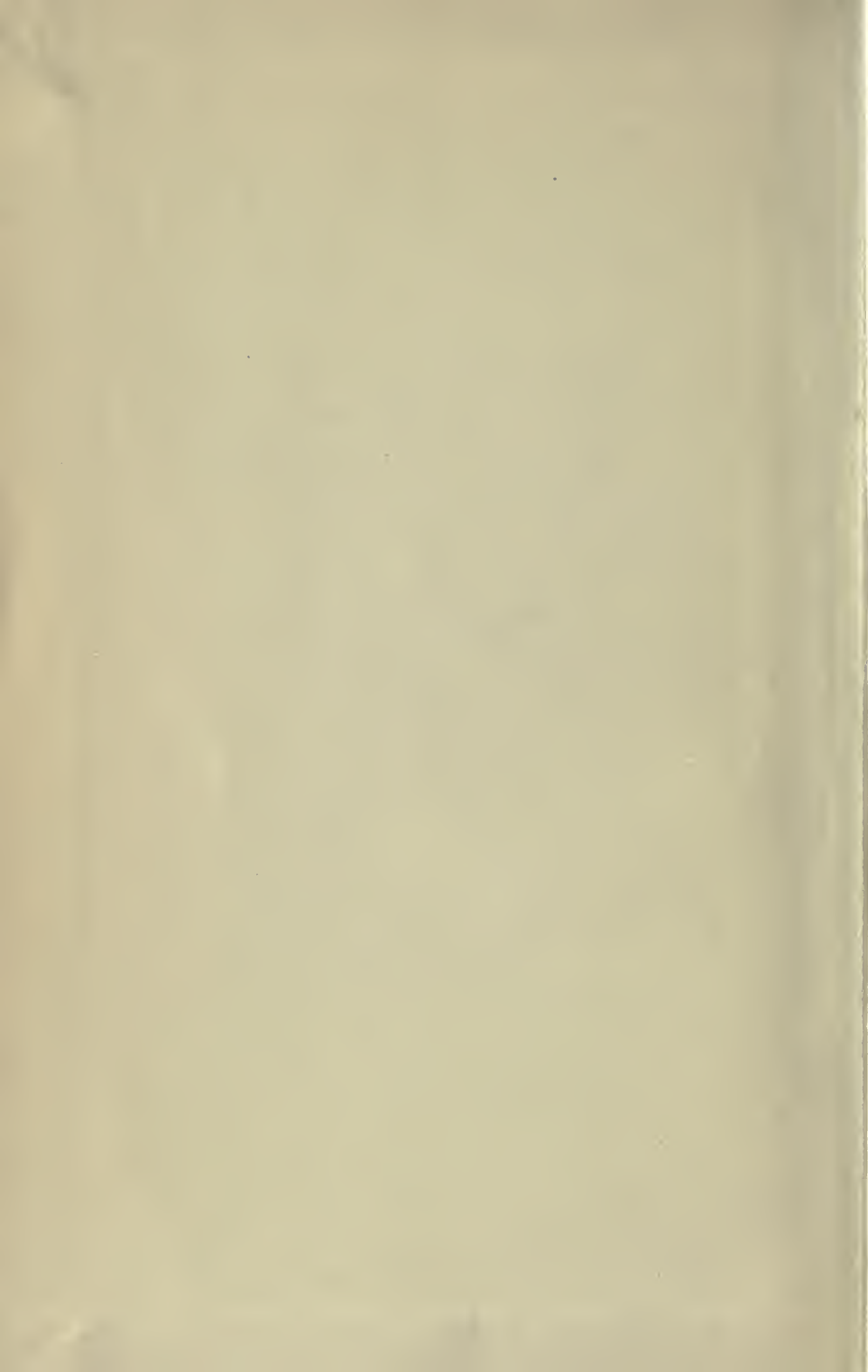


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EDUCATION, PERSONALITY  
AND CRIME



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# EDUCATION, PERSONALITY & CRIME.

A PRACTICAL TREATISE BUILT UP ON  
SCIENTIFIC DETAILS, DEALING  
WITH DIFFICULT SOCIAL  
PROBLEMS

BY

*maroon*

ALBERT WILSON, M.D., Edin.

" LONDON



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TO VIND  
ANSWERED

**Dedicated**

BY PERMISSION TO

DR. HUGHLINGS JACKSON,

THE FOUNDER OF THE SCIENCE OF NEUROLOGY,

PHYSICIAN AND PHILOSOPHER, LEADER OF

THOUGHT AND RESEARCH, HONOURED

AND BELOVED BY ALL WHO

KNOW HIM.



## PREFACE

SCIENCE has till recently been regarded as the fad of a few, but, now that its commercial value is being appreciated, it is rising to a place of recognition. Biology and Psychology are, however, still regarded, especially by the legal profession, as essentially mythical.

There are many burning questions, as education, marriage and crime, which are in a chaotic condition, the subjects of party strife; and yet there is only one way in which these difficulties can be met. That way is by bending to the laws of science, of biology, of physiology, and psychology.

The questions of life, growth, and heredity concern every one, and, with a proper understanding of their merits, we can foretell and avoid many individual and social calamities.

The subjects especially treated in this book are education, character formation, marriage, and crime. Personality is a large question and many cases of dual personality are recorded. They indicate a splitting up of the Ego or self or consciousness. Heredity, including our up-to-date knowledge of fertilization and germ plasm, will prove interesting to many; while Responsibility appeals to all, and merits more attention from the lawyer. Is there such a thing as Free Will?

Empire building is the theme of the book, not by dislocation of industries, nor by aggressive attacks on other nations, but by accumulating our intellectual forces so as to be equal to any effort or to resist any strain. Individuals must be dealt with. It is not the political orator alone who is the builder, but also those who, "unhonoured and unsung," toil deep down in the dark quagmire of poverty and immorality. There are appended to the accounts of those institutions where I had the opportunity of visiting, statistics of physique and cranial measurements (psychiatric), which will interest a few,

and require close comparison and examination; otherwise they may be ignored by the general reader.

The criminal is by no means neglected in this book. He is an important and fascinating member of society who has his merits, and whom I classify either as a pervert or invert.

I cannot help making many attacks on that unseen personality, the State.

None of these intricate problems can be explained without a clear, even though it be an elementary, knowledge of the laws of life and living matter. I therefore propose to deal with the subjects in the following order.

First: A section of biology, dealing with the simple cell, its structure, growth, and evolution into higher forms. This leads on to fertilization, which prepares the understanding for the great problems of heredity, and how we are affected by them. Second: The physiology and structure of the nervous system and brain. The third section naturally includes education, which should be contrasted with the present methods, that have proved such a failure.

Then naturally follows a discussion on the Ego and dual personalities, illustrating the composite character of our mental machinery. I will also discuss diseased or degenerated physical states, which opens the way for understanding mental and moral degeneracy as seen in our criminals. This will be illustrated with interesting accounts of some of the criminals I have known, and at once raises the question of responsibility. In a closing chapter, which I term Empire building, I give a resumé of some of the conditions met with in our large cities, which if fully understood would soon be remedied.

The Appendix contains tables of measurements, which form a little study on craniology, and psychatrie, including several records of criminals.

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## CHAPTER I

### TO THE THOUGHTFUL

The sum of twenty-five years' busy life—The social canker affects all.—  
**THE CHANGES OF TIME** : Formerly we were plethoric—Now asthenic  
—The key to prosperity—Comparison of extremes—**SOCIAL PROBLEMS INVOLVED** : Double consciousness—Abnormal humanity—  
We are all potential criminals—**THE LAWS OF BIOLOGY RULE US** :  
Nature allows no privileged class—**THE BREAKING POINT** : Overstrain : the danger zone—The criminal drawn from every class—Society lowers the moral code—**SIN VERSUS CRIME** : The neglect of the State—All depends on individual effort—The community—Effect of luxury—The neglect of the poor.

AFTER twenty-five years of very busy life in a varied medical practice, it may not be out of place to sum up for the use of the thoughtful the pith of my labours. All through a medical man's career, if he take life seriously, he meets mental suffering, in addition to, and often entwined with, physical disease. Nor can a doctor separate himself from the social side of life, for he sits daily in the confessional. While it is his delight to join in the joys of the few, his sympathies are constantly invoked for the mass of humanity groaning in sorrow and travail. The social canker does not afflict the poor alone, it chooses its victims equally among the rich ; the babe that is born to the wealthy or to the good, may bring sorrow instead of joy. In some cases this is unavoidable, but usually it is preventable.

It is therefore my earnest object to address myself to all mothers and fathers, to all young men and maidens, on whose health and integrity the next generation is cast. The mission of the physician is not to correct outward disease alone, but also to observe brain and nerve defects, which too often are the basis of disease and unhappiness, present or yet to come.

Some say the world seems off its hinges, but the doubt is if it ever were on, for we are in process of evolution. Times

The  
Changes  
of Time

also change very much. Fifty or a hundred years ago we were plethoric and sthenic, or, in simple language, full-blooded and strong. Instead of thinking slowly, we now work and live at high pressure ; we fly across England in six or seven hours, whereas our forefathers spent two days in coaching, or a week in riding. This healthy open-air life, with plenty of plain food and home-brewed ale, engendered the race which built up England's power. But after years of easy travelling, telegraph and telephone, cheaper and richer food, and warmer clothing, we have become an asthenic people. The full hard pulse has become soft and compressible, the type of disease has changed, the nervous system once strong is now vulnerable at many points ; we have improved intellectually but have lost ground physically and in endurance.

*Mens sana in corpore sano* is the key to happiness and prosperity. As it concerns all and must interest many, no further apology is required for compiling this treatise.

In dealing with such an extensive and complex subject, it makes more impression to compare and contrast the extremes of intelligence, character, and morality. Thus we have to choose sanity and insanity, describing the physical condition of the brain in each ; how to retain the one and avoid the other.

Similarly we have to contrast the highest morale with the lowest, which we style criminality ; as to material or organic basis in each there is much to be said. Nor can we leave out heredity, with its subtle influence. Finally external mundane conditions may oppose Nature's efforts ; this imports many social questions, which it is the duty of the physician as a citizen to emphasize.

There is a very curious condition of mental instability called double consciousness, in which the same individual leads two lives. It is a mystery not yet solved, and one to which I was specially attracted, having had the opportunity of watching a case which led ten separate lives.

As every composer has a thread round which he weaves his effective music, so I am compelled to weave my theme around abnormal humanity. The criminal will appear so often in these leaves that it may look as if he were the subject. It is not so ; but he is a type of what any one may slide down

to, unless bolstered up by favoured surroundings, and guided by healthy mental powers.

It is necessary for me at once to press home the solemn fact that we are all potential criminals, but saved by our heredity, education, and environment. Change any one of these factors and we are at once on the edge of a precipice. We need not therefore be proud of our virtues, but thankful that we are permitted to have them.

We have yet to learn that the laws of Biology,<sup>1</sup> which govern lower forms of life, apply to ourselves. Nature has no favourites, nor does she allow a privileged class. By comprehending these matters we can deal with the pressing social problems of the day, and, where we cannot benefit a class, we can at all events help individuals. We are a motley crowd, one halt, another blind, and a third dumb. The blind can carry the halt, and the halt may guide the blind. In this way only we get along, carrying one another's burdens.

The  
Laws of  
Biology  
Rule us

There is a breaking point to every human mind, as there is to solid objects in the organic world. But this breaking point varies in individuals, and seems to rest with the personality or ego. A large number of folk live constantly under overstrain, and in proximity to the danger zone. What the result of the catastrophe will be, depends on many previous conditions. What in one is a nervous breakdown, in another is insanity, and in a third is crime. Every rope will yield to a certain pressure, but the poorer the quality of rope, the less weight is required to break it. Nowadays, with competition, stress, and the wrong form of civilization, instruction instead of education, class against mass, we are surrounded by sad accidents. Lunacy is rapidly increasing; poverty does not lessen; while degeneracy and crime have got entirely beyond control.

The  
Breaking  
Point

If the criminal were drawn from the poor, we who are in a better position might selfishly leave him alone; but the criminal, as much as the insane, comes from every class, so that no family can afford to neglect this inquiry.

<sup>1</sup> *Bios*, Life; *Logos*, a discourse.

In dealing with the higher mental evolution we have to regard morality and rectitude as the duty demanded of normal man. Society in its evolution has not attained to this; on the plea that might is right, it lowers the code of morality and duty to one's neighbour, and substitutes convenience for conscience.

Sin  
versus  
Crime

Hence we find that sin and crime run on quite different lines. What is a small sin like poaching, becomes one of the most flagrant of crimes; whilst he who ruins a girl in the poorer ranks sins under the protection of the law, and does not lose his place in society.<sup>1</sup> When our rusty old law machine finally tumbles to pieces, crime and morality should be arranged in inverse proportion. Then, and not till then, will Law and Justice be co-related. The State is at present unmindful of the sufferings of her children; she performs little in the way of sympathy or goodness, leaving all charity and assistance for the needy to the efforts of private individuals.

After a careful study of the human organism, we shall understand more clearly the various social problems, where the defects lie, and how to remedy them.

It is quite evident that individual effort is necessary for national progress. Nations and individuals run on parallel lines; what is right for the one is good for the other.

A community is made up of personal units, while each of us is made up of several communities of complex living cells; each group of cells, with its special duties, is co-operating for one object, setting before us a plan of what a normal and perfect nation should be. There are factors which threaten us at the present epoch; luxury and over-indulgence, which ruin the human organism, canker and penetrate to the heart of the nation, producing lethargy and inefficiency.<sup>2</sup> The second cause of our national decay is the neglect of the poor and helpless, who should be a source of constitutional wealth and

<sup>1</sup> I recall one of the brightest little fellows in the Working Boys' Home, who is the son of a domestic servant. The father was a "gentleman," as his son's face and manners show. The lad barely escaped being absorbed into the criminal ranks. If he had been so absorbed, how is the matter of responsibility to be divided up amongst the three parties concerned, father, mother and State?

<sup>2</sup> Read Arnold White's work on *Efficiency and Empire*.

growth. The disaster which this brings is not a curse from God, but a logical sequence of the infringement of the laws of biology and sociology.

We are very near a precipice, requiring only a "heave over" to go to pieces, and our only salvation lies in a return to healthy and normal conditions.

## CHAPTER II

### VEGETABLE AND ANIMAL FORMS

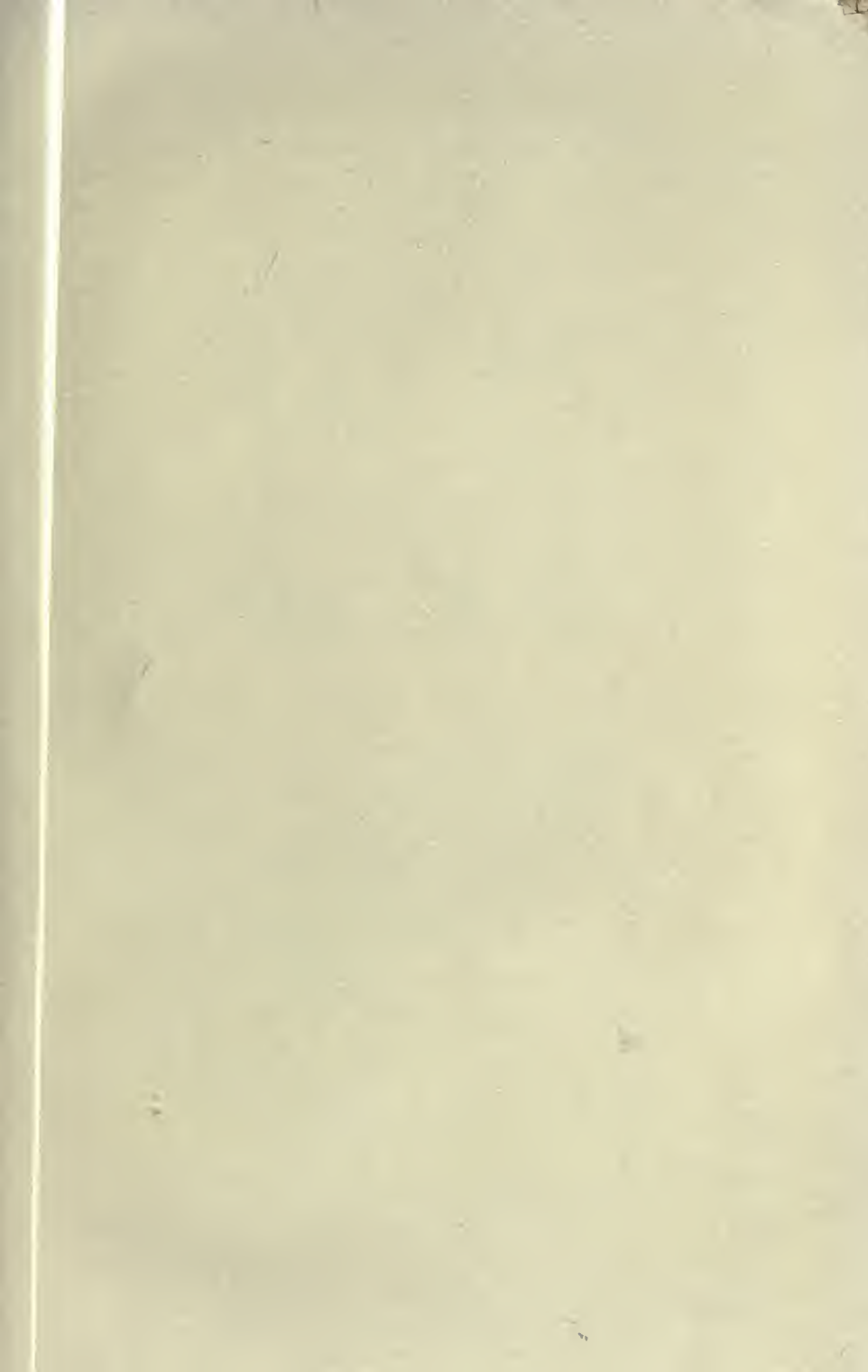
**RELATION OF ANIMAL TO VEGETABLE LIFE:** Some natural laws—Man is only an animal—Plus will-power—Man a machine—Represented in the lower creation—Animal kingdom built up in progressive series—The amoeba and leucocyte—Teach children the truth, or they resent it later.—**EVOLUTION:** Lamarck's theory, Adaptation to Environment, Wrong; Darwin, "Survival of the fittest," or "natural selection"—Prof. W. Bateson on "Discontinuous variation"—Shirley poppies—Examples of discontinuous variation—De Vries' experiments with oenothera.—**THEIR APPLICATION TO MANKIND:** Promiscuous marriage—Continuous variation, or minor individual differences—Our duty toward "the unfit"—Malthus' warning.

Relation  
of  
Animal  
to  
Vegetable  
Life

THE animal world is very closely interwoven with the vegetable kingdom. The same general laws and principles govern both alike, so that no study of the human race would be successful or complete, without a full understanding of plant life. Man is an ordinary animal, with its instincts, feelings, and impulses; but he has something in addition, a mind, and perhaps a soul. He is therefore not subject to his impulses and instincts, but is provided with a force or will power to direct and control his desires. It has taken many hundred millions of years to build him up; structure has been added to structure, until he is a most elaborate physico-chemical machine. When his various parts are taken to pieces, and examined, often with the aid of a microscope, sometimes with the test tube, we find that they are all represented in what we call the lower creation. We see the crab is made up of twenty-four segments, the worm is also divided, so is the butterfly. Man likewise is made in spinal and other segments, and resembles the lower forms of life in that each segment is provided with its own nervous mass and mechanism.

We observe also nerve masses, or ganglia, in insects and snails, that have their counterpart in the human species, controlling the organs of digestion and circulation. The animal kingdom then has been built up from very simple







- A. Leucocytes, or colourless blood cells. They are round cells with nuclei. Nature's policemen.
- B. Similar cells, scavengers. 2 destroying tubercle bacilli from a human lung ; the other full of dust particles from the breath.
- C. A double nucleated phagocyte, or scavenger cell, from a case of advanced neuritis, removing dead particles, which stain black. (Drawn from the microscope, oil immersion, by Miss B. Wilson.)

forms, by little additions to each progressive series. Perhaps the simplest form of animal life is represented in the ponds by the amoeba. This is a transparent piece of protoplasm, which looks under the microscope like a bit of jelly, having the power of movement, and altering its shape so as to include smaller particles which it digests as food. The same kind of animal exists in our blood as colourless corpuscles, on which we depend as scavengers and policemen. If we get a fever, local inflammation or poisoned wound they muster in thousands and millions, devouring the poisonous germs which have attacked us. Though they are a necessary part of our system yet they can live outside our bodies, as, for example, in a test tube which contains a weak solution of salt.

Every child ought to be taught the truth, and ought to know that man was not suddenly created, but evolved gradually from the lower creation. Nothing is to be gained by practising deception on the young, and much may be lost, as it leads later to a general scepticism and "criticisms."<sup>1</sup>

There has always been great speculation as to how this evolution of different species came about. Early investigators thought that the gaps existing between species were brought about very gradually. Lamarck who wrote on this subject in 1801 and 1809,<sup>2</sup> originated the theory of "adaptation to environment" as the cause of variation. Thus the giraffe, which has no more bones in its neck than has a rabbit or man, was supposed to acquire its long neck during many generations of stretching upwards to eat the palmleaves.

Evolution

Similarly the flamingo was supposed to have developed its long legs and neck through its habit of wading and reaching out among bulrushes. Likewise snakes were supposed to have lost their legs from their habit of crawling into narrow crevices. All this we know to be wrong.

Darwin in 1859<sup>3</sup> introduced the theory of the "survival of the fittest" and "natural selection." Darwin, the pioneer,

<sup>1</sup> Many "learned" and "higher" criticisms are valueless for want of accurate scientific data. These clever men have been brought up on dogma and tradition instead of solid fact.

<sup>2</sup> *Philosophie Zoologique*.

<sup>3</sup> *The Origin of Species*.

however, could not in a lifetime complete his work. He attributed too much importance to minor differences, thinking the gaps between species were gradually formed, and handed on from one generation to another, until a new type or species was formed. We now know that this is not so. Nature can and does take jumps. Professor W. Bateson,<sup>1</sup> of Cambridge, applies the term "discontinuous variation" to this process. Thus he points out that a tulip, which normally has three petals, may have offspring with four perfect petals which is a new and total variation from the parent: not three proper petals and one small imperfect petal, for such would be considered a malformation, or, more correctly, a "continuous variation."

Then we have the case of the Shirley poppies. The Rev. W. Wilks, vicar of Shirley, near Croydon, observed white rimmed poppies growing among a mass of wild poppies (*Papaver rhoea*). He kept the seed of this sudden or discontinuous variety, and with skilful horticulture started the new species called after his parish.

There are abundant records of several new species, or as Bateson terms them, "discontinuous variations." As common examples we have the long haired cats and guinea-pigs. Pug dogs, and bull dogs, are variations depending on arrested growth of the upper jaw. The same happens among carp and pike, so that the lower jaw protrudes. A few cases are on record of ordinary mice with no fur, naked mice, whose offspring also is naked.

One of the most applicable instances is recorded by the Dutch botanist, De Vries.<sup>2</sup> He found in a potato field several varieties and species of *Oenothera Lamarckii* growing wild. It is an American plant, and he attributed their variations to the difference in climate and soil. However, he cultivated from seed and seedlings 50,000 plants and observed among them 800 abnormal forms, or as they are termed mutations (*mutare*, to change). These 800 mutations showed 15 varieties or new species, which, in some cases, would flower and seed true to their new types, thus making distinct species, and receiving fresh Latin names; in other cases the new species or seedlings

<sup>1</sup> *Materials for the Study of Variation*, p. 15.

<sup>2</sup> *Nature*, 1901, vol. lxiv, p. 208.

were very delicate, and either died before reaching maturity, or were only reared with the greatest care. Thus some of the varieties formed new and stable species, and some were unstable.

This instructive experiment applies forcibly to the lower vegetable and animal forms, and also to our own human and social organizations. As the result of promiscuous marriage we see a motley group of offspring, some good, some medium, others weak and sickly, and a few bad. This leads us on further in the inquiry as to the unseen causes and forces at work.

Their  
Applica-  
tion to  
Mankind

In every human family we observe individual differences or peculiarities amongst the children. These are minor variations, or individual traits, and are termed "continuous variations," because they cannot be perpetuated into new forms. If we however can fathom the why and wherefore of the more definite and abnormal variations, we will have a clearer perception of the continuous examples. It will carry us on to the question of marriage and inheritance, and also of our higher duty towards the unfit. Are we to look on unconcerned? In 1798<sup>1</sup> Malthus gave a warning to the world when he pointed out, that the human population increases in geometrical ratio, therefore the less gifted must suffer in time from the stress of poverty, due to more competition and less land to occupy. Infant mortality from the weakened race must therefore increase. We now realize the truth of his prophecy, but what about the future?

<sup>1</sup> *The Principle of Population*, 1798.

## CHAPTER III

### FERTILIZATION

**THE SIMPLEST UNIT IN BIOLOGY:** Definition of a cell—Protoplasm—Nuclei: Illustration—Variety of cells—Mono-cellular structure.—**REPRODUCTION:** By simple division—Diagrammatic representation of cell division—Condition of each daughter cell.—**BY TWO PARENTAL ELEMENTS:** Studies in lower forms of life—Observations in worms and starfish.—**DEVELOPMENT OF GERMINAL CELLS.** Four stages.—**THE OVUM:** Its structure—Chemical composition—The storehouse—The nucleus—Chromatin—Polar bodies—The fertilized ovum a perfect cell—How disease and alcohol affect the ovum—Stunted children.—**THE SPERMATOZOON:** Chromosome and centrosome—Fusion of sperm and ovum—Function of each.—**THE SEX QUALITIES:** Reversal of sexes—Mental hermaphroditism—The fusion of, or third, sex.—**THE CHANGES IN FERTILIZATION IN THE SEA-URCHIN:** Entrance of sperm—Sperm divides—Nucleus in ovum divides—The two pronuclei fuse and rods of chromatin form—Unequal division of ovum suggested where disease misses a generation.—**TWO KINDS OF GERMINAL CELLS:** Reproductive and body cells—Reproductive cells not from the parent—Observations to prove that reproductive cells continued from germinal cells—Professor Balbiani's observations on the reproductive cells of a fly—Beard's observation on the skate—First division of cells, asexual, the Phorozyoon—Then embryo appears and reproductive cells remain—Resemble the runner of a plant.—**MOST IMPORTANT BEARING ON HEREDITY IN THE HUMAN RACE:** The old teaching incorrect—Haeckel's view—Darwin and Huxley—No inheritance of acquired characters—Weissmann's theory of Germ Plasm—Beard thinks embryo owes nothing to parent except shelter—The case of the hen and the egg—Mammalian ova—The higher the organization the greater the risk—Practical application of our knowledge—Causes of variation, latent characters—Delage regards environment as cause of variation.

The  
Simplest  
Unit in  
Biology

**THE** cell is the simplest unit in life. Every animal and vegetable tissue is composed of masses of cells, which are specialized in form and function in the different parts. A living animal cell consists of a body of protoplasm,<sup>1</sup> usually enclosed in a wall or membrane, with a nucleus in the centre. This is a workable definition, considering the hundreds of different sorts of cells. Protoplasm is an exceedingly complex and unstable compound of an albuminoid character, and forms the physical basis of animal life. Its composition varies according to the kind of cell in which it occurs. The nucleus is the vital part

<sup>1</sup> It is doubtful if the nerve cell has any membrane.

of every cell and contains a different complex substance, called nuclein. The nucleus is superior in structure and function to the other contents of the cell. Thus in the brain of the human embryo, the nuclei of the cells are all laid down at an early stage; as growth proceeds each nucleus builds up its own cell-body, out of a special neuro-protoplasm.

In plants we find starch cells; pith cells; those of woody fibre in which lignin is deposited, giving the characteristic hardness; while green chlorophyll cells in the leaves carry nutrition for purposes of growth. In the animal there are blood cells of five or six different kinds, each with special life-protecting functions (some non-nucleated); also muscle cells with the power of contractility; in the skin horny cells which protect the body externally; and bone cells which contain lime, in order to give a substantial framework. In the electric eel, there are electric cells, a unique and marvellous formation, for the purpose of paralyzing by shock the fish on which they feed. The highest are the nerve cells, which generate different forms of energy, from growth to muscular movements and finally to complex thought.

These are examples of composite cell masses, but there are simple cells each with a separate existence, such as spores, and the germs of disease, amœbæ, yeast cells, and various microscopic infusoria, which are so abundant in pond life.

Reproduction, in its simplest form among the unicellular organisms, consists of simple division. Here the cell divides into two, the daughter cells growing to the size of the mother cell, and in their turn each dividing again. This process, which continues with great rapidity, furnishes millions of organisms in every few hours. The processes of fermentation and putrefaction are results of the cell multiplication of yeast cells and bacteria. Somewhat similar conditions occur in infectious diseases.

Reproduction

The diagrams opposite, copied from Boveri,<sup>1</sup> explain more fully the division of the cell in the higher forms of animal life, during growth or as it is termed karyo-kinesis.

In the resting condition of a cell there is the centrosome

<sup>1</sup> "Zellen Studien," *Jena Zeit. f. Nat.* xxi, xxii, xxiv.

of a radiate appearance, and a nucleus containing wavy threads or filaments of chromatin.

When division or regeneration begins, the chromatin forms up into rods, the number varying according to the species, and there form also two asters or centrosomes, each of which sends threads to the rods of chromatin. In the third stage the wall of the nucleus disappears and the chromatin rods arrange themselves in opposite halves of the cell.

The rods and asters having assumed positions in the separate halves, division gradually follows. A nuclear wall is again formed and encloses the chromatin in the daughters and finally takes on the resting stage as at first.

We are, however, concerned with the higher form of reproduction by means of specialized germinal cells, where two parental elements are involved, which are represented in plant life by the pollen and ovule; and in the animal world by the spermatozoon and ovum. These have been studied in the lower forms of life, as the worms and sea urchin, in order to get at the foundation of the subject. Observations have been made among the ova of fish and frogs, so that confirmation among the vertebrates is assured. It is reasonably inferred that similar conditions are observed amongst the mammals.

The development of the germinal cells has been described by Boveri,<sup>1</sup> from observations on parasitic worms (e.g. *ascaris megalcephala*) and Echinodermata, as starfish and sea urchins; also among flies and other animals.

It would appear as if the germinal cells in both male and female organs go through the same processes and in the early conditions bear a close resemblance, as though male and female originally started from the same cells.

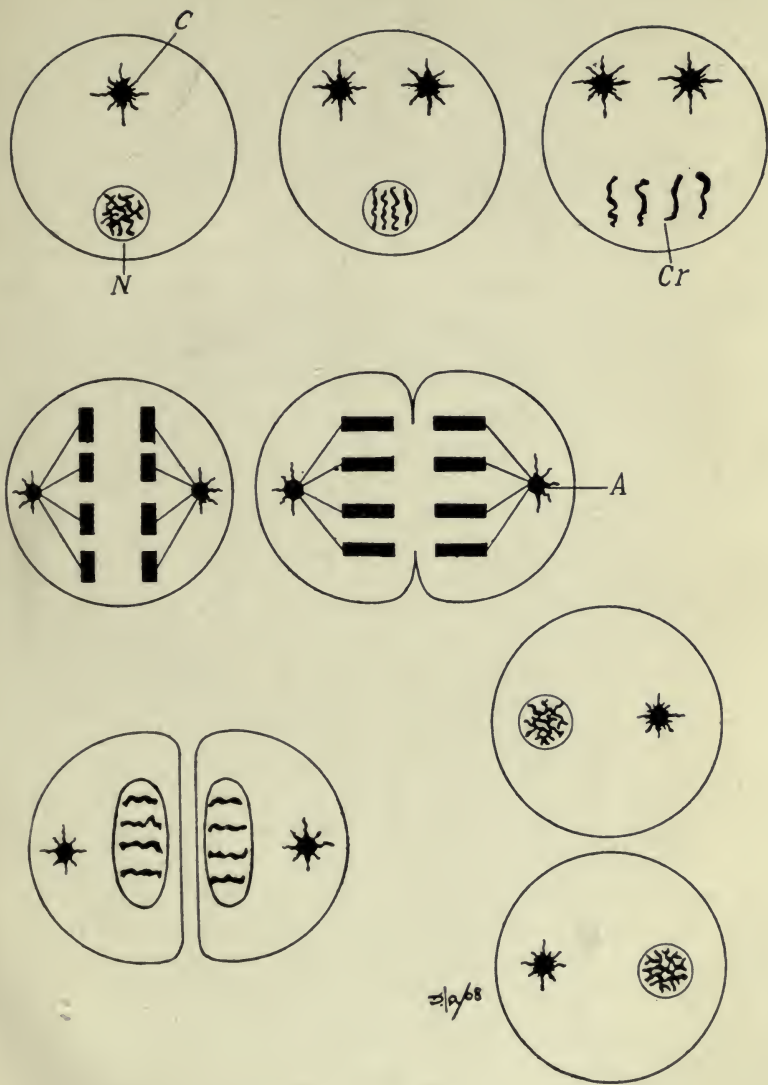
In each sexual organ, male or female, the germinal cells lie in tubes, and pass through four stages, before reaching final development—(1) Division or multiplication; (2) Growth; (3) Reduction; (4) Maturation.

The  
Ovum

In principle the ovum is the same all through the animal kingdom right up to the human species.

<sup>1</sup> *Sitz. Ber. Ges. Morph. Phys.*, Munchen, II.

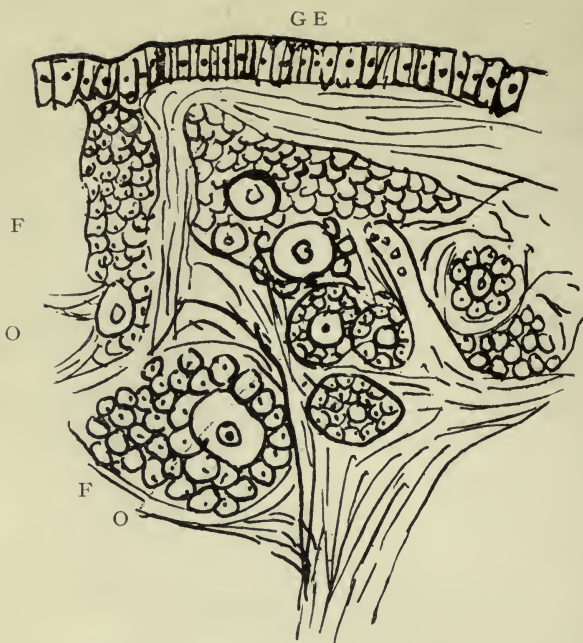




(From Boveri.)  
 C. Centrosome.  
 N. Nucleus.  
 Cr. Chromatin rods.  
 A. Asters with threads to chromatin rods





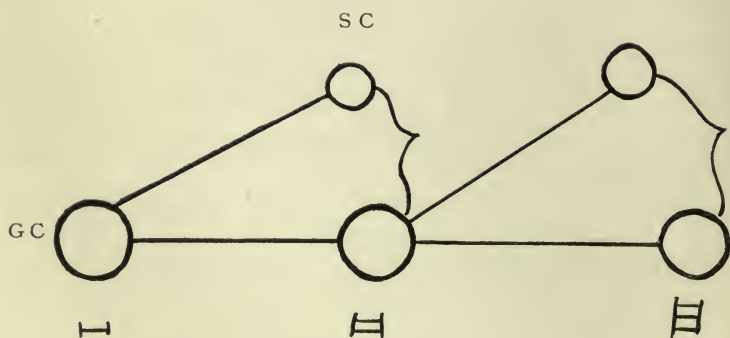


Section of ovary.

G E germinal epithelium.

F follicles in which ova are developing,

O ripe ova.



(After Délage).

G C The germinal chain which is continuous, three generations.

S C The somatic cells, which form the body, or environment of the germinal cells.

The human ovum is surrounded by a more or less porous wall, containing a nucleus suspended in the protoplasmic substances. The cell body or cytoplasm is rich in albuminous materials, lecithin or animal phosphorus, yolk, neurin, and other properties not yet determined. The egg is the storehouse for the full development of the future embryo in birds, but in the case of the mammals it only carries the embryo through the first stage till the placenta forms.

The nucleus is the centre of vitality and sometimes shows nucleoli. It always contains threads in coils or short masses. As these stain easily with aniline dyes, they are termed chromatin threads, or rods, or chromosomes. They assume rod-like shapes during the division which follows fertilization. Each species has its own particular number of chromatin rods, varying from two to more than one hundred. The chromosomes are the very essence of vitality.

The mammalian ovum develops from a delicate structure called the germinal epithelium in an organ termed the ovary.

As the ovum develops from a specialized structure, germinal epithelium, which obtains its nourishment from the blood and lymph fluids of the maternal body, there is an inevitable danger of the diseased or drunken mother poisoning her offspring, and arresting the normal evolution and maturation of the ovum. The ovum stimulates nutrition, while the sperm lends capability of construction and growth to the embryo. These functions stand in great danger where unfavourable influences exist, and explain the stunted appearance of the offspring. Reference to my observations on the working homes for London boys aptly illustrates the diminutive proportions of these poor children, due in many cases to their alcoholic parentage.

The spermatozoon differs from the ovum in size and mobility, being small and very active. It consists of a head and a tail, very much like a tadpole. The nucleus is at the tip of the head, being composed of compressed chromatin threads, or chromosomes. The rest of the body behind is called the centrosome. It is small, containing no storehouse of nourishment like the ovum. Its function is to cause division of cells, and to be a stimulus to increase of size.

The  
Sperma-  
tozoon

The fusion of these two opposite bodies makes a complete and perfect cell, capable of division, multiplication, and growth. The sperm cannot nourish, but gives to the ovum the power of cell division; the ovum having remained quiescent and conservative until the sperm entered. It, however, supplies what the sperm lacks, namely, nourishment for growth.

The Sex  
Qualities

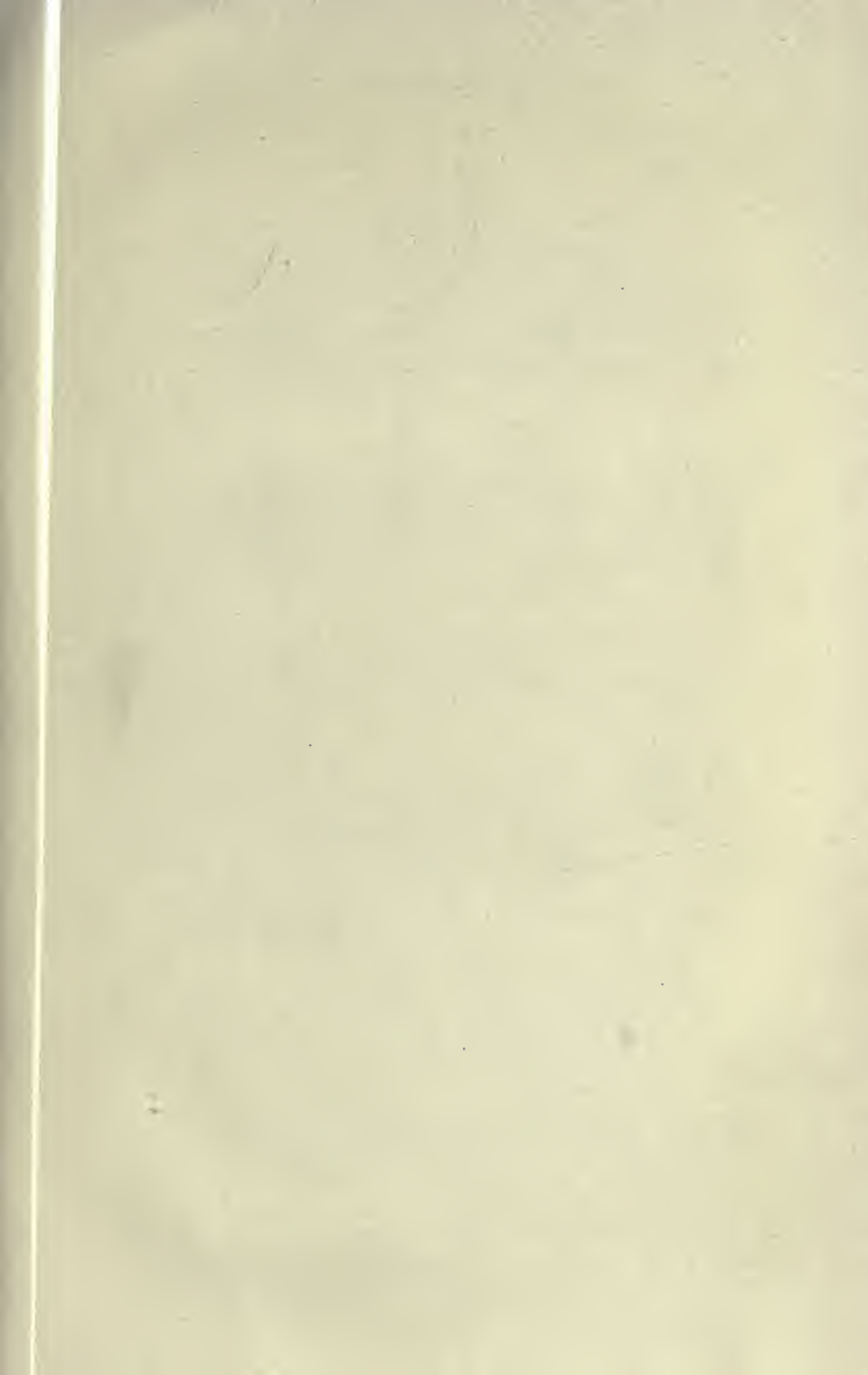
It is interesting here to observe that all through nature the two sexes depend upon each other to supply the corresponding deficiencies. The female is always passive, restful and conservative, storing up energy; whilst the male is active, restless, expending energy for family life, either to produce or protect.

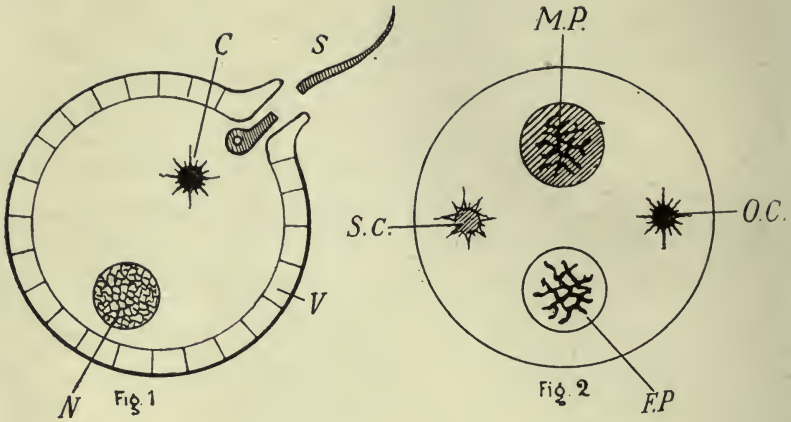
Something has gone wrong in the last generation, for these qualities are changing or fusing amongst the civilized races. There seems occasionally to be a man's soul in a woman's body, just as female deer may bear horns. Too often the reverse happens. The woman should be mother and help-mate, balancing the male and not competing with him. The dislocation of Nature's laws is developing a form of mental hermaphroditism.



In true hermaphroditism, the utmost difficulty may occur in determining the sex. Mentally the inclinations may be for the male, and females then are uninteresting, or vice versâ. These cases are too technical to introduce in a popular treatise, but shed great light on "the fusion of sex" with mixed instincts. There may be "mental hermaphroditism" without external changes, and it furnishes a key to many social problems of serious import. After a full generation of over-strain there is much instability of sex in body and mind, and the delineation of sex is not so clear as it should be. This is due to the fact that the sex gland (Woolfian body) before birth represents unity, and it is only shortly before birth that duality of sex appears, and there is an element of chance about it. Nature sometimes leaves her task unfinished.

The  
Changes  
in Ferti-  
lization  
in the Sea  
Urchin

It is so important to realize the delicate and minute changes in fertilization, that it is advisable briefly to describe this stage more fully. When the ova and spermatozoa of the sea urchin (*strongylus*) are placed in sea water, there is observed





MALE  - - - - -  
 FEMALE  ————

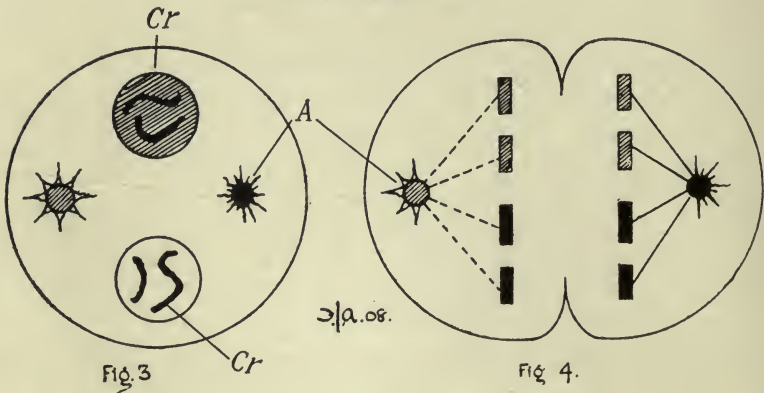


Fig. 1 Ovum with spermatozoon (s) entering.

V Vitellus or porus wall.

N Nucleus.

SC Sperm centre.

OC Ovo centre.

Cr Chromatin nuclei or pronuclei.

A Asters.

C Centrosome.

MP Male pronucleus.

FP Female pronucleus.

Fig. 4 (after Boveri).



an attraction between the two, so that eventually a spermatozoon comes in contact with the membrane or vitellus of the ovum.

At this point a cone is formed on the vitellus or wall, in which the sperm buries itself and is drawn into the ovum leaving its tail, for which there is no further use, outside. The sperm head makes for the nucleus of the ovum and separates into its two parts, the centrosome or sperm-centre, and the chromatin nucleus or male pronucleus, which latter now shows its chromatin rods.

The nucleus of the ovum also swells and separates into an ovocentre and female pronucleus.

The two nuclei attack each other, and form one mass, though the chromatin rods keep apart.

Two asters and two pronuclei now appear, the second aster being made of the centrosome of the sperm (fig. 2).

The stage advances as in ordinary cell division, but the chromatin rods of the zoon and the ovum keep apart, so that in the division each daughter cell has equal portions of sperm and ovum, and when the division is complete, each daughter cell has the same number of chromatin rods as the parent cell.

It has been argued by Delage,<sup>1</sup> that where disease misses one generation there has been an unequal division of the ovum, and one of the daughter cells from which the embryo came has lost these particular qualities. Gout or whatever disease may be suggested passes by the other daughter cell to form the ovum of the next generation. The theory is so ingenious that it is worth considering.

Boveri, studying the egg of the worm (*ascaris megalcephala*), observed two kinds of cells result after the division of the ovum. In one kind of cell the chromatin rods were preserved completely, as in the ovum described; while a second type of cell appeared in which some of the chromatin material was pushed out of the cell. These latter formed the embryo while the former continued the race as the future ova or germinal cells.

Two  
Kinds of  
Cells,  
Germinal  
and  
Somatic

But the discovery of these two kinds of cells is probably

<sup>1</sup> *L'hérédité.*

due to S. Jaeger,<sup>1</sup> in 1878, for he described Phyllogenetic or germinal or reproductive cells, and Ontogenetic or somatic or body cells.

Previous observers thought that reproductive cells were formed from the body of the parent.

Jaeger's view is now accepted and has been confirmed by many observers. Thus in the case of the fertilized eggs of insects, in which during the germinal segmentation, a few small cells separate from the main cluster to form the reproductive cells. In the Daphne, a freshwater crustacean, after about thirty divisions of the germinal cells there is a separation of the reproductive cells from the embryo.

<sup>2</sup> Professor Balbiani made a very original observation on the fly, *Chironomus*, which clearly demonstrates the isolation of germinal matter. At the earliest period of cell division of the ovum, two special cells remained distinct from the mass. As development proceeded these two cells remained unaffected, and were gradually enclosed to form the future reproductive organs. The body cells are then distinct, while the reproductive cells pass on the "family traditions" from generation to generation, independent of their host as long as normal conditions obtain.

Professor John Beard (in America) made important observations in the development of the skate, which being a vertebrate, strengthens all previous observations.<sup>3</sup>

He called the early division of the fertilized ovum by the term Phorozone, or asexual cells. The ovum divided nine times, producing 2, 4, 8, 16, 32, 64, 128, and finally 512 cells. At this stage there was a re-arrangement of the cell-mass, and the embryo developed from one of the cells, whilst the remaining mass continued as germinal or reproductive cells.

The germinal cells continue the race, while the embryo is an incident occurring in an uninterrupted chain. It has been compared to the runner of a strawberry plant, which continues the life of the parent or species, while the young plants or buds appear at intervals, and separate when mature. The simile is quite applicable.

<sup>1</sup> *Kosmos*, ii.

<sup>2</sup> *Zoolog. Anz.*, 1881.

<sup>3</sup> *Anatom. Anzeiger*, Bd. xviii, 1900. *Anatom. Anzeiger*, Bd. viii, 1902.

This idea must then be carefully remembered in studying heredity, that the germ cells form one uninterrupted line of succession, and the embryo or individual is an offshoot from that line.

This is the scientific expression of the conception of a family tree, only we are buds rather than branches.

The hen and the egg stand before us in quite a new light. The hen does not form the egg, as popularly thought, but is an offshoot, and only serves to enclose the germinal chain of the succeeding generation. The human parent is the trustee, rather than the testator of its offspring.

There is then a complete revolution from the former teaching; which, however, deserves notice.

Haeckel<sup>1</sup> propounded the theory that reproduction was an overgrowth of the individual.

Darwin formulated the following theory of Pangenesis in his work, *The Variation of Animals and Plants under Domestication* (vol. ii, chap. xxviii). He considered that every cell of the body throws off particles or gemmules, which collect in the reproductive cells. He conceived inheritance to be the development of the parental gemmules in the offspring; whilst variation is the commingling of the gemmules of two parents, modified either by use or disuse.

Huxley<sup>2</sup> thought that all the tissues of the parent contributed towards the formation of the germinal cells. Huxley said the germ was "simply a detached living portion of the substance of a pre-existing living body."

In this way they accounted for the resemblance of offspring to parent. Every part of the body was supposed to despatch infinitesimal molecules to build up the germ cells. If this were so, acquired characters would be transmitted, which is abundantly proved not to happen under any circumstances. If a man be undeveloped from malnutrition or disease, his offspring does not share that deficiency, or if he loses a limb or an eye the child is in no way affected.

Weissmann was the founder of a new theory of the "Continuity of the Germ Plasm."<sup>3</sup> He held that the germ cell

Most  
Important  
Bearing  
on  
Heredity  
in  
Human  
Race

<sup>1</sup> *Gen. Morph.*, 1866. *Die Perigenesis der Plastidule*, 1876.

<sup>2</sup> Huxley, *Evolution*, p. 296. *Enc. Brit.*, 1878.

<sup>3</sup> *The Germ Plasm*, 1895, pp. 192-193. "The ancestors of these germ cells are somatic cells."

came directly from the parent, not as Huxley and Darwin considered, as an extract from the tissues, but as a transference from one generation to the next of a definite molecular substance which he called determinants or "germ-plasm." He thought that at each formation of an embryo (ontogeny), a portion of this "germ plasm" is not used up, but reserved for the reproductive cells of the next generation. He said that "the germ plasm passes over unchanged into the organism which is undergoing development, and that this part represents the basis from which future germ cells arise." "It is therefore clear that all the cells of the embryo must act as somatic cells, and none of them can be reserved as germ cells and nothing else." So far Weissmann added an important feature to research; the separation of the germ cells from the body cells. He also was the discoverer of the value of the chromatin rods in the transmission of parental characters.

If Weissmann's view were correct, growth, nourishment and disease would act not on the embryo alone, but on the contained germ-plasm and so affect heredity. In scientific parlance, environment of the parent would affect the offspring directly. This appears probable to some observers, especially to the layman, and as so many are acquainted with Weissmann's writings it is important to refute them. Beard<sup>1</sup> goes quite to the other extreme, and in my opinion too far, stating that the individual or embryo derives nothing from the parent except nutrition and shelter. There is, however, distinct evidence of inheritance of mental traits and peculiarities. This, of course, is applied to mammals or viviparous animals, which are necessarily of higher organization than oviparous, which, like the common chick, derive all their nutrition before birth from the egg. The egg is then built up around the germinal matter, the blastoderm or "tread," the white spot which floats on the top of the yolk. This "tread" corresponds to the ovum in mammals. In it may be seen the germinal cell or spot which is the part which subdivides on fertilization. The mammalian ova are smaller<sup>2</sup> and unprotected, and rely for their development and nutrition on the maternal blood.

Hence the embryo is exposed to risks and dangers which

<sup>1</sup> John Beard, "The Germ Cells," *Zoolog. Jahrb.*, Bd. xvi, 1902.

<sup>2</sup> The human ovum is  $\frac{1}{125}$  of an inch in diameter.

do not occur when it is comfortably encased with its storehouse of food inside a shell. The higher the organization in the scale, the greater its risks and the more unstable it becomes. Thus there is actual necessity for the psychologist, or even for the philanthropist, to have some general knowledge of the laws of life and development.

The practical application of these scientific details is the object of this treatise, and to an ordinary thinker these facts apply themselves in various ways. We have studied the fusion of the male and female nuclei, the retention of the chromosomes of each, and their equal division into two daughter cells and then further.

If then, as Strassburger pointed out in 1884, each sex furnishes all his or her nuclear chromatin, all the characters of each parent will be represented in the offspring, and if certain features are not evident, it is because they are latent. The future generation have to contend with external influences and changes of nutriment, which may lead to variation or degeneracy. Delage does not agree with this view of latent characteristics. He says the egg has a complex physico-chemical constitution, which confers individual properties on the resulting cells. It is not the egg, but something outside it at a later stage of development which conditions the future characters. He expresses the general characters which develop as "tous ensemble le resultat de l'ensemble de la structure." Thus he would undermine our belief in the unfathomable molecules and potentialities of the Germ-plasm.

## CHAPTER IV

### DEVELOPMENT—INFLUENCE OF ENVIRONMENT

HERBERT SPENCER ON PREVENTING EXTINCTION: Adaptation and genesis—Competition and starvation—Self-preservation inverse to reproduction—In the "lower creation."—TWO PROCESSES AT WORK: Anabolism and Katabolism—State education upsets the balance—Bankrupt brains and moral ruin.—ARNOLD WHITE'S OBSERVATIONS: Nature's cure for the hooligans and Appaches—The connexion of Sociology with Biology—Fertilization—The forming of a perfect cell—Germinal elements form one continuous chain—The embryo, or individual, an offshoot—Pre-natal conditions—Composition of the hen's egg which feeds the chick—The mammal feeds the embryo through the blood.—THE BAD INFLUENCE OF CIVILIZATION: Malnutrition—Cases among poor boys—Duty of mothers toward offspring—Experiments in horse raising—Malnutrition due to tubercle—Or specific disease.—IMPROPER MARRIAGES: Age—Consanguineous marriages—The island of Uk, in the Zuyder Zee—History of Pitcairn islanders—Terrible list collected by Bemiss—Lessons from Nature—Experiments by M. Maupas with infusoria.—ALCOHOL: Attacks every tissue—Science supports temperance—Necessity to teach temperance to the young—Alcohol starves the child before birth—The alcoholic father—Case to illustrate—A woman with two husbands, alcoholic and teetotal—Idiocy and alcohol—Cases—Experiments on animals—Alcohol on brains of pups—Theory applied to criminals.—VARIATION: Its causes—Continuous, Discontinuous, Adaptation to environment—Environment constantly changing.—THE HUMAN "PLUM-PUDDING" SIMILE: Too salt water causing degeneration in a crustacean—Parallel to slum life—Effect of nourishment on birds and moths—Climate—Darwin's observations on rabbits—Variations only continued in same environment—Encouragement to regenerate mankind—Naegeli on variation due to climate—Tendency to sterility in variations—Influence on vegetation.—SIMILE TO OUR STORM-TOSSED CRIMINALS: Restore criminal to normal surroundings—Regeneration of offspring by dilution in healthy marriage.—DR. DELAGE ON REGENERATION: Great importance of environment—Haeckel's view—Transmission of disease—Haeckel's homochrone law—Some variations persist as a species—Examples: Hornless bulls, Thornless acacia.—ARE MENTAL CHARACTERS TRANSMITTED?: Transmission of psychological characters—Changes in the body influence heredity—Case of inherited alcoholic craving—Collateral heredity—Cases—Archibald Reid's views on heredity.

HERBERT SPENCER stated that to prevent extinction two conditions were necessary:—

1. Adaptation to surroundings, and
2. Production of new individuals to replace the old (Genesis).

He pointed out how the forces of destruction and preservation were in continual antagonism amongst all living forms, the perfect balance being difficult to attain.

When applied to the human race it is evident that too great a production produces competition and starvation. If from these causes self-preservation or adaptation fall too low, the race would die out unless the preserving factor be increased.

Self-preservation and reproductive power are therefore in inverse proportion.

Thus excessive fertility by causing starvation and competition leads to self-extinction.

Something of the same kind we observe among plants and animals, but the factors are very complex. For instance, the object of manuring a field is to increase the fertility of the crops. Again, in the case of sheep on a good pasture, the first object is to supply the food necessary for life, but perhaps the main object is to give extra nutrition to be expended on reproduction. Conversely Spencer pointed out that high-feeding and obesity favoured sterility through imperfect assimilation, which we know causes degeneracy of tissues and blood, thus starving the germinal elements.

There are two physiological conditions constantly at work in our bodies :—

Two  
Processes  
at Work

Building up and Burning up.

The first, which is rest, nutrition and growth, enjoys the Greek term of

Anabolism, while Katabolism

represents the chemical change due to work; whether the muscular energy of the athlete or the functional work of the brain in thought, or the reproductive energy.

For vigour and health these must be evenly balanced. In our State methods of education the expenditure or katabolism is in excess of the nutrition or anabolism, and so we flood the country with bankrupt brains, which spell moral ruin for the next generations.

In normal life the generative organs do not reach full activity till these nutritive conditions are perfectly fulfilled in adolescence.

There should be a vegetative or anabolic period preceding the reproductive or katabolic activities. Too often these conditions are interfered with by civilization, and then we get abnormal offspring as the punishment of offended Nature. When the reproductive period is reached the nutrition must be limited to avoid obesity in animals or too much vegetation in plants, as both of these decrease fertility. Hence we see the reason of root-pruning in fruit-trees.

Arnold  
White's  
Observa-  
tions

Arnold White, in the *Problems of a Great City*, observes that "The fecundity of starving people is notorious, and has again and again been exemplified in famine districts in India." It is very difficult to explain this "output" when anabolism is at a low ebb, unless it is the attempt of expiring Nature to hold her own.

On the other side, we see the object for snipping off flower-buds when growth is wished, or for castration in the capon and other animals. This would also be the proper remedy for the aggression of the hooligan and of the Appaches among the French; the uncurbed katabolism would yield to a peaceful, vegetative anabolism in a hornless hooligan.

I have considered it necessary for an intelligent view of the situation to go into some detail on the subject of fecundation. It may be regarded as impossible to connect potential or actual criminals with the reproductive processes of the worm, the insect, or the fish, but the relationship is closer than appears. The same laws, however, apply to mankind as to the lower "creation," and if normal conditions were observed, there would be few criminals; whereas diseased actions totally alter Nature's plans, and allow of the social product which is dealt with in this work. If we can ascertain the guiding principles of evolution and development, we may assist and no longer oppose the great Architect of the Universe. Moreover, Sociology must come to Psychology in order to unravel its conundrums, and the latter has to build on the foundations of Biology and Physiology.

Resumé  
of  
Fertiliza-  
tion

In the previous chapter there has been a short *resumé* of the mode of development of the germinal units, and the formation of the highest type of cell by their conjugation.



This perfect cell is composed of two bodies, one with the power to divide and cause growth, namely, the spermatozoon ; while the other, the ovum, has the ability to absorb the nourishment necessary for such increase.

The germinal elements form one continuous, double-linked vital chain, which represents the persistence of the race. The embryo, even before it develops into the adult form, acts as host to these elements. The host or parent passes on the guests or germinal elements to the next generation, and now we ask him or her to account for their stewardship, as in this we find the root of the whole subject.

Environment is commonly regarded as the important factor after birth, but there is a pre-natal environment which is of the highest importance and has an indirect bearing on heredity. As soon as the embryo gets its start from the primitive cells it depends entirely on its environment. In the case of the chick its storehouse is well stocked with all it requires. It has in the yolk proteids and albumens, nuclein, fats and animal phosphorus or lecithin ; grape-sugar ; iron and the same salts that occur in the blood corpuscles. In addition, the white part of the egg provides albumen, fats, grape-sugar, extractives and salts for the blood-serum. We see therefore what a perfect food an egg is. In the case of mammals the embryo, through the placenta, absorbs all it requires from the maternal blood.

It is here that the demands and penalties of civilization interfere with nature's programme. On this account many unfortunates arrive in this world without a single chance, and it seems severe to put them in prison when for pity's sake we ought to shelter them as compensation in some quiet refuge colony. When these penalties of nature occur amongst the rich they are protected, but these masses of unprepared ones, either deficient or degenerate, should enlist our deepest sympathies.

The Bad  
Influence  
of  
Civiliza-  
tion

The ante-natal causes of these social weaklings may be gathered under the few headings of malnutrition, disease, or accident.

Malnutrition necessarily affects the poorer classes, where food is difficult to obtain, but it may also visit the homes of

the wealthy, where high living occurs, which is stimulating rather than nourishing, and ends in degeneration of tissue.

The reader would appreciate more fully the effects of malnutrition if he were to study the cases I have reported (chap. xxiii.) in the "Homes for Working Boys in London," which contain many instances of alcoholic starvation.

It is the duty of every pregnant woman to do the best for her future child, in the way of nourishment and the avoidance of alcohol, stress and over-fatigue. We know only too well of the infantile mortality and degeneration where the mothers have to work in factories. We have to learn in these matters much from the less-neglected lower creation, and in this connexion it may be mentioned that in South America the breeders of a small race of horses (*la camargue*) always feed the pregnant mares more liberally, and obtain thereby an increased height in the offspring. My experience can recall many very fine infants from parents who were delicate or physically weak, merely by observing rules as to generous diet and proper rest during pregnancy. The offspring are not benefited merely physically, but mentally, and in later life morally.

Malnutrition may occur indirectly as the result of disease. Tubercle is the most formidable enemy, for where its toxin exists the blood and the tissues are starved. In spite of combined philanthropic effort tubercle has come to stay. It is a parasite, natural to the "creation," invading weakened organisms. We may check it, but we shall never extinguish it.

There is another constitutional taint—syphilis, that attacks the race often in most unexpected quarters, especially affecting the children. Probably it is the origin of scrofula two or three generations previously, and not improbably we shall discover it to be the remote ancestor of tubercle. This is quite theoretical, but the special structure of tubercle (giant cells) also occurs in some syphilitic growths, where it is called pseudo-tubercle.

These two toxins are the enemies of the race, and act directly on the germinal units, by depriving them of nourishment and injuring the structures which support them.



From left to right.

Ages

15

15½

17½

16½

Heights

4ft. 7in. ; - 7¼in.

5ft. 3in. ; normal

5ft. ; - 7in.

4ft. 7in. ; - 1in.

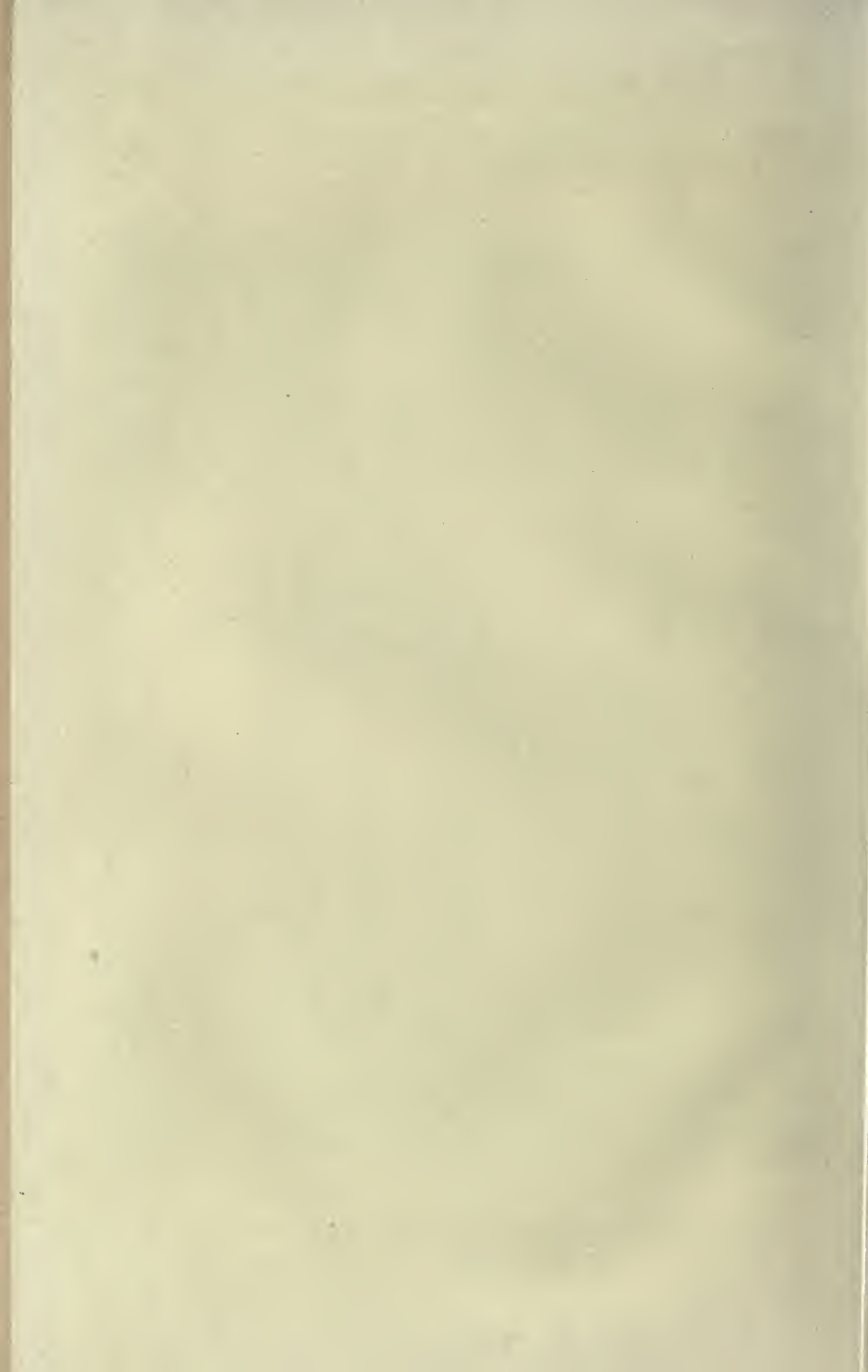
Weights

5st. 4lb. ; - 2st.

7st. 4lb. ; + 1st. 4lb.

7st. 12lb. ; - 1st. 9lb.

6st. 11lb. ; - 3st. 2lb.



Amongst accidents we classify improper marriages. Thus age has great influence on the ripeness and fertility of germ cells. Experiments have been made which support this experience, both by Vernon<sup>1</sup> with Echinoderms (sea-urchins) and by Cosser Ewart<sup>2</sup> with pigeons and guinea-pigs.

Age seems of less importance as regards the maternal unit, but it is quite otherwise on the paternal side, where vigour and activity are essentials. How often do we see infractions of this law, and how unstable are the offspring!

Consanguineous marriages are in these days of increased stress to be discouraged, lest in the ancestry there is some taint, such as tubercle, insanity, or neurosis, which might thereby be doubled in the offspring. Intermarriage affects the higher neurons.

I once visited an island, about a mile long, lying in the Zuyder Zee. It is called Uk, and packed in very small cottages are 3,000 inhabitants. There is no crime, no alcoholism, and no venereal disease. There is a governor; one policeman; three churches—Reformed, Staats, and Christian; and a doctor. The doctor told me that nerve diseases are very rife through intermarriage; idiocy, hysteria and neurasthenia are the chief troubles; there is only one case of tabes, as organic disease is rare.

Some authorities hold the opposite view, that consanguinity does not result in sterility or degeneracy, and give similar illustrations of other islands where the inhabitants have intermarried for generations. Thus on the island of Batz, half a century ago there were 3,000 inhabitants, where intermarriage prevailed for generations, and yet there was no crime or degeneracy, and the number of births was above the average.

The history of Pitcairn Island is well known, and is often quoted as an example of intermarriage amongst a limited few without degeneracy resulting. But the events have only lasted 120 years, and the original start was from such opposite races that it cannot be used in support of the healthy results of consanguineous marriage. In 1789, nine sailors landed on the island from a shipwreck. There were then six male and

<sup>1</sup> *Variations in Plants and Animals*, 1903, and *Variations in Plants and Animals*, *Roy. Soc. Proc.*, 1898.

<sup>2</sup> *Nature*, September, 1901.

fifteen female Tahitians. As the result of fighting, four years later there were only four sailors and ten Tahitian women. These multiplied to sixty-six people by the year 1825, and to 87 in 1830, and have advanced numerically since. At the present time they are absorbing fresh blood, so it must be banished as a classical test case.

Bemiss,<sup>1</sup> of New York, has collected 833 consanguineous marriages with their results, and they are very melancholy :—

	10 were brother and sister, or parent and child.
	12 were uncles and nieces, or aunts and nephews.
	61 were blood relations.
	27 were double first cousins.
	600 were first cousins.
	120 were second cousins.
	13 were third cousins.
	The number of children resulting was 3,942.
	Of these 1,134 were defective,
f 43	145 were deaf and dumb,
	85 were blind,
	308 were idiots,
	38 were insane,
	60 were epileptic,
	300 were scrofulous,
	98 were deformed,
	833 died in infancy.

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3,001

Thus nearly 75 per cent. were practically murdered *in utero*.

We get much practical help in all these questions by seeing what happens among lower forms of life. Nature makes the same laws for us as for them. Consanguinity of marriage, in the animal and vegetable world alike, tends toward sterility and degeneracy of stock. It does, of course, take several generations to produce any marked effect, but conversely we always find a race improved by adding fresh blood. In order to illustrate how low down in the scale nature's laws apply, I will quote the observations of M. Maupas in 1885 and 1886. He selected a water animalcule, an infusorian (*Stylonicha pustulata*) which breeds by ordinary division. He watched one for five months, and in that time it executed 215 generations, when it became sterile and ceased to divide. Previously

<sup>1</sup> Bianchi on *Psychatrie*, p. 111.

some were removed to another basin, where were also added some infusoria from another stock. These conjugated, and started again dividing for another five months, and then ceased after about 150 generations. How much more must the higher forms of life depend on fresh stock or strength for successful multiplication !

One of the most powerful agencies towards race degeneracy is alcohol.

Alcohol, by its very active poisonous properties, has been found to arrest the early development of the germinal cells. Féré,<sup>1</sup> in 1896, found alcohol injected into hens' eggs resulted in dwarf chicks.

Reitz<sup>2</sup> found that if young dogs and rabbits were treated with alcohol daily, they lost in weight and size and were less resistant to disease.

Ballet and Faure<sup>3</sup> made experiments for four years with five couples of dogs. These were treated with alcohol at different intervals, and of different strengths. When alcohol was freely given the pups died early, and the litters were small in numbers. Where moderate drinking was imitated the pups appeared normal, but had a high mortality. Even after the alcoholism was stopped, the mortality among the new pups was still high, with many cases of arrested development. This experience coincides with what we find in the human race.

Carrara<sup>4</sup> subjected pregnant guinea-pigs to a treatment of alcohol, and found degeneration in the brains of the pups.

This insidious degeneration is known to exist in the criminal, but unfortunately we cannot demonstrate it until too late and he has passed beyond the period when one might show him practical sympathy. The list of drunken ancestors in my collection is so long that I need not now quote cases, but it is interesting to note that skilled criminals are sober men, and some few have been abstainers.

Alcohol, in addition to its direct toxic effect, acts in diverse

<sup>1</sup> Féré, *Journ. de l'anatom, et de la phys.*, 1895, t. xxxi.

<sup>2</sup> *Neurol, Centralblatt*, 1901, p. 542.

<sup>3</sup> *Revue Neurolog.*, 1902, No. 12, p. 562.

<sup>4</sup> *Riv. Speriment. di Freniatria*, 1902, p. 696.

ways, for it attacks every tissue. It destroys the protective epithelium of the stomach, and thus removes one of Nature's most important barriers against disease. It also permanently impairs liver and kidney, and winds up by destroying the brain cells. Thus no organ can escape, and its direct action on the germinal epithelium must be included, whilst we can see how every tissue, including the embryonic, is starved beyond repair, owing to the deterioration in the nutritive value of the blood.

Thus temperance work has a scientific basis, in its object of race improvement, and with so much evidence on the post-mortem table of alcoholic degeneracy, it is difficult to explain how any medical man can sanction, or justify, the use of alcohol as a regular article of diet.

Every woman in the kingdom should be well informed on this subject, and it ought to be included in the education of the young. The alcoholic mother may start with a normal ovum, but starves and poisons the embryo *in utero*. How hard it is then to attach responsibility to one with such a history! The medical man is constantly confronted with these melancholy cases, but the law at present refuses to recognize them.

Alcoholic environment on the father's side has long been considered of less importance, but the subject cannot be scientifically considered, except with full knowledge of the conditions of fecundation as described in the previous chapter. There we see that the ovum is anabolic and supplies the trophoplasm which has nutrient powers, whereas the sperm, which is katabolic, contains cinoplasm, whose function is to promote active growth and development.

In my early days of practice I had a striking example illustrating this defective development. The mother, who was very delicate and starved, was a teetotaler and the father was a very heavy drinker. All the children were affected in development. One was blind, two were deaf mutes, three were deformed, two were idiots, and two or three had died early. Not one of the children was normal.

Selvatico Estense<sup>1</sup> mentions a healthy woman who was married to a drunkard and had five delicate children by him ;

<sup>1</sup> *Riv. Speriment. di Freniatria*, 1902, p. 698.



all of these died in infancy. She married later a sober husband, and had two perfect, healthy children.

Idiots are commonly supposed to be associated with alcoholism in the parents.

Bourneville<sup>1</sup> publishes 2,554 cases of idiocy and epilepsy, and believes that alcoholism in the father was the most potent and frequent cause of these calamities.

Sabraze and Brengues<sup>2</sup> in the case of a family of three idiots, found the fathers were drunkards for five generations back. The mothers were sober, and the rest of the stock was normal.

In order to form a more perfect picture of the artificial effects of civilization upon mankind we must study the causes of variation, of sports, mongrels, and hybrids, amongst plants and animals. I do not suggest that the two run on the same lines, but there is a parallelism between abnormal man and variation in the animal and vegetable world. Variation

There are two kinds of variation :

#### Continuous and Discontinuous.

Continuous variation is the term applied to the small differences in individuals which do not become fixed characters for transmission to the next generation. Thus in any family we see how each child varies ; perhaps not one is alike. The differences are those of degree. The term continuous variation may be applied to improving a breed of animals, such as the race-horse, or cattle, rabbits or poultry. It is necessary, then, to employ selection and keep up the same environment in order that the variations may continue.

On the other hand, where the differences are in kind or specific, the variation is termed discontinuous, and indicates a new and distinct species.

Such frequently are adaptations to environment. As Bateson<sup>3</sup> describes it, "Diversity of environment is the ultimate measure of diversity of form." Though this law is more evident with plants and animals, yet by closer study it sheds much light on questions of psychology.

<sup>1</sup> *Archives de Neurologie*, 1901, No. 70, p. 330.

<sup>2</sup> *Revue Neurologique*, 1898, No. 22.

<sup>3</sup> *Materials for the Study of Variation*, p. 15.

Nature is never still. What happens to-day, or under present conditions, may never be repeated. We do not realize how intimately the human race is interwoven with its surroundings, making us to-day a variation upon what our grandparents or even our parents were. Our children and grandchildren will differ likewise, and the organic world around them will be different. If we go further back, each century would differ, and yet through all these periods the same old-fashioned criminal law has been in force. Nothing more unscientific can be imagined. The intellectual or deficient neurotic sports of to-day require different treatment from that given to the physically fit, rough and ready, criminals of a hundred years ago.

The body of the child has never been the body of the parent. It is a new body, built up from different surroundings; hence it is quite clear that as the environment varies so does the individual.

Changes may also occur from ante-natal causes, such as unequal division of the sperm and ovum. This may act either quantitatively or qualitatively and is of wide application psychologically.

The  
Human  
"Plum  
Pudding"  
Simile

A human being resembles a plum pudding in which the flour and butter are contributed by one party, the spice and fruit by another. How the pudding turns out depends on a variety of conditions; one ingredient may be in excess and another deficient. Throughout the process the pudding is a victim and not a free agent.

We find an exact explanation of the criminal in what takes place with a pudding which evolves differently from what we expected. The pudding has turned out an anomaly, like a cat without a tail, or like a rabbit with one ear lopped, or a flower with a double crown.

The analogy may be extended further, for there is the structural or anatomical part of the pudding; in addition there are latent or chemical and, we might say, the functional parts also. So the form and character of the pudding is like the human offspring, largely a matter of luck and chance.

Such causes as soil, climate, nutrition, and domestication act upon plants and animals, as new conditions through fresh

combinations. I will cite a few well-conducted experiments in illustration.

Schmannkewitch<sup>1</sup> thought he had produced a new species of the crustacean, *Artemia salina*. A dam broke at Odessa, and some of these animals were washed into a very salt pool; the future generations became diminished in size and in their tail appendages. They then resembled a species called *Artemia Muhlhausenii*, which are only met with in very salt waters. Bateson showed this to be a variation, and not a separate species, for when they are put back into ordinary sea water they resume the larger size. Is there not a parallel here between free country life and slum life?

The effect of nourishment is shown by the custom of certain South American natives who feed their green parrots on the fat of large Silurian fish, with the result that the plumage changes from green to brilliant red and yellow. Those who are accustomed to breed caterpillars can cite several cases where diet and climate affect the colour of moths. In the case of one of the *Chelonia*, lettuce makes them white; belladonna leaves, on the other hand make the upper wings black or white, whilst the lower become blue or yellow.

Coste observed that if the eggs of salmon trout were developed in waters which nourished the ordinary white trout, they changed to a paler colour.

Climate everywhere affects both plants and animals. Darwin records finding rabbits at Porto Santo much smaller than the European types. They were supposed to have been carried there in 1419 A.D. He brought some to the Zoo, and in four years they grew in size and colour like the ordinary grey wild rabbit of this country.

Lamarck and Darwin considered that variations produced by conditions of life were passed on to future generations. It is not found to be so, unless the same conditions are continued.

From the facts just quoted we derive practical encouragement to place degenerated man under regenerating conditions.

Though Darwin, Huxley and others laid a very secure foundation on which to build by further more prolonged investigation, we often have had to differ from their inferences.

<sup>1</sup> Bateson's work on *Variation*, p. 96.

Naegeli<sup>1</sup> upset the former opinions as to variation. He collected from the mountains, for thirteen years, different varieties of *Hieracium* (2,500 in all), and sowed them in or transplanted them to the Botanical Gardens of Munich. The forms, which were diminutive owing to their harsh surroundings, at once developed, growing into larger plants which showed good flowers.

When variations occur due to surrounding conditions, there is a great tendency to sterility, as if nature desired to have a clean slate. The higher the organism, the more sensitive it is to variation, and the more unstable, hence the more likely to get destroyed and thus end the variation. In the human race natural sterilization would produce visible effects in time, were it not for the persistence of the cause of such an endless supply.

We observe how pines, which are giants in the Swiss valleys, gradually decrease in size as we ascend to the 8,000 feet level. The same tree, instead of rising 80 to 100 feet, will only rise to 5 or 10 feet. Again, far north in Norway, the silver birch, such a favourite to artists, grows no larger than a currant bush. Reverse the conditions, and you regain the normal size, form and beauty.

Simile to  
our  
Storm-  
Tossed  
Criminals

It is exactly the same with a large number of our criminals. They cannot stand the storms and stress of life, and are therefore stunted morally. Many of those who have fallen would be capable of occupying positions of trust, if other conditions had been properly adjusted. These conditions are not easy to fulfil. The Salvation Army are nothing if they are not practical, and they feel that there is great danger of many of their converts falling if they communicate with their old "pals." Some may use this as an argument against the genuineness of their conversion, but it only demonstrates the great weakness of human nature, from which, unfortunately, not one of us is exempt. Therefore it is that when the Salvation Army restore a man to his own normal self, they find that in this convalescence from crime he must be cared for as much as a convalescent from disease, or a storm-beaten shrub.

Their principle of restoring the criminal by giving him more

<sup>1</sup> *Bot. Zeit.* 1885.

normal surroundings is the facsimile of Naegeli's experiments just quoted.

Ordinary conditions of marriage do also help by dilution to regenerate the race, efface taints, and correct errors.

Dr. Yves Delage expresses his views well in the following sentence: "Regeneration does what it can, how it can, and with whatsoever it can. It is neither a repetition nor a special force in certain elements to meet certain accidental wants. It is only the manufacture of the forces of growth of an organism, which deploys its energy according to the conditions which it meets at every point and at each moment."<sup>1</sup>

Dr.  
Delage on  
Regenera-  
tion

It seems as if environment were more important than heredity in the life of the individual.

Haeckel attributes resemblances to heredity, and differences to environment. The all-important question is in relation to the transmission of characters acquired by the parent. We have seen that they continue, if the same conditions endure, and that is as far as we can go.

Mutilations, such as amputations, or blindness, are not transmitted, but diseases may be, especially where the nervous system is involved. The tendency to certain diseases is also transmitted, through some inherent weakness in the germ plasm.

Haeckel formulated a law which he entitled "homochrone," by which certain changes occurred at certain periods during life-time, as in the parent. This is a matter of common observation in the plumage of birds. Amongst ourselves we see certain mental, nerve, or physical diseases, as insanity, paralysis, gout, phthisis, apoplexy, or heart disease, occur at the same age as in the parents. The wheel of misfortune turns automatically, and beyond individual control.

We have, however, much to learn, and observations are supplied as abundantly by the laity as by the specialist. We cannot explain how some variations persist so as to become a species. As an example there is the peculiar crest of the Houdan fowl, which appears with certain regularity. So also as to many other breeds of animals. In Paraguay there are bulls without horns, and Haeckel traced them to a common ancestry in 1770, from one solitary hornless bull whose parent

<sup>1</sup> *L'Hérédité*, p. 110.

had horns. This hornless bull was evidently a sport, similar to many criminals, genii and others, desirable and undesirable, who crop up unexpectedly in families and are also sports. Their like may be as unknown in ancestry as the hornless bull or the thornless acacia. The latter is also a sport, but unstable, as it can only be propagated by grafts. If its seeds be raised the plants revert to the thorned acacia (*Robinia pseudo-acacia*).

M. Descemet in 1803 found in his garden at St. Denis a solitary thornless acacia growing amongst many ordinary trees with thorns. Let us fully realize that if such happens in every department of nature there is nothing very remarkable in the occurrence of these accidents in human families. This thornless sport was unstable, forming only a variety. It was called *Robinia spectabilis*, and never made a species, thus differing from the hornless bull. Our sports, good and bad, by healthy marriage on the same lines ought to have normal offspring. This is just what we find, and is our hope with criminal sports, if we at the same time can change their surroundings. They are unstable varieties, and not stable species disjointed from their ancestors ; hence our hopes for their improvement.

It concerns our subject more to ascertain if mental characters are transmitted. We know that nerve diseases appear in certain families with great precision.

It is generally admitted, though denied by some, that psychological characters become hereditary, such as the degree of intelligence, artistic aptitudes, and various vices and virtues, as if they had their molecular equivalent in the germ plasm. It does not follow that a naturally vicious parent, who by effort becomes virtuous, will hand on his virtue to his progeny. Probably it is otherwise, which explains how often apparently good parents have bad children. The converse unfortunately does not so often appear, as the natural tendency of man is downwards. But we get encouragement towards self-improvement, if the opinion of my old anatomy teacher, Professor Cossar Ewart, is correct. He says that "Changes in the soma (body), beneficial as well as injurious, are reflected in the germ cells, and thus indirectly produce variations."

I watched for some years a case of inherited craving for beer.

Are  
Mental  
Charac-  
ters  
Trans-  
mitted ?

The father was a chronic drunkard for thirty years; the mother, a well developed woman, was an abstainer. The children, three girls and one boy, were brought up abstainers. Two of the girls when in the vicinity of public houses felt the strongest desire to taste beer. The other two children escaped this inheritance. Fortunately, through the father's desertion and the mother's personality, all grew up and led proper and regular lives, and continued abstainers. The three girls were well developed like the mother; but the boy, who was the youngest, was stunted, which corresponds with the experiments already reported.

Cases of collateral heredity are very striking, and fall under the experience of us all. Thus I know of a young man, an actor, to the grief of his parents, who during his childhood carefully guarded him against any such tendencies. I found on inquiry that a paternal uncle is an actor, but the youth had never met his uncle; also when very young he used to build and decorate a stage and perform with dolls on it. His father is an artist, and a paternal uncle and grandfather were likewise artists. We can only infer that he had an inherited artistic tendency.

There are many other cases where genius, tubercle, insanity or amorality is hidden in a parent but visible in an uncle or great uncle or cousin, possibly not in the grandparent. This shows that the taint is somewhere in the blood, or more correctly in the germinal matter, and occurs as a pathological accident.

Archibald Reid says the child is a recapitulation of the parent, but may add or subtract. He terms it progressive or regressive variation. Progressive is a divergence from the ancestral type, while regressive is a reversion towards the ancestral type. He is also a supporter of dormant tendencies, which both Darwin and Galton have disproved.

Reid says ancestors are not represented *en masse*, but in orderly succession from first to last. While he does not believe in discrete ancestral units, he considers that dormant tendencies explain reversion to a remote ancestor. Though Reid is opposed in many important matters by recent research, his opinions and writings are very interesting on many of these obscure subjects.

Emerson arrived at the same opinion by observation, for he said "every man is a quotation from his ancestors."

## CHAPTER V

### PREPOTENCY

**DEFINITION :** Increased by inbreeding—The Jews—Their foresight and wisdom—The Quakers—The Gipsy race.—**GALTON'S RESEARCHES :** Sports or variations—Romanes' theory of physiological selection—Old English families—Aristocracy—Classes and masses—Must have classes—**PREPOTENCY ACCENTUATES DISEASE OR DEGENERACY :** The race-horse too much inbred—Other examples of inbreeding—The foxhound—The hog : Mr. Low's observations—The purer the parent the more prepotent—Cossar Ewart's experiments with dogs—Sir E. Mil-lais' experiments with dogs—Experiments with ducks.—**THE MASSES MORE BLESSED THAN THE CLASSES :** Nature dislikes inbreeding and ends it by sterility—Experiments by Vernon with sea-urchins—Cossar Ewart's case of a rabbit with young—Nutrition important in human race when inbreeding.

Prepo-  
tency  
Defini-  
tion

PREPOTENCY is the term applied to that increased power of transmitting the peculiarities of the parent to the offspring. It applies to either male or female parent, and in the human race probably to mental qualities. It is a subject which has attracted much attention among biologists. Darwin recognized its complexity, and we are but little further enlightened. Darwin<sup>1</sup> also noted a prepotency in sex qualities. This seems justified by the predominance of sons in one family and of daughters in another; or the special traits and features of one parent may be more frequently transmitted. Some species of animals are more prepotent than others. Thus the ass when mated with the mare passes its characters to its offspring, the mule; the prepotency runs more strongly through the male than by the female ass.

Cossar Ewart<sup>2</sup> and others maintain that inbreeding increases prepotency, whilst inter-crossing diminishes it. For this reason the Jews as a race are more prepotent than the Gentiles. The Jews are inbred for some thousands of years, whilst the British and Americans are the grossest mongrels of any race. What large families the Jews have is conspicuous,

<sup>1</sup> *The Origin of Species*, ch. ix.

<sup>2</sup> *The Pencyuik Experiments*,



and, considering the care and wisdom shown even amongst the poor Jews in family matters, it is little wonder that they look as if they would re-people the earth.

Prepotency was a marked feature among the Society of Friends, amongst whom there was a great deal of intermarriage due to their social isolation, and large families of ten or twelve were quite usual. Now that they are mixing with the world, they are much less fertile.

The gipsies afford an interesting example of prepotency; seldom marrying outside their own caste, they seem to retain their special characteristics even though scattered all over the world, often in small isolated groups. There are more than half a million in Europe. They first appeared in West Europe in 1418. Mr. Charles Rolleston informs me that he has resided in South India, in a district where gipsies mustered in large numbers. He held an appointment in the Sundoor territory in the Deccan and had the opportunity of studying their ways and their dialect. He regards them as representing a "degenerate heredity." Born among rocks and thickets, they are wanderers, nomadic, without ambition, energy, or even moral sense. Nor have they ever produced a statesman, artist, soldier, sailor or merchant, although they have had the same chances of advancement as the ordinary population among whom they lived. Though devoid of all moral obligations to those outside their caste, they have very strict rules regulating their conduct and dealings with each other. In whatever part of the globe we meet them, their peculiarities, due to their inbreeding, always persist. This is so conspicuous that "gipsy-blood" can always be detected, even amongst the well-to-do classes; which occasionally occurs where individuals abandon their gipsy customs and pursuits, and blend with the ordinary population.

Galton considers that very high prepotency is not normal, "but must rank as a heritable sport or aberrant variation." (See *Nature*, July 14, 1898.)

Galton's  
Re-  
searches

Some sports or varieties, however, must be prepotent in order to survive: otherwise, by intercrossing, they would revert to the type from which they had sprung.

Wild animals especially are liable to inbreeding; yet those

which roam and fight are liable to be broken up into smaller companies, and receive fresh blood in consequence.

Mr. Romanes considered that, in addition to natural selection and the survival of the fittest, there must be something in the nature of "physiological selection" by which new species or variations could isolate themselves from the general mass, and resist the effect of inter-crossing which would tend to throw them back to the ancestral type.

A somewhat similar process must occur among the different human races in order to build up some of our important families, to whom have been allotted the terms "old" or "aristocratic." There is then a law of nature, or of physiology, at the back of the "Classes"; hence, the "Masses," in seeking to destroy the select few, are fighting against nature, which is always a losing game. The only method which has proved successful has been by massacres or revolutions, and there is no country which has benefited by the experiment. The result of such operations has been in every case a steady national degradation.

In modern times we have the several Royal trees in Europe, some more durable than others, and some degenerating.

Prepotency  
Accentuates  
Disease or  
Degeneracy

While prepotency is necessary for ensuring a pure race or stock by stamping special characters, it also accentuates weaknesses and lowers the vitality. This is very conspicuously seen in the case of animals, especially the race-horse,<sup>1</sup> which is a delicate animal and only equal to occasional outbursts of energy. It is seen also in dogs, where often the purer the race the less is the intelligence.

Mr. Low, in his work on the domesticated animals of Great Britain, gives many illustrative cases. The Foxhound is an example of inbreeding. He has indicated also the evil effects of too much inbreeding in the case of hogs. Their bristles became hair, the limbs short and feeble, the mothers could not raise their young, which were often monstrosities, and finally Nature protested by rendering them sterile.

The purer, or more inbred, the parent, the more prepotent that parent will be. <sup>2</sup> Cossar Ewart demonstrated this fact

<sup>1</sup> Sir Walter Gilbey *On Breeding Carriage Horses and Race Horses.*

<sup>2</sup> *Loc. cit.*

by an experiment in crossing a Dalmatian with a pedigree collie bitch. Dalmatians are inbred, and the sire cast his peculiarities into his offspring, for the three pups had large blotches on a white ground, and the collie was not even represented.

Sir Everett Millais<sup>1</sup> likewise crossed a bloodhound with a tricoloured basset. The offspring were bassets in form, but not in colour. Crossing these by male bassets, which resembles a first cousin marriage, the offspring returned to pure bassets.

But another experiment shows how the offspring may cast back to the grandparents. A duck, the offspring of a black Cayuga drake crossed with a common wild duck, was mated to a common wild drake, and had seventeen ducklings. Of these seven were like the more prepotent sire, but ten were thrown back to resemble the grandfather, who was a black drake. We can apply these results practically in studying any family tree.

It is seen, alas, in the human race, where insanity, or some special disease comes as a blight in a good stock. In some of these prepotent families, especially where cousin marriages prevail, we can foretell in the younger members the development of certain diseases, usually nerve troubles.

It is not all bliss to be an aristocrat, or rich in this world's goods. The masses are more blessed than the classes, but they do not know it. Nature, whilst permitting, does not prefer prepotency or inbreeding, and by crossing she brings things back to mediocrity. Crossing, or new blood, gives vitality and strength to body or mind. This is demonstrated in plant and animal life beyond all question, and socially gives the masses that strength of which at present they are too conscious. But inbreeding has its advantages by way of selection, variation, and species. If it be fortunate it perpetuates in the human race some of the best families, but where it is carried too far and ends in degeneracy, which is too conspicuous in much of our aristocracy, Nature tries to curtail the series by sterility. No family then, can inbreed beyond a certain number of generations, any more than the simple infusorian mentioned in Chapter III. Fresh blood must be added

The  
Masses  
more  
Blessed  
than the  
Classes

<sup>1</sup> *Two Problems of Reprod. Our Dogs.*

from time to time to give vitality and vigour. This is aptly demonstrated in the family tree produced, where cousin marriages breed idiots, albinos, and neurotics, while fresh blood produces children who rank intellectually with any.

Both in the animal and vegetable world nutrition is a very powerful factor in heredity. Experiments were made with Echinoderms, or sea urchins (*Strongylus*), by Vernon, in which two species, A and B, were crossed. At the beginning of the season one species, A, was unripe, or, in other words, its germ cells had not received their full and complete nourishment. The hybrids then resembled B, which was ripe. As the season advanced, and the germ cells of A ripened, the hybrids got more like A.

The same applies to horticulture, when the seed must be fully ripened for successful prepotency.

Cossar Ewart<sup>1</sup> reports an interesting observation, where he found a doe rabbit with twelve foeti. The uterus in the rabbit is like a double horn, and four of the young were in one horn and eight in the other. The four weighed as much as the eight, showing that, as each horn has its own artery and arrangement of placenta, the same amount of nourishment was divided among the eight as among the four. In consequence, each of the eight weighed half that of any of the four occupants in the next compartment of the womb.

Nutrition is a factor of some importance where inbreeding is concerned in the human race. Stress, hardship, poverty and the storms of life would very soon wreck the prepotency of any good family.

About 200 years ago there was a union between a lady of noble birth, A, and a man of an old family, B.

The issue consisted of five children—

A son, who was born an idiot.

A son, who married into another county family with benefit to the nation; and

A daughter, who married a first cousin, which resulted in a series of disasters.

Two did not marry.

<sup>1</sup> *The Penicuik Experiments.*

Let us note that the idiot was the first mishap in B's family ; and as insanity and nerve tremors were very rife on the female side, A, there was no question as to its source.

The son, who married a healthy girl, was ancestor to 121 average or normal children, without any insanity and very few cases of nerve tremor. There were—

10 children . . . . .	of whom 7 married.
33 grandchildren . . . . .	of whom 20 married.
66 great-grandchildren . . . . .	of whom 9 are married, and
12 great-great-grandchildren.	

We now pass to a black page of human wreckage. Nature's toll for infringement of her laws is very heavy, and she shows no favouritism. By the consanguineous marriage there was a preponderance of the wife's family germ plasm, and therefore of insanity and tremors. There were 10 children.

Nature's toll was—

2 insane.
5 with tremors.
Only 3 were normal.
(6 married.)

Two married consanguineously into other branches of the maternal tree, A, with disastrous results. Thus—

1. Eldest son married a cousin. Prepotency by in-breeding was exceeded by nature's toll, for there were 14 children, but all abnormal.

4 were insane.
4 had tremors,
1 committed suicide.

All were eccentric, and mostly genii.

There were 60 grandchildren, and 50 great-grandchildren. In all 124 descendants.

They are all more or less tainted—some very clever and good—some very bad.

2. A son also married into a branch of the family A. Here again we meet disaster. The first brood was again conspicuous for numbers, namely, thirteen children. Of these

Only 3 could be passed as normal.
All were unstable.
5 had tremors.
4 were insane.

There were 36 grandchildren. Note the decrease of fertility. There were few really normal specimens amongst them. Many of them acquired wealth by means that were subtle rather than shady.

There were 22 great-grandchildren. In all 74 descendants.

3. A normal daughter married into a normal and aristocratic family.

All blemishes were expelled. There were 5 children, 16 grandchildren. Observe the decrease in fertility.

4. A daughter doubtfully sane marries into a family with insanity. Here again we meet disaster—12 children.

Nature's toll—

- 2 idiots.
- 1 imbecile (alas, he married).
- 2 had tremors.
- 3 very unstable.

One who was unstable married into a healthy family, and had 10 normal children.

The imbecile married into a branch of the family A, with increased ill-luck, including :—

- 1 idiot.
- 1 dumb.
- 7 unstable.

There were 16 in all, and not one worth anything.

5. A son with tremors marries into a neurotic family. There were 11 children, with 5 insane; 12 grandchildren.

6. A daughter with nerve tremors marries into another aristocratic family. There were 12 children.

- 1 an idiot.
- 3 with tremors.

Otherwise they were normal.

There were 28 grandchildren, and about 22 great-grandchildren.

To sum up (as far as they can be traced). The original first cousin marriage resulted in—

10 children	with a toll of	7 disasters.
67 grandchildren	„ „	36 disasters.
168 great-grandchildren	„ „	6 known disasters.
94 great-great-grandchildren.		

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Total 329

Note how much more prolific and prepotent the cousin marriageship became (329 against 126). It has been impossible for me to collect all the facts as to grandchildren; there are very many unstable specimens amongst them.

This is a clear demonstration against the policy or profit of inbreeding.

## CHAPTER VI

### HEREDITY—VIEWS OF GREGOR MENDEL

Gregor Mendel, the abbot of Brunn.—SPECIAL ADVANTAGE OF THE SWEET PEA FOR EXPERIMENTS: Peas selected with opposite characters—In first generation, offspring intensify one of the parental characters—Dominants and Recessives—Second generation—Third generation of self-fertilization—Recessives breed recessives—Dominants breed both.—PROF. BATESON'S RESEARCHES: Gametes and Zygotes—Hybrid of tall and short pea—Experiments with peas with three pairs of opposite characters—Further possibilities in hybrid variations—Mendelism not universal.—REVERSION: Germinal units—Each being is a living mosaic—The blue Andalusian fowl a hybrid of black and white—Experiments with coloured stocks.—SPORTS: Chances for offspring.—HUMAN MONGRELS: Our ancestral units from ten generations—Gametes vary, so the progenitor cannot be accountable for his descendants—Bateson's illustration as to pedigree.—RESULT OF GAMETES UNION: (1) Resemblance to parent; (2) Something intermediate; (3) A new form may appear. As example, the cross between white and piebald mice.—HUMAN SPORTS: De Vries' experiments with the evening primrose—Case of mixed pairing, spaniel and setter—A family with malformed fingers—Cases of congenital cataract.—ADVANTAGE OF HEALTHY MARRIAGE: As shown in cases of disease and immunity—The case of yellow rust in wheat—Experiments by Mr. Biffen—Application to sociology—Cause of degeneracy—Criminal often a sport—Compare with experiments of the stock.—GALTON ON AVERAGES: The tendency to mediocrity—Sir J. Paget's analysis supports the law of mediocrity—Law of regression—Parental gifts rarely transmitted—In stature regressive—Dame Nature throws off defects.—STABILITY IN NEW VARIETIES OR SPECIES: Sports—Stability of type necessary to be transmitted—Value of good stock for breeding purposes.—IS ALL MANKIND ONE SPECIES, OR SEVERAL?: Three clear types—Variety among white races—Families differ.—HYBRIDS AMONG SPECIES—Mongrels among races—Reversion in cross breeding—One of the "bloods" expelled—A new or disordered variation—Hybrids tend to sterility and require replenishing—Example in cross between sheep and goat—Man is a mongrel—Fertility increased by crossing—Cross with negro—Atavism—The pervert and invert due to atavism—Darwin's observations on crossing fowls.

No essay on heredity would be complete without referring to the researches of Gregor Mendel, the abbot of Brunn. He was born in the year 1822, the son of Silesian peasants, and became a priest at the age of twenty-five. He carried out a series of investigations in the gardens of the cloister, and read important papers in 1854 and 1855 before the Botanical Society of Brunn. These works were brought before the



scientific world by Professor William Bateson of Cambridge, and more extensively elaborated.<sup>1</sup>

Mendel experimented chiefly with sweet peas (*Pisum sativum*), finding them less liable than most flowers to contamination with foreign pollen, as the keel of the flower covers in the anthers, and excludes the entrance of most insects. As the pollen falls on the pistil, there may be an early self-fertilization before the flower is fully opened.

Special  
Advantage of  
the Sweet  
Pea for  
Experiments

Mendel selected peas which had opposite characters in certain details. Altogether he selected seven such pairs, or, as he called them, Allelomorphs, and they were as follows :

1. Shape of the seed, round or angular.
2. Colour of the cotyledons, yellow or green.
3. Colour of the seed skins, light grey or dark.
4. Shape of the seed pod, inflated or constricted.
5. Colour of the unripe pod, yellow or green.
6. Inflorescence. Flowers terminal or on the axis of the stem.
7. Length of stem, long about 5 feet, short  $\frac{1}{2}$  to  $1\frac{1}{2}$  feet.

Mendel crossed two varieties of peas which differed in respect of one of these pairs of characters. In the first generation the offspring always showed the character of one parent much intensified. Thus where they were long and short varieties, the offspring would be 7 to 8 feet long instead of 6 feet. He therefore called the prevailing character, dominant, and the absent, non-appearing feature, recessive. He next crossed these hybrids, and in the second generation there appeared with constant regularity 3 dominants to 1 recessive.

3 D. + 1 R.

He carried on the self-fertilization of the hybrids to a third generation, and always got a different but uniform result, namely :—

1. That the offspring of the recessives continued pure recessives in all future generations. They had thrown out the dominant characters.

2. The offspring of the dominants are split up into :—

- (i) Pure dominants which only breed dominants.
- (ii) Mixed offspring, though with dominant characters, which breed like those of the second generation.

<sup>1</sup> Mendel's Principles of Heredity.

The third generation yields per cent:—

$$1 \frac{D}{D} \text{ 25 Pure Dominants.}$$

$$2 \frac{D}{R} \frac{D}{R} \text{ 50 Mixed Dominants.}$$

$$1 \frac{R}{R} \text{ 25 Pure Recessives.}$$

The mixed  $\frac{D}{R}$  work out again in the same fashion, throwing out pure recessives and apparent dominants in the proportion of 1R to 3D. In other words, in each generation half return to the pure parental forms and half are mixed in character.

Prof.  
Bateson's  
Re-  
searches

Professor Bateson,<sup>1</sup> having regard to our present knowledge of fecundation, expresses the subject diagrammatically by means of black and white squares to represent dominant and recessive qualities. One can attain the same object by the use of Roman capitals. Referring to the Chapter III on Embryology it will be seen that when ovum and sperm unite, or as Mendel styles them two gametes, they form a zygote which divides into two daughter cells. Therefore each germinal unit is expressed in pairs, thus  $\frac{D}{D}$ , in which the upper letter represents the apparent character.

We can represent this fertilization of peas in the following picture:—

$$\frac{D}{D} \times \frac{R}{R}$$

$$\text{1st Generation } \frac{D}{R} \times \frac{D}{R}$$

$$\text{2nd Generation pure } \frac{D}{D} + \text{mixed } \frac{D}{R} + \frac{D}{R} + \text{pure } \frac{R}{R}$$

The pure continue to breed pure—

The mixed  $\frac{D}{R} \times \frac{D}{R}$  repeat in the

$$\text{3rd Generation pure } \frac{D}{D} + \text{mixed } \frac{D}{R} + \frac{D}{R} + \text{pure } \frac{R}{R}$$

And so on.

Pure dominants and pure recessives breed pure.

<sup>1</sup> Address to Neurolog. Soc., *Brain*, cxiv, 1906.

If applied practically and a tall variety is crossed with a short sweet pea, then the first generation is all tall, showing that tallness is dominant,  $\frac{D}{R}$ .

The second self-fertilized generation shows three tall to one dwarf. The dwarfs or recessives RR when propagated produce no more tall, whilst of the three tall, one is pure producing no more shorts; the other two are mixed,  $\frac{D}{R}$ , the recessive quality R being latent or covered. The same process continues; so that the pure forms return to the parental type.

Mendel crossed plants having 2, 3, or more pairs of opposite characters, but the result is too intricate and long to quote. As all this bears directly on the variation of individuals and families in the human race I will mention that from 24 hybrids raised from peas having 3 pairs of opposite characters he got 687 seeds and in the following year 689 fruited plants. There were among them 27 combinations, some very complicated. I copy the table from Bateson's work, merely to impress the imagination with the knowledge of such complex arrangements of characters in ourselves, with the suggestion that it has a psychological application. The letters Aa, Bb, Cc represent the opposite characters or allelomorphs; for example, Aa long *versus* short, and so on.

Three characters :	Four characters :	Five and Six Characters :
8 A B C	22 A B C c	45 A B b C c
14 A B c	17 A b C c	36 a B b C c
9 A b C	25 a B C c	38 A a B C c
11 A b c	20 a b C c	40 A a b C c
8 a B C	15 A B b C	49 A a b B c
10 a B c	18 A B b c	78 Aa Bb Cc
10 a b C	19 a B b C	
7 a b c	24 a B b c	
	14 A a B C	
	18 A a B c	
	20 A a b C	
	16 A a b c	

The characters A and B in gametes may blend in a zygote, or one of the characters, as A, may in the presence of B split up into minor integral characters (hypallelomorphs)  $A^1 A^2$

$A^3 A^4$ , so that the compound resultant cannot be foreseen. One gamete might be B and the other  $A^1$ ,  $B A^1$ , or  $B A^1 A^2$ , or  $B A^4$  or  $B A^1 A^2 A^5$ , presenting endless possibilities.

This we may safely anticipate occurs pretty frequently in the complex mysteries of humanity.

Mendel's theories are not universal in their application, but there are other more recent experiments in support of it which are worth quoting.

C. C. Hurst<sup>1</sup> records the results of breeding black and white rabbits. Here black was dominant (D).

In some of the hybrid families of the second generation he obtained the usual number of :

$$3 \text{ gray } \frac{D}{D} + \frac{D}{R} + \frac{D}{R}$$

$$\text{and 1 albino } \frac{R}{R}$$

While in other families he obtained—

$$\text{mixed } \frac{D}{R} \quad 9 \text{ gray}$$

$$\text{(pure) } \frac{D}{D} \quad 3 \text{ black}$$

$$\text{(pure) } \frac{R}{R} \quad 4 \text{ albinos.}$$

This works out at  $3D + 1R$

$$\text{or } \frac{R}{R} + \frac{D}{D} + \frac{D}{R} + \frac{D}{R}$$

which falls in with Mendel's law.

But some of the blacks may contain white or recessive germs and thus throw off some more albinos. The casual observer would be struck by apparently pure individuals throwing off impure (white) descendants; the way in which each reader can apply this to human families of his acquaintance must afford the very greatest interest.

Rever-  
sion

In these cases there appears to be a union of a latent invisible character from one parent, perhaps from each parent, and we may regard these hidden units as ancestral. Or reversion may be due, according to Bateson, to meetings of complementary pairs of factors, which at some time of their

<sup>1</sup> *Journ. Linn. Soc.*, xxix, p. 283.

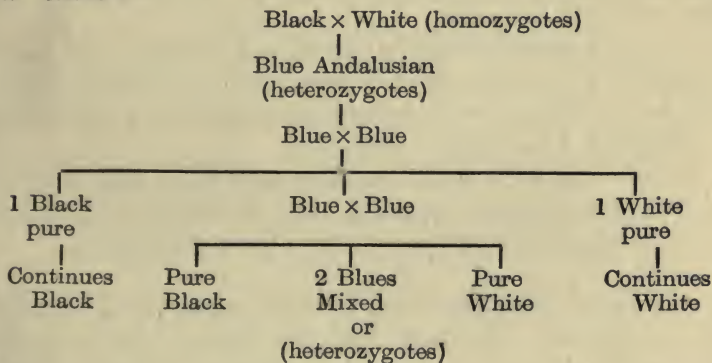
history have lost their complement. It emphasizes the unit formation or division of apparently simple characters or properties, and it changes the old ideas of heredity, treating an individual as a unit. Naudin put forward the theory that each individual is a living mosaic, which gives great support to the view that the Ego or Personality is also a mosaic.

Punnett <sup>1</sup> made some useful investigations concerning the blue Andalusian fowl, and proved the blueness to be a heterozygote of pure black, and white with black splashes.

The blue Andalusian fowl never breeds true, but their offspring yield :—

- $\frac{1}{4}$  pure black, which breed pure black.
- $\frac{1}{4}$  splashed white, which breed pure splashed white, and
- $\frac{1}{2}$  blue.

The blacks, and splashed whites, are then pure or homozygotes, and when they are paired they yield the blue Andalusian fowl. Thus —



The experiment of Professor Bateson with coloured stocks will appeal to every student of sociology. He made a hybrid of the two following stocks :—

- a red stock which had—
  - (a) Red sap,
  - (b) Colourless corpuscles.
- a cream stock which had—
  - (c) Colourless sap,
  - (d) Yellow corpuscles;

<sup>1</sup> See Punnett on *Mendelism*.

The red was proved in the first generation to prevail or be dominant.

The second generation by self-fertilization showed :—

- (1)  $\frac{D}{D}$  or Dominant 9 reds—pure a b  
 (a) Red sap.  
 (b) Colourless corpuscles.
- (2)  $\frac{D}{R}$  3 red cream.  
 (a) Red sap.  
 (d) Yellow corpuscles.
- (3)  $\frac{R}{R}$  or Recessive 1 pure cream—pure c d  
 (c) Colourless sap.  
 (d) Yellow corpuscles.
- (4) 3 new variations or whites.  
 (b) Colourless corpuscles.  
 (c) Colourless sap.  
 or 3D to 1R as before.

These white varieties, perhaps due to non-development of pigment, might be called “sports,” but they may be a reversion to some ancestor.

We have already seen in plants and animals, and have no reason to exclude man, that heredity may produce offspring like one or other parent, or a blend of each, or a new form, or a reversion to a former ancestor.

In this way by a study of parents we may form some idea of what the children’s prospects are, for they are in one sense as helpless as the plants we have been discussing.

Human  
Mongrels

Are not the Britishers the greatest mongrels in existence? Celts, Normans, Romans, Saxons, Danes, not to mention the foreign invasion now commencing of Germans, Swedes, Russians, Italians, French and others. The potentialities of mixed molecules in the germ plasm exceed the imagination. Let us see what may happen to each individual in regard to his ancestry.

The first generation travelling backwards represents our parents.  
 The second generation backward represents 4 grandparents.  
 The third generation backward represents 8 great-grandparents.  
 The fourth generation backward represents 16 ancestors.  
 The fifth generation backward represents 32 ancestors.  
 The sixth generation backward represents 64 ancestors.  
 The seventh generation backward represents 128 ancestors.

The eighth generation backward represents 256 ancestors.  
 The ninth generation backward represents 512 ancestors.  
 The tenth generation backward represents 1,024 ancestors.

We must apply these facts to our population in order to unravel the question of individuality and personality. Mendel says the gametes or germinal units of hybrids are different at each successive generation, and therefore the progenitor cannot be accountable for his descendants, and applies this to the laws of ancient heredity.

Bateson compares the formation of new varieties to the chemical union of sodium and chlorine making common salt, which is a new body in no way resembling its "parents."

By the union of different gametes (perhaps characters), one of three results may obtain:—

Result of  
Gametic  
Union

(1) Something may appear like either parent, as in the cases where the dominant theory applies.

(2) An intermediate form may appear. Thus Mendel found that hybrids flower at the intermediate period when their parents flower at different times, early and late.

(3) New forms appear, which are quite different from the parent, as in the case of a cross between the magenta Chinese primrose and the clear white variety, resulting in a "washy" magenta. This last condition specially appeals to Anthropology or Criminology.

Variation may be due to some putative ancestor, and thus correspond to Darwin's theory of reversion. As an instance, if the tame white (albino) mouse be crossed with the piebald Japanese, the result is the grey "wild" form. These reversionary greys produce:—

- (a) The parental tame types.
- (b) Reversionary greys.
- (c) New types.

We can infer then what chances there are of some putative human ancestor asserting himself in a new combination as a sport. This theory is rejected by many as incapable of proof, but surely what has once entered "the blood" can only be eliminated by dilution, not by extinction, and it is a recognized fact that whatever variation has once appeared may appear in any future generation.

Human  
Sports

In support of this idea De Vries<sup>1</sup> sowed a wild specimen of *Oenothera Lamarkiana* (evening primrose) in the Botanical Gardens at Amsterdam, and obtained no fewer than 9 variations, all of which must have been represented in a latent form. Some of these varieties were stable and formed new species, which Bateson terms "discontinuous variations." Others reverted to the parental type and were unstable. A few were so sickly and weak that they could with difficulty be reared.

Again in the "International series" there is mention of a cross between a setter and a spaniel. A male, which resembled the setter, was paired with a pure setter, and the offspring were spaniels. This case appeared as a reversion, but with Mendel's law it is easily explained.

Similar occurrences frequently crop up in the human race. Farabee<sup>2</sup> quotes a family in Pennsylvania where several members had 2 phalanges instead of the normal number (3) in the fingers and toes. This malformation was a dominant character. Those with normal fingers were recessives and their offspring were likewise normal; while the dominants allied in marriage to normal individuals produced some recessives or normals and some dominants.

The summing up of the offspring showed :

36 Dominants or abnormals and  
33 Recessives or normals  
from 14 abnormal parents.

This shows that marriage so far corrects defects as to give equal chances for normal results.

Mr. Nettleship<sup>3</sup> reported three families affected with congenital cataract, and the offspring of the abnormals yielded :

26 affected with cataract,  
and 29 not affected with cataract,

showing again even chances for the future generation.

The inference is that if physical defects are thus cut out of the offspring there is hope for nerve and mental defects,

<sup>1</sup> *Die Mutationstheorie*, 1901, H. de Vries.

<sup>2</sup> Papers Peabody, *Mus. Amer. Arch.*, 1905, p. 69.

<sup>3</sup> *Rep. Roy. Lond. Ophth. Hosp.*, xvi, pt. iii, p. 23.



perhaps vices also, being reduced in the same ratio by healthy marriage. Probably the ratio will be more favourable if the environment be carefully studied, which is a scientific argument in favour of suitable emigration.

As regards disease and immunity from disease, we can bring forward cases by way of illustration. Consumption enters a family, say by the mother, and carries off those children which follow the maternal type. The same applies to mental disease, and, though we cannot always trace it, perhaps also to moral disease. This method of examination is but very seldom resorted to. During many years of general practice I was struck with this fact, and while giving comfort and assurance to the one type would carefully guard the children built after the style of the affected parent. Though I style it as inherited disease, it may be more correct to say an inherited tendency to disease. Here again we fall back on botany and biology for a basis on which to rear the Temple to Hygeia. Thus some kinds of wheat are liable to attacks of yellow rust (*Puccinia glumarum*), other kinds are almost immune, although they may grow side by side. Here we have two Mendelian allelomorphous characters :

1. Predisposition to rust, and
2. Immunity therefrom.

Let us substitute the word tubercle for rust, and see if it does apply to the human family, for with this knowledge by careful intermarriage we might improve the race against tubercle.

At present we are in a state of confusion and can only think of isolation with a view to extermination of individuals. In this matter a State Marriage Bureau would greatly assist.

The experiments of Mr. Biffen<sup>1</sup> at Cambridge have not as yet been encouraging. He crossed two wheats, one which was quite immune from rust with another which was very liable to rust. The first generation were all rusty, showing that rust-weakness was the dominant character. The breeding of these hybrids produced in the second generation just what one would predict, namely, three rusty plants to one immune. Immunity was the recessive quality and remained pure. These experiments are capable of enlargement, and may then enlighten

<sup>1</sup> R. H. Biffen, *Jour. Agric. Sci.*, 1905.

us on the subjects of tubercle and insanity, suggesting artificial selection in marriage.

This is a most useful illustration for sociology and criminology of how two unharmonizing units may come together, and produce degeneracy, or even lay the seed of the criminal or the insane.

I have so frequently found the criminal to be a "sport"; the only one out of a large family group, and no special cause to be traced. Supposing we liken a father to the red stock and that he be intellectual, but "naturally" lazy: this last quality to correspond to the colourless corpuscles. He may by the instinct of self-preservation rise to a good social position. The mother let us say is vain amidst many fine qualities which conceal the defect. The vanity corresponds to the colourless sap in the cream stock. Nothing therefore can be even whispered against the parents, yet a son may be a criminal. The Judge would consider he merited more punishment than a similar criminal in humbler circumstances. But the psychologist, who builds on natural sciences, views the subject from a totally different standpoint. Many cases of this character are constantly passing before us.

Galton on  
Averages

Sir Francis Galton has written a very interesting book on *Natural Inheritance*. It is full of statistics, tables and mathematical calculations as to averages, but it is not biological. He has made a large number of observations and has formulated various laws and general conclusions. He finds there is in families and groups a tendency to mediocrity. Thus if one parent be very tall and the other very short, the offspring will not be either very tall or very short, but the majority of them will be of average height.

As an example Sir James Paget investigated the careers of 1,000 of his pupils and divided them into five classes, thus :

Distinguished . . . . .	28
Considerable attainments . . . . .	80
Moderate or mediocre . . . . .	616
Very limited success . . . . .	151
Failure . . . . .	125

Galton formulated a law of Regression, which puts a

“succession tax” on offspring, and tells heavily against the transmission of any hereditary gift.

As we often observe, the more bountifully a parent is gifted the more rare it is for him to beget a child equal to himself.

The children of gifted parents may, however, be more gifted than those of mediocre parents. Galton says “the ablest of all the children of a few gifted pairs is not likely to be as gifted as the ablest of all the children of a very great many mediocre pairs.”

In matters of stature Galton finds there is a regressive tendency from parent to child, and the same as to finer qualities. But Nature is just, and on the same plan tries to throw out defects and badness in the progeny. Cancer, tubercle and mental disease, may be taken as types of this, for in families so affected the offspring are either badly affected or throw it off altogether.

Galton insisted that stability is the factor in new varieties, or as Bateson terms them “discontinuous variations,” which in reality are new species and therefore do not apply to the human problem. Bateson invented the term “continuous variation” to describe the individual differences, or characters, observed among the members of one family, or if speaking of the lower creation among any particular species.

Stability  
in New  
Varieties  
of  
Species

Where a new variety or species appears, if it be stable it will not blend easily with other forms.

“Sports” are found to be unstable, but are “often transmitted to successive generations with curious persistence,” due, as Delage says, to the same environment continuing.

Anything that deviates from the central type, or typical centre, is in proportion unstable. Stability of type is an important factor in the general theory of heredity. Mediocrity is however the commonest condition, and as applied to humanity we see that all children tend to it.

Galton illustrates the value of good stock to breed from in this way. He suggests two couples naturally alike, one couple is made of two gifted members of a poor stock, while the other is quite ordinary but belongs to a gifted stock. The children of the former couple will regress, whereas those of the

latter will not regress. Galton thinks that ancestors contribute very little to the individual. He takes as example the descendants of "pedigree wheat." The first generations are large, but after a few generations the wheat loses all the ancestral quality of largeness, but this has been explained by the Mendelian theory already described.

Many who are interested in this question will inquire whether Mankind now represents one original species or several species. There used to be two schools, those who believed in the former theory, or Monogenism, while the second supposition or Polygenism has still its supporters.

There certainly seem to be three clear types among the human races :

The black or negroid,  
The yellow, and  
The albinos.

It is doubtful if external or geographical conditions will change a negro to a white, or a white to a yellow man, or vice versâ. By artificial means the black pigment melanin can be bleached in the negro : while if white skin be grafted on a negro it turns black and vice versa.

The Jews, I am told by one of the fraternity, develop a resemblance to the people they settle amongst. Thus there are negro Jews, Chinese and Japanese Jews, and European Jews and so forth. In Europe they certainly become nationalized if they dwell long enough, as we observe in travel. Since I received this information I have noticed many Jewish ladies, who have ordinary English features and seem to have lost the Jewish type. As the Jews have come to stay, it would be of great advantage to both parties, but especially to the English, if they would blend in marriage.

The globe is peopled with varieties of these types according to the older investigators, but the modern ethnologist is pursuing research by more subtle and delicate methods.

If we take a flock of sheep, to us they seem alike, but to a shepherd each is different. If we could look on all the white races collectively from a balloon they would appear alike. How different is the reality! What resem-

Is all  
Mankind  
one  
Species or  
Several ?

difference is there between the French and the German and the Russian, or between either the English or the Scots? And when we take our own people what difference there is between families! What variation also we find in families: some become sterile in one or two generations, others can raise only sons or only daughters; and few can show a tree of more than 300 to 400 years duration.

Thirty years ago it was considered that the term hybrid should be applied to crossing between species, and the term mongrel when the cross was between families or races of the same species.

Hybrids  
among  
Species

We have seen how the crossing of hybrid plants (peas) tends to a partial reversion to the original parents in each generation. There appears a complete rupture between the physiological connection of the two species in some of these descendants, and one of the two "bloods" is expelled. But some of the descendants of the hybrids persist, while others differ from the hybrid parents. This was styled by M. Naudin<sup>1</sup> as "disordered variation," and the fact may be well applied to what occurs in the human race in explaining degenerate stock.

In animals there is a tendency to sterility amongst hybrids, and this factor is seized by older writers in order to distinguish mankind as made up of races and not species. Thus the mule is a sterile hybrid, while other experiments show that hybrids if replenished from one parental stock keep up fertility.

In South America, for the sake of procuring a better fleece, the goat and sheep are crossed, and the hybrid must be re-crossed to keep up the breed (chabins). To be successful there must be  $\frac{3}{4}$  paternal and  $\frac{1}{4}$  maternal blood.

But man is a mongrel split up into races, consequently when the races are crossed fertility is increased. The British nation thereby gets more backbone, and though we may deeply regret the present foreign invasion, our descendants may profit by it a few generations hence.

Many observations have been made in America of crosses between whites and negroes with a resulting increase of fertility. If the negro were a different species the hybrids would be more or less sterile. There is then in the mongrel a physio-

<sup>1</sup> *Ann. Sci. Nat. Bot.*, xix, 4.

logical union of all the germinal parts of one species. If there is a throw back to an early ancestor we call it "atavism." It is not a complete reversion, as in the above case, to a perfect sheep or perfect goat. There is a general resemblance to the one species, but a variation in some special detail. Thus we can explain the moral and mental pervert, or invert, as a throw back or atavism on our more savage ancestors.

Darwin observed a case where the crossing of the Malay fowl had been pursued for forty years, and yet after that long period pure Malays were occasionally thrown out; so it is not much wonder if some of us throw back to what our ancestors were five, ten, or even fifty generations ago.

## CHAPTER VII

### REFLEX ACTION

Another element of inaccuracy in all physiological experiments.—**THE NERVOUS SYSTEM, CELLS, AND FIBRES:** The cells vary—Microscopic—Grey matter—Insulated Nerves—Nerves in all animals—The sea anemone—Reflex action defined—In the worms—Sensory cells, motor cells—Resemblance to the telephone—The spinal cord.—**THE SCRATCH REFLEX IN A FROG:** Cells in spinal cord to connect up sensory and motor groups of cells—The antagonism of muscles as in drawing up the leg or foot—When flexors contract the extensors relax—Tonus—Walking movements—In the scratch reflex in a dog while one limb scratches, the three other limbs rigidly fix the body—Comparison with telephone system.—**THE NEURON:** At least three neurons in reflex action. A neuron includes cell, dendrons, and axon—Grey matter in spinal cord—Sensory cells or receptors—Motor cells—Neurons not connected—Terminals may be in membranes—Terminals may have amoeboid movement—Synapses cause a delay—The delay in the grey matter.—**REPEATED SLIGHT STIMULI ACCUMULATE IN INTENSITY:** Many stimuli enter, but only one exit in any reaction—Therefore more sensory or afferent nerves than motor or efferent nerves—Example in writing—Or in skilled acts—Inhibition—One reflex may oppose another—As in walking where opposing muscles are inhibited—The nervous system is one mechanism—Sympathetic pains—Fatigue—Occurs in reflex nerve centre, not in the muscle.—**BOTH WE AND THE LOWER ANIMALS ARE BUILT IN SEGMENTS:** Example in the divided bee—The frog and its matrimonial choice—Lower consciousness in insects, etc.—**THE SEAT OF THE EMOTIONS:** Removal of cerebral hemispheres—Emotions are primarily stored in mid-brain or stem—Emotions at first reflex for sudden calls of defence—And on a lower neural plane—Must be reinforced from the upper brain or cortex—The philosopher's view of emotion confirmed—Emotion not visceral—Happiness in the higher cerebral plane.—**THE OBJECT OF A NERVOUS SYSTEM.—INSTINCT AND INTELLIGENCE:** Four degrees: (1) Innate instinct without experience; (2) Instinct and slight experience; (3) Instinct with capacity to learn; (4) Intelligence.

To make the most complex subject in science intelligible to the laity is so difficult, that I must plead for toleration from the physiologist and ask to be spared from harsh criticism in the free handling of abstruse technicalities. The physiologist must not forget that the accuracy of many of our most careful observers has been found wanting in a large number of cases. So much is this the case that experiments on animals

hardly merit the importance that has been attributed to them.<sup>1</sup> They carry us only part of the way and no further, for there are so many subtle factors which cannot possibly be discounted. The personal equation in all physiological experiments makes or mars the result. If a thousand observers add a solution of common salt to one of nitrate of silver, there can be but one result, whatever the dilution or environment of the substances, whether single or in combination. Far different is it where a galvanic instrument is placed on a particular convolution of the brain, or if a portion of the brain be removed or destroyed. There is much source of error from the fact that the convolutional pattern of the brain varies even in the same species, while one operator may be less skilful and damage parts of the subtle machine without being conscious of it. Above all things, I have from observation been struck with the difference in descriptive powers of those anxious to portray successful results. I have, however, selected very carefully from both experiments and observations, and am confident that the material collected will be as good in twenty years as to-day.

The  
Nervous  
System,  
Cells and  
Fibres.

The nervous system consists primarily of cells and fibres. In this it resembles the Telegraph and Telephone systems.

The cells vary in shape and size and function. Some are round like granules, some are pyramidal looking, triangular in section, others take on various angular processes. They are all quite microscopic, invisible to the naked eye, but when collected in masses cause a buff colour, which we call the grey matter! The fibres like the wires of the telegraph conduct nerve motion.

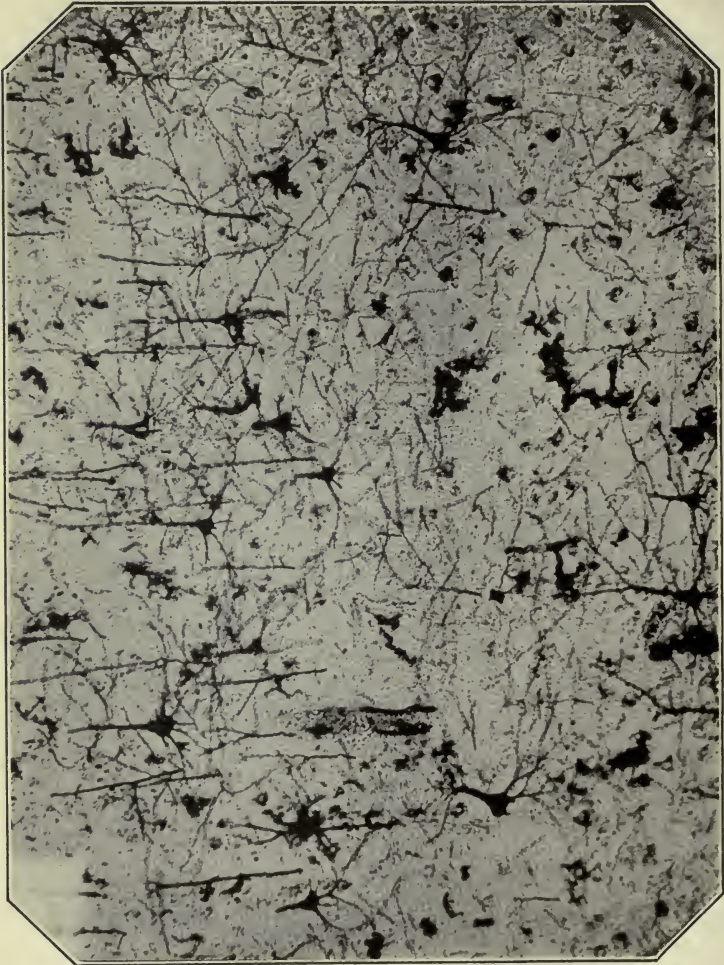
<sup>1</sup> It is unfortunately necessary for physiologists and pathologists to resort to experiments on living animals. It is, however, quite unjustifiable to perform experiments for purposes of demonstration in girls' colleges, as happens in London; where operations are performed anaesthetics must be used, and animals need not thereby suffer. The statements by anti-vivisectionists are mostly untrue or contortions of what may have occurred years ago in Continental laboratories. It is inconsistent for an anti-vivisectionist to hunt and shoot for sport poor innocent animals which have a right to live, and this is of frequent occurrence. Such is actual cruelty. The physiologist is working for humanity, not for personal pleasure. In daily practice we save lives by the knowledge so gained.





A Purkinje cell, illustrating the receivers or dendrons branching above, and the axon or single fibre of exit below.

Kindly lent by Dr. Mott.



To illustrate nerve cells and fibres.  
Kindly lent by Dr. Mott.

They are insulated, probably to avoid confusion or leakage of nerve motion, but principally because the insulating material is rich in phosphorus and keeps the fibre in healthy vitality. The fibres carry impressions to and from the nerve cells; some convey impressions from the outer world, some from other cells, others, as a result, carry motor impulses to various parts of the body.

Even the lowest animals are believed to be provided with nerves. Wherever muscular movements occur we would logically expect to find nerves directing those muscles. Every one must know how the sea anemone at the slightest touch withdraws its beautiful petal-like tentacles and closes up. This simple act exemplifies all nerve mechanisms and is the forerunner of the intricate processes of thought in man. We call this action reflex.

In the sea anemone it occurs from an impulse carried by a nerve fibre along a feeler or tentacle to a central nerve cell, thence to the muscles, which in turn contract the tentacles and close up the anemone. This is the meaning of the word reflex; nerve motion which is bent back or reflected within the body. The reaction is not quite so simple, as will be seen, in higher animals. In the worm, which is covered with a thin coating of horny material, there are delicate nerve fibres and "terminals" which carry sensation to sensory cells. These latter send out impulses to motor cells, which cause the muscles to contract.

Thus at once we begin to specialize between cells varying in function.

We depend on reflex mechanisms for our very existence. Thus if dust impinge on the sensitive surface of the eye, the muscles of the lids are called upon to close tightly and with rapidity, squeezing the tears from the lachrymal gland to wash away the particle. Again, when food reaches the back of the tongue it is beyond control, and the act of swallowing is then reflex.

So is the secretion of saliva. Stimulating impulses of taste and smell travel to the blood-vessels of the gland, causing a flow of saliva, which is prepared from the blood by the gland cells (see diagram).

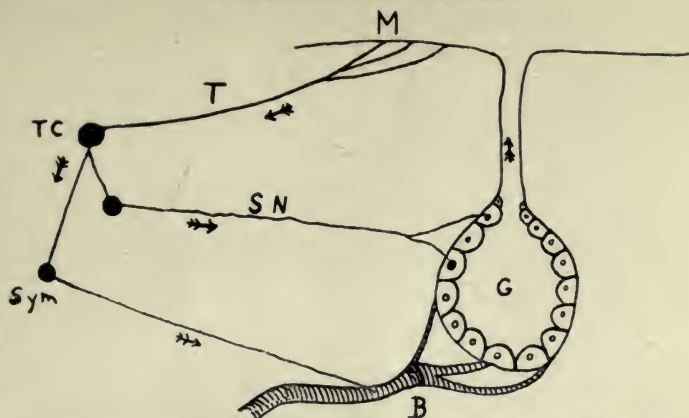
The  
Scratch  
Reflex in  
a Frog

Let us as an example consider the scratch reflex. Thus if a decapitated frog were tickled on the left flank, it would raise the left hind leg to scratch, but if the irritation were continued, it might raise the opposite or right foot, bringing it across to scratch. It would even scratch with its forefeet if the irritation continued. In this comparatively simple process, the tickling sensation of the flank is carried to sensory cells, at the hinder part of the spinal cord. Here the nerve fibre breaks up into branches and gives stimuli to other "connecting" or "reflex" cells in the cord, which call into play certain groups of motor cells. These latter send impulses to the muscles which perform the complex act of scratching. Thus the thigh must be flexed or drawn up; the leg, likewise, is flexed and rotated, while the muscles to the toes also have their duties. But if that foot cannot remove the irritation of the skin, the intensity of the stimulus causes an increase or overflow of nerve energy to cross to the opposite side of the spinal cord, and invoke the motor cells and muscles of the opposite leg. The excessive nerve impulse continuing may overflow still further and travel up the cord to the forelegs or arms.

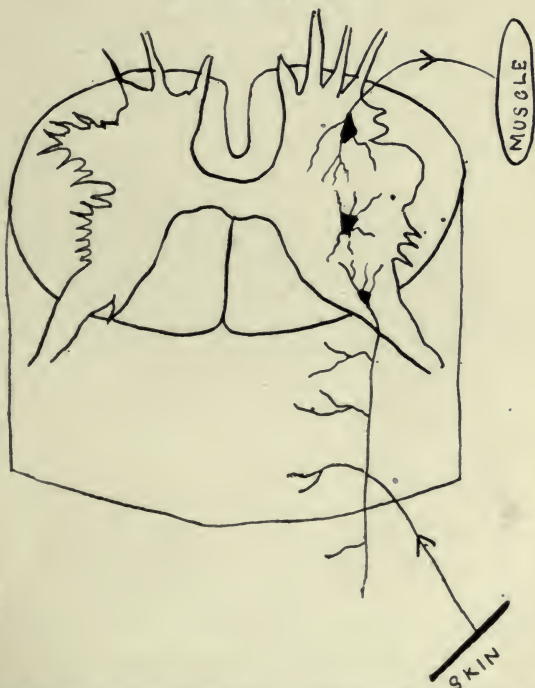
This complex muscular action demands further explanation; thus, if the left hind toes of the dog be tickled under certain conditions it draws up the leg; but as there are two important systems of muscles, those of flexion or bending and those of extension, each opposing the other, one can imagine a constant antagonism between the two groups of muscles. Therefore before the dog can draw up or flex its leg, which act is performed by the hamstring muscles behind the knee, it is essential that the extensor muscles which end at the kneecap in front should give way. This is exactly what happens. It is such a beautiful contrivance that it is worth considering. When the tickling message arrives at the spinal cord, the reflex operators, or connecting cells, simultaneously inhibit or shut off the action of the extensor motor cells, and then they call the flexor cells into action.

These simultaneous but antagonistic movements are constantly in play, for in man the natural condition requires "tonus", or activity of the extensor muscles, to maintain the upright position of the body.

The reflex mechanism of salivation.



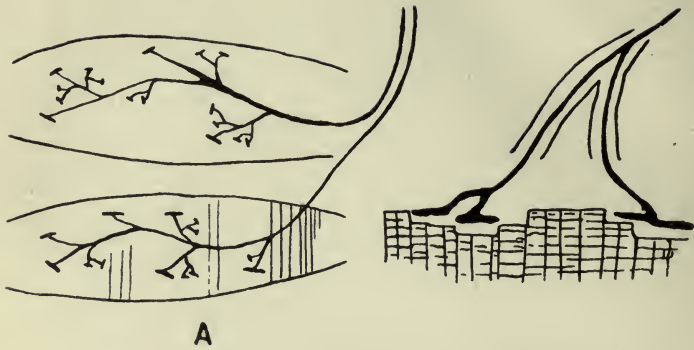
The taste impulse passes from "taste cells" on the tongue (M) to the nerve centre (TC), which sends a message by the secretory nerve (SN) to the gland G, and also to the sympathetic nerves on the artery (B) to supply the salivary gland cells more freely.



To illustrate the reflex spinal mechanism. The arrows indicate the direction of the nerve current from skin to muscle. Note the reflex or associating nerve cell in the centre. This is quite diagrammatic.







A

B

Nerve terminals in muscle fibres. (A) from above ; (B) in cross section.



C



D

(C) a touch receiving corpuscle in the skin showing the terminal of a sensory nerve.

(D) motor terminal in muscle fibrils.



If then we wish to walk and flex the thigh on the body and the leg on the thigh, the opposing extensors must relax at the exact moment before flexion.

It is important to understand neuro-mechanics before we can realize what complex thought may be reduced to ; therefore we must further examine the spinal mechanism. The  
Neuron

The reflex action engages at least three neurons. A neuron comprises a nerve cell, which at one end has receiving fibres, termed "dendrons," because being so numerous they resemble the rootlets of a tree ; and at the other end one "axon" or fibre for emitting the special nerve motion from the cell. In the centre of the spinal cord there is a collection of grey matter which in transverse section is not unlike a butterfly ; the large, anterior wings correspond to the anterior motor horns, and the smaller posterior wings to the posterior sensory horns in the cord. This grey matter is surrounded by long bundles of insulated fibres which run between the head and the foot. The skin contains receiving or sensory cells of varying kinds in shape and function. Some cells react to touch, some to temperature, some to pain. The stimulus is carried by an afferent<sup>1</sup> nerve fibre to the posterior part of the spinal cord, when the analysis of the stimulus is undertaken by a reflex cell in the grey matter. Messages are then sent across to the motor cells which lie at the front part or horn of the grey matter.

These two sets of neurons are not jointed together. They are each distinct systems, and there is an infinitesimal gap which the nerve current must jump over. Some imagine their terminals are inclosed in membranes to prevent leakage of nerve force. It is proved by Sherrington<sup>2</sup> and Wundt<sup>3</sup> that these breaks in the connexion, or as we call them "synapses," cause a delay in messages, which we call "inhibition." This is proved by measuring the rapidity of a stimulus along a nerve trunk, and then comparing the speed of the reflex arc.

<sup>1</sup> From *ad.*, to ; *fero*, I bear.

<sup>2</sup> Sherrington, *The Integrative Action of the Nervous System*, ch. iii.

<sup>3</sup> Wundt, *Untersuch. z. Mechan. d. Nerven u. Nervencentren*, Stuttgart, 1876, abt. 2.

Repeated  
Slight  
Stimuli  
Accumulate  
in  
Intensity

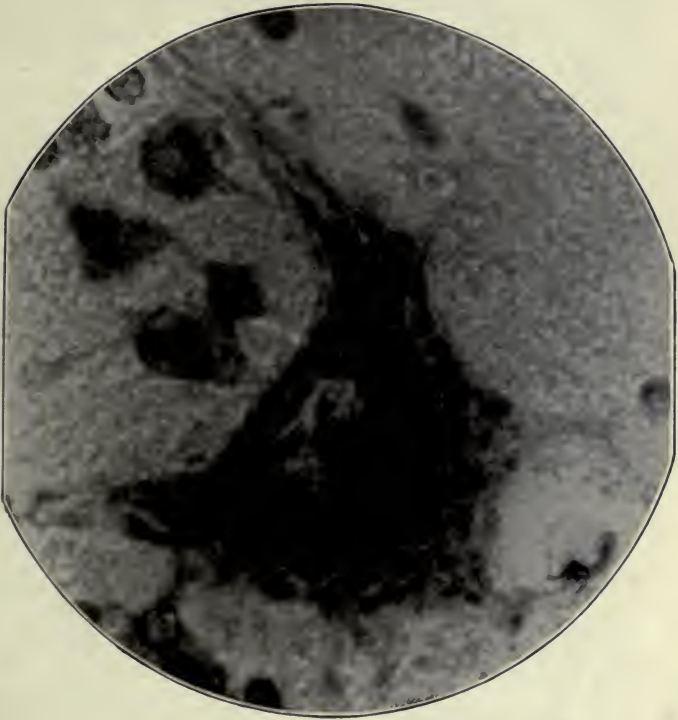
It is likewise found that continued slight stimuli accumulate in their effect. The tortures of the Spanish Inquisition revealed this, where a victim had to suffer the continued drop of water on one spot for a long period. One drop falling on the skin barely attracts attention, whereas a drop every few seconds or half-minute becomes exquisite torture on account of the accumulated stimulus to a touch corpuscle or perhaps to a "pain" cell. Experiment shows that when a slight stimulus as tickling fails to call forth a motor response, if the same stimulus be applied as well in two or three places, there is then at last a motor response. The former feeble stimulus was unable to jump the synapse to the next neuron.

Professor Sherrington<sup>1</sup> has pointed out that whereas the reflex arc receives many sensory stimuli of different kinds, there is only one motor exit to the muscles. He therefore describes the sensory or afferent nerves to the grey matter as private routes or paths, and the motor nerves he likens to one common public highway.<sup>2</sup> This explains why the afferent or sensory nerves are three to five times as many as the efferent or motor nerves. It is also demonstrated in higher complex acts, as in writing. For instance, I am aided now by my eyes, by the sense of touch in my right hand, both from the paper and the pen, and also by another muscle sense, which gives me a consciousness of the position of my hand. Thus I have now three primary receptors at work, and all these "private" paths converge on one common hand motor centre in the brain; the same efferent or motor route to the hand could be stimulated to perform other skilled acts from other receptors or stimuli, such as the acts of drawing, painting, cutting, striking, and so on. This subject has to be borne in mind when discussing the subject of education, for the more "private paths" the better.

There are other processes to consider in the nervous system, namely, antagonistic and refractory or inhibitory processes, for it happens in hundreds of ways that a fresh stimulus requires some motion to be stopped, and fresh muscles to come into play.

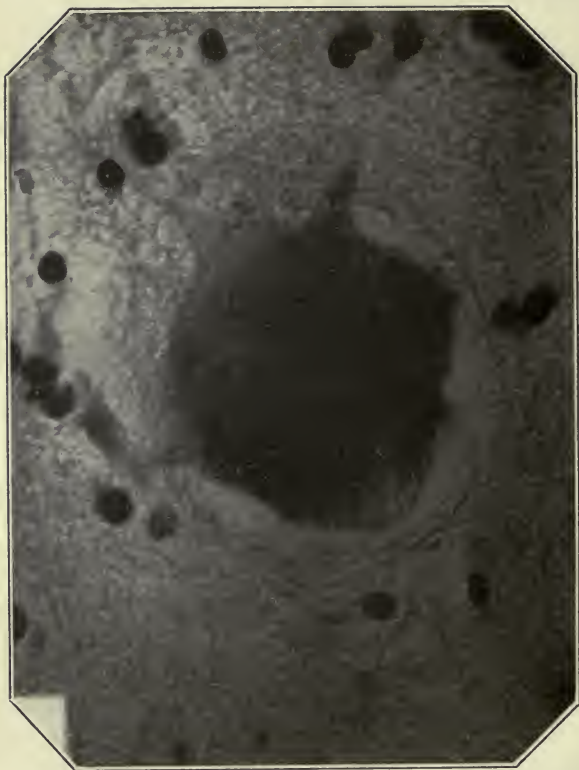
<sup>1</sup> *Loc. cit.*, p. 115.

<sup>2</sup> *Loc. cit.*, ch. iv.



A healthy motor cell (Betz) from the cortex of the brain. Note the pattern and nucleus.

Kindly lent by Dr. Mott.



A sensory nerve cell from a spinal ganglion  
in a state of fatigue after prolonged epilepsy  
—observe that the pattern has disappeared.

Kindly lent by Dr. Mott.

Professor Donaldson<sup>1</sup> pointed out that the whole nervous system is continuous throughout, each and every part ultimately associated and interwoven like a network; we can therefore explain what are called "sympathetic" pains felt in different parts of the body, distant from the organ affected. Liver pains are carried to the right shoulder. Fatigue of the eyes may travel to the back of the neck and so on.

It hardly requires stating that after a stimulus is carried on for some time fatigue ensues. I think it fell to the task of Professor Sherrington to elucidate this, and he found the site to be in the reflex centre; that is the connecting-up neuron in the grey matter of the spinal cord. This was arrived at in the following manner. If a dog got tired of flexing or bending its leg in response to tickling the toes, its muscles were still quite equal to respond vigorously to the scratch reflex, excited by tickling the flank. The leg muscles were not tired, but the nerve potential in the reflex neuron was fatigued, and readily made way for another reflex arc. In our daily routine, we know how restful change of work is by employing fresh neurons. We now can understand the mystery of writer's and other trade cramps, without wasting of muscle.

By a clear conception of the spinal neuro-system we can understand the lives of many of the lower animals, most of whom are built in chains or segments; for instance, the worm is in rings and each ring has its own nerve ganglia. So it is with the lobster, the fly, the beetle, and us ourselves. Each joint in the spine contains a nerve segment connected with the trunk and limbs, while the face and head were built up during the embryonic state in segments also; yet all these segments are united in one complex system. The higher we ascend in the animal scale, the greater the risk to life. Experience and education become necessary to adapt the individual to the environment. While the lower forms, as the invertebrates, those without a spine or backbone, act like automata, the higher forms exhibit a consciousness which at first is machine-like but gradually rises to the highest form of intelligence.

Both we  
and the  
Lower  
Animals  
are  
Built in  
Segments

Thus the busy bee is an automaton. Taste or smell guide

<sup>1</sup> *Amer. Textbook of Physiol.*

its choice of food, whilst sight directs its flight, and perhaps hearing warns it of danger. Yet you may cut it in two without at once killing it, and if you touch the hinder end, in reflex response it stings you. Similarly, if you place food to its jaws, it will seize and devour it. All this is due to segments of the reflex neuro-mechanism, without intelligence and consciousness in the ordinary sense.

If we take, as another example, a male decapitated frog, he will clasp his arms as if in embrace, if the skin of his chest or bosom be stimulated; yet he is unconscious, being without his head. It is a reflex movement, similar to that of the divided insect. If, however, a gentleman frog with his head on be so stimulated, he resents the interference and thrusts away any object other than his spouse laid on his bosom.

This opens up the question of several degrees of consciousness.

The bee, the ant, and the million creepy things each may have a consciousness of their own, having nerve ganglia masses which resemble minute brains. They are however hardly equal to the stem or base of the human brain.

Some light may be shed by experiments done by Professor Sherrington,<sup>1</sup> Golz, Schafer, Mott, Ferrier, Rutherford and several other professors abroad on the seat of the emotions.

These consist in removing the upper part of the brain hemispheres from the dog or cat, which portion is concerned with what intelligence and higher consciousness they possess. There remain then the spinal cord and the base of the brain or stem. We now have in action the receivers or receptors from the skin, as well as from all other sensory organs. These include the eye and ear, also the sense of taste and smell. If anything be done to annoy the animal, as holding its leg, or hurting it in any way, it puts on all the expression of anger, snarling, growling and spitting. Yet there is no upper consciousness or sense of pain. (Nothnagel considers the optic thalamus as the seat of the muscles of expression or emotion.)

These experiments are mentioned to show that the emotions of anger and passion are reflex, and at the onset have nothing to do with the upper consciousness. The angry dart of the serpent, the attack of the tarantula, perhaps even the first

<sup>1</sup> *Loc. cit.*, p. 265, ch. vii.

snap of the dog and the spit of the cat, are thus on a lower physical plane of subconsciousness.

But this neural plane tires out and does not continue its emotion. If the emotion is still further provoked, then the upper brain or cortex comes into play, involving the field of consciousness and intelligence.

Darwin, Spencer and others considered the emotions as inherited ancestral instincts, and this almost appears confirmed by the experiment on the dog. Emotion is on a lower physical plane than intelligence, which may explain why the more intellectual folk have less emotion, while our poor degenerates, especially if enfeebled by alcohol, give way so easily.

Sherrington by further investigation proved that emotion has nothing to do with visceral or internal sensations, for these sensations, in heart, bowels, stomach and other internal organs, are the result of emotion and not the cause. He says that in this condition neither cat nor dog can be induced to show pleasure, as though happiness belonged to a higher plane, the cerebral cortex, while these emotions are reflex for protection, defence, selection of food, amorous instincts, etc. These experiments give us a valuable insight into everyday occurrences which are not appreciated by the lawyers or the laity.

We know also how the higher plane of thought can inhibit or control the emotions, yet in such conflicts we are conscious of effort and the necessity sometimes of strong effort. How many crimes and rash acts are committed by the overpowering, reflex, but irresponsible machine! We must treat our difficult social problems with all the knowledge that science gives us. Quite recently a man was hanged for the murder of a woman who threw a pot of beer at him in an alehouse. The total scene between the woman's act and the death-blow was ten seconds. Considering the probability of the man's brain being out of action from alcoholism, it might be described as a reflex act, as in the experiment just described. There was barely enough time for mentation in such a brain.

The whole idea of a nervous system is to protect against enemies as well as to direct us to food, and finally it exists for purposes of propagation. As we rise in the animal scale there is a continued addition of superstructures.

The dog perceives danger and uses some intelligence to get out of the way. Not so the fish, for its optic nerve is closely connected with the long nerves of the spinal cord directing rapid flight from danger. Birds are likewise constructed for rapidity of action, and excel in their powers of vision also. They have a higher type of brain than that of the fish, a brain which somewhat corresponds to the base or stem of the human brain.

When we reach the mammals or animals that suck in infancy, we get a still higher order of brains than in birds, a new superstructure of the same type as in man, but very rudimentary, steadily rising in complexity till the anthropoids or apes are reached.

Instinct  
and In-  
telligence

There are then grades of intelligence and instinct, but it is almost impossible to say where the one begins and the other ends.

The subject of instinct versus intelligence has engaged observers since time immemorial. It now seems elucidated, especially through the researches of Romanes, Dr. G. A. Watson, and R. Lloyd Morgan. There seems however to be a gradual dawning from the lower to the higher. We might treat it thus:—

*a.* The instinct of the lower animals which requires no experience or education, and which is said to be due to “inherited habits.” It appears to me that the early nerve structures are thus reduced to simple mechanisms. We see this in the proverbial busy bee and wiseacre ant. Among vertebrates the building of nests by sticklebacks and the similar interesting ways of birds form abundant illustrations.

*b.* Next come the “incomplete instincts” of Lloyd Morgan or the mixed instincts of Romanes, which are shown by so many animals and have much to do with their practical animal behaviour. These have a very large “innate” basis, but require some individual experience to set them agoing or to perfect them. Such examples may be seen in what we would popularly call the intelligence of birds in their relation to man; the way in which the rooks follow the ploughman and the various tricks they learn; the “ancestral” fear which fledglings show towards man.



c. The intelligence that individual animals show in being able to acquire the capacity for learning new acts is a much higher development. In this way animals can react to new surroundings. This is daily exemplified by domestic animals, especially the dog and cat. It marks an advance in brain structure.

d. Intellect stands at the zenith and belongs more especially to the Anthropoids, of whom the apes are lowest, and rise by the chimpanzee, ourang, and lastly gorilla, to man. Here there is an association of ideas and the capacity of abstract thought.

## CHAPTER VIII

### THE BRAIN

**GENERAL STRUCTURE:** The skull—The membranes—Cerebrum—Cerebellum—The spinal cord below—The medulla or bulb—The function of the cerebellum.—**THE CEREBRUM COVERS THE CEREBELLUM IN NORMAL MAN:** but not always in idiots—A reversion to animal type.—**THE DEVELOPMENT OF THE BRAIN:** The central canal—Hydrocephalus—Symptoms.—**BRAIN WEIGHTS:** Normal adult—Child's—Let young brains lie fallow—National decay due to education—Smallest brain—Brain weights in insanity—American and Negro brains—Cause of large brain weight in animals—Whale and elephant—Man and gorilla—The association centres.—**THE BRAIN PATTERN:** Simple to complex—Herbivora *versus* Carnivora—Apes and monkeys.—**THE HUMAN PATTERN:** The cause—Convolution and grooves—The areas—Simple patterns in the less intelligent.—**MICROCEPHALIC IDIOT:** Dr. Watson's unique case—A revert to the felines—The key to criminology—A new standard of measurement suggested—Details—A "beast"—Second case of Dr. Watson's—A revert to the ape.

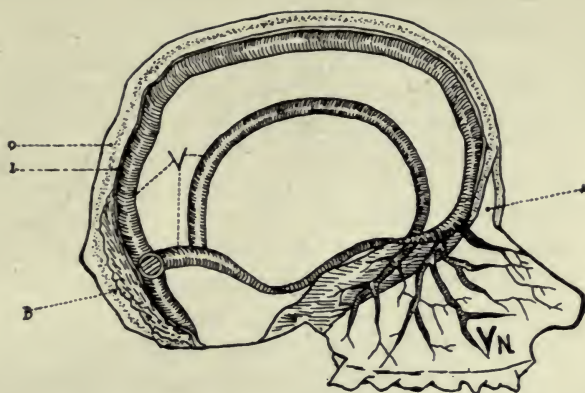
General  
Structure

WE can only demonstrate the brain and nervous system by reference to a diagram or photograph in the absence of actual specimens.

The brain is protected by a strong bony case, the skull, which in the infant is made up of several pairs of bones. These bones, which in the embryo have been developed out of membrane, unite in infancy, but are not firmly welded together till early adult life. A dense fibrous membrane, the dura-mater, encloses both the brain and the spinal cord or marrow, which latter receives protection in its canal from the vertebrae or spinal bones. A delicate membrane made of bloodvessels, the pia-mater, closely covers the whole surface, and fulfils the purposes of nourishment.

The higher brain or cerebrum occupies all that portion of the skull above the level of the eyebrows and ears. The smaller brain or cerebellum lies below this level, posteriorly just above the neck.

We have then the big upper mass or cerebrum, which is connected below and continuous with the spinal cord. The connecting part is of the greatest vital importance. It is



The skull, with large veins or channels (V), which may be relieved in congestion by bursting of the veins in the nose (VN). A. is an airspace in the brow called the frontal sinus. The skull has two layers, inner (I) and outer (O).

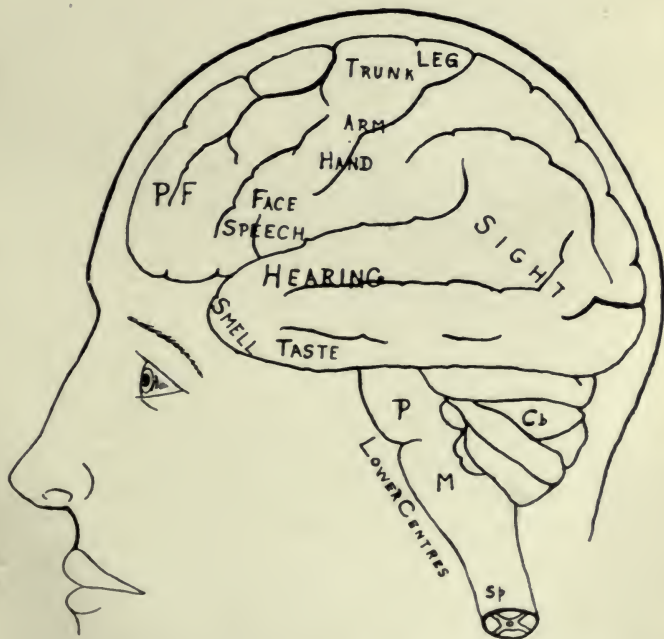


Diagram to illustrate the cerebrum, with the cerebellum (Cb) below. The medulla (M) and the spinal cord (Sp) below.



called the medulla oblongata or bulb. It is a continuation of the spinal cord broadened out, and receives all the fibres en route to and from the head and the body. It also contains the breathing, heart and digestive nerve centres, as well as the roots of other nerves for taste, tongue, face, hearing, etc. An injury here is fatal. It is the position in which cattle are struck.

The cerebellum lies behind and above this part. It might be well now to dispose of its function. It has never been clearly elucidated. Phrenologists thought all sexual desires sprung from this region, and therefore gave a bad name to any one who was fully developed at the back of the head. Its true function has been largely elucidated by Dr. Mott. It is a large sensory organ for the whole body, keeping all the muscles in a condition of healthy tone and tension. It also has to do with steering. Thus the inert frog and tortoise have hardly any cerebellum, while active fish, as the herring and whiting, and birds in proportion to their rapidity of flight, have well developed cerebella.

It is the cerebrum that interests us chiefly. The base and middle part are occupied by large nerve ganglia or centres, which are "way stations" between the upper surface and the spinal cord.

There are in reality two brains, right and left. They are convex on the outer side and flattened in the middle line, where they are joined together by fibres so as to produce co-operative action.

When we speak of the upper brain, as the cerebrum, we include both halves, right and left. In man the cerebrum overlaps and hides the cerebellum, being due to the larger development of the areas which concern intellectual operations; whereas in the higher apes, through this want of development, the cerebellum is slightly uncovered. In all the lower animals the cerebellum is also much uncovered or placed quite behind: see figs. (pp.74 and 76).

It has been observed in some cases of idiocy that there is in this respect a reversion towards the lower animals, and Dr. Watson's interesting cases, to be described later, show this very clearly.

The Cerebrum covers the Cerebellum in Normal Man

The Development of the Brain

The brain develops in the embryo from a hollow tube of nervous matter, which becomes constricted into five masses, and passes through an intricate course of enlargement and development. Yet in all this there is a resemblance to the brains of the lower animals, even of the fish, illustrating the evolutionary process in the "creation." Man is then a repetition of what has gone before in the lower animals.

Though the tiny tube becomes a mass weighing at birth almost a pound, yet it retains the central canal as the representative of its embryonic state. These form cavities or "ventricles" inside the brain, which in the normal state contain a small and negligible amount of fluid. But in some diseases of a tubercular character, the fluid accumulates, dilating these cavities considerably. This condition is termed Hydrocephalus, or water on the brain, and may be fatal in infancy, while many of those who recover are well represented in asylums and among degenerates. The skull is then large, broad, flat and the forehead overhangs the brows. I think in some cases a little hydrocephalus proves useful by expanding the skull and giving more room or area for the outer surface, and it is a fact that many people of extraordinary intellect are slightly hydrocephalic.

The brain may be likened to a telephonic or telegraphic system, as in the case of the spinal cord, only infinitely more complex.

Brain Weights

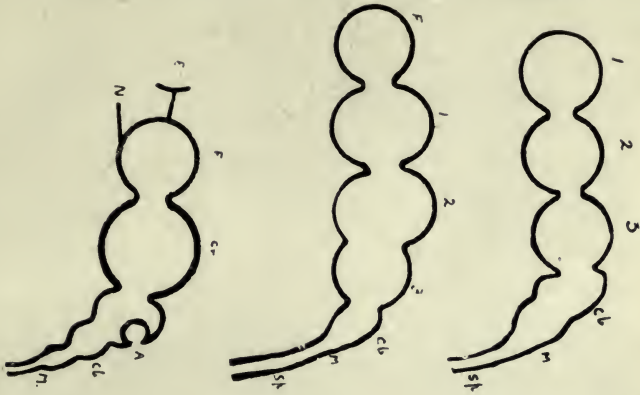
It will be convenient here to consider some brain weights.

Comparison of the weights of *whole* brains is not very scientific, but as most of the records are in such terms one must quote them.

	Oz.	Grms.
The adult male brain weighs about . . .	50 or	1,416
„ „ female „ „ . . .	44 „	1,246
The brain at birth „ „ . . .	14 „	396
„ „ 1st year „ „ . . .	30 „	850
„ „ 2nd „ „ . . .	31 „	878
„ „ 5th „ „ . . .	36 „	1,018
„ „ 10th „ „ . . .	45 „	1,275
„ „ 15th „ „ . . .	49 „	1,388

The practical side of this table is that until a child is five its brain may safely be allowed to lie fallow and gain in weight and growth.

Diagrammatic representation of the embryo brain developing.



1, the forebrain. 2 and 3, the midbrain. Cb, the cerebellum. M, the medulla. Sp, the spinal cord. E, the optic nerve and retina budding out. N, the nerve of smell A, becomes the labyrinth or nerve mechanism of hearing.



A normal, well-educated brain, to show the pattern. I am indebted to Dr. Mott for this valuable photograph. Most so-called normal brains are either out of asylums or hospitals, and therefore on a lower platform of intelligence.

Ti  
Do  
m  
th

B  
W



Little can be done before the age of seven or eight ; after ten it becomes efficient. One sees here the explanation of the national decay through the thousands of dullards whom the State creates by enforced education at the age of three, four, or even five.

The brain weights of notable men give striking results thus :—

	Oz.	Grms.
Cuvier's brain weighed . . . . .	58	or 1,643
Napoleon's „ „ . . . . .	53	„ 1,501
Gambetta's „ „ . . . . .	41	„ 1,167
Turgeneff's „ „ . . . . .	71	„ 2,011
(A Russian novelist)		
Cromwell's brain weighed . . . . .	78	„ 2,210
Byron's „ „ . . . . .	79	„ 2,238
Abercrombie's brain weighed . . . . .	63	„ 1,786
Goodsir's „ „ . . . . .	57½	„ 1,629
Sir James Simpson's brain weighed . . . . .	54	„ 1,530
Dr. Chalmers' „ „ . . . . .	53	„ 1,501

The lowest brain on record is in the possession of Dr. Watson. It belonged to an idiot woman and weighs only 8 oz. or 227 grammes, and is described at page 76.

An adult's brain should not fall below

40 oz. in the case of a man, or  
35 oz. „ „ woman.

On the other hand many common labourers have very heavy brains, going over 2,000 grammes. Mass without quality !

Sir James Crichton Browne <sup>1</sup> has recorded several weights of the brain among asylum patients. Those of idiots range from 40 oz. or 1,150 grammes downwards among males ; while in females they vary below 35 oz. or 1,000 grammes.

Imbecile brains are a little heavier ;

In males 44 oz. or 1,246 grammes ; and  
In females 41 oz. „ 1,167 „

The brains of melancholics are not under weight, while senile brains lose about  $\frac{1}{3}$  of their value. Those suffering from delusions or mania show no alteration in weight.

Mr. Hunt and others <sup>2</sup> have recorded interesting observations on American and negro brains.

<sup>1</sup> *Brain*, 1880. <sup>2</sup> See Quatrefage on *Social Evolution*, ch. xxx.

The average weight of 24 American white soldiers was 48 oz. or 1,360 grammes ; the maximum 64 oz. or 1,814 grammes, while the minimum was 44 oz. or 1,247 grammes.

Compared with the above are 141 negroes, whose average brain weight was 47 oz. or 1,331 grammes.

The maximum was 53 oz. or 1,501 grammes, while the minimum was 38 oz. or 1,176 grammes.

The effect of half-breeds was very striking, for the more white blood the heavier the brain.

Thus out of 240 crosses with negroes where there was :—

	Oz.	Grms.
$\frac{3}{4}$ white blood, the brain weight was . . .	49 or	1,388
$\frac{1}{4}$ " " " " . . .	45 "	1,275
$\frac{1}{16}$ " " " " . . .	44 "	1,246

One Hottentot brain recorded weighed 50 oz. or 1,430 grammes.

In connexion with the brain weights of the lower animals, the size or weight of any given animal depends largely on the extent of the sensory surface such animal possesses. This accounts for the very large brains in the whale and elephant, whose large exterior body surfaces require a huge number of sensory points and afferent nerves to carry the impressions and likewise an increased sensory area on the brain. But when we compare man and the gorilla, which are about the same size, we find an exception in man, whose increased brain surface is due not to more sensory representation, but to the enormous relative development of the areas set apart for the grouping and analysing of these sensory impressions. These newly evolved areas are called Association Centres.

Brain pattern is the term applied to the outer surface of the cerebrum. It is a very apt term, as the pattern is quite decided and representative in different classes of mammals. This subject has been worked up by Sir Victor Horsley, D. J. Cunningham, Elliott Smith, G. A. Watson, and others.

The general results show that complexity of pattern increases as we ascend the scale. This is apparent even in any one group, as, for example, the Carnivora, where the ferret, which is a low class brute, has a much smoother brain as compared with a cat or dog who live in a much more intel-



31.A/08.

Type of Ungulate brain. (*Sus salvanus*) a pig.



31.A/08

Type of carnivora brain. (*Viverra civetta*) a civet.

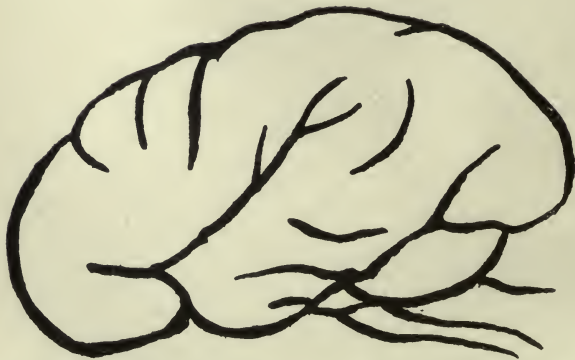






J.A.

Brain of a lower ape. (*Cebus lunatus*) a capuchin.



Brain pattern of a human being about four months before birth. Only the chief fissures are represented. The actual brain is much smaller than the diagram.

lectual environment. The Carnivora, which require increased instincts to survive, have a better pattern than the hoofed herbivorous animals, the Ungulata. They have no mental domestic strain for their food, it lies like a carpet in front of them.

When we examine the Primates, or Quadrumana, which includes apes and monkeys, there is again a vast difference. The smaller or lower class monkeys have poor intelligence with a corresponding simple brain pattern, whereas the ourang and gorilla very nearly approach man in the complexity of their grooves.

The pattern of the human brain, failing actual specimens, is best understood by photographs, of which there are many in the book. It is very complex, and is subject not only to gross variations, but also to minute differences which can only be detected by the few experts in this subject.

The  
Human  
Pattern

The cause of the pattern is the infolding of the surface, an effort of Nature to secure a larger superficial area in the compressed non-expanding skull. We call the raised portions convolutions, and the depressions grooves or sulci. The surface in man is divided into frontal, behind which is the parietal area, at the posterior pole the occipital, and above the ears the temporal area.

The pattern is simpler in the less intelligent human beings and races. The convolutions in these are larger, fewer, coarser, less wavy, and the grooves may be wider apart.

Some of the Italian school profess to have seen a simpler pattern than normal in the criminal's brain. The laity should not rest content until we have a large collection of criminal brains with a reliable scientific description so as to compare them with the normals. The criminal, I find, is not sane, and yet admittedly not insane. He has his own territory, and I may prophesy it is one of simple brain pattern (see p. 225 for report on murderer's brain, examined by myself).

I am indebted to Dr. G. A. Watson for the following interesting photographs of the smallest adult human brain on record, and the notes thereon. I am sorry that it is not

Micro-  
cephalic  
Idiot

suitable to show the face, as it indeed supplies the equivalent of the "missing link."

Here is demonstration and proof that the human race can revert to the type, not only of the lower apes, but far below to the cat, or carnivora, and even lower to the ungulates, which include the cloven-hoofed animals, as pig and cow.

This is no theory or speculation. We have also to remember that there are all grades of degeneracy, and the slighter forms will explain the types which we call incorrigible, or born criminals.

The point to remember about these microcephalic brains is that they are not diminished men, but reverts to the lower beasts. Arrested development accounts for many degenerates, and these facts open up a new method of dealing with them, and present a fresh standard by which to measure them.

Of the four photographs, two are of the smallest brain, one of an imbecile's brain, and the highest developed specimen belonged to an ourang.<sup>1</sup>

The female died when 44.

The weight of her brain was 250 grammes, or 8 $\frac{3}{4}$  oz.

The circumference of the skull was 15 in.

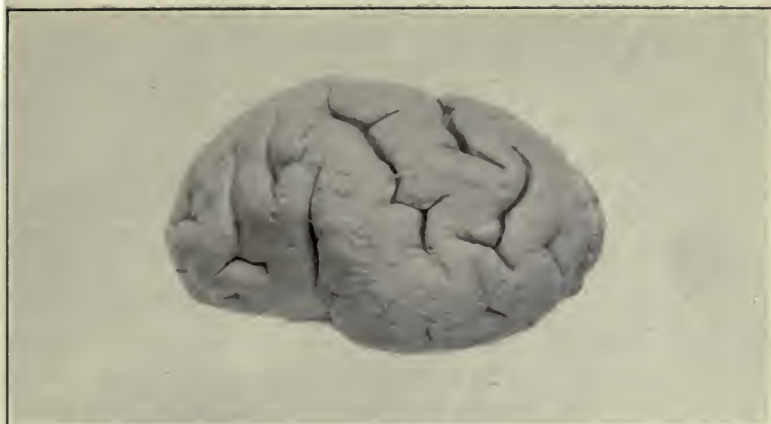
Her height was 4 ft. 5 in., the body fairly proportioned. The small head and long nose gave her a bird-like appearance.

Mentally she was an idiot. She never understood any verbal communication from the outer world, and never uttered any articulate sound, nor made any intelligible sign; nor did she ever know, recognize or remember any one. Sometimes she smiled feebly to herself, but she would grin and make grimaces, and also express her emotions by hideous sounds. If vexed she would spit like a cat.

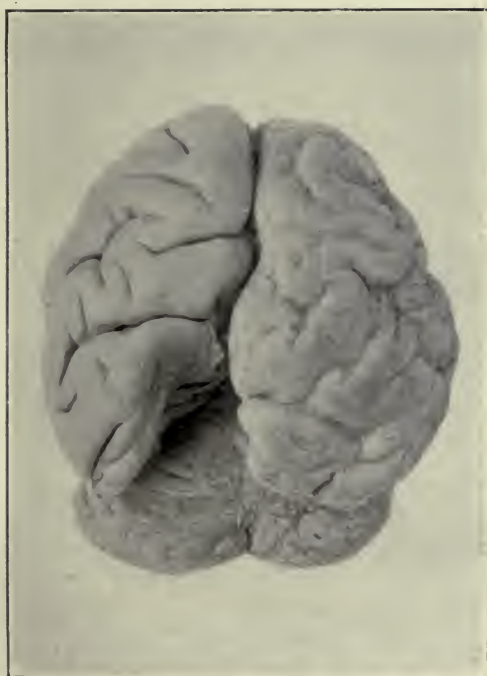
She had a big appetite, and when the bell rang for meals, clapped her hands and uttered frightful screams, and always had to be served first. She had to be fed on mince and soft food, or she might have choked, as she bolted her food like a dog. She was so greedy that she would grab food off other plates. After a meal she would remain lethargic like an ordinary beast.

<sup>1</sup> Dr. Watson and myself are indebted to the Zoological Society for much material, and especially to Mr. Beddard, F.R.S., for his assistance and courtesy.



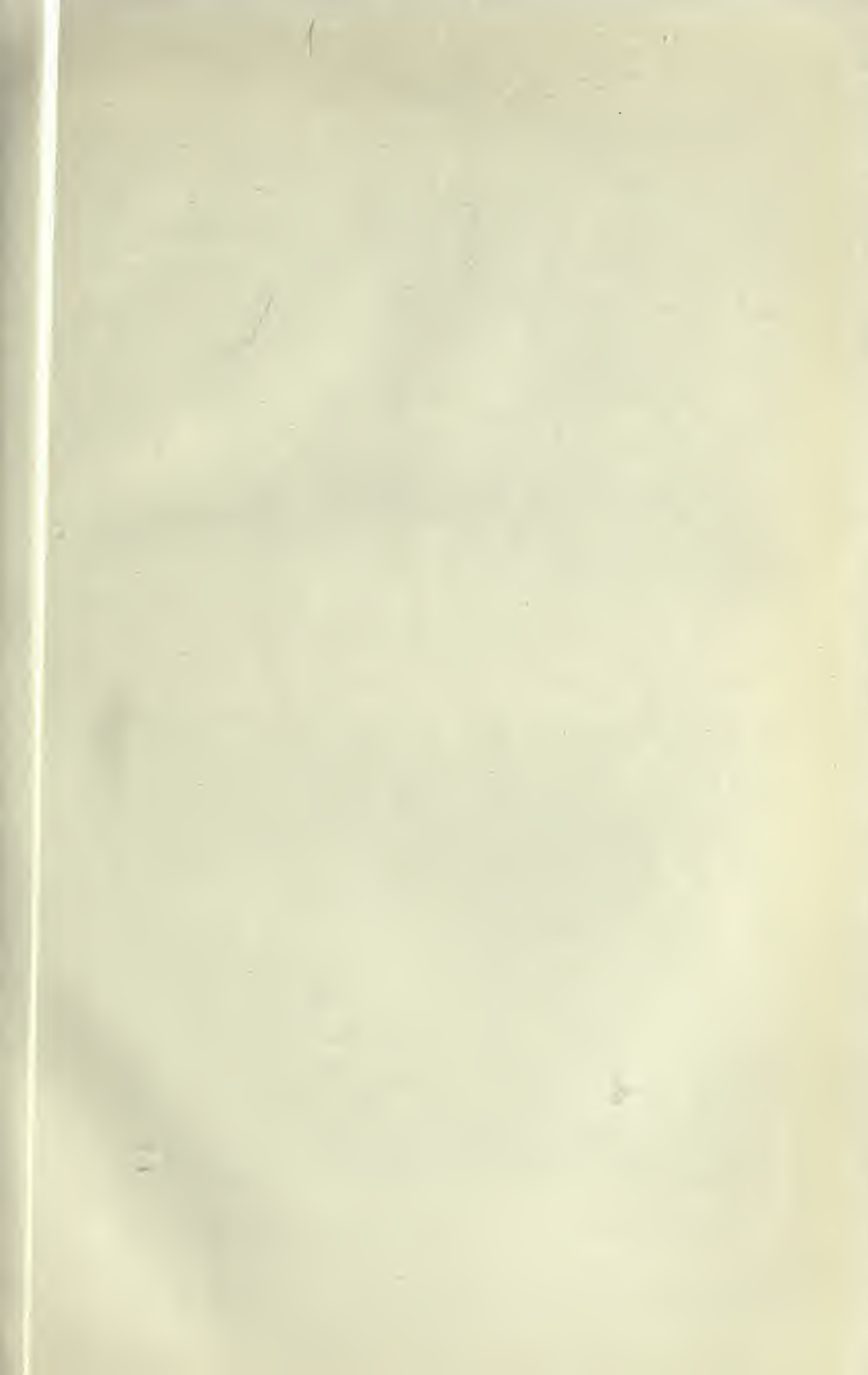


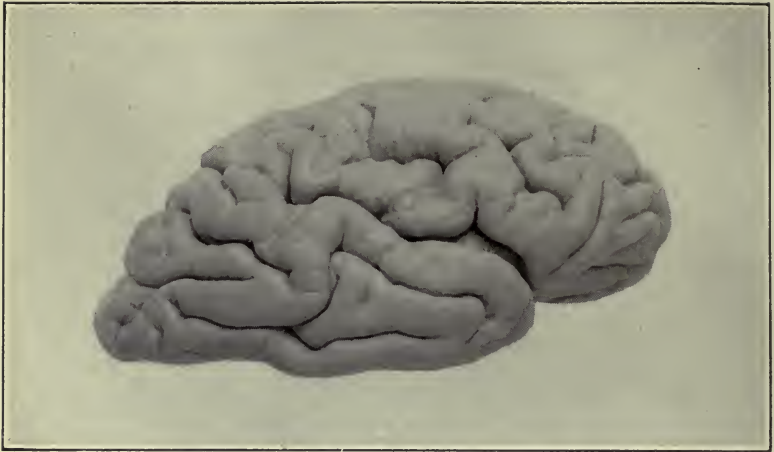
The smallest idiot brain on record, 8 oz.  
Lent by Dr. G. A. Watson.



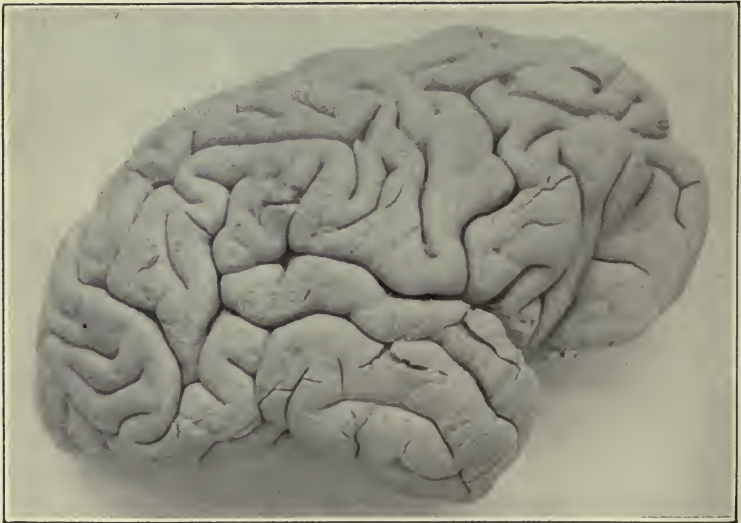
The same brain from above—note that the cerebrum does not cover  
the cerebellum.







Brain of an imbecile, aged 40.  
Lent by Dr. Watson.



The brain of an ourang, for which I am indebted to Mr. Beddard, F.R.S.

The brain resembles the type of lower mammals, in that the cerebrum does not overlap the cerebellum.

	Grms.	Oz.	Normal.
The cerebellum, pons and medulla weighed . . . . .	56	or 1 $\frac{7}{8}$	5 oz.
The cerebrum weighed . . . . .	194	,, 6 $\frac{3}{4}$	36-38 oz.

In the normal state the cerebrum is seven times heavier than the cerebellum and pons ; here it is about three times.

The cerebrum is smaller than in a new-born child.

As will be observed, the pattern of the convolutions is much simpler than that of the ourang. Dr. Watson points out that it is not simply or solely a case of arrested development. It is not like the brain of the unborn child at any period, not even at the 5th month. It is really a very complex brain, and the analysis is not yet completed. It partly resembles a brain of the lower apes, and in some points resembles the Felidae, or cats, and yet the cat has a much better cortex. The student can compare the diagrams, and will find a fathomless mine of interest therein.

Microscopically, the pyramidal cells were few and badly formed, and fibres deficient.

The second photograph is of the brain of a male imbecile who lived to forty, and facially was not unlike the many low degenerates we meet in the streets. His brain weighed 660 grammes, about 23 oz. The circumference of his skull was 18 inches. He had very little intelligence : he knew people, and had a few articulate words.

The chief interest is that his brain conforms in some respects to the ape type.

Microscopically, there were more pyramidal cells laid down than his intelligence would warrant, but then these cells were badly formed.

## CHAPTER IX

### THE STRUCTURE OF THE GREY MATTER OF THE BRAIN

**THE BRAIN CORTEX:** The grey matter—Motor areas—The three motor planes—The motor area—The five sensory areas—Brain reflex—The silent non-responsive areas.—**ASSOCIATION AREAS:** Resumé of cortical areas—Sensation—Mind—Will.—“SMELL”: The intellect of the lower vertebrates—Technical detail—Their application in psychology.—**THE SENSE OF SIGHT:** Analysed—Must understand the brain to appreciate thought and character.—**BOLTON ON THE PYRAMIDAL LAYER:** The prefrontal varies in normals according to will power and control and *vice versa*.—**FUNCTIONS OF THE CORTEX:** Memory—Example of the cortex in action—How an imbecile would compare with normals in thought processes—The mentation of the music player—A complex reflex act—Automatic by repetition.—**THE MECHANISM OF PROCESSES OF THOUGHT:** Memory—Processes of mentation—Perceptions—Associations—Motions—The advantage of education.—**SUBCONSCIOUS MENTATION:** Mnemonics—Illustration.

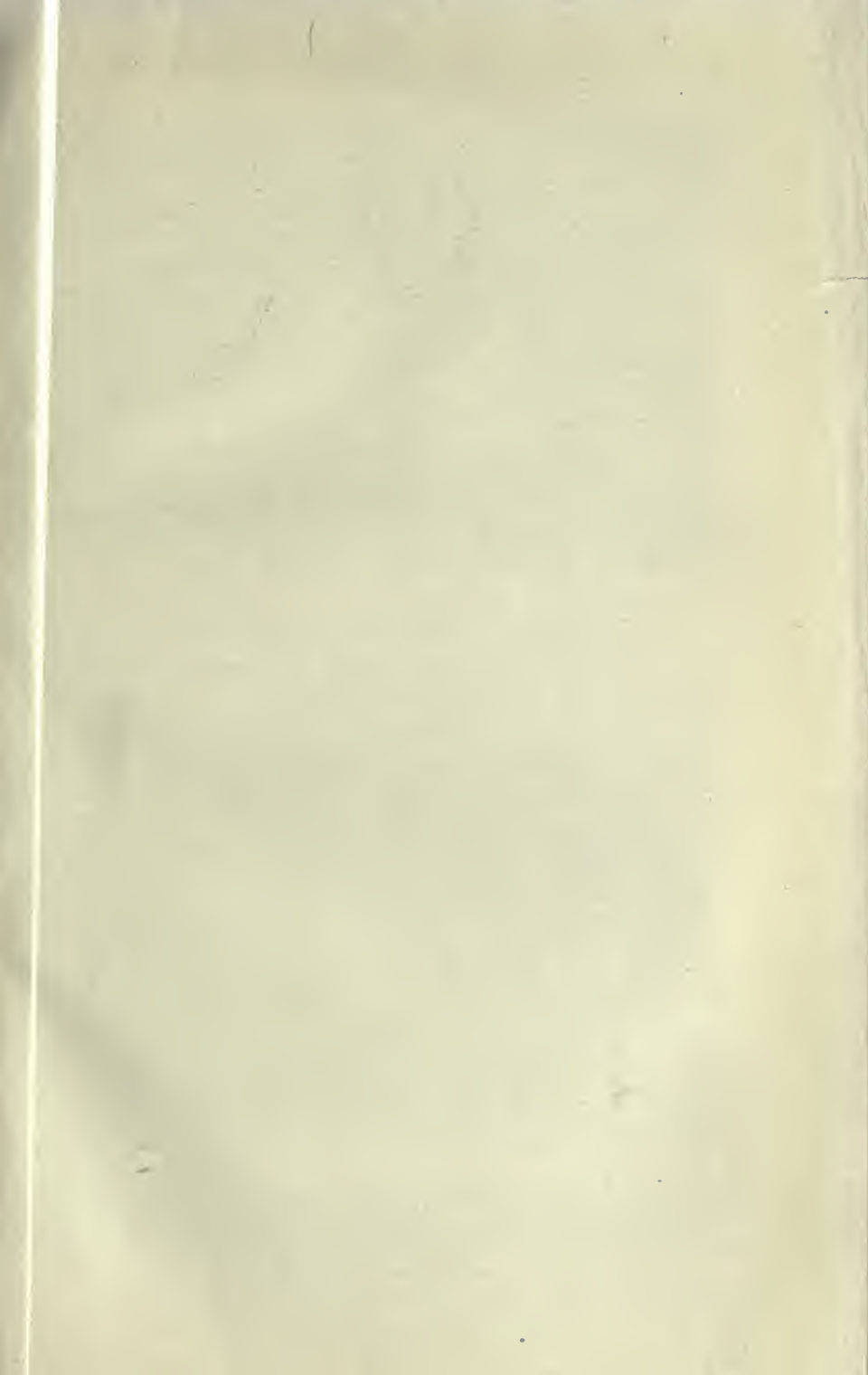
The  
Brain  
Cortex

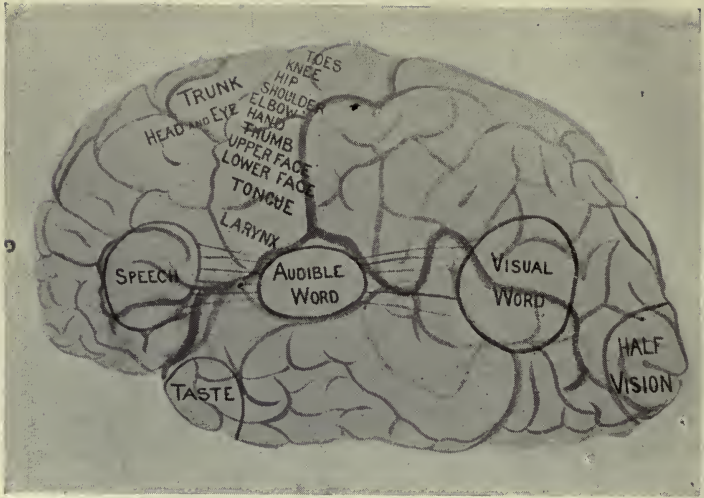
THE brain has a buff colour outside to the depth of  $\frac{3}{8}$  of an inch. This is styled the cortex or the grey matter. It is the most important part, not only of the brain, but of the whole body. In this thin coating are contained thousands of millions of microscopic cells, which are concerned not only with the necessities of our present environment, but with our happiness, and perhaps with our future in the next world.

It was discovered by Hitzig and Flechzig, and later experiments by Ferrier, Mott, Schafer, Sherrington, and many others proved, that if a galvanic stimulus were applied to certain portions (precentral convolution) of the frontal lobe that certain muscular actions occurred (see diagrams).

In this way all the muscle groups of the body were accounted for, beginning with the foot and leg above, and ending with the lips and speech muscles below in the region of the temple.

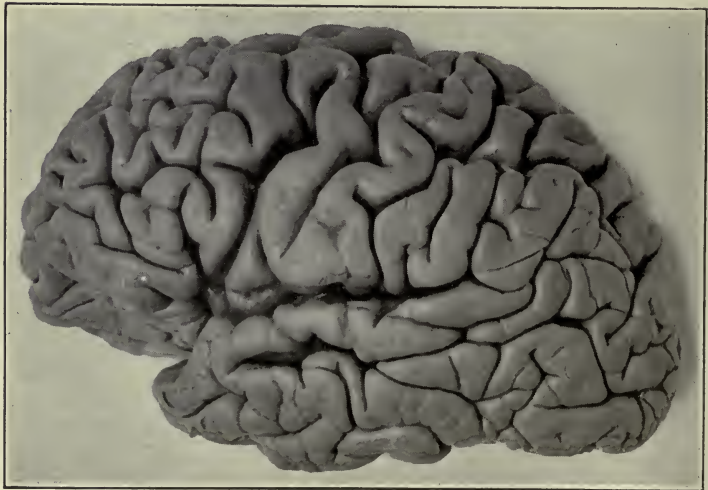
We have already studied the motor centres in the anterior horns of the spinal cord, and the higher reflex centres in the stem or midbrain. We now see a third motor plane, the cortex. This is the highest and most perfect, because these motor cells may be called into action by thought, from remote stimuli, such as the eye or ear or distant touch, taste, or smell.





To illustrate sensory, motor and association areas. The last are clear.  
Lent by Dr. Mott.

M S



T

The brain of a female dement, aged 53, which shews much wasting, chiefly in the prefrontal association area (PF), while the motor sensory areas (MS) stand out distinctly. (T) is the temporal association area; (PO) the parieto occipital association area, and (O) the occipital pole. Compare with the diagram above.

Lent by Dr. Bolton.



The broad convolution (post-central or ascending parietal) behind the central sulcus or groove is sensory and represents the terminal cells of these nerves from below.

The eye and face muscles are governed by the frontal convolutions, which occupy a position in the region of the forehead.

The centre of vision is at the posterior pole of the brain (the occipital lobe), while the taste and smell centres are in the temporal lobes, in front and above the ears.

The important sense of hearing is also in the temporal lobe.

The simplest brain mechanism consists in receiving impressions from the outer world by these sensory centres, and calling forth some muscular action from the motor areas. It is a reflex, though somewhat complex process.

There is however a large area in the human brain which does not respond to galvanism, and was originally called the silent area. To the great Flechzig<sup>1</sup> belongs the honour of solving this mystery.

These areas lie between the sensori-motor, sensory visual, and auditory areas. This large surface is called the parieto-occipital, and below it is the temporal area, and another smaller one (the insula), while just in front of the eye centres at the extreme front of the brain, above the eyebrows, is a silent area, called the prefrontal. These are the Association Areas before spoken of as occurring in man and rudimentary in apes. The title expresses the function. These areas associate the different sensory impressions of sight, taste, sound, and so on, in order to connect them with the motor areas. They are the seat of intellect and intelligence, storing past stimuli or impressions as memories. There will be much to say about these association areas all through the book, for they elucidate many of our important social problems.

The  
Associa-  
tion Areas

By way of resumé, then, the cortex is mapped out into three chief functional areas, which in order of action and development are:—

- (1) Sensory.
- (2) Motor.
- (3) Association.

<sup>1</sup> *Neurolog. Centralblatt*, 1894, and later, *Archives de Neurologie*, 1900.

Or as Bolton puts it :—

(1) Projection spheres (sensation), where impressions from the outer world, such as sights and sounds and sensations, are thrown on to the mental screen. Each of these areas of sensory function is surrounded by and connected up with—

(2) Centres of lower association (content of mind), which elaborate the sensorial impressions into simple perceptions. These are then passed on to the—

(3) Centres of higher association (will). Of these the chief is the prefrontal, which by attention and selection co-ordinates the whole mental process.

“Smell,”  
The  
Intellect  
of the  
Lower  
Verte-  
brates

Watson and Elliot Smith have described in lower animals the centre of smell, which is as important to them as sight is to us. I may be exaggerating when I describe the lower creation as smelling machines. Yet a large portion of the brains of many are given up to this function.

There are, then, two parts of the brain given up to smell :—

(1) The Hippocampus or marginal pallium of Elliot Smith.

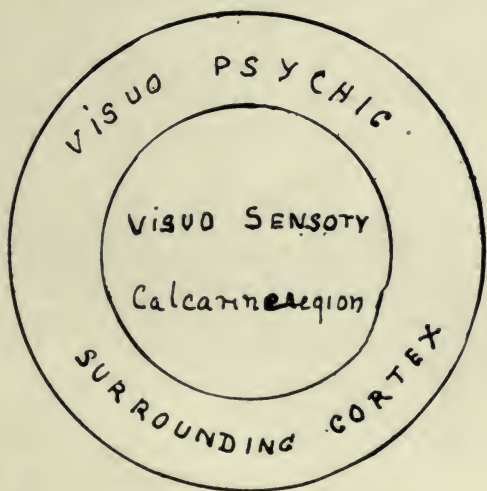
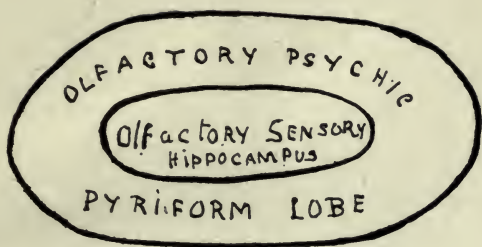
(2) The Pyriform lobe or basal pallium of Elliot Smith.

Dr. G. A. Watson says that these are of very ancient development in time or phylogeny, as compared with the newer cortex of mammals (neo pallium). Nevertheless the olfactory portion of the brain prevails in the lower mammals, but dwindles in the anthropoids, and is quite absent in the whale and porpoise, as they cannot smell.

The hippocampus is made up of only two layers, the granular and infragranular, and is therefore purely instinctive.

The pyriform lobe has superadded a thin supragranular layer, the first dawn of intelligence for analysing the object smelt (see figures).

These facts in comparative anatomy are not considered by some of the present day psychologists, who wish to place hunger and other appetites and sensations in the psychic sphere and not in the brain. Thus they give a dog a saucer of red paint, and it approaches thinking it is blood to lap. That is no different from attracting a person with wax models of fruit. The dog applies the test of smell, showing how no single sense is to be trusted in matters of judgment.



To illustrate the sensory and psychic areas and functions of smell and sight.



The sense of sight is built up on similar lines. Bolton showed there was (1) an area which received the visual impressions, the calcarine area. This was surrounded by (2) a psychic area, the occipital lobe,<sup>1</sup> which analysed these and turned them into perceptions, ready for use.

These psychic centres are those described by Bolton as of lower association.

I have considered it essential somewhat fully to describe the mechanism of the brain, in order to define it as the physical basis of thought and of character. If the brain machinery be impaired we get the lunatic, if less impaired the poor thinker and the uncontrollable character which we style criminal. Bolton writes, that the potential lunatic and the actual low grade ament are born not made. In one sense we may be all potential lunatics or potential criminals, but I hope to show that many of our criminals are born, and not made out of normal stuff.

In such an all-important subject it is necessary to quote from Dr. Joseph Shaw Bolton's<sup>2</sup> paper in the April number of the *Journal of Mental Science* for 1906.

He writes, "This pyramidal layer increases in depth *pari passu* with the development of the psychic powers of the individual, whereas the other cell layers of the cortex develop earlier and soon reach their adult depth." Bolton on  
the  
Pyrami-  
dal Layer

"Further, in the prefrontal region, in the different types of mental alienation, the pyramidal layer exhibits degrees of under-development which vary inversely with the mental power of the individual. In this region the pyramidal layer is the only layer of the cortex cerebri which varies appreciably in depth in normal individuals."

We must not let the word "normal" slip from the memory, for many who are criminals or criminaloid are accounted normal, whereas the purport of this book is to prove that they are not normal. Nor can any family lightly treat this

<sup>1</sup> See "Histological Studies on the Localization of Cerebral Function," by A. W. Campbell.

<sup>2</sup> "Histological basis of Amentia and Dementia," *Archives de Neurol.*, 1902. "Histological basis of Amentia and Dementia," *Journ. Ment. Sci.*, 1906 and 1908. "Functions of frontal lobes," *Brain*, 1903.

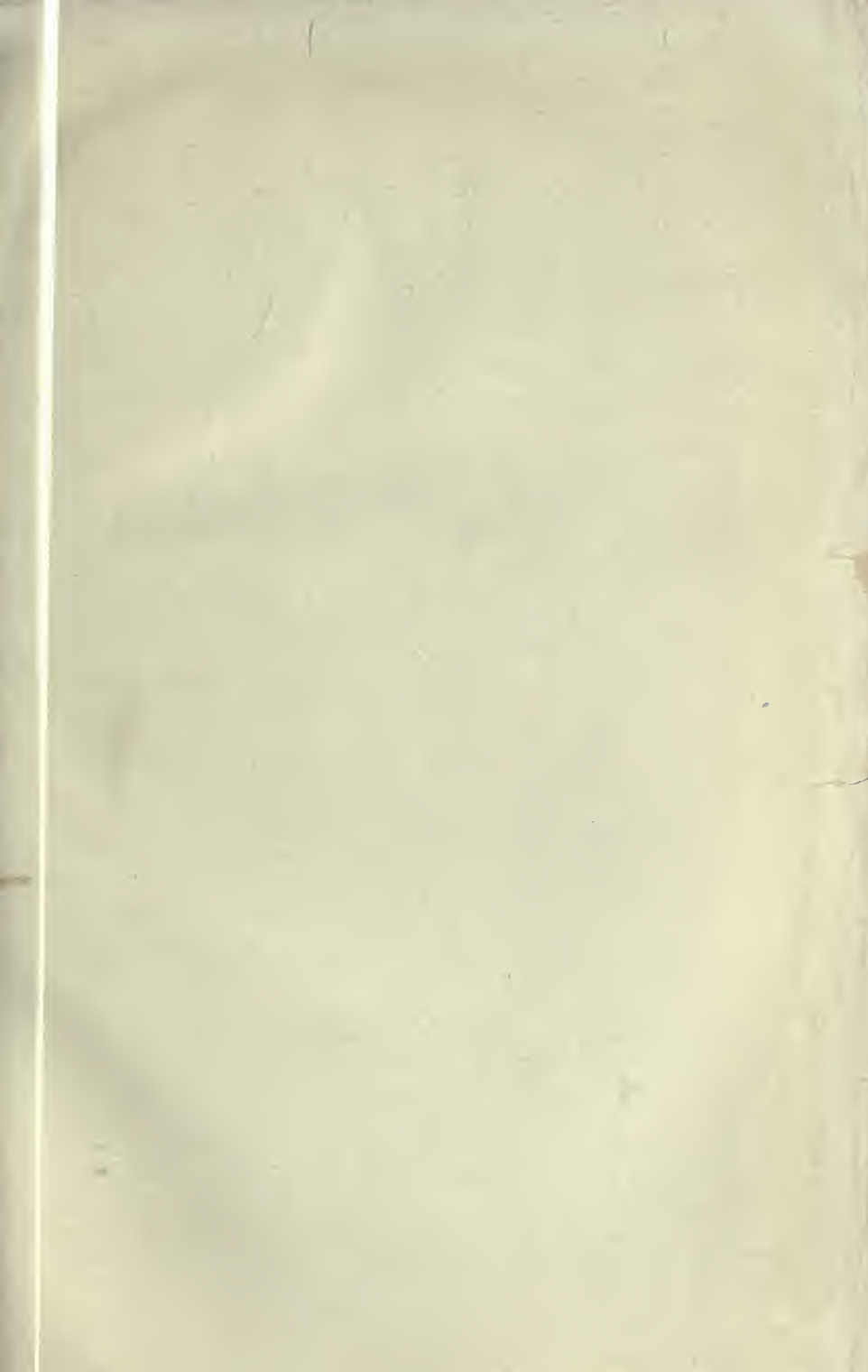
subject, for no family is exempt from abnormals, and what the end of such may be largely depend on their environment.

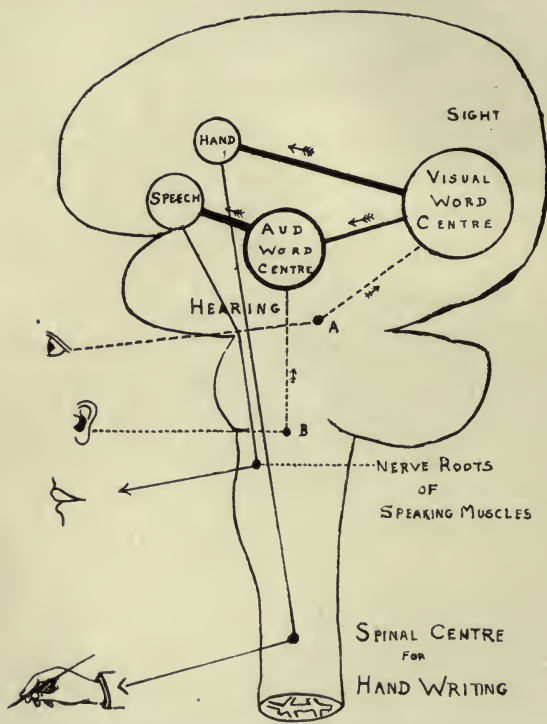
Remember, then, that Bolton after 2500 measurements finds the prefrontal arc or cortex to vary in normal individuals, and this is the centre of will, self-control, or government, attention and the higher processes of the mind.

The  
Cortex in  
Action.  
Thought  
Mechan-  
ism

Having gone thus far, let us see how these three centres act in simple processes of thought. Every combined muscular movement, including every word we utter, has its origin from the brain surface ; and every object around, to which we devote attention, is recorded in the brain cortex, which forms the physical storehouse for memory. According to our intelligence and effort so do we associate the above objects, and also recall them when required, which is the active process of memory.

Let us take the word lemon as an example. If spoken, it enters the brain through the auditory centre and sets in motion certain association nerve apparatus. The following are called into action : (1) past visual impressions or mental pictures of a lemon, with a form, and (2) colour ; (3) a revival of bitter taste in the gustatory centre ; (4) a sensation of the smell, and (5) one of the feel of a lemon ; and (6) in addition the speech centre unconsciously responds to pronounce the word without actual or visible movement of lips and tongue. If on a hot day we see a lemon at our disposal, the higher prefrontal association centre probably suggests using it, and sets the various motor centres to work to hunt for a knife and glass, and the speech centre to call for some soda water, and finally the complex act of carefully handling the knife, and preparing the beverage to quench the thirst, and satisfy the desire or sense. This may seem so simple as to be idiotically stupid for any one to describe it. Not so ; for if we take an imbecile dying of thirst, he may even know the taste, and would greedily suck a lemon placed to his mouth, but would not have enough initiative from his prefrontal cortex or "commandant" to aid himself in the manner described. To choose another illustration, those who play music receive the motor stimulus to the fingers from the organs of sight and sound. The sight of a piano creates by past association a desire to move towards the instrument. Other stimuli follow from the optic areas, which recognize





To illustrate the mechanism of thought. Impressions pass (from eye and ear) to sensory centres; thence to motor centres (as the hands or lips). Arrows indicate the direction of the nerve motion (diagramatic).



the printed music, whilst the auditory centres correct any error of harmony. There are then three processes: first—a sensory stimulus from outside; second—association or inter-communication of sensory and motor cells; and third—activity of the motor cells. This is a complex reflex act as opposed to the simple reflex already described, such as tickling the foot. These acts when frequently repeated become automatic, sinking somehow into a lower consciousness. The nerve channels then become so clear and direct that the higher association or consciousness is not appealed to.

Ordinary processes of thought work very much on the same lines. Thus if one sees the photograph of Saint Paul's Cathedral, several trains of thought commence, and continue from the mental photograph already stored in the optic centre. Or if the name be uttered, a message is switched on from the word hearing centre to this optic area. If there be conversation, the motor centres for speech, i.e., for the tongue and lip muscles and larynx, are also called into activity. Thoughts diverge to architecture, old picture memories being thereby revived; geology, history, commerce, and ecclesiastical matters are awakened from different cell groups where lie hidden past impressions, forming the physical basis of memory. To sum up, Mentation, at all events in some cases, consists in the entrance of sensations from without, which call up one or more associations connected with the objects or stimuli. These in their turn invoke the motor cells, resulting in some simple or complex act.

Many thoughts or acts are therefore in response to some sensory stimulus.

From this we can see the advantage of education in furnishing stimuli, or objects for thought, and especially how to associate ideas. Suppose a man had never heard of St. Paul's, neither the name nor even the picture of it would raise the same train of thought.

If we take the words dynamo, turbine, karyokinesis, they convey little to the minds of ordinary people beyond the sounds; whereas the engineer or scientist has his brain well supplied with mental pictures of details relating to these terms. Central Africa conveys little to the ordinary mind

The  
Mechan-  
ism of  
Processes  
of  
Thought

beyond the idea of a map. But if a traveller shows animals from these and a series of photographs, the brain is at once stored with mental pictures, which are revived at any future time by the association of the name. According to the number of objects stored in the sensory area, such is the measure and proportion of the intelligence of the individual.

Subcon-  
scious  
Menta-  
tion

Many processes of thought from frequent repetition sink into the regions of subconsciousness, so that at other times related associations call them up again into consciousness with the proverbial rapidity of thought.

Thus if one hears the word "circle" uttered, there occur unconsciously and very rapidly several stimuli, first to the hearing word centre; second in a discharge of motor energy in the speech centre to represent the pronunciation of the word "circle," which motor act never rises to our consciousness; third a circular rotation of the eyeballs, as if one were tracing out the form: fourth there may be in the hand centre a stimulus as if to draw a circle, fifth a mental picture of a circle. The height of education and intellectual growth consists in the number of imprints or impressions on the brain cortex which every surrounding object has produced. One association aids the other and leads to the formation of special associations or mnemonics to assist bad memories. Thus if I could not remember a man whose name was Martin, I would cease to tire the brain, but as it were attach it to an old familiar association, like hanging it on another peg. I might associate him with the sand martins or the swallows.

Occasionally people find there is a name or word which never can be remembered.

Perhaps I may be allowed to speak of my own case. I never can remember the word "macaroon." I fancy its special recording brain cell, if such exist, as we believe, has been left out of my construction. If I want one I always have to describe it accurately to the waitress, but I am unable to connect the mental picture with a word or name; the scene is somewhat ludicrous and not always successful.

One is conscious of effort and strain when memory is defective, as if some association cells were "ringing up" some latent memory and could get no response. By the use of mnemonics

that overstrain is relieved, and the association fibres go by a more familiar by-path.

Edinburgh medical students had an interesting mnemonic, which assisted in retaining correctly the position of nerves, arteries, and veins, on the inside of the ankle. It is an important piece of anatomy in treating deformities of the feet.

The mnemonic ran thus :—

Turner, for the tendon of the tibialis (he was our popular professor)

doth, for the tendon digitorum

vex, for the vein

all, for the artery

very, for another vein

nervous, for the nerve

pupils, for the tendon of the pollux or toe.

Probably this mnemonic has saved many a professional career at an examination.

Some words or terms can only be stored up by mnemonics.

## CHAPTER X

### AUTOMATISM AND CONSCIOUSNESS

**AUTOMATIC ACTIONS:** Subconsciousness on a lower plane of consciousness—Importance of accuracy of detail—Dual brain action—Consciousness and subconsciousness—Tracing a thought backwards to its origin, which is a sensory stimulus—Worries—Mental visualization—Dreams—Imagination.—**MENTAL PICTURES LIKE PHOTOGRAPHS: UNDER-EXPOSED OR PROPERLY EXPOSED:** Physical basis of memory and of imagination—The barrister—The case of the blind and mental ideation—Resumé: Thought; Memory.—**INFANTILE MEMORY ALMOST ABSENT IN THE POOR AND UNEDUCATED;** Memory of B7—Memory in criminals and starved poor cases—Cause.—**COMPLEX AUTOMATIC ACTS:** Consciousness and subconsciousness—Different levels of consciousness—Simile to an army—Mind.—**THEORISTS ON SUBJECTIVE MIND:** The objective mind—The subjective mind—Sea of the memory and emotions—And the soul—And latent memory.—**THE ASSOCIATION CENTRES:** The soul—Phenomenal memory and prodigies: Case of "Blind Tom"—Brain and mind—Lower brains—Education and association centres—Memories.—**INTUITION:** Ancestral instincts in animals—Suggestion and the subjective mind—Hypnotism—"Under Control"—The preacher—The unseen influence—Imitation and suggestion.

Automa-  
tism

**AUTOMATIC** acts, such as playing music, dressing, cutting up one's food, walking in a thoroughfare, and so forth, become so by constant repetition in consciousness. As soon as the nerve channels are so perfected that fixed attention is no longer required, these actions seem to pass to the lower plane of subconsciousness already alluded to. But if anything occur to interrupt the smooth run of this auto-mechanism, as a note out of tune, then attention is aroused, and the pre-frontal or commandant is invoked to direct procedure. It is therefore extremely important in the commonplace details of every-day occurrences, to act methodically so as to establish accuracy of automatism. The brain continually acts in a dual capacity, consciously, and subconsciously or automatically. If the automatic action has been trained without due care, it makes mistakes, rousing consciousness and absorbing the attention often unnecessarily.

Thus to take an ordinary illustration, a man may have his attention fully engaged in some important discussion or thought whilst shaving. If he has been painstaking in the latter all goes well, but if clumsy or careless he is sure to cut himself. Suppose we have a serious trouble that is a great burden and anxiety absorbing the attention, we go through the routine of daily duties in a mechanical or sub-conscious fashion. The mind is preoccupied in deep thought. Thus whilst dressing the thoughts are fixed on the trouble in consciousness, but the process of dressing proceeds automatically in a state of subconsciousness.

One is perhaps surprised, after pulling oneself together and saying "Begone, dull care," to find that one's garments are on and there is no memory of the actual performance. Later, when hurrying to business one finds an important letter missing. The upper consciousness ordered the lower consciousness to bring the letter half an hour ago. The letter is nowhere to be found, but arriving at one's office it is found secreted in some unusual way, having been specially placed there by the lower consciousness to avoid its being left behind in the general hurry. Thus the lower consciousness acts like a valet or private secretary to the Ego. This tedious description may be applied in all sorts of ways, by each individual, to show the varying degrees of subconsciousness. There are then, probably, different planes of the brain cortex, each of which have their own special associations and perhaps lower planes of attention. The lesson to be learnt is, that from infancy upwards the attention ought to be focussed to do everything carefully and accurately, so that processes of subconsciousness may work smoothly and correctly.

Regarding the mechanism of thought from a different standpoint, it is interesting to trace a line of thought backwards to its source. One may thus find that it started as an indirect stimulus, from some hidden memory, which is but a latent sensory impression. Some picture memory, which is mental instead of actual, without any external cause being traceable, may start off a train of thought. Such a sequence often occurs at night when one has worries. The last brain stimulus or train of thought has not been shut off properly, and sleep cannot be sound if certain areas of the brain are semi-active.

Mental pictures of distressing circumstances may be connected up with vivid reality, and in some cases the association centres switch on motor groups, as in the case of sleep walking. It may be well asked by the layman, How can any one visualize when the room is dark, or even during sleep? One can visualize mentally in the dark, by the revival of past impressions already stamped on the visual brain cells. In the case of sleep, where the control is lowered, this process is irregular, which leads to confusion and to the fantastic forms which dreams assume. This is the basis of imagination. The unfortunate speculator in the stillness of the night, and sometimes in the dreamy condition, pictures to himself the distress and ruin which are possible to him. If the mental agony is too protracted, physical depression of the heart and stomach (vagus nerve) and disturbance in the brain circulation cause actual suffering.

One cannot call up pictures unless the parts of them are already stamped on the brain cells. If objects are not examined carefully, they resemble under-exposed photographs, and are soon forgotten; but important objects which fix the attention are stamped more or less permanently in the sight and auditory areas. This is the physical basis of memory and imagination which play such an important part in intellectual processes.

Thus the prosecuting barrister from the account of his case rouses a series of mental pictures of the whole incident. During his address he is merely describing a mental vision. According to his zeal and ability he fills up the gaps of the evidence by associating some of his own memories. In other words he may have to appeal to his imagination, using the term in a proper and fair sense. The imagination must not be treated as if it were a perversion of truth, for it enters into every normal complex act of thought, for the mind, by rousing stored visual impressions, contributes a good deal more than does the eye.

The architect designing a building resorts to his imagination, or visual memories, until his elevation and details are completed. He has to imagine the size and position and decoration of the rooms, and all the processes arise from the association

Mental  
Pictures  
like  
Photo-  
graphs ;  
Under-  
exposed or  
Properly  
Exposed

of fragmentary memories. According to his past education so is his visual storehouse full or empty.

A man blind from birth has of course no direct visual concepts, so his memories must be in other sensory areas, chiefly those of touch and sound. How pathetic and equally scientific is the account of the man blind from birth, who, when vision was restored, described men as "like trees walking."

But though the sight may have been absent, yet I have found these afflicted ones trying to form mental pictures, as the result of descriptions from others.

*Resumé.* Thought then arises from sensory stimuli which may be external and actual, or internal and imaginary from associated memories. Memory is the result of correct observation, which implies attention or mental focussing, in order that external impressions can be stamped efficiently in the brain cortex.

I have gone to some trouble in examining people of all classes, by way of testing their infantile memories. I can remember much of my life when three years old and one or two incidents when two. The same is common amongst the educated and well nourished, and so may be regarded as normal. In the case of Mary Barnes, to be described later in Chapters XVII and XVIII, one subpersonality, B7, remembered events which happened before she was two years old. It is important to state that there was no imposture, nor had the events she described been mentioned in front of her.

When we take the poor and uneducated we find them remarkably deficient in infantile memories. This is conspicuous among the criminals, juvenile offenders, and homeless boys, whom I have examined, and fully reported on later. I might here, however, illustrate with two cases I examined casually at Shadwell whilst being escorted one night to the docks. (1) A slender undeveloped boy with refined gentle features, who was fourteen years of age but looked only ten, and could remember nothing before he was eight years of age. His parents were Welsh, and he earned seven shillings a week at a tinsmith's, working twelve hours a day, which is a little more than 1*d.* an hour. His height was 4 ft. 8 in., and his weight 4 stone 8 lbs. net, which is 2 stone below the average.

Infantile  
Memory  
almost  
Absent in  
the Poor  
and Un-  
educated

(2) The other case was a hooligan ; a degenerate in every sense, extremely ugly and malproportioned, and with a nasty temper, but evidently docile if treated kindly. He was twenty-six years of age, but looked only seventeen, and he could remember nothing before he was the age of ten. His height was 5 ft. 2 in., and his net weight 9 stone, which is 2 stone below the average.

Why are these memories so bad ? Is it malnutrition in infancy, and want of good milk ? Or is it the intense monotony of their lives, food one day, starvation the next, alternately ? Probably it is a little of each, but chiefly the instability of the brain cells from malnutrition. It is not so much under exposure of the mental photograph, as that Nature has been cheated in the quality and composition of the photo plates, if the simile may be extended, to compare the occipital cortex to such. It is rather non-development than want of education, although the pressure of State education puts on the finishing touches of mental obliteration. Their other finer perceptions are also dull. They are not good judges of shades of colour, and the natural delicacy of touch and fine muscular movements are likewise absent. This has been observed also in criminals.<sup>1</sup>

Complex  
Auto-  
matic  
Acts

Complex automatic movements are supposed by some to be revived memories in the motor areas, rather than revivals in the sensory areas of sight, hearing, and even touch ; but the latter view is probably correct, as it is the route traversed during education, whilst the sensory cells stand as sentinels guarding against error, and are roused when special mental effort is made.

Automatic action is interesting because it acts independently of attention, and sometimes of consciousness. It therefore opens a wide field for discussion on consciousness, subconsciousness, and even unconsciousness. Thus a skilled musician can play the piano and carry on a conversation at the same time. The automatic act of playing is subconscious ; and the theory is, that brain cells on a lower plane are in action, while the upper strata of brain cells are acting consciously

<sup>1</sup> Lombroso, *L'homme criminel*, 1887, part iii. ch. ii. p. 290.



during the conversation. Undoubtedly many automatic actions appear to be devoid of all consciousness; thus one may lock a drawer or put away papers or books, and have no memory or consciousness of the acts. It would indeed seem as if there were different levels and different degrees of consciousness from zero to full activity, and that when any act can be performed without attention or consciousness it falls to the lower plane, or there may be a subconsciousness which controls daily necessary actions, leaving the higher consciousness for emergencies.

By way of illustration, it resembles an army, the regiments of which perform their routine without reference to or supervision from the general and his staff, who are only referred to in cases of emergency.

So many volumes have been written on mind that Punch has felt it necessary to volunteer the opinion: "What is mind? No matter. What is matter? Never mind."

The philosophers and theorists who are psychologists but not physiologists write very freely, and somewhat dogmatically, on the "subjective" mind. Their works would be valuable if their premises were correct. They ignore the subtle and at present unfathomable actions of the association centres, which is excusable as they were so recently discovered. With our present knowledge the subjective mind requires to be measured by a different standard.

Theorists  
on Sub-  
jective  
Mind

Physiologists are allowed to hold opinions on the objective mind, which is represented on the cortex of the brain in the sensori-motor districts.

The objective mind connects us with the outer world or our surroundings by the five senses. According to Hudson<sup>1</sup> and others its highest function is reasoning, which is inductive or analytical, discovering general principles from observation of details.

The subjective mind is enveloped in mystery, for it is said to be independent of the brain or any physical basis, perceiving by intuition, and only able to act when the objective mind is in abeyance. Thus the subjective mind is in evidence during hypnosis, clairvoyance, and telepathy. It "is unqualifiedly

<sup>1</sup> *The Law of Psychic Phenomena*, ch. ii.

and constantly amenable to the power of suggestion" (Hudson, *loc. cit.* Chap. II, p. 30).

It is supposed to be the seat of the emotions and of memory, and accepts any statement as true, however absurd. Logically it is deductive or syllogistic or synthetic, but has no power to examine its premises.

It is the soul, but if it "usurps complete control the individual goes insane."<sup>1</sup> It is also concerned in spiritism, but its knowledge is limited by that of the medium through whom it communicates.

It is liable to phenomenal memory, and Sir William Hamilton applied to it the term "latent memory."

The  
Association  
Centres

The unlimited complexity of the association centres and our limited knowledge of the brain must be accepted *pro tem.* as an excuse for dogmatism on this very interesting subject.

The soul as the medium between God and man is probably something higher than mind, and the limitations placed by the medium on the powers of spirits relegate them to a so much lower position, as to eliminate them from present consideration. Phenomenal memory is seen in some cases of double personality, as in B7 of my case Mary Barnes, to be described in Chapters XVII and XVIII, whereas new light is shed on prodigies by the powers Mary Barnes exhibited of drawing when blind, and yet unable to draw in her normal condition. Hudson says that "music belongs to the realm of the subjective," and thus explains the marvels of some prodigies, quoting the instance of the negro idiot, "Blind Tom" (*loc. cit.*, Chap. VI), who having no objective mind, and no education, could play any musical piece, however complex, after hearing it once.

In studying mind one must remember that the simplest processes of objective mentation must involve the action of lower groups of association cells.

Intuition

The subject of intuition merits present consideration as it is usually ascribed to the subjective mind. When a man claims to be guided intuitively in certain matters, if his judgment be carefully analysed, it would be traced to a series of

<sup>1</sup> *Loc. cit.*, Hudson.

similar occurrences or experiences in the past. The difficulty is in actually tracing the forgotten past, so that some of the past seems to be ancestral or in our parents rather than in ourselves. These are often erroneously called ancestral instincts. Ancestral instincts are, however, seen in lower animals, such as the fear of man in wild fledglings, as in the wild duck, in contrast to the absence of that fear in domestic chickens or ducklings. But much that is termed "ancestral instinct" in the lower "creation," I consider to be merely the representation of an automatic, machine-like brain.

In regard to suggestion acting on the subjective mind, as is especially evinced in hypnotism, there is little difficulty in explanation. In hypnotism, as in the first stage of chloroform or natural sleep, there is paralysis of control, and some loss of outward attention. The sensori-motor and lower associations are receptive, but the individual being deprived of will and judgment is necessarily "under control." The same semi-hypnotic effect is obtained in some religious services by monotonous or continuous music. The preacher is then in full control, and the effect he produces depends on the particular condition of the hearer. In emotional people like the Welsh, the influence of numbers heightens the effect.

But between man and man there is always an unseen influence, the stronger over the weaker. If the stronger is wicked the result is disaster and *vice versa*. The older writers term the two living but unseen forces Example and Precept; we call them Imitation and Suggestion.

## CHAPTER XI

### THE MINUTE STRUCTURE OF THE BRAIN

No apology required for pressing this subject on the layman. The key of social problems.—**MAN IS THE EVOLUTION OF COUNTLESS AGES**: The lower forms of brain represented in man—The cortex in man and lower animals.—**THE MYSTERY OF THE CORTEX**: Microscopic appearance—Cells and fibres—Each cell or neuron a unit—Its processes or fibres—Dendrons—Axons—Fibrillar network—Shapes—Tigroid bodies.—**THE LAYERS OF THE CORTEX**: Bolton's five layers—Watson's law of cortical architecture in mammals—The granular layer—The infragranular or polymorph layer.—**THE MYSTERY OF INSTINCT**: The supragranular layer—Psychic or mental.—**RESUMÉ**: Bolton's classification—Watson's classification—Comparison of human polymorph layer with the same in other mammals—The supragranular layer in man and animals.—**THE PYRAMIDAL LAYER**—in aments and demented: The best developed cells are the oldest—Undeveloped cells in cortex—The brain before birth—The brain at birth—Prefrontal undeveloped.—**THE KEY OF THE SOCIAL PROBLEM**: The slummer's brain—The criminal's brain—Cause of prison failure—The Salvation Army—Punishment on wrong basis—Law—Politics.—**DEVELOPMENT OF BRAIN**: Cell—Embryonic nuclei—Their use to adult—Condition in aments—Insulation of fibres—Their chemical composition: aids in staining processes.—**FLECHSIG'S DISCOVERIES**: Sensory fibres are insulated before motor—Association fibres last—A sense of position.

If any lay reader be interested in the previous chapter he will naturally inquire into the more delicate or microscopic structure of the brain. It requires no apology for introducing this material, for it is essential in order to understand the evolution of the child's mind and the mental phenomena of the weak-minded and of the criminal. It is just this absence of technical detail which prevents the politicians, philanthropists and lawyers from joining with the medical faculty in placing criminology on its true basis. They talk of liberty, free will, and responsibility, as if they had the same value amongst this class as amongst others.

The physical basis, therefore, must be recognized, and it is the only firm structure on which we can build a healthy social system or commonwealth.

We must realize that man was not a sudden afterthought or accident in the creation, but that he became the capping stone, after ages of evolution through lower stages. This is exemplified during the foetal condition, where his development *in utero* reflects at different stages the lower forms of life from which he is evolved. We need only concern ourselves with the brain, without pursuing the details of primitive types. Suffice it to recapitulate that the optic lobes and other ganglia in the brains of fish and birds are represented at the base of the human brain. In the mammals an improved superstructure is added, which has been suggested in birds. This superstructure we call the Cortex or grey matter, and it contains rows of cells and fibres which form the basis of thought or mentation. This cortex forms a thin layer on the surface of the convolutions of the brain to a depth of  $\frac{1}{4}$  to  $\frac{3}{8}$  of an inch. In order to examine the cells carefully, very thin sections are cut at right angles to the surface, and after certain staining processes, can be examined with the microscope, whereby we can fix a normal standard and detect deficiencies, either in quality or quantity, size or shape. There are, at a rough guess, 50 to 80 rows of cells, but the number is very variable according to the area and development.

Man is  
the Evo-  
lution of  
Countless  
Ages

Though the mystery of the cortex remains unravelled, and is a deep impenetrable study to the physiologist, yet it is possible to give a clear general idea to the layman.

The  
Mystery  
of the  
Cortex

Under the microscope (*see* Fig. p. 108) one sees rows of cells and fibres. It is computed by some that there are 4000 millions of cells, a point at any time difficult to estimate. Each nerve cell, however, is a unit in itself, which we call a neuron.

There is first a round central nucleus which in early evolution builds up the cell body (cytoplasm) around it. Each cell has two kinds of processes. At the apex there are so many delicate branches that they look like the root of a tree (Fig. p. 60), hence the Greek name, *dendrons*, is applied.

These dendrons are "receptors," or receivers, carrying impressions to the cell.

At the base of the cell is a single outgoing fibre called the axon, which carries the special impulse or form of nerve motion

of which that particular cell is capable. The various staining methods have demonstrated a network of fibrils (*see* Fig. opp.) in the body of the cell, hence it is believed that there is an infinitesimal network carrying impressions right through the dendrons, and the cell into the axon.

The cells vary much in shape. Conspicuous are triangular cells, some of which loom out largely and are big motor cells (Betz). They contain, in their body substance, stainable platelets, called tigroid bodies, which give the appearance of a leopard's skin (Fig. p. 95). It is not yet clearly understood what their use is, but in acute disease they disintegrate and disappear.

As each nervous system has been planted above the last during evolution, so the lower earlier structures remain as ganglia or "way stations," *en route* from below to the cortex. The whole plan and structure might have suggested our modern telephone system.

The  
Layers  
of the  
Cortex

Upon the number of the layers of the cortex the views of many experts differ. Some make out twelve layers, some six, and so on. Light was shed by two pathologists who, working separately, and from different points arrived at similar conclusions.

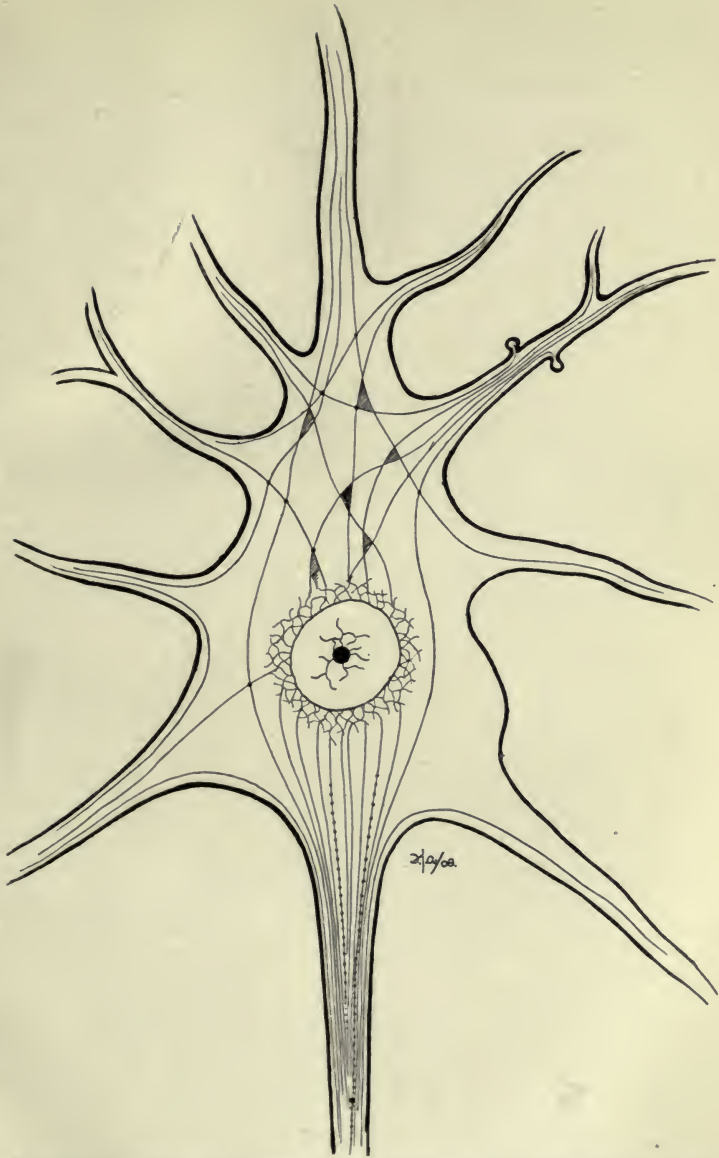
Dr. Joseph Shaw Bolton in the *Phil. Trans.* of the Royal Society in 1900 described five layers in the cortex, and this view has been adopted by most leading physiologists, including Dr. Mott in his classical Bowman lecture on the visual area (1905).

Dr. G. A. Watson, working at the comparative anatomy of the brains among mammals, formulated the principles or laws of cerebral cortical architecture.

He showed that the essential part of the lower mammalian cortex consisted only of two layers.

(1) A layer of round cells, called granules, and generally termed the sensory layer. It is not, however, strictly a sensory layer, being the receptor of sensory impressions from other areas.

(2) The second layer, the infragranular layer, also called the polymorph layer, because the cells vary so much in shape, lies beneath this; being ovoid, triangular, and angular, some



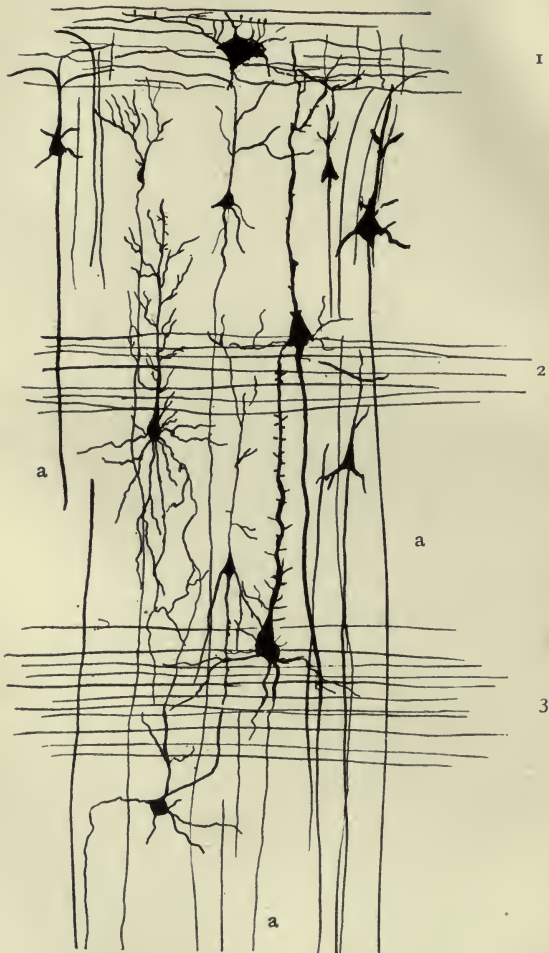
A diagrammatic sketch of a nerve cell to illustrate the arrangement of fibrils, which arise in the dendrons or branches, and pass to the nucleus, conveying different impressions; and thence to the exit or axon at the base. The tigroid platelets or Nissl bodies are formed of a chemically unknown substance lying between the fibrils. They disappear with fatigue or disease, and are therefore a sign of a normal cell in health.







A diagrammatic sketch of cells and fibres in the Cortex.



The top layer, the tangential (1), contains delicate fibrils of association and is the first to decay when mind fails. The 2nd or supra radial layer disappears next. The finer fibres decay before the coarser ones. This gives an idea of the interlacing of processes and of axons (a) descending; each system forms a neuron.

Drawn by Miss B. Wilson.

small and some large. This layer associates many of the sensory impressions received. It is, therefore, truly an instinctive layer; in fact when Watson first demonstrated this to me some years ago I said he had solved the mystery of instinct *versus* intelligence.

Moreover Watson found this layer as thick in the lower animals as in man, because they live by instinct. Bolton also observed in the decay of the mind, when the instincts or desires of nature had disappeared then the instinctive layer had likewise disintegrated. It was a great step forward in psychology, to be able to locate nature's cells and functions, and separate them from the mind proper.

On top of the external cellular layer, there appeared in lower mammals a thin layer of pyramidal cells—the supragranular layer. This slowly increases in depth and complexity as we rise in the scale. Cats and dogs are fairly well equipped, while lower carnivora like the ferret are poorly developed. That of the ourang and chimpanzee almost equals that of the human.

The function of this layer is mental or psychic.

We have then three distinct layers superimposed. The middle is granular and a receptor layer and serves as a landmark. The deeper or infragranular has the function of instinct; while the superior, external, or supragranular is usually styled the pyramidal layer, and is concerned in the intelligence.

Externally—

- (1) The tangential layer, made of delicate association fibres.
- (2) The pyramidal layer, of cells whose function is psychic or mental.
- (3) The granular layer, consisting of sensory cells, receptive in function.
- (4) The layer of Baillarger, a fibre layer called after the French physiologist. It contains a few cells, especially the large motor cells of Betz.

The  
Mystery  
of  
Instinct

Resumé

Bolton's  
First  
Classifi-  
cation  
(*Phil.*  
*Trans.*  
1900.)

- (5) The polymorph layer of cells now regarded by Watson and myself as purely instinctive and shown by Bolton in the human to be concerned in Nature's duties.

Thus Bolton made out three cell layers and two fibre layers. This classification is the most accurate yet described.

The later classification adopted by Watson is a purely cellular arrangement.

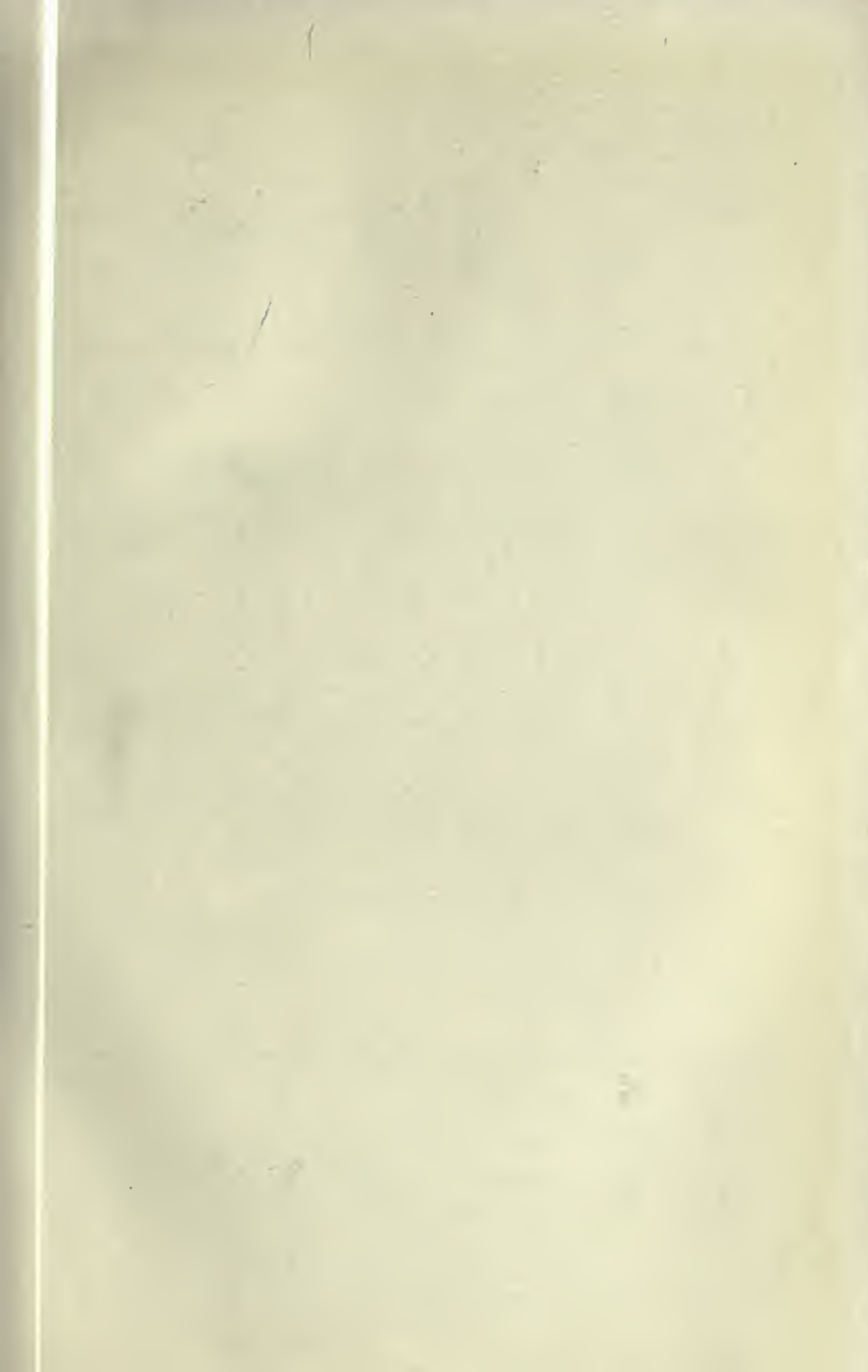
- (1) Supragranular or pyramidal layer, psychic in function.
- (2) Granular or sensory in function, a receptor layer.
- (3) Polymorphic layer, the layer of instincts.

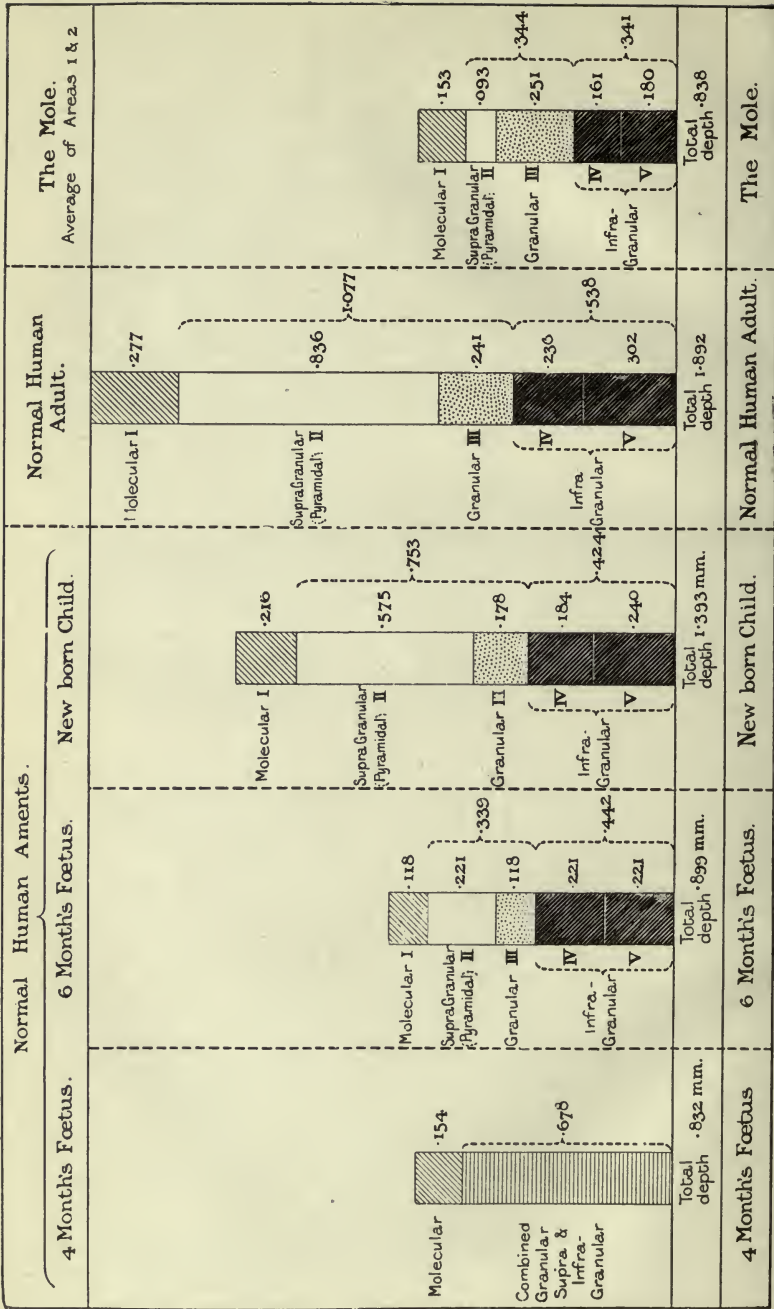
I shall for simplicity follow this description, ignoring the fibril layers as not essential to my purpose, for I wish to emphasize Watson's discovery<sup>1</sup> that the polymorph layer is almost as thick in the mole as in the child, in spite of the immense difference in the sizes of the two brains. There is indeed very little difference in thickness between that of the adult human and of the rabbit; whereas the supragranular or intellectual layer is in the rabbit only  $\frac{1}{4}$  of the depth attained in the human brain. Even before birth the pyramidal layer in the human is three times the depth of the same layer in the mole or the rabbit. It was also Dr. Watson's opinion that those animals which had to live by their wits had the best shaped pyramidal cells.

The Pyramidal Layer

The pyramidal layer will always be associated with Bolton's great work in the way of measuring its depth in demented and imbeciles. In these he found a thinning or wasting in proportion to the loss of mental power. In the case of imbeciles and idiots the thinness of the layer was due to non-development. The relationship between intellect or intelligence and this pyramidal layer helps us with the problem of the criminal. The pyramidal layer has larger and better formed cells at the bottom, while more superficially the cells are smaller and not so well shaped. The deeper cells are necessarily older in time, so their depth is probably due to the evolution of Ages. This is confirmed by the presence of round cells or nuclei on the outer surface of the layer. In the unborn child

<sup>1</sup> See *Archives of Neurology*, vol. iii, 1907 for Dr. Watson's discourse on the Mammalian cerebral cortex, p. 109, and *Proceedings Roy. Soc., B.*, vol. lxxvii, 1905.





Observe that the infragranular layer (instincts) is almost as thick in the mole as in the child : by contrast compare the supragranular layer No. II, that of intellect, in each of the columns.

Lent by Dr. Watson by the courtesy of the Royal Society.

these unripened cells are more numerous<sup>1</sup> than in the adult, as if they were nuclei "waiting for orders." This illustrates the effect of education. I here use education in its true sense, not in any way connected with what is called education at Whitehall.

Dr. Shaw Bolton has also worked out the development of the brain before birth.

The infragranular layer first appears four months before birth and is then  $\frac{3}{4}$  of its normal depth.

About the same time the granular layer appears, only half its ultimate depth. A little later the pyramidal layer may be seen  $\frac{1}{2}$  of its normal thickness. Here then, we have a brain about equal to a rabbit's.

At birth, this pyramidal layer is of nearly normal thickness in the motor and sensory regions; less in the psychic or association areas; while in the prefrontal cortex, the seat of will and control, it attains only half its destined development.

This knowledge gives us the only lever by which we can arrest our present rapid national deterioration. Consider the "slummer's" brain, how it is arrested in infancy by starvation, hereditary taint and alcohol. Its sensori-motor part is nearly normal, as we find in criminals; yet not quite, for criminals are mostly deficient in sensation and in fine muscular action. Their control power, will, and faculty of continued attention which reside in the prefrontal have never been trained or developed in youth. So in the criminal we have the man with a child's undeveloped control and will. We now can understand why these cases cannot improve by our present prison methods, and why they fall away after apparent reform, unless they come under such protecting care as that of the Salvation Army or some similar agency.

The Key  
of the  
Social  
Problem

We can also appreciate the injustice of punishment in many cases. Each criminal should be viewed as a clinical or psychological study. When Law admits a little knowledge into its veins, and purity takes the place of passion in politics, then the nation will look after the undeveloped prefrontal cortex and give it a fair chance of normal development.

<sup>1</sup> See figs. pp. 104, 108.

I will hark back to this subject in the Chapter on Responsibility.

Develop-  
ment of  
Brain  
Cells

Every brain cell develops from a small round nucleus in the embryo, which is termed "neuroblast". In that antenatal condition the whole brain is laid down in these important structures, and many of these embryonic nuclei or cells remain through adult life. Perhaps they form a reserve force, and give opportunity for recovery in brain disease, or for further development racially or even individually, by opening up fresh tracks or communications.

Apart from brain disease these embryonic nuclei play a great part in the animal economy, because they offer chances for higher intellectual development. No one attains his or her highest possibilities, for we always find some of these embryonic nuclei undeveloped on the extreme surface of the pyramidal, which is our highest layer of activity. Rows of these nuclei are waiting in all our brains, like raw recruits, ready to be drilled into active service. I have observed that they are very abundant in the dips of the convolutions. In imbeciles or weakminded people they are absent, they are also destroyed by infantile meningitis, or malnutrition and hereditary taints, thus crippling the individual from his first start.

We must now turn our attention to the fibres which carry the messages or impulses to and from the cells and groups of cells.

There are two classes of fibres :

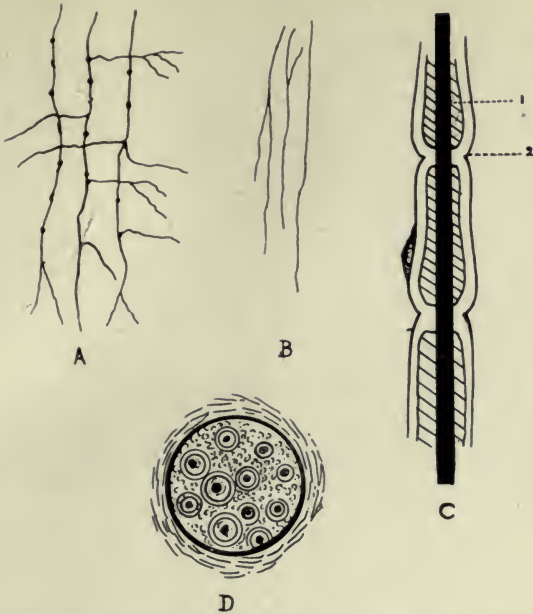
insulated and noninsulated.

The motor fibres which leave the cells of the cortex to pass to the muscles are insulated, as are also the sensory fibres running from the skin to the cortex.

The insulating sheath is complex both in its structure, arrangement and chemical composition. In nerve diseases or neuritis it disintegrates, resulting in loss of function, pain and paralysis. Under certain chemical treatment in the laboratory the fibres take on a black stain and by this method Flechsig made important researches in the development of different areas of the brain before the birth of the individual.



Sketch of nerve fibres.



A and B are non-insulated fibres and fibrils as in the sympathetic system.  
C represents an insulated fibre.

D. The section of a nerve showing healthy and atrophied fibres.

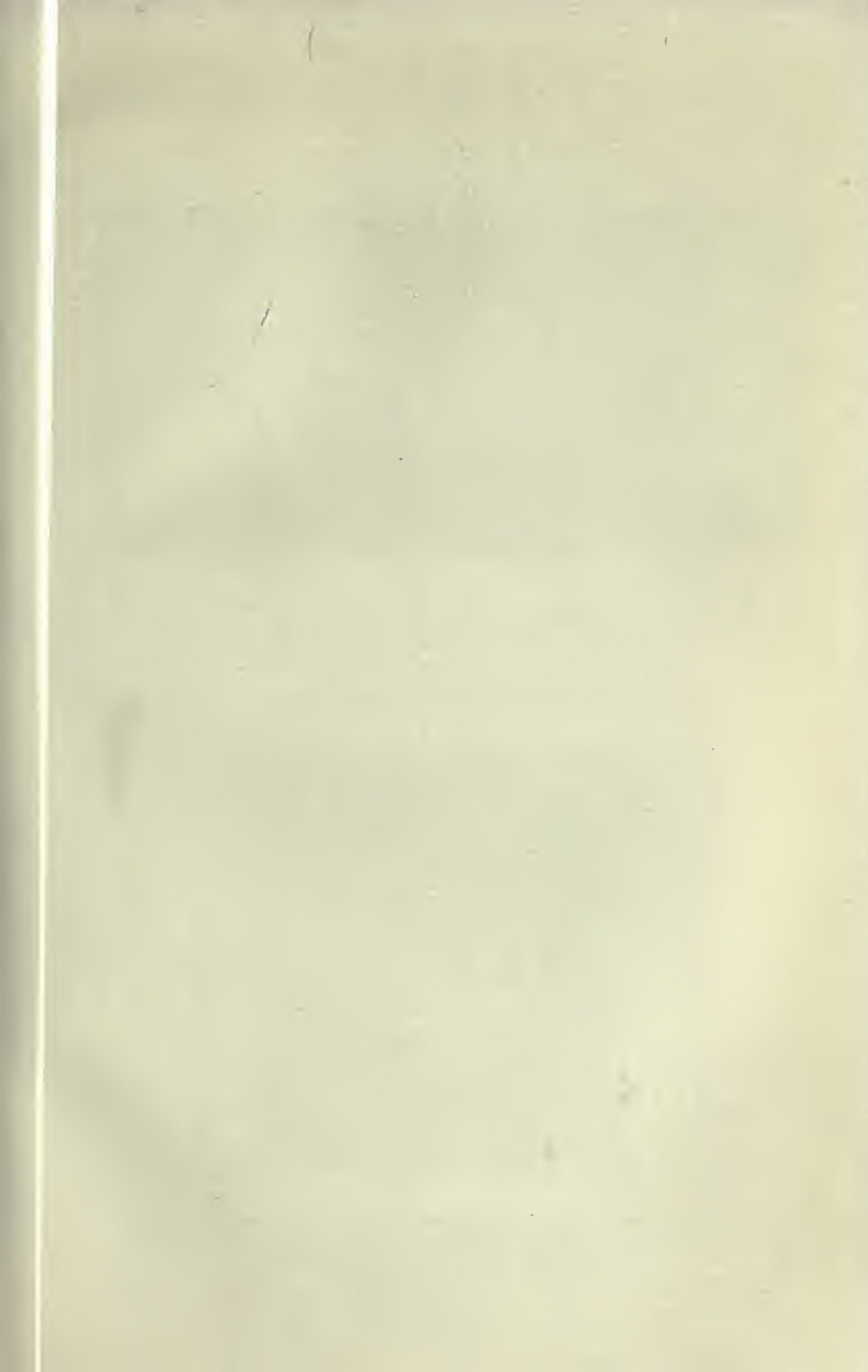
In C, 1 marks the insulating or myelin sheath. In neuritis this disintegrates.  
2 is a sheath which encloses the fibre. The dark central line is the 'axis cylinder' or fibre; the middle sheath keeps the fibre in health.

3



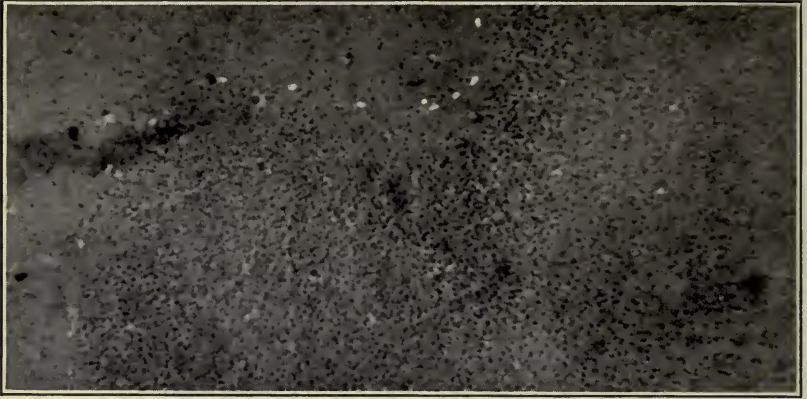
Section of an embryo-brain to show the first insulation of fibres.  
The black fibres are the sensory and first to develop.





The Cortex of a Kitten before birth.

Outer or Upper Surface.



This shows the whole brain cortex laid down in cell nuclei or neuroblasts. No pyramidal cells have yet developed. The dotted lines mark the upper border of the layers.



This shows the condition of advanced neuritis. The broader fibres have degenerated and are swollen. The dark round and oval bodies are phagocytes scavenging. (See Fig. page 7.)

Flechsig discovered in 1890 that the brain developed in different areas at different times, and he divided the cortex into three areas :

Flechsig's  
Discov-  
eries

sensory, motor and association areas.

The sensory areas are concerned with the five senses, of which the sense of touch evolves first. That is shown by the strands of fibres, which Flechsig called "projection systems," blackening first.

The strands of fibres or projection system running from the motor cortex to the muscles develop later. While the last to evolve are the association fibres, some of the more delicate of which are thought to be non-insulated.

One infers from this that as sensation precedes motion in development, likewise muscular movement depends primarily on the sensation of touch. This is more applicable to the lower forms of life which are not so well developed in the other senses. As a simple example take the sea anemone; or consider how the muscular system depends on touch in the absence of light and sound to guide, which also explains the value of massage and skin rubbing in restoring weak and flabby muscle. The insulation must be perfect to prevent confusion of messages.

Thus with the eyes closed cases so affected cannot stand upright, or walk without stumbling, or if asked to touch the nose would touch the mouth, and so on. There is in the brain a sense of position or "stereognism," by which one knows where one is, and where each limb is situated. If lost, the equilibrium is disturbed and limbs might be moved about without the patient knowing exactly where they were.

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## CHAPTER XII

### THE FUNCTIONS OF THE BRAIN CORTEX

Brain areas—Sensory-motor area.—THE MOTOR AREAS: Size of area on cortex varies according to skill required—Speech centre—Hand centre—Educating hand centre as in writing—Muscle motion in thought—In the educated, automatic—In the uneducated motor centres assist visibly—Sloyd—The association centres of complex arrangement—Nodal points in centre—Their situations.—PREFRONTAL AREA: Seat of the emotion and personality—Experiments on apes—Tumour in prefrontal—Prefrontal the general—Prefrontal sends its fibres all over the brain—Latest to develop.—SEAT OF SELF-CONTROL: Intelligence varies with its development—Senile demented sent to prison—Ill development amongst the poor—Consciousness.

To the Sociologist it is of the greatest importance all through this study to remember these three great functions of the brain, that unseen machine, working underneath all these vital problems. They are:—

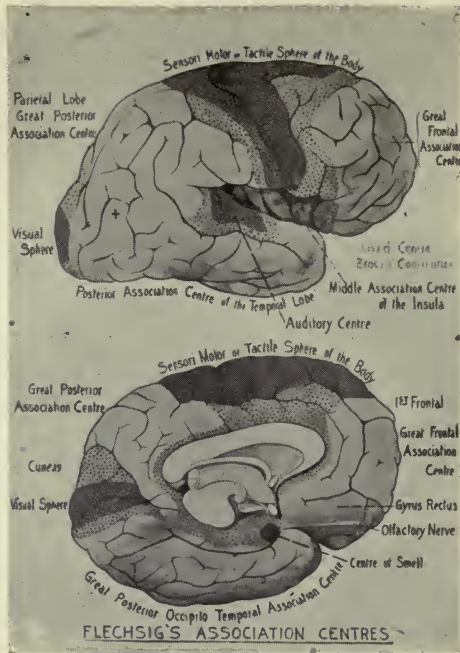
- (1) Sensory centres which are receptive,
- (2) Motor centres to direct the muscles, and
- (3) Association centres, which as their name implies connect the above and are concerned in the processes of thought.

The great sensory-motor area is shown in several of the diagrams.

#### The Motor Areas

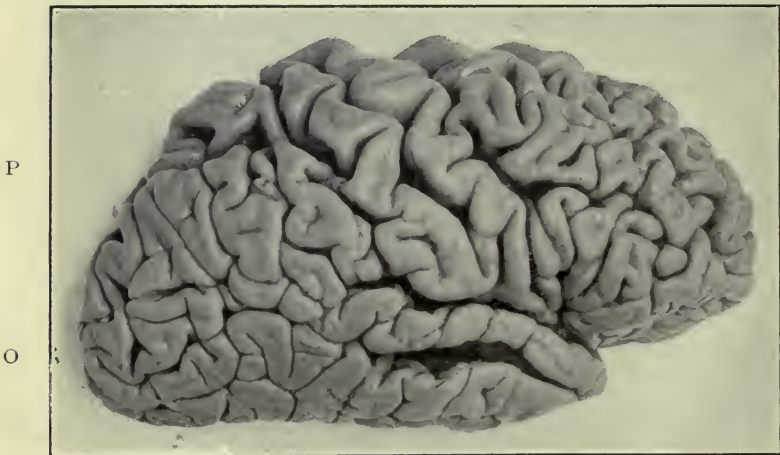
It will be seen that the greater part of the front half of the cortex is given up to motor functions. These cells originate the movements of groups of muscles, on receiving stimuli from sensory cells situated behind, or experimentally the same effect may be produced by weak galvanism directly applied to the surface of the brain. There is one centre for the foot at the posterior part, others for the leg and thigh further in front. Still more to the front are the centres for the arm, hand and face. The area of each centre varies according to the amount of skill required. Thus the lower limbs have proportionally smaller areas than the upper limbs, for though the muscles are larger yet they are coarser; whereas





Kindly lent by Dr. Mott.

S M F



T

Brain of a female lunatic, aged 53; showing general wasting, especially of the prefrontal association area (PF); also in the frontal (F); moderate wasting in the parieto-occipital association areas (P, O) and temporal (T); whereas the sensori motor areas (S, M) stand out by contrast. She was an advanced dement.

Kindly lent by Dr. Bolton.



in regard to the upper limb, the hand has a larger group of cells to direct it than has the rest of the upper limb.

The speech centre is another area, large out of proportion, because of the intricate movements of the tongue and lips.

The motor centre of the hand requires to be large, for manual skill is one of the distinguishing features of the human race, and the hand is capable of being trained to such a variety of delicate movements.

Each act, during the period of education, has to proceed slowly until by practice several simple movements are "joined up", or associated. Thus in writing one's name, at first each letter was carefully worked out, being as it were photographed on the area of sight for future reference, or remembrance.

In the absence of a printed copy this mental picture would through the association centre guide the hand, while in dictation the stimulus from the auditory area would have to be associated with or "switched on" to this same visual centre and thence to the motor centre.

Practice leads to perfection, so that groups of cells, formerly acting slowly and separately, now work rapidly and automatically. One can understand how muscular movements enter prominently into many other processes of thought, and how the processes become rapid and automatic or sub-conscious in the educated.

More attention is being paid to muscle movements in education, and herein lies the value of the Sloyd and Swedish methods.

About 1894 Flechsig announced the discovery of four, **Thought** perhaps five association centres (*see* diagram).

- (1) The parietal and
- (2) Occipital which fuse into one.
- (3) The temporal.
- (4) The prefrontal, which is the highest in function and is discussed freely in Chap. XXII, in connexion with responsibility.

(5) The insular and precuneal which are of simple organization and probably will be found in the lower animals.

Fibres from the sensory areas run into these districts, their object being, as the name indicates, to switch together

different impressions as they are received from the outer world and to convey messages to the motor districts. This process of association represents thought.

Flechsig found each association area was not simple but complex. He found the centre of each had a "nodal point" or position of superior mental activity, and divided them into central and peripheral territories, the latter having some intermediate function. We have yet more to discover, but Flechsig proved that when the "nodal points" were damaged on both right and left sides of the brain "intelligence is affected and especially is the association of ideas interrupted." These functions are especially interfered with in affections of the posterior (parietal) centres of association." This opinion is held by Dr. Mott and other observers. This fact is interesting to phrenologists as showing the intellectual activity of the hinder part of the brain, whereas they place many undesirable qualities at the back of the skull. A glance at Fig. p. 79 shows the position of the different association areas in the cortex as follows :—

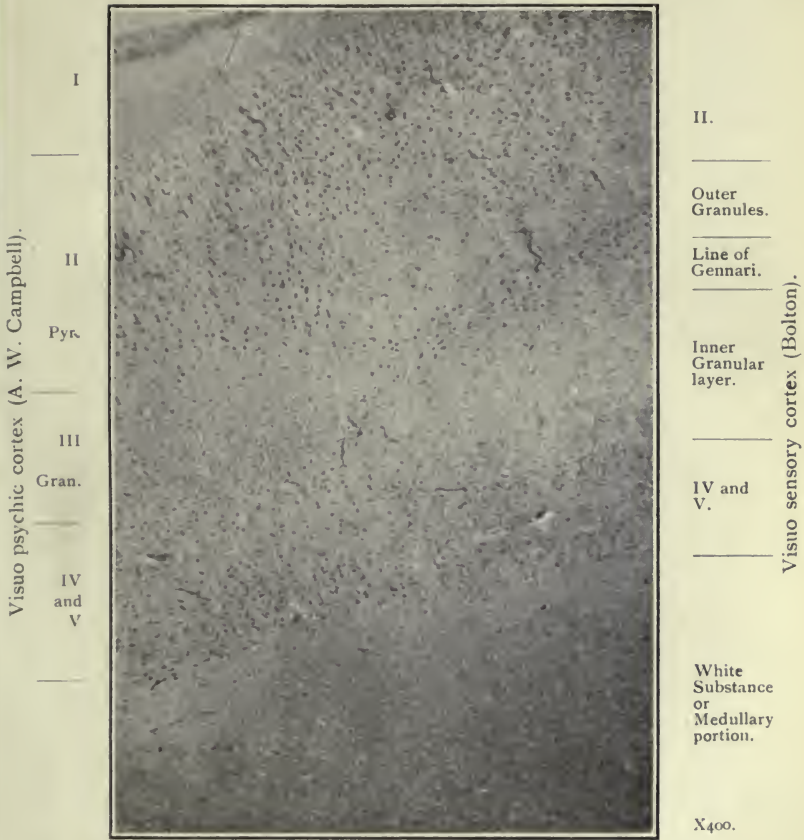
The parieto-occipital or posterior association area, from its situation between the visual and sensori-motor areas, links up the sense of sight with all muscular acts. At each side above the ears is the temporal association area which joins up sight with hearing.

In the very front of the brain, above the brows (prefrontal), there is a smaller association area, absent in the lower mammals and very rudimentary if at all in apes, being the highest refinement in the work of the Great Architect. It confers on mental activity the higher control, the power to direct wisely, and the force of inhibition or self-control. When this area is diseased as in general paralysis or in mild degrees of alcoholism, wisdom and control disappear.

Some writers place the Ego or personality in this small association centre. They base their opinions on experiments, and cases of disease. Thus when a monkey has its forebrain destroyed it loses normal parental instinct towards its young and becomes savage.

Many years ago I saw a patient with a malignant tumour in the prefrontal areas on each side. I diagnosed it by several symptoms, including the absence of motor or sensory defects.

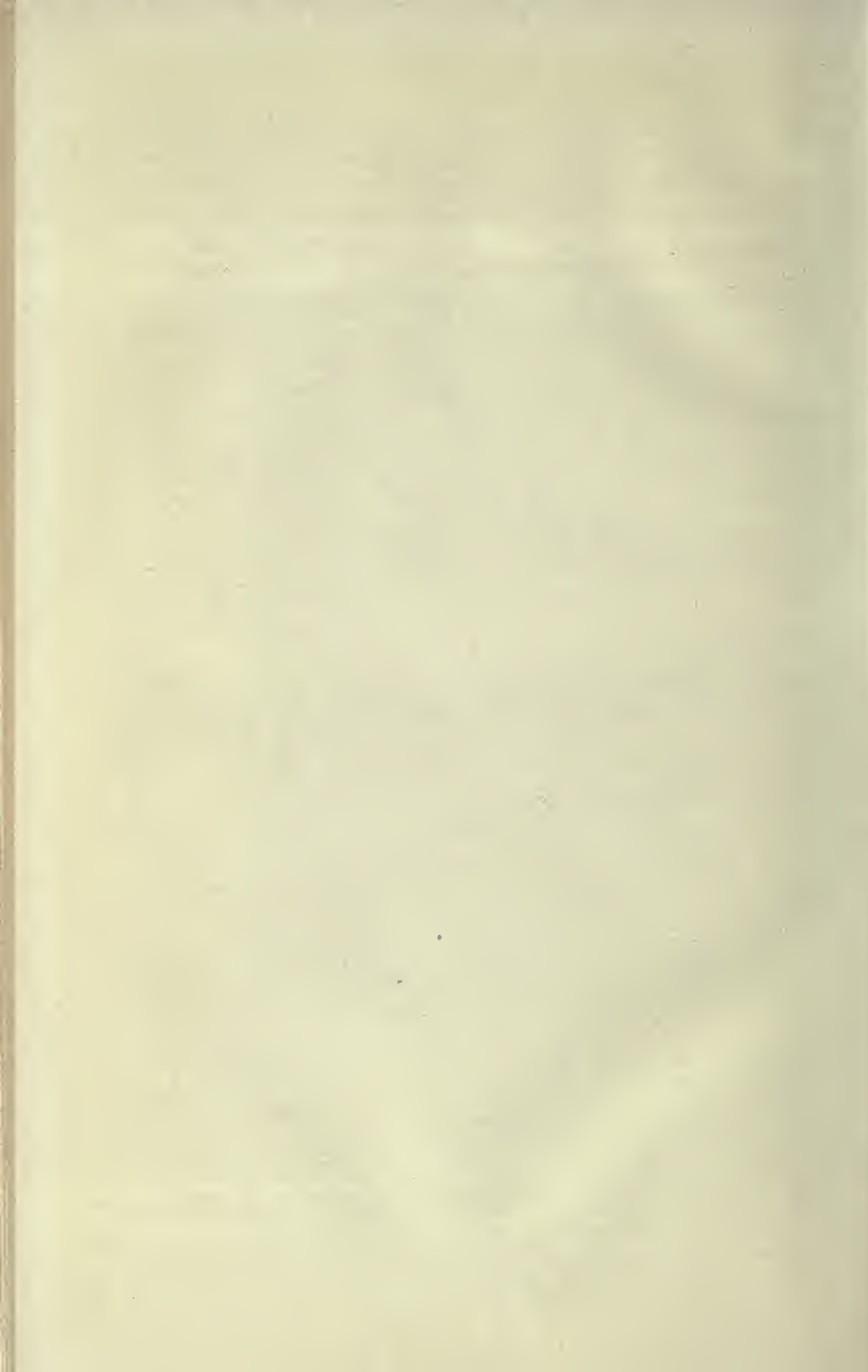
The meeting of the visuo-sensory and visuo-psyhic centres.



It is clearly recognizable where these two differently functioned areas meet. The visuo-psyhic on the left has a deep layer of pyramids, and a single row of granules. In the centre of the plate the latter splits into two, an outer shallow granular layer and an inner deeper layer. Between them is the line of Gennari. This is the visuo-sensory area of Bolton. This is from the cortex of a Mangaby which died of tubercle of the brain. The tubercle invaded the white substance only, whereas the more vascular grey substance resisted the invasion of the bacilli.

I am indebted to Mr. Beddard F.R.S. for facilities in his laboratory and for the specimen.

Facing page 104.



For two years he had shown loss of attention in business, causing much inconvenience to his customers.

There was also a great change in his disposition towards his family and friends. His whole intellectual sphere and even his personality were damaged, while at the same time he showed no care or trouble for the distress his family laboured under, nor could he locate himself as the cause. One circumstance which especially tried them, was that he could not read correctly, nor would he conduct family prayers, and while his son performed that office he went on indifferently with his breakfast. How often do similar symptoms appear, without tumour. It is then probably want of development or of use. We may from many proofs safely declare the prefrontal to be the highest brain association centre: the leader of the house: the commandant, and director of the other association areas. We know anatomically that it has fibres going to every part of the brain; so that it can command or originate brain action or thought in any centre. We have seen in a previous chapter that it is the last to develop or ripen, for at birth it is only half its adult thickness, and this corresponds with observation, for wisdom does not belong to youth, nor always to adults. It depends on physical evolution, aided by the continued efforts of perception and attention.

So we cannot become wise, which includes the higher moral qualities, as self-control, unless we exercise all our faculties. This is one reason why the uneducated poor are at such a disadvantage and often become criminals. Who can blame them, when they have had no chance of mental improvement? What will happen when we banish all religion from the State schools?

Dr. Bolton says (in *Brain*, 1903), that the great anterior association centre is undeveloped in all grades of primary mental deficiency, and undergoes wasting *pari passu* as dementia occurs. Would that these words could be remembered thoughtfully by every criminal lawyer and judge. It is on this knowledge a great error to send a man to prison for horse-stealing at the age of 84, as senile dementia may be in progress, while on the other hand a very heavy percentage of

Seat of  
Self-  
Control

our gaol-birds are partial aments with undeveloped cortex, and yet the State insists on hunting them down.

Whenever we are consulted by the poorer classes we must feel struck with their helplessness and inability to focus their attention, or arrive at wise decisions. It is not right to despise or neglect them. On the contrary they require our patient sympathy, to assist in putting some of their prefrontal neurons into activity. We see fortunately the reverse conditions where some of the poor are self-educated and very capable, and there is no reason why knowledge, intelligence and moral control should be the privilege of the rich.

The prefrontal represents the activity or personality of the Ego, which is the highest form of consciousness. From this we descend to states of motor and sensory consciousness, until we reach a plane for automatic actions and subconsciousness, which subject has been dealt with in Chap. XI.

The posterior association area, the "silent" parietal lobe, non-responsive to galvanism, is one of the finest concepts of the Great Architect. It gives width and size to the back of the head, and has been observed in great thinkers, as Helmholtz, Liebig, Döllinger, Bach, Beethoven, Kant and many others. It is the seat of the intellect, and hence belongs to man, though it is represented feebly in the apes. It associates man's environment with the direction of his actions. It switches on his visual cortex behind, to his sensori motor cortex in front, including hearing and speech. Dr. Mott in his classical Bowman lecture, 1904, on the "The Evolution of the Visual Cortex in the Mammalia" points out the relationship of this area, the parietal lobe, to the area of vision, the occipital pole (*see* Fig. p. 79). In apes the sensory visual cortex lies partly on the outer surface of the occipital pole; but in man through the increased development of his parietal lobe, this visual cortex is pushed back, round the corner into the middle line. But in some human beings, of low intellect, and consequently a smaller parietal lobe, this has not happened. There is in them a set back or reversion towards the ape. Dr. Watson showed me some years ago an imbecile's brain, which in this respect resembled an ourang's brain which we were then examining.

Elliot Smith has described a similar condition in some Egyptian Fellaheen and Soudanese brains. Dr. Mott has also described in his lecture similar conditions in natives of China, the Congo, and even in some Europeans and British, and in about twenty per cent. of the insane. Clearly then man is liable to a set-back in his brain architecture, and if it be lowered towards the status of a gorilla or ourang, it is in one sense a reversion. Surely then we need not be too anxious about forcing education on the coloured races. Mr. Charles Rolleston, who has travelled much, has observed that the negro can be educated only to a certain point, and that not very far. Similarly amongst our dullards and defectives, we can safely surmise that in some cases there is structural defect, and in consequence "education" as now administered is hopeless, nay, more, destructive. It also supplies a key to the lives and peculiar actions of the criminal masses, and explains why many drop out of good surroundings into their ranks. I will allude again to this subject in the description (p. 224,) of a murderer's brain in Chap. XXI.

## CHAPTER XIII

### THE INFLUENCE OF ENVIRONMENT ON THE BRAIN

**ENVIRONMENT** : A slum infant's brain—Action of disease on cells.—**ALCOHOL** : Deeper cell layers older in development—Superficial cell layers recent and unstable—Alcoholic poisoning of these, and the results morally—Cases of alcoholic dements treated as criminals.—**ALCOHOL A BRAIN POISON** : The condition of the slightly damaged brain—Early loss of control with unfortunate results.—**LAW AND MEDICINE SHOULD JOIN IN PROTECTING SUCH** : Case to illustrate—Senile devolution.—**FAILURE OF MENTAL POWER** : Its effect in Parliament—In senile decay the reflection of childhood.—**INCIPIENT MENTAL DECAY** : Symptoms—Improvement of the fair sex through occupation—Frequency of arrested development in childhood.—**LOWER POTENTIAL IN STARVED CHILDREN** : Treatment of weakened brains.—**ANTENATAL CONDITIONS AND PROSPECTS—POSTNATAL ENVIRONMENT AND ITS CONSEQUENCE** : Illegitimacy.

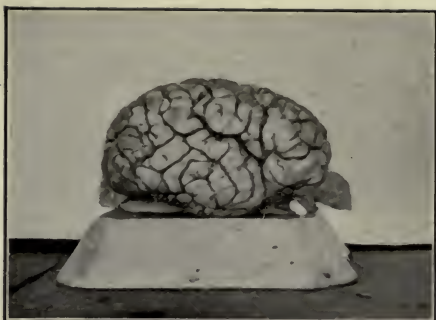
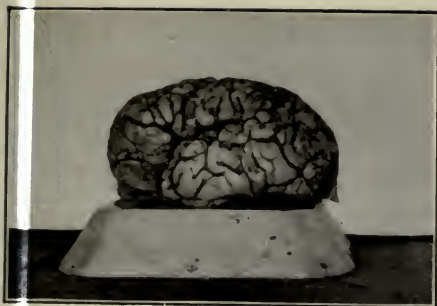
Environ-  
ment

FEW people understand the correct application of the term environment. It is not limited to our outward surroundings in this world. It actually commences before birth. Thus to the chick the contents of the egg form its environment; and so with the human family, a great responsibility rests with the mother in paying due regard to the environment of her unborn babe.

No one knows the quality of brain, even in a child, whatever the external appearance is like, therefore it behoves all to raise the brain potential to its highest development.

I examined the brain of a prematurely born infant from a Westminster slum, which was so highly developed in all areas, and very rich in its embryonic nuclei, that it was intended by the Great Architect for a position of eminence and usefulness. Yet one could not regret its demise, for the slum life and the mill of civilization probably would have ground down the normal Ego to a degraded subpersonality. I felt constrained to offer a short prayer for the offspring of the slum dwellers. I have met them at the Salvation Army bureau in the adult form, as social derelicts, yet not of their own making; as we have seen, unwholesome surroundings cause alterations in the cells of the brain.





A slummer's brain, one month before birth (Westminster).  
A well-patterned cortex.

N      N      P      G      Pol.



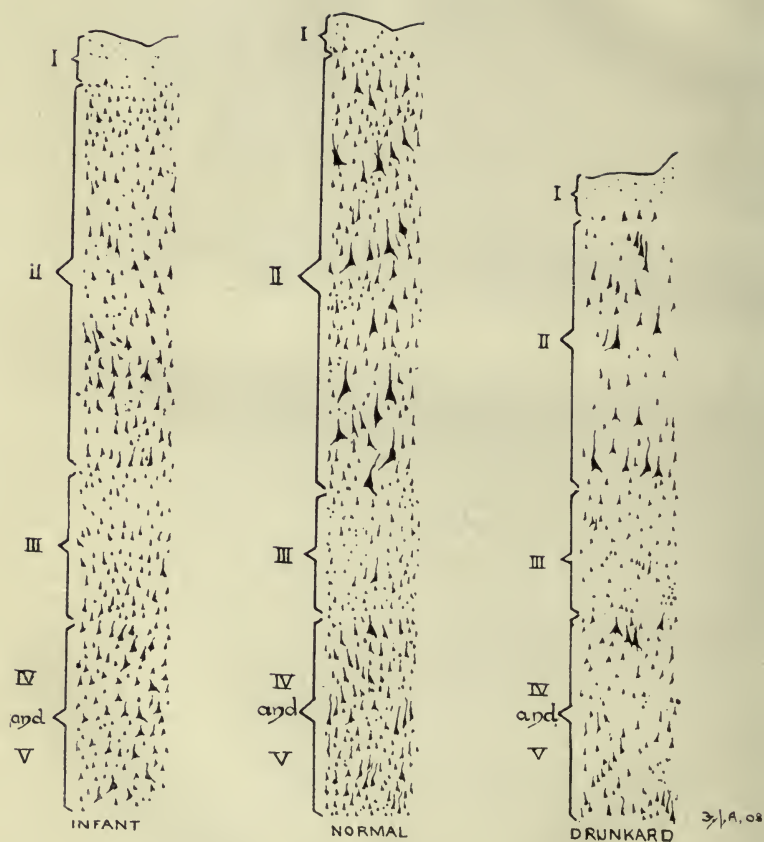
P      N      D      N      P      G      Pol.

This is a section of the infant's brain, showing the dip (D), of a sulcus; at the foot of which there are an excess of nuclei and an absence of pyramidal cells. Observe the nuclei at the surface (N); (P) is a well-packed layer of pyramidal cells, normal; (G) is the granular layer, and (Pol.) the polymorph. Compare this cortex with that of the murderer, insane and alcoholic, pp. 220 to 227.

Facing page 108.







Drawn from the microscope to show the brain cortex in the above three conditions. Note the great shrinkage from chronic alcoholism in layer II, the pyramidal, or layer of intellect. How then can a drunkard be responsible?

Thus in acute alcoholism they are swollen and the nuclei pushed aside ; while in old standing cases of alcoholism they are shrivelled up beyond repair. Through the courtesy of Dr. Mott I examined in his laboratory at Claybury Asylum the brain of a patient in whom alcoholism had persisted for years. So many of the pyramidal cells were destroyed that the cortex was very much diminished in thickness. This cell destruction is quite sufficient to explain the want of will power, vacillation and irresponsibility in the drunkard.

As evolution or development is from within outwards, it can be plainly realized that the deeper layers of the pyramidal cells are more educated, while the more recent superficial cells are less stable. These less stable external layers are the first to disappear in alcoholic decay, and we can safely infer are the first to suffer in mild intoxication. Among those not well equipped in morals or intelligence, when the higher control which society demands is weakened by alcohol, we get not merely silly actions, but crimes of varying degrees of gravity. Here is a wide field for discussion with arguments and evidence to fill many volumes. The jurist will not absolve the mildly intoxicated from responsibility, or make any allowance for the temptation he is exposed to. Those who imbibe mildly, after a certain period of brain damage lose their power of resistance to the drink craving. It thus forms a vicious circle from which there is no escape, so long as the drink traffic remains in its present condition. Imagine the absurdity, as well as the injustice of sending a woman, of 74, to 3 years' penal servitude for stealing about 10s. worth of material ; for she was an alcoholic dement and the fact that she was a petty thief all her life shows that she has been mentally deficient, and years ago should have been protected from herself.<sup>1</sup>

<sup>1</sup> In *The Times* of June 20, 1907, a case is reported of an old man aged 85 being sent to prison for 18 months with hard labour for stealing a horse. It is not the first crime of the kind, and he had spent altogether 41 years in prison. Has his mental machinery ever been normal ? Is it ignorance, stupidity or culpable neglect on the part of the State ?

"A curious-looking woman," aged 74, was recently sent to penal servitude for 3 years for stealing a pair of shoes. The detective

Alcohol  
—A Brain  
Poison

Alcohol is the most powerful brain poison we have in use. I have referred to its influence on the race by heredity, but this seems a fitting place to give caution to young people who have a healthy desire as to their future prosperity. Many young men imbibe not only wine but also spirits, and think the small quantities they take can do no harm. It is not a question of no damage to the brain, but the ratio of injury to other cells which are awaiting development. It simply means that young people who indulge deprive themselves of attaining their fullest mental powers.

In every walk of life the young should aim at success and rising to a higher plane, which becomes impossible with a weakened or impaired brain, for it is just this slight damage which takes off the keen edge of the intellect, and destroys the power and finer perceptions. A distinguished physiological chemist says that, if he has any delicate work to do, his mental machinery is unreliable if he partake even of lager beer.

We must also realize that this damaged condition of the brain is often the cause of the dethronement of the Ego. The brain being the most delicate part of the human machinery, it is necessarily unstable, and the more likely to suffer injury, and it is only its great recuperative power which saves us from disaster.

As the more recently evolved or highest brain cells in the association areas<sup>1</sup> are the first to suffer, so patients who have had long, wearing illnesses, and have little recuperative power or are in the early stages of insanity, or whose neurons are unstable through weakened control, occasionally come within the grip of the law. When this happens in respectable

described her as a dangerous West-End thief. To get such a character at the age of 74 showed a rather valuable personality hidden somewhere but probably distorted by circumstances, as in 20 years she had been convicted 10 times for shoplifting. Though she had £200 in the savings bank, the stolen property at home showed 22 gloves, 13 pairs of stockings, 84 separate ribbons, 7 lace scarves, and endless other things. If she had been an American it would have been called kleptomania.

<sup>1</sup> Dr. Bolton has shown that the association areas are the first to disintegrate microscopically, and Dr. Watson has demonstrated the same macroscopically. Both facts were discovered independently, which gives great value to the work.

families it causes a great shock, and is just a case where Medicine and Law should fraternize in order to relabel the supposed criminal as a "mental invalid."

In many of these cases juries will not admit mental decay because they see no signs of physical decay, as if one could see the delicate workings of a watch through its case. Quite recently a worthy clergyman was sentenced to five years' penal servitude for an assault on a child, in spite of one of our best alienist's statement, that he was suffering from incipient general paralysis. Time will prove the diagnosis, but nothing will heal the social wound.

Law and  
Medicine  
should  
join in  
Protecting  
such

As age approaches devolution follows the reverse course of evolution. Some men are old at 45, some at 60 and some weather the storms till ripener years. The brain loses weight soon after 50, and as age advances the trusty brain cells yield up their service and fall out of action.

Memory fails first, the hand becomes shaky, lastly the feet drag and shuffle along, indicating the failure of the function of association, before that of the sensori-motor areas. Likewise as the deeper layers of pyramidal cells are the earliest educated, so the more superficial cell layers degenerate first, and with them pass away the more recent and complex visual memories, leaving the deeper or more ancient memories of childhood. These facts are of value in the practical life of every social community.

Failure of  
Mental  
Power

This solid fact is worthy of national consideration in the election of members to Parliament. The very serious and anxious duties of governing the Empire falls into the hands of inexperienced amateurs. It would be wise at all events to place an age limit, as in the case of the army and of consulting surgeons to hospitals. If the Empire is to keep pace with other nations it must be controlled and guided by younger and more active brain cells, and the senile cells must retire to their normal and well earned condition of rest.

Thus senile decay like a mirror reflects youth and infancy. Sound training in these early periods is of great importance, for if neglected one gets in senility much waywardness and many other faults more or less serious, which are not new,

nor do they belong to old age, but are the uncovering of the long buried past.

Incipient  
Mental  
Decay

When the brain deteriorates, the effect is so gradual that it easily escapes recognition. The father who has conducted a model home gradually loses his parental interest, causing his family distress. The thrifty man becomes extravagant, while the honourable and moral show unusual frivolity and tend to stray. Friends say he is quite altered, and so he is, for the machinery, which can only last a certain time according to stress, is wearing out. It is time for the doctor, lest there be social trouble and disorder. These cases increase in number, for there is now greater stress, through more rapid methods of business and keener competition. Ease and luxury are also in themselves powerful aids to degeneracy.

We see the converse where young women have in late years gone in for sports and also for business and abandoned their former inactive methods. Their diseases have in consequence visibly decreased, but their type is altering and they become slightly masculine.

It requires no power of imagination to realize the thousands of children growing up with slightly damaged brains, who attract no special notice from the casual observer. It is, however, just the little damage, sometimes curable, which turns the scale against an individual in the struggle for existence. He never reaches the proper level of development that God originally equipped him for. If such belong to the poorer classes they naturally tend to swell the numbers of the submerged, or of the criminal masses.

Lowered  
Potential  
in  
Starved  
Children

If the brain potential in children be lowered, they cannot be forced to intellectual effort, as we see daily demonstrated in the State schools, the condition being frequently aggravated by starvation. I maintain that these weakly, ill-nourished children have no business at school, and would be better with no strain from education of that kind.

Where damage to the brain has occurred much ground may be regained by suitable nourishment, and by gently stimulating processes of thought, not by constant pressure, nor dry-as-dust methods, but by placing a variety of subjects



before the child, so as to bring out observation and mentation, and probably fix on some hobby or faculty capable of further development in a useful direction.

The antenatal conditions must not be overlooked. Given the prospects of offspring, we must do everything to make their journey a success.

Ante-natal Conditions and Prospects

There are according to Dr. Ford Robertson 3,000,000,000 cells in the brain, all of which are foretold in the embryo in the form of small round nuclei or neuro-blasts.<sup>1</sup> These nuclei absorb nourishment from the blood, and upon this maternal environment hangs the future fate of the child. It is a terrible responsibility and one which is so lamentably neglected by many.

Poor are our chances where the mother's blood may contain gouty, phthisical, syphilitic, or alcoholic toxins, or be deficient from anaemia, and malnutrition. During development these nuclei absorb leicithin, which is rich in phosphorus to build up the body of the surrounding nerve cell, and later shoot out the nerve fibres, dendrons and axons.

It is quite evident that many a child is ruined in utero, and its miserable fate decided before birth.

Postnatal precautions may undo some of the unfavourable antenatal conditions, and every new-born infant should be regarded as a valuable asset to the nation. If we ever do become truly civilized, this will be the first care on the part of the State, and the infamy of treating innocent babes of obscure origin as offenders against society will be removed.

Post-natal Environment and its Consequences

It is in infancy that the little life can be specially moulded, for good or for evil. No success in mind or morals can be expected, unless due regard is paid to physical health and nutrition. Our poor boys, degraded unjustly in prison, are mostly victims of neglect and heredity from unwholesome marriages, while the melancholy histories I have recorded show how many of our criminals were ill-fated from infancy and some were doomed before birth.

Can it be wrong to control and forbid marriage in certain cases, or are we sinning against God and humanity in permitting such unwholesome mixtures ?

<sup>1</sup> See fig. pp. 101, 108.

## CHAPTER XIV

### THE RELATION OF PHYSIOGNOMY TO BRAIN CELLS

Popular phrenology, or bumpology.—PHYSIOGNOMY: A counterpart of the brain—The development of the eye—Facial muscles and expression.—RELATION OF BRAIN CELLS TO MUSCLE FIBRE: Muscular representation on the cortex—Paralysis—Muscle tone.—DEVOLUTION: General paralysis: its course—Expressionless boys—Climate and character—Brain is the central authority.—THE INFLUENCE OF MARRIAGE ON CHARACTER: Marriage—A bureau desirable—Misfits—Small families desirable.—TEMPERAMENTS: The nervous; The bilious; The sanguine; The lymphatic; Marriage.

It would be of no practical value to discuss seriously the subject of "Popular Phrenology," described by Sir William Turner "Bumpology," as it has no foundation in fact. True phrenology which has a scientific basis, being always confronted with the quack, has no opportunity of declaring itself under that title. Otherwise much could be written under that heading in regard to cranial measurements, anatomical and racial peculiarities, and other details.

The surface of the brain is mapped out into areas, as already described in previous chapters representing

Sensation, Motion, and Association.

The description of the skull for different "faculties," as music, colour, destruction, amativeness, combativeness, and so on, is purely imaginary and founded on fanciful and fallacious observations. It is, however, only just to observe that many phrenologists are earnest philanthropists, not working for gain, and many do very useful educational work.

Physiognomy

But there is another art, "Physiognomy," which appears to rest upon a scientific basis. We are all aware that some carry their characters in their faces, but it is probable that all do so if we only understood how to interpret the manifestations. It is therefore important to examine this direct associa-

tion of the brain with physiognomy. The result suggests indeed that they are counterparts.

In such research one must always go back to the early development in the embryonic state. For example, the eye is an outgrowth from the forebrain of the embryo (fig. p. 72). There is first a stalk, which becomes the optic nerve, and then a cup at its termination which develops into the retina. The whole is covered over by a horny cap, the cornea. Every one knows how the eye expresses the degree of intelligence, both active and passive, while we have in the Old Book the following scientific declaration, which appeared long before mankind was ready for it: "The light of the body is the eye." The word "light" implies intelligence. Thus the mental relationship of eye to mind, so long known by observation, has a true physical basis.

Examining in a general way, we observe that the facial expressions are entirely due to fine muscular movements, which show anger, pleasure, pain, sorrow or mirth, corresponding to the mental associations.

Most animals are devoid of facial expression; but many, as birds and lower mammals, have powers in this direction through the eye and scalp by means of the surrounding muscles. When we consider the cat, dog and ape tribe, we find a decided advance in facial characteristics.

The cells of the brain cortex are in communication with the skin and all the muscles of the body. One might almost suggest the muscle fibres as the terminals of the motor cells, for when a central group of motor cells is destroyed, paralysis and wasting of the particular muscles occur. In cases of infantile paralysis, of an arm or leg, the corresponding motor cells are diseased or dead. The muscles consequently never develop, and the skin over that part shrivels from want of stimulus and nutrition. When a limb is amputated its special motor area on the cortex atrophies. Though every muscle and group of muscles is represented on the cortex of the motor area, yet its quantitative degree varies as stated in Chapter XII. Thus the coarse leg muscles require less representation than the finer muscles of the hand, which is capable of skilled and complex acts, and therefore the hand has more cells and a

Relation  
of Brain  
Cells to  
Muscle  
Fibre

larger area in the cortex than the leg. In the same way the motor cells of the muscles of speech occupy a larger area on the cortex than those of the hand, as representing the crowning skill of the human species.

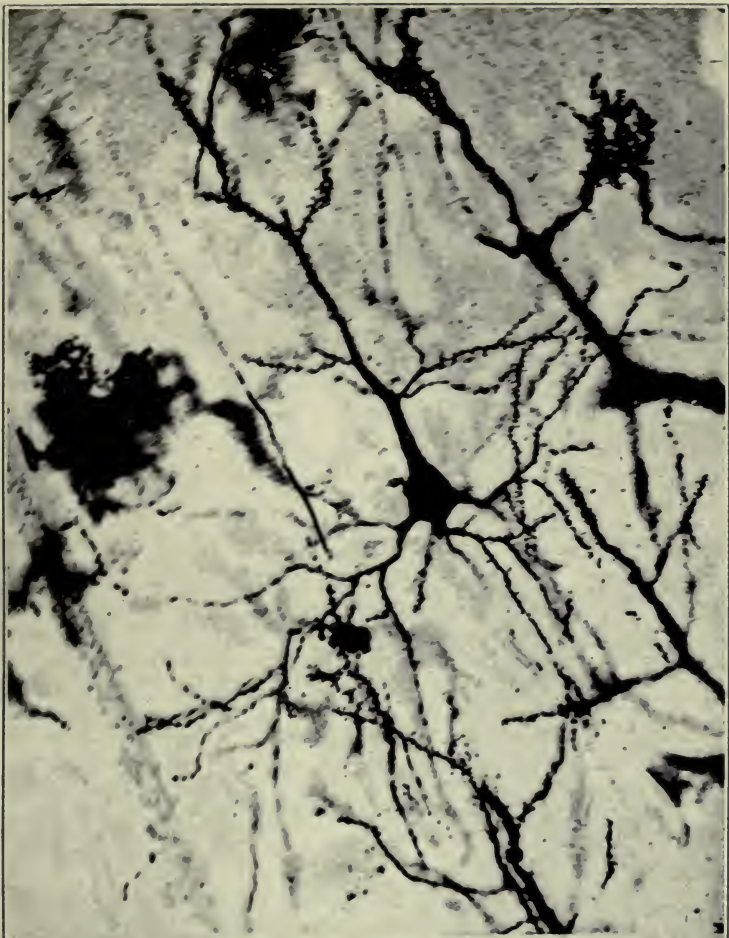
The motor functions are chiefly in the frontal region. That which represents the facial muscles is entirely in the upper part and side of the forehead ; the speech centre residing at the left temple.<sup>1</sup> When destruction of groups of brain cells occurs, as from haemorrhage or tumour, there follows a paralysis of the muscles so affected. From other pathological conditions we know also that tone and vitality of muscle depend entirely on the healthy state of the central nerve cells.

Thus brain cell and muscle are counterparts of one system, of which the cell may be likened to master and the muscle to servant.

Devolu-  
tion

In general paralysis of the insane, which has been alluded to, one can see the muscles gradually fail as the motor areas are invaded by the disease. After the association areas degenerate, the speech fails, because it is the last muscular function to develop, and therefore the most unstable. Almost concurrently, the facial muscles lose tone and become flabby, which results in apathy and loss of expression. A placid calm, betraying neither interest nor emotion, reigns over the faces of these deeply afflicted ones. This expressionless face from devolution has unfortunately its counterpart in some of our youths from want of evolution, being noticeable among the insipid youths who aim at snobbism, but though a type of mental enfeeblement, it is in most cases curable. This type of young man is supposed to look bored if any intellectual subject is brought to his notice, and it would be incorrect to be interested in his surroundings. His chief interests are his clothes and his complexion. He is, alas, an invert, and is found in those walks of life where industry is discouraged and honest work despised. These young people are of no value to the commonwealth until they have recovered. Many, perhaps most, of them are the fault of their parents, while some are imitative weaklings, trying to resist their normal mental

<sup>1</sup> In left-handed people the speech centre is supposed to be in the right temple.



MEDIUM SIZED PYRAMIDAL CELL

MOTOR AREA FROM RHESUS MACACUS

AFTER LIGATION OF VESSELS

This beautifully stained diagram has been lent to me by Dr. Mott. It shows the cell body and dendrons. The axon is faint and comes off the hillock at the base. It also demonstrates a neuron.



development. They are very largely the product of ease, and consequently are met with among the wealthy more than the aristocratic classes. Their counterparts in the lower ranks occur among the poor wastrels and unemployables. Climate and general surroundings have much to do with energy and character formation, as one may realize by comparing the hardy Scot and his stern countenance with the soft lined Italian whose needs are liberally supplied by nature without much effort on his own part.

The brain then is the central authority of the body, governing and directing all details. In one sense it would appear as if the body was built on the brain or attached to it in order to subservise its purposes, while in no part does the brain manifest itself more clearly than in the physiognomy.

It is the object of all to get the best value out of every brain, and try to improve all future stock. Here comes in the importance of wise and wholesome marriage.

Selection in marriage would undoubtedly raise the standard of individuals. It would not make a new human species however, for De Vries, in experimenting with sugar beet, found that "selection" gave phenomenal results only for a time. The same happened with cereals in producing large and heavy grain. After a certain period there was a higher average standard. Karl Pearson in biometry arrived at the same result. Malthus expressed the same opinion in his *Essay on Population*, ii, p. 11.

But while perfection is beyond any dream, what a grand thing if we could be permanently raised on to a higher platform socially, morally and intellectually!

The greatest boon to the nation would be a Marriage Bureau, scientifically conducted under Government control. Wise supervision is to be desired for the young to prevent foolish and thriftless unions, while many valuable members of both sexes are yearning, in a state of bitter disappointment, for a healthy offspring.

On the other hand the vast number of misfits in the present speculative methods of marriage is the cause of much domestic misery and crime; whereas in our modern civilization, marriage is a duty requiring much judgment and very careful selection.

The Influence of Marriage on Character

Ignorant marriage is largely responsible for the heavy burden of disease, lunacy and crime.

The benediction of the Psalmist on large families does not apply in these days of overcrowding and competition. Few people can now afford to be generous to the population, as long as generosity spells poverty, discontent, and crime to the offspring, not to mention the drain of health on the mother. We have also very carefully to mate suitable temperaments.

Tempera-  
ments

We usually recognize four temperaments :—

1. The Nervous.
2. The Sanguine.
3. The Bilious and
4. The Lymphatic.

The Nervous Temperaments.—These are active, rapid thinkers, intellectually fertile, and adventurous ; but also sensitive, excitable, irresolute, and secretive. Being very persistent they often exceed their power of endurance. Most geni and reformers belong to this class. Physically they are fair, and of spare form, with finely-cut features. In morals they are apt to go to the extreme of what is right or wrong, and whilst usually lively, are subject to unreasonable depression and despondency.

The Bilious temperament contains those who are of dark eyes and hair; broad and thickset. Mentally they are serious, and slower in thought and action, than those of the former temperament. They are good in business, not rash in speculation. They are apt to be spiteful and not very willing to forgive. They are very domesticated, good to their families, and being inclined to selfishness accumulate wealth.

The Sanguine folk are ruddy in complexion and hair, florid, blue eyed and broad in build. Whatever troubles come they are cheerful, impulsive, and never lose hope. They are also emotional and energetic, but changeable. They are just as happy over trifles as over big things. They are frank and outspoken, never spiteful or secretive. They are too superficial to be great students, and too happy-go-lucky to be disagreeable.

The Lymphatic or Lethargic people are fair, fleshy and heavy in build, often with brown eyes. They are mentally slow



and careful, very thoughtful in arriving at conclusions, and ready to forgive, being too lazy to be wicked or to cherish unkind feelings. They are never brilliant or active but plodding, and with great power of endurance. They spend little, and are very self indulgent.

It is dangerous for two of nervous temperament to marry, as the offspring may be neurotic in high degree. In any case they will probably be unstable, and are therefore liable to deviations in any direction, either good or bad.

A nervous temperament should be allied preferably to a lymphatic. One then gets stability of character from the latter, with the finer perceptions of the former. Nervo-bilious alliances are passable, and nervo-sanguine are good, lethargo-lethargic combinations are very bad, producing the lazy beings who block all progress, and also inverts, who so commonly become criminals.

## CHAPTER XV

### PHYSICAL DEGENERATION AND DEFICIENCY, EXTERNAL AND INTERNAL, SEEN AND UNSEEN

- (A) EXTERNAL STIGMATA.—FEW HUMAN BEINGS ARE NORMAL SPECIMENS : The criminal not a type—Lombroso's work—A broad middle line necessary—MacAlister on brain—Lunatic skulls.—ASYMMETRY OF SKULL AND FACE : We are two-sided and unequal—Abnormal skulls—Transverse diameter in normal skull—The palate—Thickening of the skull bones—Asymmetry of features—Lombroso's statements not quite trustworthy.—ABNORMALITIES AMONG GREAT MEN.—INFLUENCE OF ENVIRONMENT ON DEGENERACY : In Ireland : Juvenile adults—City lads—CRIMINALS' SKULLS—(B) CRANIAL MEASUREMENTS : A TECHNICAL APPENDIX : Cranial index—Very misleading : cases—No guide as to size.—DR. SUTHERLAND ON CRIMINAL HEADS : Circumference of skull—Two arches : anteroposterior and lateral—Family types—Ford Robertson's measurements.—ABNORMAL CASES : Idiots—Sir J. Crichton Browne's cases—Difference in area of surface of skull according to rank and education—Head measurements open to fallacies.—(C) SKULL DEVELOPMENT AT DIFFERENT PERIODS.—THE NEGRO SKULL : Our skull quite different from the ape's—The missing link—D'Aubenton's and Soemering's observations—Corrected by M. Broca—The facial index.—INTERNAL CAPACITY OF THE SKULL : Skull comparison open to great fallacies.—ARRESTED EVOLUTION IN LOWER RACES : The skull of pre-historic man.—DEGENERACY NOT A REVERSION TO PRIMITIVE MAN : Due to unseen causes—Changes in germ-plasm.—(D) INTERNAL, UNSEEN DEGENERATION : Destruction, or arrested growth of nuclei in brain—Infantile type of nose—Precocity among genii—Precocious children must not be forced—Observation by Robert Knox, the Edinburgh anatomist.

“*Deficiunt Vires*” (Ability is wanting)

#### (A) EXTERNAL STIGMATA

Few  
Human  
Beings  
are  
Normal  
Specimens

Too much importance is attached to external malformations, deficiencies and asymmetries. Few of us could pass as perfect specimens, whilst many with marked stigmata of degeneration have shown not only superior intelligence, but also high morale.

On the other hand a number of criminals are manifestly of very low type, showing every variation of irregular and malformed features, and arrested development. In them we find

in many cases arrested physical growth, combined with feeble intellect, and, as a rule, absence of moral sense.

The Italian Professor Lombroso has written very extensively and rather dogmatically on this subject, carrying his conclusions far beyond legitimate bounds; nevertheless, his works are now classical. They contain a collection of facts and evidence, not too complimentary, concerning every world-known character, for even if a man is too tall he is labelled by Lombroso as a degenerate. Morel and Feré (*La famille neuropathique*) have written a good deal on the subject of degeneration, but they go too far as they include every malformation to which the human body is liable.

In summing up physical abnormalities, we must make a broad middle line, and only regard as degenerate characters those very far removed from the common or average type. Too much importance has been attached to the size or shape of the head, nose, ears, palate, and even to the irregular colour of the eyes. Too large a face in proportion to the cranium is usually considered degenerate, but here again we often find ourselves in error.

Professor MacAlister pointed out, in 1898, that the "Brain shape determines the skull shape," and is the mould on which the skull is developed. But for results we have to depend on brain contents, and we often observe very large heads in idiots, yet they may be very deficient both in quality and quantity of nerve cells. The average size of lunatic skulls is below normal merely on account of the number of small-headed idiots, otherwise the ordinary lunatic's skull presents no variation from the normal type. Any who have visited asylums must have been struck by this fact.

Lombroso finds in asymmetry a profitable field for his theories of degeneracy. He is very unyielding, for we must remember that we are two-sided beings. We have in our bodies a strong right side controlled by the left half of the brain, and a weak left side governed by the right side of the brain, therefore some observers maintain that the left half of the skull is normally slightly larger and longer. The difference is however so small that we may dismiss it. Benedikt attaches no importance to the greatest asymmetry. Giuf-

Asym-  
metry of  
Skull and  
Face

frida-Ruggeri<sup>1</sup> on the other hand says the normal asymmetry merely consists in a little extra prominence on the left side of the forehead, and posteriorly of the left occipital bone.<sup>2</sup>

The midway opinion is probably correct, namely, that excessive asymmetry of skull is more frequent among the criminals and insane, if we include idiots, than amongst normal persons, and is evidence of some degree of faulty construction and degeneracy.<sup>3</sup> On the other hand some of the worst criminals are of perfect exterior; while many individuals who are externally degenerate are almost incapable of evil.

Lombroso describes skulls as abnormal if they are dome-shaped, keel-shaped, flat, narrow, broad, high or low, so that we all come somewhere within the category. Rather is it to be suggested that these variations occur as family types, and constantly interbreeding intensifies any variety.

We know that in the normal skull the greatest transverse diameter is behind the centre. If it occur in the anterior third, it is called "the insane type."

The palate is considered by many as of great importance as an indicator of physical degeneracy. It is generally considered that if the palate is very high, narrow, irregular or deformed, it is a sign of bad or neurotic heredity, while others maintain that they find many well-shaped and broad palates among idiots. Among intelligent criminals I have usually found broad palates, except among the neurotic ones, when they are narrow and high. It seems probable that people with narrow oval faces and higher skulls, lend their cranial architecture to narrow palates, and vice versâ.

Thickening of the skull occurs in about 25-50 per cent. of the insane according to different observers; so that the bosses and irregularities, being due to excrescences of bone, have no connexion with the brain, but are due to faults in development and primary malnutrition. The skull has been known to exceed one inch in thickness (Professor D. J. Hamilton). There are, however, great variations among the sane; thus a navvy may have a much thicker skull than an artist or

<sup>1</sup> *Journal of Mental Science*, 1888, and *Dict. Psych. Med.* 1892.

<sup>2</sup> *Riv. Sperimentale di Freniatria*, 1899.

<sup>3</sup> Read Sir George Humphries' notes on skulls in *Journ. of Anat. and Phys.*, vol. xxix, 1895.

literary man, and a larger, heavier brain also. We can therefore make no law in these matters; the question is one of types, and perhaps adaptations to surroundings which have taken several generations to build up. Thus though a navy might make an artist as a great exception, it would take several generations before a sensitive literary man, such as Ruskin, or a family of that kind, could produce a navvy.

Those wishing to follow up this subject cannot choose better works than those of Lombroso,<sup>1</sup> and Dr. Barr of America, and Dr. Bianchi. How Lombroso's information is gathered is a mystery, but it cannot carry much reliability, for how does he authoritatively know that Socrates was a cretin, or even that Rembrandt and Pope were such? How did he get access to their skulls? Carlyle and Darwin are also described by him as cretinoid.

Among the long and interesting list of abnormal men, I have picked out the following. Abnormalities among Great Men

Dante had an irregular left parietal skull bone.

Robert Bruce's skull was after the type of prehistoric man.

Kant's head was too broad.

Volta's skull was too heavy, and of aboriginal type.

In Byron and Humboldt the sutures or joints ossified too soon.

Descartes, Guido Reni and Schumann had small heads.

Milton, Linnaeus, Cuvier and Gibbon had hydrocephalus, or water on the brain, and so on.

With an apology to the friends of a great Nonconformist preacher, I must beg the right to make free with public men. I never saw any one who could sum up so many stigmata of degeneration as in his case. There seemed nothing left out, and yet how the light of his eye and his superior personality came out in expression, so to as draw more men to him than any before or since! The mental and moral qualities were all of the finest, but he was quite conscious of the way in which nature had neglected him physically and treated it with humour.

La Roche consoles the great by saying:—

*Il n'appartient qu'aux grands hommes d'avoir de grands défauts.*

"It is only great men who can afford to have great defects."

<sup>1</sup> *L'homme criminel* p. 142.

Influence  
of Envi-  
ronment  
on De-  
generacy  
in Ireland

Dr. Pritchard, an eminent psychologist, in his *Physical History of Mankind*, gives a remarkable illustration of the influence of environment on degeneracy. In the seventeenth century, conflict and oppression drove many finely developed Irish peasants into the mountains of Sligo and Mayo. Here they were exposed to great privations and starvation, which brutalized them, and their progeny degenerated.

He reported on them as of small stature, averaging 5 feet 2 inches, bow-legged, high cheek bones, depressed noses, projecting mouths, prominent teeth and exposed gums. There is no reason to doubt the accuracy of the observer, and, if true, we ought to endeavour to restore Nature's gifts where "hypocritical civilization has interfered."

Among the "juvenile adults" in prison, many of them only 16, a great amount of deterioration in physique and form is to be seen. Their skull measurements are quite up to the average, as compared with lads of the upper class, showing that nature has started them fair in many cases. They are just at the age when healthy exercise and occupation might restore that which nature demands, but what civilization has robbed them of. Examining the younger city lads, rescued and sheltered in homes, we find great diminution of stature and weight. Their intelligence is low, but they are without a marked excess of "stigmata" about the face and head. They likewise show a fair average in skull measurements. Malnutrition is their ruin.

Criminals'  
Skulls

Amongst criminals I find quite average-sized skulls, as may be readily seen by referring to the cases described. Comparing these with prosperous and upright city merchants there is no difference.

It is, however, only fair to say that many prison doctors do not agree with this statement. Thus, Dr. Wilson, in 1869, read a paper at the British Association in which he gave the results of 460 head measurements. He said they were cranially deficient, especially in the anterior lobes. Often there was a real physical deterioration, and 40 per cent. of the convicts were invalids.

(B) CRANIAL MEASUREMENTS<sup>1</sup>

## A TECHNICAL APPENDIX.

I have collected a few cases recorded by Ireland and Crichton Browne and others, which might suitably be compared here with normals.

In order to increase the interest of the subject, which to a few will be fascinating, I will give a sketch of the methods of measuring the skull.

One finds with a pair of calipers the greatest width and length, and from this calculates the

## CRANIAL INDEX

This is a comparative measurement, irrespective of size, and therefore appears devoid of scientific merit, as I will presently show.

The Cranial Index is found by multiplying the width of the skull by 100, and dividing by the length.

The figures work out usually between 70 and 85.

70 to 75 represents longheaded people (*dolichocephalic*).

75 to 80 are medium (*mesaticephalic*).

80 to 85 are broadheads (*brachycephalic*).

Outside these figures are extremes.

Intellectually, longheaded people are thought to be more impulsive, and carry less ballast than broadheads. This view is, however, very misleading, as some examples will show. Nevertheless both primitive man and the negro races are longheaded, whilst the type of the European is brachycephalic.

I selected a merchant prince in the city with an enormous head,  $8\frac{3}{4}$  long by  $6\frac{1}{2}$  wide (Case 133). His cranial index,  $74\frac{1}{2}$ , appears below the average. I compared this with another equally intellectual city merchant, and a conspicuously large head. The latter measured  $8\frac{1}{4}$  by  $6\frac{3}{4}$  with a cranial index of 82 (Case 135). The two heads are, however, of about equal internal capacity.

Place alongside two young offenders: one that of an intelligent poor lad, charged with "sleeping out," aged 18, with a cranial index of  $74\frac{1}{2}$ , whose head measures  $7\frac{3}{8}$  by  $5\frac{1}{2}$ ; the other

<sup>1</sup> This may be omitted by the lay reader, resuming again at C.

youth, with a cranial index of  $82\frac{1}{7}$ , measures 7 by  $5\frac{1}{4}$ ; he is also 18 and not only a thief, but a middle grade imbecile.

Selecting from some other cases, I know of a poor murderer with an index of  $74\frac{1}{4}$ , whose skull measures  $7\frac{3}{8}$  by  $5\frac{1}{2}$  and he is also mentally deficient. On the other side, out of 26 active who were ex-criminals of all sorts, I have 9 who vary between 80 and  $86\frac{2}{3}$ , which shows a larger ratio of broadheads than is normal. The index  $86\frac{2}{3}$  belongs, however, to a German ex-criminal, and the Teutons are broader in the head than their Anglo-Saxon cousins.

The cranial index is no guide as to size or intelligence, or else the young and deficient criminal would equal the capable city merchant.

Dr.  
Suther-  
land on  
Criminal  
Heads

Dr. G. H. Sutherland, Commissioner of Lunacy in Scotland, from a large number of statistics finds a difference in size of skull in different classes of criminals, but the variation in size is small, and from my measurements I cannot formulate any similar conclusion. I find a most dangerous man is the possessor of the largest skull,  $8\frac{1}{2}$  by  $5\frac{7}{8}$  with the lowest index  $70\frac{2}{3}$ . One sees by these many cases or by a glance at the tables, that the cranial index or head measurements are absolutely of no value in the study of this wide question of criminality. The other ex-criminals run chiefly from  $7\frac{1}{2}$  to  $7\frac{3}{4}$  in length, and about 6 in width, which are quite average sizes.

One would expect some definite results from closer measurements of the skull, and I have made a table of both normals, exceptionals, criminals and "embryonic" criminals, if I may so term the youngsters whom we are steadily pushing into that "class."

The circumference of the base is taken just above the brows and round the occiput.

There are then two arches:—

(1) Antero-posterior, from the glabella, or prominence above the root of the nose to the occipital point behind: and

(2) The transverse or lateral, from the upper border of the auditory meatus, or orifice on each side.

Family configuration causes a certain amount of variability, so there is always a margin for inaccuracy.



Dr. Ford Robertson<sup>1</sup> gives the average measurements of a normal male British skull as—

*Mesaticephalic*—78 cranial index.

	Inches.	Millimetres.
Circumference . . . . .	19½ to 21	495 to 545
Length . . . . .	7¾	—186
Width . . . . .	5¾	—144

I have been unable to find observations on the arches, but they seem to vary from 12½ to 14 inches—320 to 355 millimetres (including boys). It is most interesting to notice in the tables that the two arches are very often equal in the same skull. These should of course be mesaticephalic, but the indices do not always corroborate this.

With these brain weights and skull measurements we might now consider some extreme abnormal cases. Abnormal Cases<sup>2</sup>

(1) A paralysed idiot of 10.

The skull—

	Inches.	Millimetres.
Circumference . . . . .	20	510
Antero-posterior arch . . . . .	12½	320
Transverse arch . . . . .	13	330

The brain weighed 48 oz.

(Cerebrum, 42 oz.; Cerebellum and medulla, 6 oz.)

Here then we have an idiot with a small but normal skull and a brain slightly above normal weight.

(2) An epileptic idiot.

The Skull—

	Inches.	Millimetres.
Circumference . . . . .	18⅝	480
Antero-posterior arch . . . . .	11⅝	300
Transverse arch . . . . .	11⅝	300

The right half of the brain (cerebrum) weighed 21 oz.

The left " " " " " " 16 oz.

In this case the two should have weight 42 ounces.

(3) Hydrocephalic idiots.

Average of several cases of both sexes—

Skull—

	Inches.	Millimetres.
Circumference . . . . .	20-24	510-630
Antero-posterior arch . . . . .	15¾-16½	400-420
Transverse arch . . . . .	15¾-16	400-410

<sup>1</sup> *Pathology of Mental Diseases.*

<sup>2</sup> See Ireland's work on *Mental Affections of Children.*

These are collected from Dr. Ireland's writings, he being one of the greatest authorities on this class of mental disease.

Lombroso furnishes five cases of Microcephalic idiots.

Case.	Age.	Size of Skull.	Circ.	Arches.		
				Ant.	Post.	Lat.
1 . . .	10 . . .	$5\frac{1}{4} \times 4$ . . .	16 . . .	9		8
2 . . .	13 . . .	$5 \times 4$ . . .	16 . . .	10		8
3 . . .	21 . . .	$6 \times 4\frac{1}{2}$ . . .	17 . . .	$9\frac{1}{2}$		9
4 . . .	— . . .	$5\frac{1}{4} \times 4$ . . .	15 . . .	—		—
5 . . .	— . . .	$4\frac{1}{4} \times 3\frac{3}{4}$ . . .	$13\frac{1}{2}$ . . .	$7\frac{1}{4}$		$7\frac{1}{4}$

The fifth case was the celebrated idiot, Antonio Grandoni, who was like a mischievous brute. His brain weighed only 289 grammes, or  $10\frac{1}{2}$  ounces, and the convex surface was 11,310 square millimetres, which is about  $\frac{1}{20}$  of the average.

Middlemass recorded in the *Lancet*, June 1895, an idiot's brain weighing  $65\frac{1}{2}$  ozs., or 1850 grammes. This idiot lived to 70. On microscopic examination the cortical cells were very few, but the non-active supporting tissue was in great excess.

Walsen in Germany published an account of an idiot's brain which weighed 2,028 grammes, or about 72 oz. This man only lived to the age of 22, and was an epileptic. He had a very small complement of active brain cells.

Sir J. Crichton Browne<sup>1</sup> has made a large collection of brain weights in the West Riding Asylum.

(1) Idiots—averages.

		Oz.	Grms.
Males . . . . .		$40\frac{4}{5}$	1,156
Females . . . . .		34	1,019
Cerebrum only in males	{ R. half . . . . .	$18\frac{1}{4}$	518
	{ L. half . . . . .	$17\frac{1}{4}$	490
" in females	{ R. half . . . . .	$15\frac{3}{4}$	446
	{ L. half . . . . .	$14\frac{2}{3}$	415

(2) Imbeciles—averages.

Males . . . . .		$45\frac{1}{4}$	1,282
Half-cerebrum only	{ R. . . . .	20	563
	{ L. . . . .	$19\frac{1}{2}$	552
Females . . . . .		$42\frac{3}{4}$	1,211
Half-cerebrum only	{ R. . . . .	18	533
	{ L. . . . .	$18\frac{1}{2}$	525

<sup>1</sup> *Brain*, 1880.

(3) Melancholics—averages.

Males . . . . .	49 $\frac{3}{4}$	1,410
Half-cerebrum { R. . . . .	22 $\frac{1}{4}$	630
{ L. . . . .	22 $\frac{1}{4}$	630
Females . . . . .	43	1,220
Half-cerebrum { R. . . . .	19 $\frac{1}{2}$	550
{ L. . . . .	19 $\frac{1}{8}$	540

(4) Senile decay—dements—averages.

Males . . . . .	46 $\frac{1}{2}$	1,320
Half-cerebrum { R. . . . .	20 $\frac{1}{2}$	576
{ L. . . . .	20	570
Females . . . . .	41	1,180
Half-cerebrum { R. . . . .	18	515
{ L. . . . .	18	510

These researches were reported in *Brain* in 1880 and show an amount of very accurate and valuable research.

It shows that melancholics are about average weight; while seniles lose about  $\frac{1}{4}$  in brain weight or 7 per cent.

Epileptics usually have large heavy brains, and thick skulls, of rounded shape. It would seem as if the fits represented explosions from high tension of accumulated nerve force.

In general paralysis, as disease advances the brain falls in weight, in some cases very rapidly. This is due to wasting of the cortical surface, especially in the association areas, as well as to the decay of the fibres in the white substance underneath; the space thus produced in the skull is then filled up with clear fluid, almost like water.

Lombroso<sup>1</sup> has observed amongst five persons having the same brain weight, that there is a difference in the superficial area of the head between the educated and the uneducated. He gives four cases to illustrate this:—

	Brain weight.	Head surface.
(1) Fuchs, a physician	53 oz. or 1,499 grms.	221,005 sq. cm.
(2) Gaus, a mathematician	52 $\frac{2}{3}$ " " 1,492 "	219,588 "
(3) A common woman, unknown	" 1,492 "	204,115 "
(4) A common workman	" 1,492 "	187,672 "

This subject requires many more cases, but seems to suggest that given equal weights, the intellectual brain is more spread out in its cortex, which is the intellectual region.

It is certainly more correct to measure the surface of the

<sup>1</sup> *L'uomo diling.*

head than guess its size and capacity by merely measuring the length and width, for the dome varies greatly in height, as my measurements show.

### (C) SKULL DEVELOPMENT AT DIFFERENT PERIODS

In regard to the general outline of the skull at different periods of life, it is seen that in the infant the skull is chiefly developed behind in the occipital part. During the childhood the temporal area develops, while as adolescence approaches the skull develops frontally. This was pointed out by M. Gratiolet, who also observed that in woman the elongation of the head was due to development in the temporal region, and so nature has placed her midway between the child and adult man. If this be so, it gives food for solemn reflection to the modern women, who wish to change their place in nature with the stronger sex.

The  
Negro  
Skull

A negro, being on a lower plane of evolution, is developed in the occipital region rather than frontally, which latter marks the white races. The negro, therefore, presents the infantile type of mind, which explains their servile position, and would justify slavery if it could be combined with humanity. Some who are keen on evolution suggest that we are descended from the apes. But M. Broca and others have shown by careful skull measurements, in relation specially to the distance of the projecting upper jaw from the foramen magnum, that our skull bears no direct relation to that of the ape. It certainly may cause anxiety to some, to be deprived of a supposed Simian ancestry, but it rather sets at rest the missing link which never existed except in the imagination of its author. Aboriginal man undoubtedly came from man and not from monkey, but there are many other anatomical facts and relationships, including the evidence of embryology, which indicate evolution. Of special importance is the idiot's brain in Chapter V which reverted to the carnivora. That case shows there is a link. The link is not missing but invisible.

D'Aubenton<sup>1</sup> said the foramen magnum (which is the opening at the back of the skull through which the spinal cord passes

<sup>1</sup> See Quatrefage's *Social Evolution*, Chap. XXVI.

on to the brain) was further back in animals than in man. Soemering also thought that it was placed further back in the negro than in the white races, which would look as if the negro was more closely related to the ape than we are. The error arose from measuring the skull as a whole. The negro's upper jaw is prognathous, that is, projects further forward than what is normal in white races. Broca corrected this by measuring from the anterior margin of the foramen magnum to the alveolar or posterior border of the upper jaw, which prevented error from the variable prognathism. M. Broca compared 60 European with 35 negro skulls. If 1,000 represents the total projection, a negro's is 498 and a white man's 475, only a difference of 23. Therefore, the foramen magnum is more forward in negroes than in whites, whereas it is the reverse in apes, which cancels any resemblance between the ape and the negro.

In comparing individuals of lower grade, Camper suggested the facial index as a measurement. This angle is found by taking the length of the face from the tip of the chin, to the tip of the nose where it joins the forehead, multiplied by 100 and divided by the greatest width between the cheek (malar) bones. This in white races works out about  $80^\circ$ , in yellow races about  $75^\circ$ , in the negro  $70^\circ$ , and in the higher apes  $65^\circ$ .

But all these measurements are subject to much error. The most accurate is that of the internal capacity of the skull, obtained by filling it with shot, which of course cannot be practised during the lifetime, so that it is not a present help. The European skull varies from 1,200 cubic centimetres to 1,900 cubic centimetres in its capacity. Broca, however, considered that if the cranial capacity of the aboriginal Australian were 100, that of the African negro is 112, and of the fair European 125.

Careful measurements by Broca place the Italian and the Maori on the same platform, likewise the Parisian and the Malay, the German and the Annamite, the Jew and the native of New Guinea. None of the superior races can be grateful for the compliments. Such comparisons show that external manifestations cannot carry much weight.

Internal  
Capacity  
of the  
Skull

Arrested  
Evolution  
in Lower  
Races

Broca thought that the lower types in the coloured races were due to arrest of evolution, and I think we may also safely look upon the so-called physically degenerate as examples of arrested development during the infantile or prenatal conditions as stated in the previous chapter. Some describe such as a reversion to primitive ancestry. We have not enough information on this subject, and what little we have does not support this view; for though the Neanderthal skull found in Germany is of low type, yet the Cromagnon skull found in France, in the valley of Vezire, in 1858, was of superior type. M. Larlet described it as having a large open forehead, and an aquiline nose, with a capacity of 97 cubic inches, or 1,590 cubic centimetres. The cranial index was 74, which is quite respectable and long-headed. These people stood about 5 feet 10 inches; they were, therefore, superior to our poor degenerate brothers.

Degen-  
eracy not  
a Rever-  
sion to  
Primitive  
Man

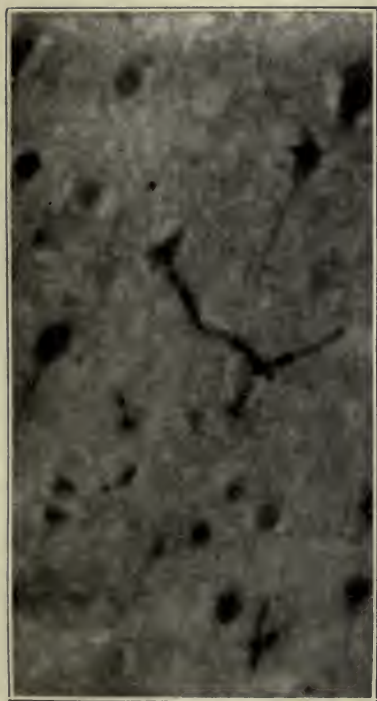
External physical degeneracy then is probably not a reversion to primitive man, but due to internal unseen causes, such as arrest of development, or of natural evolution. In this treatise the probable causes are put forward, especially in the part given up to heredity, hybrids, and to environment, such as poverty and alcoholism. There is an alteration of the germ plasm, and while some of the variations are downwards, others, as genii, are upward.

#### (D) INTERNAL UNSEEN DEGENERATION

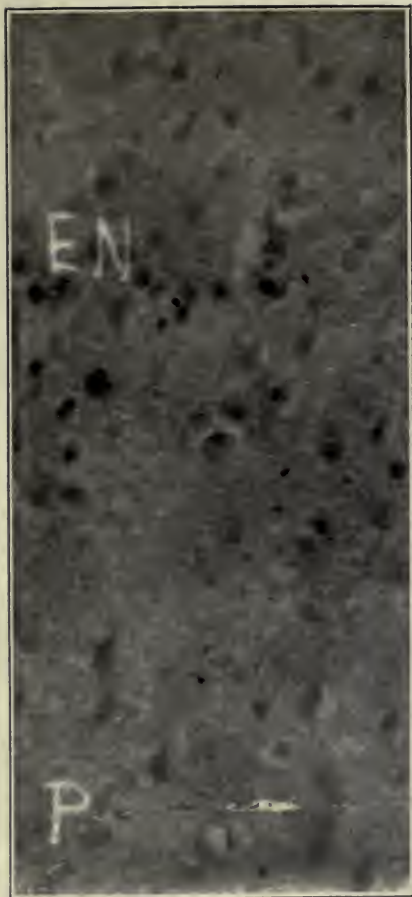
Destruc-  
tion or  
Arrested  
Growth of  
Nuclei in  
Brain

Referring to Chapter XIV the lay reader will see that I advance the theory that the nuclei of the brain cells are laid down before birth and are called neuroblasts, and form the main factor in growth and development. If any of these are destroyed, loss of function in the part governed at once occurs. Conversely, if they are arrested at certain stages of development in childhood or youth, there would be a corresponding under development of that part (figs. pp. 101 and 132).

This explains how many adults retain infantile types such as we see more frequently among the poor, who are ill nourished, and especially the syphilitic. The infantile type of nose, hollowed at the bridge, persists with many adults.

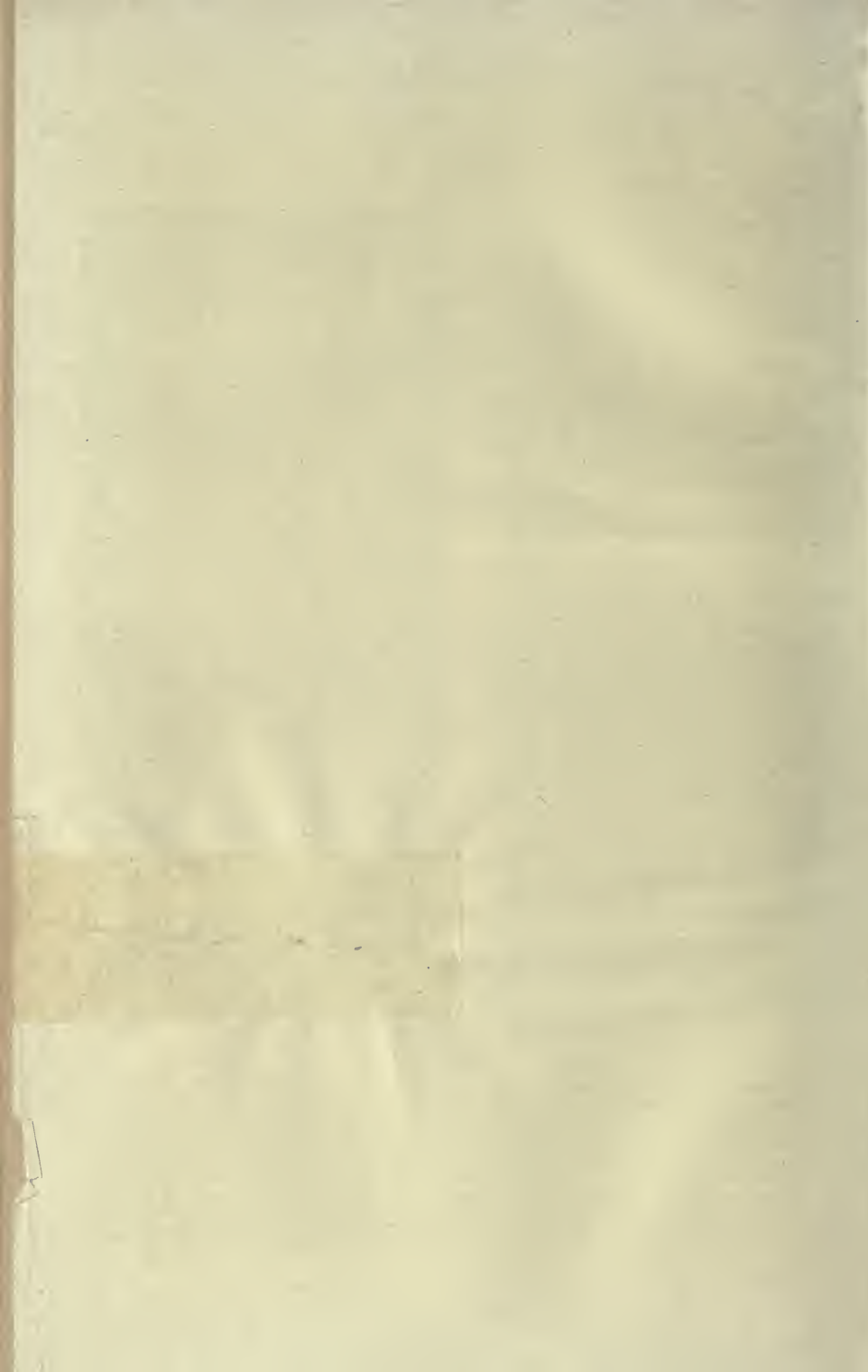


A



B

These instructive and practical photographs show the extreme outer or upper surface of the pyramidal layer in (A) a normal man, and in (B) a degenerate. In the former, there are well-developed though small pyramidal cells. In the latter, a murderer, there are undeveloped cell nuclei or neuroblasts, and below, badly shaped imperfect pyramids. This lends support to my theory that the degenerate lives in a realm of his own. He is not insane, for he has never been sane or normal as in A. Nor is he an ament or imbecile, for their brain cells and nuclei are absent; whereas in B the nuclei are laid down abundantly, but remain undeveloped as in infancy. Hence the criminal has the will or control of a child.





Precocity is considered a form of degeneracy, being a process of over-ripening, with the natural consequence of premature deterioration. These are cases in which it is wise to hold back the brain until the body matures. Unfortunately parents are sometimes so pleased with the extraordinary talent of the child that they press him on, adding to the evil. Some break down early and occasionally become permanently damaged, whilst others are dullards when they reach their teens. It is far safer and wiser to restrain children and allow their brains to grow with and not before their bodies. Precocity

There are of course exceptions, where great men have been precociously intellectual from childhood, but they are in the minority. As examples of precocity, Lombroso mentions :—

Dante at 9 wrote a sonnet to Beatrice.

Goethe at 10 wrote in seven languages.

Victor Hugo composed a novel at the age of 15.

Pope wrote an ode to Solitude at the age of 12.

Raphael was famous when 14 and Byron was a writer when 15 years old.

He supports the view that “a man who is a genius at 5 is mad at 15.” The reason is that precocious children are unstable, and with deficient nutrition superadded, they often break down about puberty.

Those who wish to pursue the whole of this subject further should read *A Manual of Artistic Anatomy*, by the great anatomist Robert Knox of Edinburgh.

Speaking of the malformed ear, he says, “the lobe is peculiarly human, and when wanting in man or woman causes the ear to resemble the ear of the ape. When the helix is wanting and the ear is spread out it resembles that of the ass or dog.” Knox formulated a new law by stating that all such varieties, or as we now call them, degeneracies, are comprised in “the law of unity of the organization,” which we call atavism or reversion. On the other hand, when beauty and perfection of form and development obtain, it is the carrying out of “the law of specialization,” or, as Darwin termed it, “natural selection.”

## CHAPTER XVI

### EDUCATION

Scotch *versus* English.—EDUCATION AND CRIME : Decrease of crime due to social improvements—Crime changes with the times—Increase of lunacy since education.—EDUCATION BILLS : Scotch methods—The railway porter and Greek Professor—The city sparrow *versus* public boy.—ENGLAND UNPREPARED FOR EDUCATION : Philanthropic enterprise killed—Compulsion and starvation—Delayed mental development of the poor—Free meals—DIETARY FOR THE POOR.—THE CARE OF THE JEWS FOR THEIR CHILDREN : The poor healthier without shoes.—OVERCROWDING OF CLASSES : Practical comments from a teacher—Tendency for State methods to improve.—WHAT EDUCATION IS : Parents' duty—Education begins in the cradle—Sights, sounds, muscle training, touch—Faculty of speech : the highest motor act.—STIMULATE AND GRATIFY INQUIRY IN THE YOUNG : The storage in the sensori-motor area—For reference by the association processes.—NATURE STUDY AND THE DEVELOPMENT OF LOGIC : Induction and deduction—Common sense or intuition.—CONTRAST BETWEEN THE UNEDUCATED AND THE EDUCATED—LANGUAGE : In the lower animals and savages—Monosyllabic—In infants—The dead languages—The growth of language—Due to science.—DEFICIENT CHILDREN : Must make haste slowly—Symptom of deficient children—Phenomenal memory in imbeciles—Zerah Colburn, the lightning calculator.—TREATMENT OF DEFICIENT CHILDREN : Results : many recover—Cause of anxiety—Become invert—The higher morals—Imitation the key of training children.—PARENT IS TRUSTEE : Fashionable women and nursing.—THE SIN OF THE STATE IN DESTROYING PRIVATE SCHOOLS : A model private school—Science and school.—THE PERSONALITY, THE SECRET OF A SUCCESSFUL SCHOOL.—THE STATE METHODS DESTROY INDIVIDUALITY : Early memories blotted out by State education—Board school children cannot remember before the age of five as a rule—and start life handicapped—They have no energy left to learn skilled trades—Not “born tired,” but “made tired” by the State—Mr. Llewelyn's report to the Government on the flourishing condition of the barge children.—STATE RELIGION : Church schools.—RELIGIOUS TRAINING VERY IMPORTANT : No dogma—The Bible quite safe—Singing religious and moral songs—Children pliable like clay—Encouragement to teachers.—THE THREE R'S HAVE FILLED MANY A PRISON : Instructed degeneracy dangerous—Bad literature—The prevention of crime by education.—MUST TRY TO UNDERSTAND THE POOR : Desire conquers will which is stunted—Juvenile prisoners.

“Ignorance is a heavy burden.”—*Gaelic Proverb.*

THE evolutionary process of the brain depends on education ; whereas the devolution of the mind is fostered by unwise

methods of instruction, an error which the State has steadily pursued since the seventies, when England made the effort to become educated as a whole. Before then it seemed as if Scotland were a foreign land, for, being accustomed to meet hundreds of adults in England who could neither read nor write, it was strange to find the poorest children over the border fairly well educated. The rivalry, or jealousy, of the two lands perhaps prevented England from following the example of Scotland: a great pity, for in matters of education, law, and whatever requires brains, the Scotch always excel. The Scotch children are educated, and now after more than thirty years, our own poor remain uneducated. They can manage the three R's, and are so far instructed, which is an advance, as it opens the portal for those who are keen to improve themselves. But instruction is not education.

Several members of Parliament are fond of stating that education has diminished crime. Whilst admitting that Board School teaching has improved the morals of the poorer children, yet no account is taken of the great strides of Temperance reform and the many social improvements. Moreover, crime is always changing with the times, as are also the indictable offences, and the quantitative and qualitative methods of administration. As crime is a more variable quantity than insanity, we might at all events see what the ratio of insanity is during the stress of education.

Educa-  
tion and  
Crime

The numbers of lunatics per 10,000 were :—

In the year	1871	England and Wales.	Scotland.	Ireland.
„	1881	30·4	34	30·5
„	1891	32·6	38·5	35·6
„	1901	33·6	38·4	45·0
„	1901	40·8	45·0	56·2

Crime has its fashion and must be up to date, or it would die out. Crime aims at being a science as well as a refined art; the older clumsy and often brutal methods are passing away, and this alteration, one freely admits, is due to modern education.

I am not in a position to argue as to the technique and merits of the various Education Bills, but, like many others,

Educa-  
tion Bills

feel competent to express an opinion on the results. In Scotland there is every variety of educational institution open to any child. Whatever is required to enable the bare-legged Scot to become superior to his Southern rival is ready to hand in profusion.

Fancy a railway porter attending University lectures, and obtaining a degree in Arts. Of course many will say it shows the ease with which such honours can be obtained in Scotland, for it would seem to many that a railway porter's brains could not equal those of our well groomed 'Varsity men. The only answer is, that the railway porter was taken on as professor of Greek at one of the Oxford colleges. Such things continue, because the Northerners have more grit in them.

Observation shows that some of the poor city lads and juvenile offenders have as much intelligence, which only requires developing, as the average public schoolboy. We are killing mentally and physically hundreds and thousands of our best national assets.

England was unprepared for such sudden universal and wholesale education, yet things were in a very unsatisfactory condition. The event of the seventies was a political earthquake, in which the children have been the sufferers. Free and charitable schools, worked for the love of the children, were exterminated, and many teachers, who fulfilled their trust faithfully to the children and the nation, were ruined by competition.

The compulsion to attend school tells very heavily on the starving poor, and the injury to the badly nourished and defective children spells ruin for their future careers. Such children should not be at school, or working their brains. They are far better playing about the streets, so that their intelligence may gradually evolve. These children at the age of 8 are only equivalent to well-favoured normal children of the age of 4. Hence these "city sparrows" should be treated on different lines. I attribute the extreme intellectual dullness of these waifs to this system, which leads to mental confusion and brain exhaustion for life.

There is a great deal of philanthropic agitation in favour

of free meals for starving school children. It is as hopeless to expect mentation and brain development from a starving child, as to move the Cornish express if there is no fuel underneath the engine boiler.

On the subject of dietary I might perhaps make a few helpful remarks. The poor, under the instinct of imitation, think they can only live on the same dietary as the rich. They therefore aim at a meat dietary. This is expensive and not as beneficial as other foods. Milk is expensive, but cheese is cheap and one of our best foods. It contains casein, albumin, fat, lime, phosphates and leicithin. This last, a phosphorus compound, is of great value in building up the nervous system, and encouraging physical development. Potatoes are very wholesome, containing 20 per cent. of starch, beside albumin and salts which improve and purify the blood. This fact is well appreciated on sailing ships in order to prevent scurvy. Wheat, maize, oatmeal and rice are all cheap and rich in starch, moderate in albumin and fats. Most valuable are peas, beans and lentils, being equal to meat in albumins, and twice as nutritious as wheat. Those interested in the poor should endeavour to educate them on these lines, and devise palatable methods of cooking cheaper foods.

Dietary  
for the  
Poor

The Jews set us a good example in domestic life, which is the chief reason of their durability. They are most careful of their children in matters of feeding; it is a common sight to see the Jewish mothers giving them food boluses or tit bits during the intervals of school.

The Care  
of the  
Jews for  
their  
Children

There is a great desire on the part of the county councils to see poor children well shod. It is a mistaken sympathy, for children are stronger without either shoes or stockings. The money spent on cheap shoes and stockings would be better used for food. Bare feet dry quickly, whereas feet in wet boots lower the vitality.

In State schools the overcrowding of classes, in order to spend less on salaries, is an effectual block to educational progress. The rules limit each class to sixty, but the numbers frequently reach three figures. One teacher told me she

Over-  
crowding  
of Classes

had 120 in her class. They were under four years of age, and had to be taught the alphabet, and to spell words of two letters. I have some notes from an intelligent teacher, who writes the following about examinations :—

“Some years ago, to satisfy the Inspector’s requirements, cramming had to be resorted to,” but now the aim is to examine “the nature of the teaching itself. Specific knowledge of the children is not so much examined now, as their ability to use their own common sense, to find out things for themselves, and to lay the foundation for an active mind rather than a passive receptacle for dates in history, lists of rivers and towns, etc.”

I quote these remarks in fairness to show the recent tendency to improve the past injurious methods : but I feel sure that a great deal of excessive cramming and examining still continues. I find that these excessively large classes of over sixty in number still continue, and that the pupils receive little if any personal attention or influence in consequence. No class should exceed thirty, and the younger children should be limited to groups of ten. Individuals could be studied, the clever children sent forward, and the slow or deficient ones allowed to lie fallow. As things are, children are often pushed up one standard higher than they should be. This is confirmed by Mr. Wheatley, who says few of his lads are equal to the standards they are in. A teacher tells me, the deficient children are numerous, and are pulled along in the crowd comprehending little of what surrounds them.

What  
Educa-  
tion is

Having satisfied my conscience a little by unpleasant remarks as to the present woful measures in education, I will call the parents’ attention to what education really is. The State instructs, but parents can never shift their own responsibilities to other shoulders. Education commences in the cradle, at which period the little life must be joy. A child is not fractious if in health, and therefore the physical cause of a bad-tempered baby must be traced and removed. Everything around a child must be bright in colour and clean. Physical cleanliness paves the way for mental purity.

The sensory centre of hearing must be educated to pleasant sounds ; the soothing voice during suffering : in health the

cheerful lively tones : and above all, much singing of simple hymes and tunes, which should be accompanied by muscular movements of the limbs as the basis of harmony, which is the secret of contentment and prosperity later in life.

The centre of touch is the one which appeals to the infant first by way of encouragement and self-control, which are the two most important functions in forming the basis of character. How distressing it is to see short-tempered parents handling their children roughly ! How surprised the children sometimes look ! The parents however are really to be pitied, on account of their depravity. From its cradle the child appreciates gentleness, and what soothes the little broken heart more than the mother's hand !

When the speaking stage commences great attention should be paid to the proper pronunciation of words ; or, to put it differently, the correct muscular action involved. No less important is correct breathing. The old idea of silence in children is as much to be discouraged as sitting in a chair all day instead of romping. Children should be brought up to express themselves intelligently and without nervousity. As vision is the highest sensory function in man, so is speech the highest motor act, and therefore merits its full complement of attention.

There is no greater pleasure or privilege than the daily care and education of one's children. Inquiry should be stimulated and always gratified. Any object that is being examined should be dealt with to the minutest detail, so as to fix as many brain impressions as possible. If we take an apple or an orange there are the shape, colour, taste, odour and composition to be examined ; the demonstration that the real fruit is in the pips, and that we only eat the pulp or covering ; the nature of the seeds, the countries the fruit comes from, the subject of tree grafting ; the commercial values, and other endless details with allied interests.

The education of the sensori-motor centres consists in the storing up of facts. These facts are not to be left like dusty volumes in a library. They are for reference and for comparison through the medium of the higher processes of association.

Stimulate  
and  
Gratify  
Inquiry  
in the  
Young

Nature  
Study  
and the  
Develop-  
ment of  
Logic

Study will become pleasant and attractive the more the child is drawn towards the works of Nature. Perception increases, accuracy of observation leads on to comparison between objects, classifying resemblances or differences. It will not be difficult to develop the powers of reasoning or argument, following up first the inductive, and later, the deductive methods. It is the former, or method of induction, which develops the child's brain. Here it proceeds from the mass of individual facts which it observes to find out some general law or principle. Induction is a process of analysis. Later on, from the more general knowledge, the child will argue to particular cases, after the deductive method or synthesis. Deduction consists in examining general principles to find out a particular truth, sometimes a theory or hypothesis.

As mentation increases many facts and associations become so impressed that they pass more or less from consciousness to subconsciousness, forming the basis of what we call common sense, or more correctly intuitive perception. Some call it the subjective mind. A poorly educated person thinks slowly and with effort, but a brain well stocked works with rapidity, and acts partly subconsciously.

Contrast  
between  
the Un-  
educated  
and the  
Educated

There is more expansion, or as it is termed in logic, extension in the meaning of words, in the educated mind. What does any flower convey to the mind of an ordinary person as compared with a botanist?

“A primrose by a river's brim  
A yellow primrose was to him,  
And it was nothing more.”

—Wordsworth.

Who reaps in one of Turner's paintings so much intellectual pleasure as an art critic? Or what does the word “book” imply to an English ploughman as compared with a student?

Languages

One of the evidences of intellectual growth in the human race is the expansion of language. The monkey tribe have eight or ten different vocal symbols. The lower animals, cat and dog, have only expressions of their emotions, as pleasure and anger. The Bushmen and savage races have feeble and limited vocal development: and most of the



African and some of the Asiatic races depend entirely on monosyllables.

Infants likewise begin by using sounds to express their emotions, and later employ monosyllables, which require very simple muscular movements.

The dead languages are very limited and would be no use to us now. The Persian vocabulary reached 379 words in their cuneiform inscriptions, and the Egyptians only got to 50 words. To illustrate the growth of language amongst ourselves: the Old Testament contains about 5,600 words, while Shakespeare has 15,000 different words. Webster's dictionary, which at first contained 40,000 words, has now grown to 70,000. The Germans, who are very prolific, can count 94,000 words in Flügel's dictionary. Though there are only about 500 root words, Max Müller estimates the English language to contain about a quarter of a million words. Science is responsible chiefly for this rapid development.

Children mentally deficient are usually poor in language; their ideas, being necessarily limited, require little expression. It rests largely with the parents to help on the mentally weak, but where the parents have no time to bestow, then institutions are second best. Children not actually deficient, but backward, are very numerous, and they must make haste slowly. The more anxious parents or teachers or county councils are to push them forward, the more they stumble and the more permanently they are damaged.

Deficient  
Children

A deficient child, according to the degree of deficiency, is slow in its movements; lacks initiative; stops too long over one subject; and is dull in perception or recognizing persons or objects. Eyes and ears are there as receptacles, but there is no analysis of the sensations, and no recall or memory of past impressions. Such a child looking at a picture fixes its attention on one object, and cannot make a concept of the whole. As a rule their memory is very poor, many cannot remember anything earlier than 5, 8 or even 10 years of age. It will appear therefore strange to most of us that some imbeciles are gifted with extraordinary memory, being able to repeat columns of newspaper after once reading. But these imbeciles could not repeat a sentence in the middle

without beginning at the commencement. Occasionally they are good at figures, sometimes phenomenal, doing difficult sums without the aid of paper or pencil. The most remarkable lightning calculator that I know of was Zerah Colburn in the United States<sup>1</sup> who, at the age of 8 could solve any arithmetical problem without visible assistance. Thus, when asked how many minutes in 48 years, he answered at once 25,228,800; and seconds, 1,513,728,000. He also raised 8 to its sixteenth power, which goes to 15 figures, 281,474,976,710,656. He was brought to England on show in 1812, but ended in failure, being mentally feeble in his teens. No explanation is satisfactory, though the mystics associate it with the subjective mind, which is not clearly defined by them. These precocities are difficult to explain, and rather to be envied.

The ordinary deficient children lack moral courage and are usually timorous, always fearing personal danger. In tastes they are dressy, vain and emotional, or else the very opposite.

Treat-  
ment of  
Deficient  
Children

No progress can be made until the affection and the confidence is gained by the person in charge. After much labour some of them will come all right, and take their places in the world. Others will be weaklings for life, and have to occupy easy billets without much strain. Among the well-to-do they do not cause a great deal of anxiety as they are so sheltered, but among the poorer middle classes difficulty arises. Having no powers of concentration or application they never settle for long to one occupation, and their natural tendency is to vagrancy, showing strong opposition to being guided.

What becomes dissipation in the rich becomes crime in the poor, for these deficient go to make up the mass of inverts in society. The higher moral sentiments, which are all offshoots from one stem, sympathy or love, though developing from within, must nevertheless be cultivated. Some children are naturally kind and good, "born saved," others are selfish, cunning and cruel, or "born lost." As imitation is the most powerful factor in training, the parental example should be a constant guiding light from the earliest infancy.

<sup>1</sup> See *Annual Register* for 1812.

A study of the chapters on heredity will show that the parent is the trustee of the child, and when people engage in marriage they must not live to themselves, but discharge their trusteeship faithfully. Many fashionable women, chasing the worthless vanities of society, actually decline to nurse their children, in order to continue their gay and selfish lives.<sup>1</sup> Such women deserve prison, however wealthy they may be, as they sin against the commonwealth, for they are guilty of a slow moral and mental murder. If a woman cannot be bored with her child, she should consult the surgeon in the interest of future events.

Parent is  
Trustee

State education has occasioned great loss in destroying private schools, which represent the ideal system. In a model private school the number of children should be sufficiently large to establish a healthy community, but not so large as to prevent individual interest and supervision. The teachers must attain a high degree of culture and refinement. Thirty years ago, classics and mathematics were greatly overdone, but more recently science has been introduced. Science provokes observation and reasoning, and is the greatest stimulus to mentation. The success of a private school depends entirely on individual efforts, which in turn stimulate healthy rivalry and competition.

The Sin  
of the  
State in  
Destroy-  
ing  
Private  
Schools

The personality of the staff is of immense importance in the character formation of the scholars. This is difficult to obtain by state methods, for the teachers are underpaid and overworked, while the children are all cast in one mould, individuality perishing at its birth.

The Per-  
sonality  
the  
Secret of  
a Success-  
ful School

In my examination of criminals I was struck by the fact that few can remember any event in their lives previous to the age of five. When I found the same among Mr. Wheatley's first offenders and again among the poor lads at the "Homes," I put it down to malnutrition. But when the sturdy, well nourished country lads in Cornwall and elsewhere exhibited the

<sup>1</sup> I have before my mind a society lady, who is so busy attending parties and giving dinners that she often does not see her seven months old infant for ten days at a time. Fortunately the old nurse is capable and kind.

same deficiency, I saw that lack of food could not be the only cause.

Frequently I have found children who have reached the sixth and seventh standards unable to go further back than the ages of 6, 8, and even 10.

The Council schools insist on children of 5, whatever their condition, passing into the thought-destroying machine. Some go at 3. God help them!

At the age of 5 the brain weighs about 32 ounces, which is  $\frac{2}{3}$  its full weight, the latter being attained at the age of 10. Though the weight and material be prepared, its evolution or functional development is a gradual process occupying years. If the child be in good health, the state method of overpressure is wrong, but if the child be starved, delicate or neurotic, the state inflicts untold mental suffering and injury, which may wreck the future career, and even thereby make criminals.

At this stage of half-way development, the pressure of instruction is forced on the young brains, amidst unhealthy surroundings. A subtle tissue like the brain is unequal to the stress, and past growth or evolution is damaged permanently; hence the absolute mental blank of early life. Nevertheless the State continues to drive in its instruction for another 7 years, and then when the mind should be rapidly evolving, the child is cast out on the world with a damaged organ. Damaged, nay ruined! The early evolution up to 5 is destroyed, and it requires neither persuasion nor argument to convince any one of the futility of success by building on a damaged foundation.

What does the State do?

Hundreds and thousands of its young victims are annually cast on the world with damaged brains, and therefore inferior mentation and lowered morale. There need be no surprise that they have no brain energy with which to tackle skilled occupations. Their brains are worn out, and they can only undertake easy jobs and unskilled labour. They are more inclined to loaf or even pass into the shady avenues of crime. I was much struck by a sturdy lad of 17, who asked me if I knew of a situation, stating conditionally "there must not be much work in it." One might blame him for laziness,

but one must not be too harsh on these State-crushed innocents. It was not that he would not ; he could not apply himself to work ; he was not a " born tired " but a " tired " of state manufacture. We must not then be surprised if there come a gigantic revolution of these damaged brain machines, who have nothing to live for. They make up the mass of that large army of lower socialism which is anxious to wreak vengeance by destroying everything that can be called English.

The following, copied from *The Times* in December 1907, is very serious and profitable reading to those who think that modern education is all in all.

In the report of Mr. Llewellyn on the canal population no attempt is made to estimate the number of persons dwelling on the habitable barges, of which about 12,000 have been registered, and half that number are believed to be still in use. Each boat appears to have been inspected by local authorities on an average about half a dozen times in the course of the year, and in 45 cases legal proceedings were taken for some breach of the regulations. As regards two of the most important matters, however, namely, overcrowding and indecent herding together of men, women, and children, we are told that it is often impossible to obtain satisfactory evidence, since inspection is allowed only by day, and it is of course at night that these particular offences would be discoverable. As to the education of the children, the Act seems to have done very little ; for Mr. Llewellyn finds that they seldom attend school, where indeed it is not easy to deal with them, since usually, whatever their size, they are mentally capable of instruction only in the infant class. Despite their lack of education, the inspector considers that they are superior to land children in honesty, manners, and physique, and that they " grow up to be better citizens by reason of their training to face hard work and to fight life's battles on their own account." Yet, if means could possibly be devised for their purpose, perhaps their good qualities would not suffer materially if some instruction were given in the R's.

Any state religious tests would be very unsound in principle. In these days of independent thought and rising intelligence, any such foolish autocracy could only end in disaster. The tendency now is to believe in nothing or to be absolutely sincere in devotion, for it is no longer necessary to be religious for the sake of respectability. At the same time I have been very fortunate in my acquaintance with Church schools. The influence of the clergy over the staff and the children has been of that character-moulding kind which could only result in

State  
Religion

raising the morale to a high level. I also find that the children of the Church schools have better infantile memories than those of Board schools, going back to the age of 3. These infants have not been pressed to learn, but had kindergarten and games, etc.

The former Church school methods illustrate another principle, namely, the invisible but powerful influence for refinement of the educated gentleman over those of humbler rank. That is often lost in the state school methods, and there is nothing to take its place. The school boards or councils are seldom composed of gentlefolk, but usually of successful tradesmen who have somewhat risen. As a class they have neither sympathy nor broad intelligence, and therefore their influence cannot be elevating. Their sporting instincts find full vent in quarrels over religion and politics, and the sufferers are the poor children. Many of the teachers might be improved, for too many of the same class qualify for these posts, and too few, if any, of the gentry ever engage in this holy occupation.

Religious  
Training  
very Im-  
portant

I very strongly hold, from years of observation (and every doctor occupies a confessional), that children should have a sound religious training. I do not advocate sectarian dogmas nor men's traditions, described by the psychologist Saint Paul as old women's fables; for I find the nearer the religion keeps to the simple Bible truths, the more stable is the result in the individual. Another form of useful training is the free and constant habit of singing simple hymns, or songs with a moral. If the tunes are musical and agreeable, they are easily remembered, or stamped on the sensory centres. It is an easy and practical method of "rubbing in" good, sound, guiding principles. Children are pliable like potters' clay, and should be shaped into beautiful forms by those in charge. But if those responsible are passive and unsympathetic chances are lost which will never again be offered. No teacher should feel discouraged by occupying a humble post, for no one can render better service to the Empire or to the Great Architect. What opportunities teachers have to train the young minds! How to learn and observe; how to be happy, how to be good, and why to be good!

As a critic of state methods, I should say that the three R's have filled many a prison. Most of the criminals examined have passed average standards; some have done well. In none have I found school influence producing any valuable effect. Had they been in good private schools some would probably have been saved, and the others would have been better without the three R's. Instructed degeneracy is a formidable weapon against peaceful communities. In olden days the illiterate used their intelligence or associative powers with more useful results, and were far happier; whereas now the same class fill their minds with penny dreadfuls and improper subjects, and suffer from a mental auto-intoxication. What will become of us if the religious and moral training is expunged from the already imperfect, undeveloped system? Crime is not lessened by teaching that it is wrong to steal. It is the effect of reasoning and demonstration which prevents crime. We must associate on the mental screen pictures of the horrible nature of such actions and of the dangerous consequences. When the temptation arises in the sensory centres, and desire is followed by choice, the well stamped moral and religious "associations" may dictate a choice which is at the same time prudent, wise and righteous.

The Three  
R's have  
filled  
many a  
Prison

If we realize a little of the brain machinery, it is so easy to understand how and where the poorer classes go wrong. They know as facts, or one might say like parrots, what is right and what is wrong; yet their higher association fails and desire conquers will. Will is to them as a withered plant, that might have developed, but has died of starvation soon after birth.

Must  
try to  
Under-  
stand the  
Poor

It seems hard that our prisons are full of boys some of whom are the pick of the land, but have been placed there by the over-weighting pressure of civilization, and failure of courage on the part of the state to do what is right and just: class against mass: one law for the rich and another for the poor.

## CHAPTER XVII

### MULTIPLE PERSONALITY AND CRIME

THE PHENOMENA OF DOUBLE CONSCIOUSNESS, OR ALTERNATING PERSONALITY: Somnambulism—Mental confusion, or aberration—A case of post-epileptic confusion—Risk of illegal acts occurring during this state.—CASE OF A MURDERER WHERE ALCOHOL PRODUCED A VIOLENT SUB-PERSONALITY: The ego seems to be only present during normal consciousness—A sub-ego rules during alcoholic intoxication—Certain drugs dislocate the ego: alcohol, Indian hemp, opium.—NECESSITY TO MAKE EACH CRIMINAL CASE A PSYCHOLOGICAL STUDY.—CASES ILLUSTRATING DOUBLE PERSONALITY: Case of Mary Reynolds—A French seamstress, R. L.—A soldier, F., caused by a bullet in the head—A Frenchman ruined by his B personality—Felida, watched for many years—An Italian: wicked when normal, A, good in character as B—At Naples—At Palermo, abnormal personality superior to normal.—Tomassi's case at Rome.—Case described by Dr. Lewis Bruce, Welsh and English States.—Dr. Hyslop's cases.—Case in the United States related to me.—CASE OF MISS BEAUCHAMP.—MY CASE OF MARY BARNES: ten sub-personalities. Her ego may never return.—Sub-personalities B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub>, B<sub>10</sub>, like a criminal—Each sub-personality has a different handwriting.—The way in which M. B. changed her personalities: Transition types.—EXPLANATION OF MARY BARNES' CONDITION.—THE CIRCULATION OF THE BRAIN: The sympathetic nervous system—Cases of vascular spasm—Hysterical paralysis—Sick headache.—spasm of retinal arteries.—SPASM OF BRAIN ARTERIES IN ALTERED PERSONALITY: In B<sub>2</sub>, In other conditions—The blindness was physical, not psychical—The concentric stratification of the brain cells—Disturbed circulation in the brain of M. B.—DISEASE MAY ALTER THE PERSONALITY: We frequently observe two personalities in the same individual—The mystery of eleven separate lives in one body.—THE MIND IS COMPOSITE: Evidence from this case—Case of Miss Beauchamp.—THE LEGAL ASPECT OF THESE CASES: Crime during hypnosis.—INFLUENCE OF SUGGESTION AND IMITATION: Like sowing seed—A case of kleptomania cured by suggestion—A born thief—A lust to steal.

The Phenomena of Double Consciousness or Alternating Personality

IN order to trace the relation of Psychology to criminal and allied abnormal cases, it is necessary that there should be taken into consideration the remarkable phenomena of double consciousness, or alternating personality. Those who know R. L. Stevenson's account of Jekyll and Hyde will understand the type I am alluding to, in which the subject exhibits two different personalities. These appear alternately, living and acting quite unconsciously of each other.



It is possible that Jack the Ripper was an example. He may have been in one personality a good citizen, and without any power of control have changed unconsciously into the murderer, prowled the streets, perpetrated his dreadful crimes, using elaborate precaution against detection, and then have passed back into his normal state. Some might call it somnambulism. The true Ego or person seems to be asleep, while a subpersonality takes possession for a time. There is no stupidity implied in these conditions, for the mind acts with intelligence according to the personality it is serving. Jack the Ripper may have been an honest workman, and may be alive now, quite unconscious of his somnambulistic periods.

Mental aberration of a similar type occurs in epilepsy, and is in some cases termed *petit mal* to distinguish it from the convulsions or *grand mal*. I have watched for about four years a young man so affected. He was cured of the *grand mal* by hypnotism, but the *petit mal* persisted in a curious form. In these attacks, which would occur anywhere, his facial expression and manner changed. If thwarted he would hit out, and sometimes did personal injury. Once on his way home in this condition he was robbed of a parcel of new clothes, which he was carrying. He remained at home two hours in this state of unconsciousness, or subpersonality, before he came to himself, and discovered that his parcel was gone. The last thing he remembered was looking into a shop window in Commercial Road. On another occasion, he left chapel during the Sunday evening service. Some one who knew his complaint followed him, and, suspecting one of these fits, interrogated him, but as he answered quite rationally and seemed normal, allowed him to leave.

Two or three hours later he returned to his proper state and was surprised to find himself four or five miles from home.

One might give many such stories of this and similar cases with an apparently clear understanding, in illustration of this alternating personality, which we call post-epileptic automatism. There was no connexion with hypnosis, for in the hypnotic state my patient had no knowledge or memory of his post-epileptic wanderings. We can easily see the awk-

wardness of his position, if he had committed a breach of the law in the subconscious state.

Case of a  
Murderer  
where  
Alcohol  
Produced  
a Violent  
Subper-  
sonality

I have found an illustration in a criminal case where a man was addicted to alcohol, and received five years' imprisonment for a very serious offence. Some years later a sentence of death was passed upon him for an actual murder.

This case is of medico-legal interest, for he was abnormal from his youth, being subject to a violent and impulsive temper. He was in fact homicidal from his boyhood, though now a quiet harmless-looking individual. When I examined him he wept over his past; yet, if not under kind but firm control, he might easily repeat the offence on but slight provocation. As a boy of fourteen he would have killed a caretaker, who rightly interfered with him, if the man had not hastily retreated. He was a country lad and sportive, but when annoyed became like a wild beast, and always sought for revenge. He used to "drive himself mad" by drinking spirits, illustrating the lamentable want of supervision over young and unformed men which often obtains under present licensing regulations. When in this drunken condition he appeared to change to another subpersonality. His Ego, a poor one at best, seemed at such times to vanish, for he was quite ignorant of these many serious actions. This case lends support to the idea that the Ego is only present during normal consciousness. He was arrested in a murderous assault on his employer in the nick of time, and solemnly affirms that he is even now quite unconscious of this particular act, for which he received five years in prison. Very soon after his release he actually killed a man. He had been drinking spirits for two or three days, and he was quite confused, yet his sub-ego directed him to hide for the first three or four days after the crime. This appears contradictory to his tale and my theory; but he always knew after these occurrences that he had been in a row. He did not, however, know that he had committed murder until charged by the police. One would in reality expect the alcoholized sub-ego, B., to possess some self-protective instincts, as shown by his hiding after the murder. At the trial the details of his crime

were quite a revelation to him in his normal or A personality. About eight months after the event, when in prison, the whole picture of the murder gradually unfolded before him. This may have been because he heard the story at the trial, or there may have been some subtle psychological awakening from a long somnambulism caused by alcoholic poisoning of the brain cells. The brain must have taken in the whole picture at the time, but the alcoholic poisoning may have paralyzed the mental associations which would connect up his memory of the event. It seems that under the injurious action of alcohol the normal Ego is disjointed, and a fractional sub-personality appears to rule under those circumstances. Similar toxic effects are observed from the use of Indian hemp, where delirium and vivid hallucinations occur : or from opium, as is evinced in the writings of De Quincey, R. L. Stevenson, and others.

In this particular case, the murderer was ordered to be hanged for a crime of which he was ignorant, and he feels somewhat aggrieved that no excuse was allowed for his drunken state. This of course is a one-sided aspect of crime, but the moral is, that every case should be regarded as a psychological study, in order that both the criminal and the long-suffering public may have their claims fairly adjusted. If such a process had been observed after the first murderous assault, it would have been seen that the killing instinct in this man was so pronounced as to be an incurable disease. He would have been permanently located, after a term of punishment, in a refuge colony, there to be supervised and protected for the whole of his natural life.

Necessity  
to Make  
Each  
Criminal  
Case a  
Psycho-  
logical  
Study

Double personality is not a new phenomenon, though it may occur more frequently with the strain of advancing civilization. In searching records the first case that I can find occurred in the early part of last century.

Cases  
Illustra-  
ting  
Double  
Person-  
ality

The subject of our inquiry was one Mary Reynolds,<sup>1</sup> born in 1791 in Birmingham, and who emigrated with her parents to the far west of America in 1795. She was "uncommonly well-balanced" though rather low-spirited. When

<sup>1</sup> See *The Occult Review*, January 1907.

about 18 she became subject to hysterical fits, and was found one day lying in a field where she had been reading, unconscious, and in convulsions. When she rallied she was blind and deaf, but recovered in a few weeks. Three months later she was found in a profound sleep which lasted about twenty-four hours, and when she awoke she had lost all recollection of her former life, nor did she know her relatives. She was precisely like a new-born infant, except for the faculty of pronouncing a few words. She rapidly learnt to read and write, and would argue as though her intellect were fully developed. One morning five weeks later, she awoke in her original state, as if nothing had happened, and took up her ordinary life precisely where she left it when she became abnormal. She was surprised at certain new arrangements of things around her, occurring in what she thought was one night.

In a few weeks the deep slumber returned, and on waking she took up her second life precisely where she had left it off. These alternations continued for about fifteen years. When about the age of 35, she settled permanently into her second state, and so remained for the last twenty-five years of her life. The periods of the normal, or A, condition gradually grew shorter, till A disappeared, while the abnormal or B state varied in time from a few hours to several months. She passed easily from B to A, but only after prolonged sleep from A to B. She stated that previous to her transition from A to B she had a terrible fear as of death upon her, lest she should not return. Each period was unconscious of the other, forming corresponding blanks in her memory of the ruling period.

Dr. Dufay de Blois reports the case of a seamstress, R. L., who became subject to momentary unconsciousness, and thus passed into a second personality. The normal A had defective vision, whereas B could see perfectly. The abnormal B was more active mentally and talked of herself in the third person. The condition lasted two or three hours, the normal A knowing nothing of the second personality B, and *vice versa*.

W. Mesnet reports the case of a soldier, F., wounded in the head during the Franco-German war of 1870. He made his living in Paris by singing in cafés. He entered a second personality, B, after a transitory unconsciousness, during which there is very little change except that he becomes a thief and is anaesthetic.<sup>1</sup> He knows nothing of this change, which occurs every two or three weeks.

M. Tissié published the case of a man aged 30, who was a neurotic, and occasionally had dreams directing him to go to certain places in quest of work. He would rise in the morning in another personality, B, and obey the dream. In this way he lost his proper work, and was reduced to poverty. He was often robbed in the B state, and might tear up bank notes in mistake for ordinary paper. He was also frequently put in prison for tramping. He was specially interesting, for though A the normal knew nothing of B the abnormal, yet B knew of both states and happened to be the more intelligent of the two conditions.

MacNish reports a case in the year 1812, which is apparently the second on record, but not of much interest.

Professor Azam of Bordeaux watched a case from 1858 until his death in 1899. A girl Felida, aged 15, and very hysterical, would develop neuralgia, and fall into a state of unconsciousness for about three minutes. She would awake in a very merry mood, singing and joking. In this abnormal B state she was more intelligent and active, and the neuralgia never affected her. The normal, A, does not know of the second personality B, whereas B knows of A. B came more frequently and lasted longer, extending her visit for three or four months. In 1891 Felida suffered from an ovarian tumour, and I hear from Dr. Camille Julian of Bordeaux that she is still alive enjoying a simple old age (1907).

Camuset in 1880 reported a case in Italy in which the normal

<sup>1</sup> Anaesthetic means insensitive to touch.

A was wicked, and the abnormal B was good. V. L., the son of a drunken prostitute, was a beggar and a thief, in consequence of which he was sent to a reformatory at St. Urbain. Here one day whilst working in the fields he disturbed a snake among some faggots, and fell down in convulsions from fright. After this he became altered mentally; paralysis of the legs with wasting developed. He was therefore sent to the asylum of Bonneval, where he was regarded as a respectable, well-behaved boy, and was gentle and grateful. On account of the paralysis he was employed in the tailor's shop. A year later he had a fit of hysteria which lasted sixty hours, and when it passed off he got up quite well, free of all paralysis, and wished to join his old companions of the reformatory in their field labour as before. He did not recognize the doctors or nurses of the asylum, or know anything about the tailoring, while his kind, gentle nature was replaced by his old ruffianly manners and vicious instincts. The question is, whether the abnormal B was what nature intended, and the normal or degenerate, A, was the product of an alcoholic and depraved parentage?

Bianchi <sup>1</sup> reports other cases.

A Jewish girl in Naples, who, without any external manifestation, changed her personality from A to B. If she were conversing, she would stop; or if doing embroidery, she would leave it and go to something else, as house or kitchen work. When she returned from B to A, she would be quite surprised to find she had left her embroidery, or whatever she was engaged in, and quite ignorant of all that had passed in the interval.

A girl in Palermo every day about four o'clock changed from a sad, fastidious, torpid individual to a lively active state (B). In the morning she was normal (A). One evening, as B, she was very lively and pleased to have a visit from her brother. In the morning, however, as A, she was surprised to see him, and was ignorant of his visit the previous evening. Similar occurrences were frequent.

<sup>1</sup> *Psychatrie.*

Professor Tomassi gives a case not unlike the recent notorious "Koeppenich" case in Germany. A young man in Rome called on a policeman to assist him in searching the house of an advocate, at the same time representing himself as a superior officer. After the visit and search, he dismissed the civil guard and mingled with the crowd on the Piazza. A legal process followed, when it was found that the accused knew nothing of the event, and that he had many gaps in his memory or consciousness.

Dr. Lewis Bruce reported a case of dual brain action in the year 1897,<sup>1</sup> and he attributed the cause to the right and left brains alternately exerting a preponderating influence. He calls attention to "spurious duality," where a patient thinks himself inhabited by another individual, or when other similar delusions exist. Such appear to occur where a patient carries on a conversation with his supposed internal lodger; a casual listener would fancy two different people were conversing.

The patient described by Dr. Lewis Bruce had an English stage and a Welsh stage. In the English stage he was right-handed, and the subject of chronic mania. He spoke English, but understood Welsh. He was restless, destructive and thievish. He was in touch with his surroundings, but his memory was a blank to the Welsh stage; he was, however, in touch with the previous English periods. He wrote in the ordinary way, but could also write backwards, mirror writing.

In the Welsh stage he was demented, left-handed, and spoke Welsh. He could not understand English, either spoken or written. He did not know the doctors or attendants, and could only write with the left hand, from left to right. Once, when he wrote with the right hand, he wrote backwards. He was therefore quite out of touch with his surroundings as a Welshman, but normal as an Englishman.

In 1899 Dr. T. H. Hyslop, Medical Superintendent of Bethlem Hospital, read a paper on this subject at the British

<sup>1</sup> In the *Scottish Medical Journal*.

Medical Association. He makes seven different types associated with night terrors, somnambulism, loss of memory, epilepsy, insanity, hysteria or mediumship.

The interest of his paper consists in the demonstration of the instability of character and the moral perversions which occur, involving questions of criminal responsibility.

Thus, Case 1 was a boy of 14, with night terrors and a propensity to steal money and stamps from other boys at school. When convicted and reprovved, he was much distressed, but appeared to have no memory of the circumstances.

Similar events are of daily occurrence in our police courts, but no allowance is made for the accused.

Case 2 was a precocious boy of 14, who had attacks of stupidity at school, and was found one night sharpening a knife with intent to kill a schoolfellow. He was with some difficulty overpowered.

Most of the cases were on the border line of insanity, thus differing from Mary Barnes, and especially from a very remarkable case in America, the account of which was recently given to me by her cousin.

Mrs. W., of M——, related to me personally a remarkable instance of double consciousness which has lasted over thirty years. It is the case of her cousin who resides in the United States, and is married and mother of six children. No cause can be traced. Every evening about eight she has a slight twitching, sometimes a convulsion, or perhaps turns her head round and looks strange. She then enters into the abnormal state B. B knows everything about A, and has a better memory than A: whereas A knows nothing of B. B goes to bed and changes during sleep back to A. B is very clever and witty, but also very religious, reading and expounding the Bible better than A, and writes beautiful letters. The state B is always a mental blank to A. B is very restless, and gets out of bed in her nightdress, and may walk out of doors, and has been known to walk miles along the railway track, avoiding express trains. This has been proved by information received from tramps and others who are startled by her appearance, for in addition her facial expression alters,



and her eyes are only half open. Sometimes she may go down to the cellar, procure the ingredients for a pie or cake, and bake them in the dark in the kitchen before morning. B can read print, but she cannot recognize photographs or people. She is conscious of the presence of any person near, but does not recognize the person whom she knew in her normal state A until she approaches and grasps the hand or touches any other part; recognizing by touch alone who it is. This applies not only to acquaintances and friends, but even to her husband, whom she would not otherwise know. As soon as she touches or feels a person, she begins a suitable and intelligent conversation. Sometimes the family get B to promise not to go out, and this especially when she is at hotels, for she travels a great deal. She seems to have a power of thought reading, for they may lock the outside doors and hide the keys, but she always goes straight to the place where they are concealed whatever precautions may be taken. She is now 56 years of age. She has never had good health, and her chief anxiety is lest she becomes insane.

The following incident occurred in which the normal personality A was conscious of an act performed by the abnormal B. Though the story is gruesome, I must repeat it, for it throws light on the case of the murderer who was ignorant of his crime during the trial, but remembered the details some months later.

Mrs. W. told me that once, when she stayed a night at her cousin's house, she slept in a wing extending from the main building. She awoke during the night to hear approaching footsteps. The person slowly entered the room and came so close that she could hear the breathing. She was in great terror, fearing a robber. Presently the person as slowly retired. Nothing was said about it next day, for apparently A did not know what B had done. A few months later, A in ordinary conversation referred to it. She spoke of visiting Mrs. W. in her bedroom, and said that she did not speak lest she would frighten her. There is no question she was that night in the B state, and it appears to be the only time that A remembered or knew of the acts of B.

Case of  
Miss  
Beau-  
champ

The classical case of Miss Beauchamp has been very fully published by Dr. Morton Prince in America, in his book on *Dissociated Personality*.

Miss Beauchamp was a single consciousness or personality until 1893, when a psychical catastrophe occurred in the shape of a serious family trouble and illness.

As a result of disintegration of the personality or consciousness of Miss Beauchamp, a new sub-personality B1 arrived.

B1 was serious and refined. She went to college in 1898 and then came under Dr. Prince's observation. From excessive study she became neurasthenic and unstable, although to outsiders she would appear quite ordinary.

Another sub-personality appeared which called itself Sally. Dr. Prince called her or it B3. These alternating personalities would change about without apparent rhyme or reason, possibly several times a day.

Sally was lively, reckless, saucy and mischievous, teasing and playing tricks on B1. She would write abusive letters to B1 and leave them where B1 would find them later. When B1 realized the presence of Sally, she became depressed and thought she was possessed of an evil spirit. Sally knew everything that went on in the life of B1, but B1 was ignorant of Sally's life. Thus Sally claimed a concomitant existence for herself, with a double mental condition for B1. Sally had her own thoughts, perceptions, and will during the time B1 was in existence. At the same time Sally did not partake in the higher education of B1. Thus B1 knew French and shorthand, but Sally knew neither.

Sally was strong and healthy, and would sometimes walk a long way from home, and disappear, leaving B1, who was easily fatigued, to struggle back.

When B1 was tired or poorly, Sally dominated and led her a fearful life, but if B1 were well and strong, it was more difficult for Sally to get the upper hand. Once when B1 was in exceptionally good health, Sally expressed herself as feeling "squeezed out." This phenomenon sheds very great light on our own individual lives. It seems to explain the dominance of the evil sub-ego within us. It often happens that a person goes wrong, in some cases to an alarming degree, during periods of physical or mental ill-health. One can

trace the cause to neurasthenia, or some sudden excesses which have exhausted the nervous system. Under suitable treatment and often by suggestion the healthy, normal condition is regained. There is however always the risk of social disaster during these wanderings, and such events may, in wrecking a career, postpone or even prevent a return to normal. This is demonstrated daily in the instances of good people going wrong, as it were running off the tracks which they had previously followed in exemplary lives.

B1 in a measure illustrated this when Sally made her tell lies, or act rudely and foolishly to her friends, or do anything repulsive to her ordinary ideas. B1 was thereby much distressed, but unable to help herself.

A third sub-personality B4 appeared on June 7, 1899.

B4 knew nothing of B1 or B3, nor did she know Dr. Prince or the other friends. Her character was different; for she was combative, and inquisitive as to her new surroundings. Though Sally knew all about B1, she knew nothing of B4, except what an outsider could observe. B4 had a hatred for Sally, and contempt for B1. B4 also shared the accomplishments of B1, as her knowledge of French.

Dr. Prince at first thought B4 was the original Miss Beauchamp, for B4 knew her whole life previous to the shock in 1893 and the appearance of B1, but knew nothing of the six years until 1899, when B1 reigned. Dr. Prince, however, found that neither B1 nor B4 was the original Miss Beauchamp. He, however, discovered that during the hypnotic state B1 and B4 became the same, and he called this state B2.

B2 was sad, anxious and passive.

Dr. Prince now endeavoured to synthetize B1 and B4, and tried to wake up B2. But for a long time he failed, as B4 resented it, having a contempt for B1. There was also a strong conflict between Sally and B4 for supremacy. They even exchanged letters, abusing each other. Sally was afraid of being extinguished. Finally in 1902 there was a sort of compromise between Sally and B4 and Dr. Prince was able to wake up B2 and thus he restored the normal Miss Beauchamp. It will be remembered that B2 lived up to 1893 and B1 since, so that the broken chain was united.

As an instance of how these sub-personalities quarrelled,

on one occasion the mischievous Sally heaped all the movable furniture on the bed, and then disappeared, or in other words B4 appeared. B4 determined not to gratify Sally, rolled herself up in a rug on the floor and went to sleep, but woke up as Miss Beauchamp, the latter having all the trouble of putting the room straight.

My Case  
of Mary  
Barnes'  
10 Sub-  
Person-  
alities

One of the most remarkable cases of abnormal personality yet recorded came under my care in 1895. It occurred in a girl (Mary Barnes), and was induced by influenza when about 12 years of age. She exhibited ten phases of sub-personality, each of which was a distinct and separate life. No one personality knew anything of the others, nor yet of the normal life. The normal and the abnormal personalities appeared and disappeared in the most remarkable manner without any discoverable cause. The sub-personalities might last only a few minutes, or for hours, often for days and weeks; indeed, she has now been living in an abnormal state since 1898. I have no hope of her Ego or original self ever returning. I will call the normal Ego A, and the abnormal sub-personalities, B, ranging from B1 to B10. Each sub-personality showed a continuous existence or memory, or in more technical language, a continuity of consciousness. Thus if B6 left any time and returned in six months, she would interest herself in what occurred on the previous date, as if nothing had intervened. B6 did actually leave in December 1896, returning in June 1897, and could not understand why there were flowers in what she believed was still December 1896. The six months' interval was a mental blank. This case was fully reported in the *Journal of Mental Science* for October, 1904, and in the *Proceedings of the Society for Psychical Research*, Vol. XLIX.

These sub-personalities differed completely in character. Amongst them, B1 was a condition of mania or excitement; at times of coma, and even trance. Once, in the latter condition, she was supposed to be dead, and actually was prepared for "laying out."

As B2 she was quite ignorant, requiring to be completely re-educated. She knew the names of things, but could not apply them correctly, as if her associative memory were

my dear tom

I have just got up  
I hope you are  
not worried.

~~I~~ shall ~~be~~ glad  
glad when you come  
home so you can  
~~give~~ give me some  
brownies

Written by Bro, the "wicked" stage. Note that each word was written from right to left.

This print is lent by the Med.-Psych. Association.





Drawn by M.B. when B3 or "Old Nick."  
Lent by the Med.-Psych. Association.









Drawn entirely by touch by M. B. when blind, as B9.  
Lent by the Society for Psychological Research.

detective. B2 bore a close resemblance to Mary Reynolds.

B3 was a mischievous romping girl. In this condition she was taken to the seaside, and though in her normal state she knew the sea yet now as B3 she beheld it for the first time. When she revisited the same place the next year, in a different personality, as B6, it was again to her as a new sight.

She learned to swim in one personality, B3, but later could not swim in the B6 condition.

In another phase, B9, she was blind and developed a new faculty, perhaps a legacy from some remote ancestor. This was the power to draw; drawing entirely by touch, even to the detecting of colour. B9 was also imbecile. (Study the drawings of B9 and compare with that of B3.) This case of M. B. is of value to our present subject because one state, E10, was of criminal appearance. As A, or normal, she was a girl of the very highest morale, and the simplest wrong-doing was an absolute horror to her. Yet as B10 she was a thief, and only by chance saved from murder. The theft was a very ordinary one, from a shop door. On seeing a policeman she ran back, replaced the article, but justified the theft on the same lines of thought as in the criminal's mind. "If you want a thing and can't get it, why nick it. No harm if you are not found out."

A very striking feature in this case was the different handwriting in each personality. The most curious part was the illiterate scrawl in B10, the degenerate state; and the badly formed letters in B2, which were written quickly and without hesitation from right to left, instead of from left to right.

The account of Mary Barnes would not be complete unless I describe the way in which she changed from her normal ego, and how the sub-personalities shifted about.

The first sub-personality B1, which exhibited mania, coma, and trance, was supposed to be an acute and severe illness of ordinary brain type, and was not properly recognized at the time. In the sixth week of this condition B2 appeared as an ignorant child, clipping her words and unable to associate the names of things correctly. Thus she did not know what her foot was called, or would call her mouth her eye, and

The way in which Mary Barnes changed her Personalities

so forth. She also reversed colours, calling black white, green red, and vice versâ. It was considered a loss of mind following on the acute illness. But one day during an apparent relapse of the B1 state she appeared dazed, pushed things away, and suddenly turned a somersault on the bed. She at once assumed the B2 characters, but later relapsed to B1. This happened again and thus attracted close observation though the facts were impossible to explain. In this B2 condition she commenced scrawling with a pencil and it was noticed that she wrote correctly each word backwards, that is from right to left, beginning at the tail, with as much ease as in the ordinary way. It was not mirror writing. Interchanges occurred quite irregularly between her normal self A, and B2, from the last week of May 1895 until July 24, when a new sub-personality, B3, appeared. B1 having completely gone for a time, B2 was up and dressed, and on July 24, 1895, it was observed that her mental attitude was quite different from before. The transition was marked by the appearance of mental confusion with flushing. When she changed to B2 she usually fell to the ground, because B2 was paralyzed at the ankles. This fact was of great assistance to me in unravelling the cause, as it pointed not only to a paralysis of that motor centre in the brain, but also to the particular artery of supply (the anterior cerebral).

The transitions might be extremely rapid, lasting two or three minutes, or drawn out for days, leaving us in anxious doubt as to what might happen. As an illustration of rapid change she was in a comatose condition on Sunday April 4, 1897, and seemed to be dying; suddenly she jumped up with a clear mind and called out, "What am I in bed for? Don't you know I am Nick?" Nick was the name we gave her as B3. She had been very ill for three weeks, fed by spoonfuls, and now she demanded a good meal. Our predicament can easily be imagined. B3 had been absent for six months, having left on Sunday, September 20, 1896, at dinner time, and now B3 wished to dress and go downstairs, as she supposed, to finish her former dinner, it being again a Sunday. It was a difficult case to treat, as there was no similar one on record to guide us.

you know old you did not  
do that. the dear tom  
and mary ann ~~the~~ say  
you do a nice man and i

Writing of B2. Each word was written from right to left.  
Lent by the Society for Psychical Research.





Februgesy the fourteenth  
18 ninty seven  
Sunday

The dear voice I am writting  
~~you~~ a letter to <sup>tell</sup> you lots

Written by B9 in the blind and imbecile stage. The "dear voice" was the name she gave, when B9, to the author.

Dear Dr. Wilson  
I am writing you  
a letter to tell you how I am  
enjoying myself in M  
It is such a glorious place.

Written by B6, the nearest substitute to normal.  
I am indebted to the Medico-Psychological Association for these prints.



Turning from the purely psychical aspect of this interesting case I wish to offer an explanation based on our knowledge of the manner in which the blood vessels act, and also on the anatomical conditions of blood supply to the brain.

The Physiological Explanation of Multiple Personality

It will serve a useful purpose towards unravelling some of those temporary mental aberrations which so constantly present themselves, if I apply this technical knowledge to the case of M. B. to explain her varying personalities.

We have not so far considered the mechanism of the blood supply of the brain. The vast system of blood canals all over the body have a special nervous system, almost entirely given up to them, which is called the Sympathetic nervous system. It sends delicate branches along the vessels, causing them to contract, in which case there is a pallor, and a sense of chilliness, whilst if the blood vessels dilate there is flushing and heat. An example of both conditions is seen in nettlerash, where toxin from the stomach, or formic acid from the nettle, enters the blood and causes both conditions, namely, a pale centre from contraction of the blood vessels, or anaemia; and a red periphery, from dilatation of the blood vessels on congestion.

The Circulation of the Brain

Chilblains or numb fingers are also examples of spasm of the arteries. These arterial contractions may last a few hours or days or extend to weeks and months. In Raynaud's disease the arterial spasm of the fingers or toes may continue until there is ulceration and gangrene.

Since advancing the theory, some years ago, of arrested function being the result of arterial spasm, depriving the area affected of its chemical nutrition, certain cases of spasm of the retinal artery have been reported, which support this doctrine to the point of demonstration.

W. Tyndall Lister, of London, described to me a case, not yet published, in which a man complained of sudden attacks of half blindness or darkness. During one of these attacks Mr. Lister was able to show his students a condition of complete spasm of certain branches of the retinal artery. After a period of perhaps half an hour, these pale contracted arterioles relaxed, filling with blood and shortly after vision was completely restored.

Drs. C. E. Beevor and Marcus Gunn describe the case of a man,<sup>1</sup> aged thirty-four, who had attacks of headache with blindness in the right eye since childhood. One attack continued for nine months, on which account he sought special advice.<sup>2</sup> It was diagnosed as recurrent spasm of the central artery of the retina.

In the same journal, J. B. Story, of Dublin, recited two similar cases.

One case, a man aged thirty-five, was attacked suddenly with blindness on December 28, 1898, and the condition lasted till the middle of April, 1899. This very much resembles the period and character of the blind stage of B10.

The second case lasted ten weeks. In both, spasm and contraction of the retinal arteries were observed.

In vol. 26, p. 282, of the above, Lundie publishes another case in which he watched the spasm of the retinal artery; and Hartridge of Philadelphia, reports a case in which the blindness, lasting a few minutes, was due to contraction of the larger vessels outside the skull, namely, the temporal and nasal arteries.

Dr. Arthur H. Benson, of Dublin, also published a case of "Temporary visual obscurations from retinal vascular spasm" (*Trans. Internat. Ophth. Cong.* 1894).

If such disturbance of the circulation occurred in the brain, important mental phenomena must result. In what is wrongly termed hysterical paralysis and anaesthesia, there is reason to believe that the particular brain cells involved are for the time deprived of function, and the cause is probably an arterial spasm such as this. In the condition termed sick headache, or megrim, there is a spasmodic contraction of the carotid artery so that it may be felt hard in the neck. Certain of its branches in the brain are thereby deprived of their normal blood supply, and this leads to confusion, sometimes deafness, and great irregularities of sight, by throwing particular groups of brain cells out of action.

The brain receives its supply of blood from two large arteries

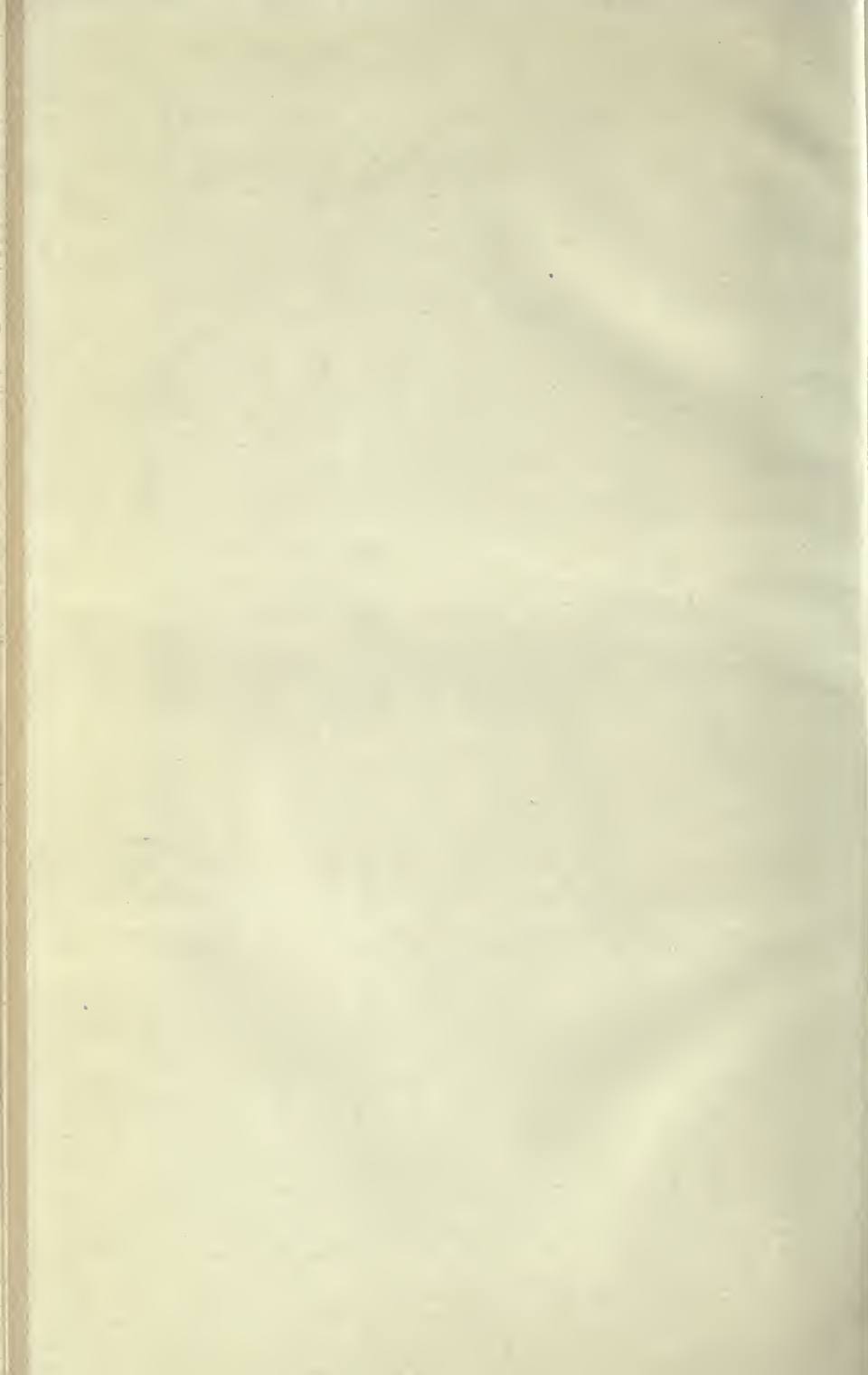
<sup>1</sup> *Ophth. Review*, 18, 1899, p. 204.

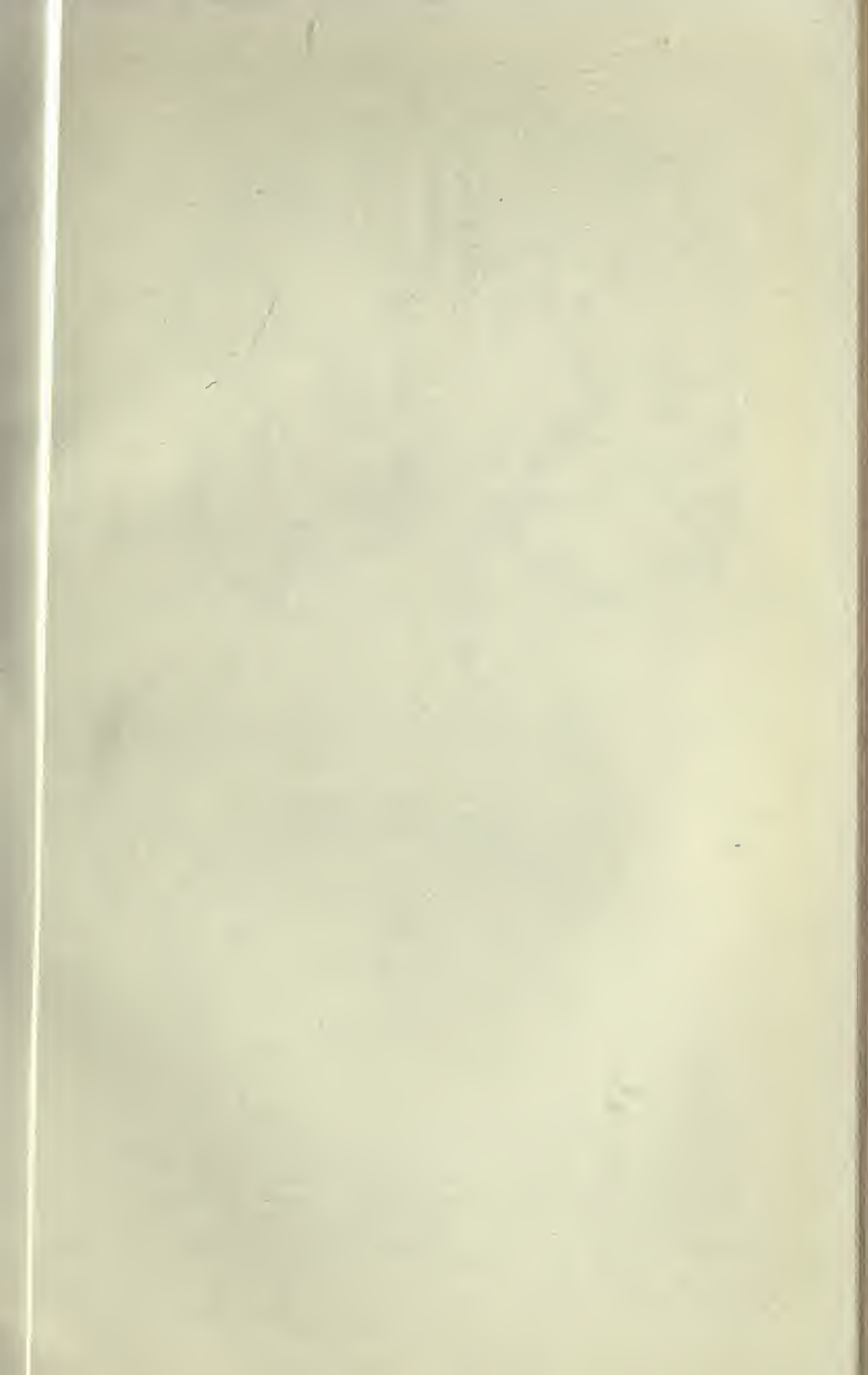
<sup>2</sup> In this condition there was blindness of the superior half of the field of vision with spasm of the lower branches of the central retinal artery. He had occasional attacks in the left eye, losing the lower half of the field of vision.



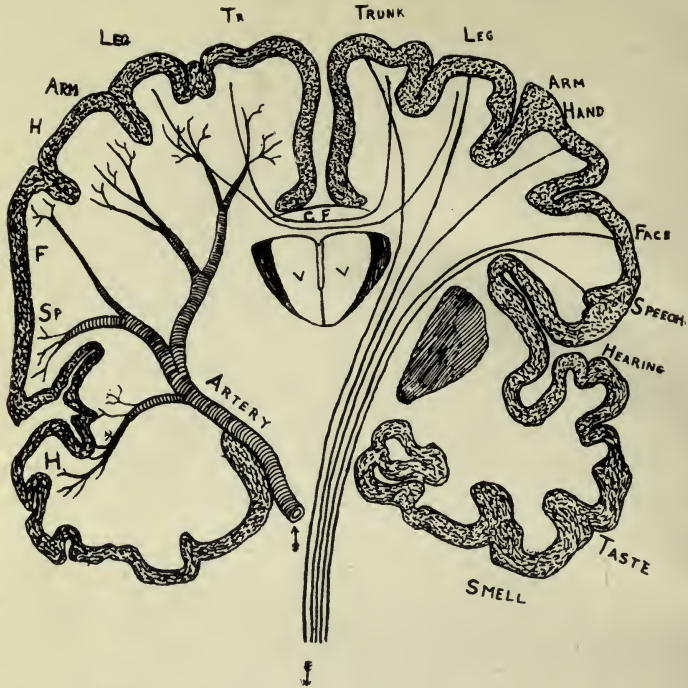
Photograph of arteries and arterioles, with delicate fibres (probably sympathetic nerves) running along their walls. These regulate the supply of blood by causing the vessels to contract or relax.

Prepared by a special process and kindly lent by Dr. Ford Robertson, of Edinburgh.





Sketch of a branch of the middle cerebral artery supplying the motor centres.



Diagrammatic sketch of a section of the brain to show how the cortex gets its blood supply, and to demonstrate how spasm of a branch of an artery may arrest its function in any part.



A sketch of the arterial supply of the brain. AC—anterior cerebral artery. PC—the posterior cerebral, which supplies the visual area. MC—the middle cerebral artery supplies the clear part.

Spasm of AC would account for B2, by shutting off the higher association and the motor centre of the foot.

in front, the right and left carotids, and two smaller arteries behind, the vertebrales. These are connected up inside the skull to form a beautiful system of vessels, so as to ensure a steady and regular supply. From off this system on each side, right and left, arise three arteries, the anterior, middle, and posterior cerebral arteries. These inter-communicate by their smaller branches to ensure still further a steady flow. But if any important branch be shut off permanently, as by a clot or a rupture, as in apoplexy, there results a permanent paralysis of some part of the body according to the brain area attacked. Whereas if an artery be in a state of spasm as just described, the particular group of nerve cells supplied will for so long be put out of action. I contend that this offers a reasonable explanation of these extraordinary psychic phenomena.

In my opinion the spasmodic contraction of certain arteries in the brain might account for loss of the corresponding mental functions in the case of Mary Barnes. Thus the B2 condition, in which there was a complete loss of association between objects and their names, was always associated with inability to stand, as she lost the use of her ankles ; contraction of the anterior cerebral artery would account for both phenomena, as it supplies the prefrontal association area, which guides the processes of thought, and also the motor centre of the foot, which was always paralysed. The paralysis of speech, hearing and blindness are likewise easily accounted for, but the blindness was more complicated, as it was physical, not mental. The physical blindness was probably due to spasm of the branches of the middle cerebral artery, which supplies some of the way stations between the retina and the cortex (the geniculate bodies). Sir John Tweedy testified to the normal state of the eye.

Psychical vision, or ideation, is situated at the posterior pole of the brain, and from this area were evolved, during the physical blindness, a wonderful group of drawings. We know that the blind are very sensitive to touch, and M. B. during her blind condition guided her pencil solely by touch, even in the matter of colouring. M. B. had her brain stored with mental pictures which she had "gathered" during

Spasm of  
Brain  
Arteries  
in  
Altered  
Person-  
ality

her lifetime, whereas by contrast those blind from birth or infancy have not had the opportunity of collecting visual impressions.

The Con-  
centric  
Stratifi-  
cation of  
the Brain  
Cells

It will be remembered that the pyramidal or intellectual brain cells are in layers and develop into activity from within outwards.<sup>1</sup> In this way we may say they resemble the concentric layers seen in the section of a tree. Supposing there are fifty layers of pyramidal cells, and that ten layers are educated by the age of 3, if the circulation of the blood was shut off all the upper layers, then the individual would become childish, as in the B2 state. Again if the thirty deeper layers were educated by the age of 10 and the circulation were shut off the upper twenty layers, we could account for the character B3.

B6 was like a good child of 12 or 13, about as high a level as M. B. attained normally. She has continued as B6 with some slight advance, and this might be explained if the embryonic nuclei were permanently damaged. The disturbance of the circulation might impair the remaining higher layers from their further normal evolution. Such would appear to have happened in this case, for though about 23 she is mentally on the plane of a girl of 16 to 18 years of age.

Disease  
may  
Alter the  
Person-  
ality

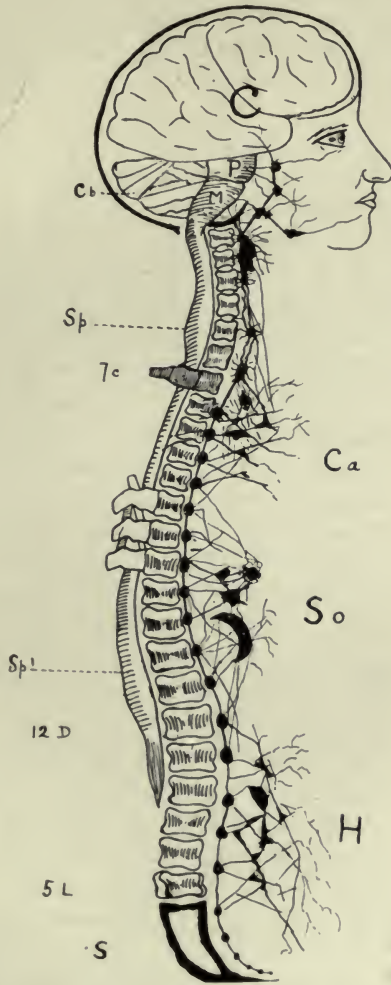
If we apply the lessons of this unique case we see that the degenerate, and perhaps criminal, sub-personality B10, suggests the possibility of a similar condition in some of our criminals, where from disease or accident, probably in childhood, the original self is disintegrated, and the lower nature takes charge of the individual. We must have observed with some acquaintances a complete change of character or personality after a serious illness. We are apt to say, "So-and-So is a changed person, quite different" since some trouble or illness. In reality the personality has been attacked at the foundation, and the dissolution of the Ego has resulted in a sub-personality assuming control.

There are also many apparently normal people who show two distinct natures or sub-personalities. For example the same person may show the mother's sweetness and the father's temper, or a peculiarity which does not occur in a parent but in an uncle or aunt or even cousin. Here we have a

<sup>1</sup> Fig. p. 108.



Diagram of the sympathetic nervous system .



Which lies in ganglia or chain masses in front of the spinal column. There are 3 chief masses: over the heart and lungs (Ca), another plexus for the stomach and viscera (So), and third for the reproductive organs (H). They are intimately connected with every nerve and blood vessel, and when out of gear produce functional diseases.

1  
S  
C  
T  
C

E  
r  
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a

personality from each parent or from some more distant relative. In such cases one encourages the good sub-ego while endeavouring to postpone the visits of the unpleasant sub-personality.

The case of M. B. showed eleven separate lives in one body, and is full of unravelled mystery. We cannot call them eleven minds, nor yet ten aberrations, but ten fragments of the whole or perfect mind.

I call them ten sub-personalities, and I compare mind to a piece of fine architecture which is composed of so many structural parts. If an earthquake shake the structure beyond the point of stability, there is an internal dislocation, so that the whole shape is altered and hidden parts are seen. But these are only substructures, however complete in themselves they appear. In B2, who was like an ignorant infant, the mental fragment was very small. She had to be taught or retaught the application of every name, yet she could express herself in writing. B10 was full of wicked thoughts, and showed an intelligence much below the average. She had no moral sense in this state, for though she knew she was doing wrong, she had neither shame nor sorrow. This condition is a replica of the criminal mind. Such indisputable evidence shows the mental states of the criminal as being abnormal to the true Ego.

The Mind  
is Com-  
posite

The most inexplicable feature was that in every sub-personality she knew her parents, although she gave them the nicknames of "Tom" and "Mary Ann."

The previous case, Miss Beauchamp, was under the hypnotic influence and single control of Dr. Morton Prince, and thus differed from my patient, who resisted the strongest attempts at hypnotism. Moreover my case was critically examined by the highest mental experts to eliminate personal error on my part. Amongst them were Drs. C. Mercier, Robert Jones, T. Hyslop, Outterson Wood, T. Savill, Sir Thomas Barlow, Drs. Milne Bramwell, Lloyd Tuckey and others. She was also twice shown in the abnormal states to the Clinical Society of London, with Dr. Buzzard presiding.

It would be a very serious matter if such a case came under the operations of the law. As Dr. Mercier pointed out, this

The Legal  
Aspect of  
these  
Cases

case showed the possibility of a person committing a crime in one sub-personality, and being punished in another phase, or in the normal state. Such might have happened with B10 if a desperate act had been done, and no one could have shielded her. From the sudden manner in which she changed her personalities it is quite possible that the trial would have been of a sub-personality other than B10, and totally ignorant of B10's actions. It is at least possible that such things occur, and is a strong argument for modifying the law of capital punishment. In this case we had to protect B10 against herself. It is right for the public to be protected from the criminal classes, but it is equally just to demand of the law the institution of machinery for protecting the criminal from himself.

It is just possible that some crimes committed by neurotics have been committed in the hypnotic state, and it is worth while to try the experiment of regenerating some such criminals by wholesome suggestion during hypnosis.

Nearly all influence resolves itself into either imitation or suggestion, and the power, effect and duration of suggestion can never be fathomed or estimated. The evil suggestion of a bad companion may be compared to a draught of disguised poison. It is like the insect's sting in the young oakleaf, which ripens into the gallnut when the leaf is mature; or the sowing of seed which may not bear fruit for an indefinite time. Yet there they both are, absorbed and buried, for good or for evil. Conversely the usefulness of the preacher depends on his power of suggestion. The conversions of criminals by the Salvation Army is due to the same cause, aided by imitation and the hypnosis of music.

I once cured a girl of kleptomania by suggestion. Her condition was undoubtedly criminal and she had been a great trouble to her employers. She could not resist pilfering, but was sharp enough to take precautions or guard against detection, for if there was any chance of being caught she controlled her desire. This to many would appear simple wickedness, but it was not so. She was a moral cripple, and was cured by sympathetic supervision. Nevertheless my patient was a born thief, for she told me that if alone in

my other room and a lady's bag were on the table, she could not resist stealing from it. It was not the value of the object, but a lust to steal. Many of the criminals have used the same expression. As all these abnormal people take precautions against detection, the law cannot realize that it is an obsession, or possession, and deal with them as if they were normally equipped in intelligence and self-control.

There is indeed nothing externally visible to separate B10, or this other girl, from the common thief; and this suggests a closer relationship between crime and mental dislocation than society is at present prepared to admit

## CHAPTER XVIII

### THE EGO AND SUB-EGOS OR PERSONALITY AND SUB-PERSONALITY

**THE EGO :** Spiritist's opinion—No sub-personalities, but many personalities—Possession and control—Science refutes spiritism.—**ONLY ONE EGO IN EACH PERSON :** A perfect child as example—"Born saved" *versus* "Born lost"—A sub-personality.—**WHAT THE EGO MUST BE, A NORMAL PERSONALITY :** Sub-egos in all of us—The ego of M. B. gradually disappeared after two years—Now B6 requires care against mental fatigue being unstable.—**M. B. ONLY A PART OF HERSELF NOW :** Proof that M. B. is only a fragment of her original self.—**CRIMINALITY VERY RARELY DUE TO DOUBLE PERSONALITY :** Case of No. 3—The criminal abnormal from childhood—Poorer classes more liable to mental instability, and perhaps to sub-personality.—**CASE OF TOTAL DESTRUCTION OF THE EGO :** How to treat and save these cases.—**HUMANITY ON AN INCLINED PLANE :** Average egos subnormal—Causes of sub-personality—Environment—Heredity and conditions at birth.—**CONSTANT CAUSES WORKING AGAINST THE EGO :** Treatment of brain cases where damage suspected—The dethroned ego—Definition of the ego—What is sleep?—**SCIENCE ADMITS UNSEEN FORCES :** The spirit—The subnormal ego and the spirit—Influence of religion and ethics—On abnormal types—A converted criminal.—**CONTRAST OF THE LAW AND SALVATION ARMY IN IMPROVING THE CRIMINAL :** A sub-ego reviving under the S. A. influence—The case resembles somnambulism.—**RELIGIOUS CONVERSION EXAMINED SCIENTIFICALLY :** The distorted ego—My conversion under Lister—Stages of conversion—Brain the physical plane of the higher spirit, and mind the psychical plane—Body, brain, mind, spirit or ego.—**ETHICS *VERSUS* RELIGION :** Knowledge always interesting. We cannot busy ourselves in tradition—Cannot limit or define the horizon of science.—**THE AGNOSTIC :** We only see results, not the how or why—Vita, Life—Anima, the soul.—**MAN LIKE A MACHINE :** May be bad—May wear out—Duty of the State—Cases.

The Ego

**THE Ego** is a subject of great discussion, and must be regarded as undefinable by psychologists. Spiritists, however, are more decided, and say there is not one Ego but many to each individual.

They therefore dismiss the terms sub-ego or sub-personality, and regard the human frame as a tenement, which may be occupied or "possessed" by several personalities or Egos. These invade, one at a time being in control, and direct the thoughts and acts of the individual. They claim scriptural support in the parable of the man who had seven devils, but

they do not appreciate that biblical spirits were regenerate as well as degenerate, whilst modern spirits never do anything that is useful or sensible. My case (M. B.) has been selected as the most illustrative of their theories, but unfortunately I do not agree that M. B. was possessed by ten different personalities, and explain the phenomena of mental dislocation on purely physiological conditions.

I consider it possible on scientific grounds to refute spiritism, whilst charitably ignoring the fraud and humbug which attaches to it. The basal theories of spiritism, which are non-proven, are put forward as facts; but if common sense declines them, the whole fabric falls to the ground. Nevertheless there are many phenomena difficult to explain, which suggest a future state.

Surely there can only be one personality or Ego as representative of each individual body and brain. To illustrate this practically, take a handsome well developed child of fine perception, thought, and control. Such a one represents a perfect and normal Ego, which is single and complete, with every mental part properly adjusted and balanced. The future of that child is assured, or as some might put it he is "born saved." Alas! the converse is too often apparent, and the child is "born lost." The former starts better equipped than most for the struggle of life. But if that child suffer at any period from a severe illness affecting the brain or nervous system, it is probable that a change will be observed in his demeanour or character. Such a change indicates a damaged Ego, or shattered and altered personality. The damage might be slight and with care recoverable, or it might be permanent, and even though he or she might mix with the world, it would no longer be the original Ego which the child possessed at birth. I should regard this as a sub-personality of the true Ego: a part only of the whole. Surely the Ego is what God made and intended each individual to be; which is a normal personality, or a perfect mind.

Only One  
Ego in  
each  
Person

One might also define the normal Ego as the most perfect balancing of all the mental parts. There must be good and active intelligence, with full control of all lower instincts: instincts which have remained with us during the countless

What the  
Ego must  
be—a  
Normal  
Person-  
ality

ages of past evolution. We see that the normal Ego or personality is absent in many people. We cannot believe that God intended to place an imperfect mind within the human frame. Nor can we raise up an imperfect Ego as a standard for comparison. When abnormality of body or personality occurs, it is the result of disease, accident, or environment. Are not these sub-egos or sub-personalities fragments of the true Ego? We know by our own lives that while there is the true Ego in which we find peace and power, we are subject to sub-personalities which are less perfect than the normal and possibly of overpowering strength and influence. The Ego in its normal state has great power of control to expel these sub-personalities, which appear to us like foreign invaders. It is only when the Ego is weakened by any physical or moral cause that it is possible for sub-personalities to control us. In the case of M. B. influenza had so weakened the brain, that her normal intervals got fewer and shorter, until after three years the true Ego entirely disappeared. For the last nine years she has remained in one of her sub-personalities, B6, which fortunately is a very healthy sub-mental condition, and one in which she is intelligent, industrious, and of high morale. She not only supports herself, but is able to do something for her family. But when she is fatigued, the mind shows threatening symptoms: headache, malaise, loss of memory, depression and a weakened will power. I have therefore found it necessary two or three times to advise change of occupation or complete rest.

Mary  
Barnes  
only a  
part of  
herself  
now

It is difficult to realize, but nevertheless a fact, that M. B. is not her original self. She is mentally only a part of her Ego; much of the Ego having been shut off. She now only remembers the events of the B6 periods. Thus, she remembers Dr. Lloyd Tuckey, for he visited her as B6, but she does not remember Dr. Savill who saw her as B2.

As at present B6, she is also ignorant of the periods of the other sub-personalities, and cannot in any way fill up the gaps or blanks in her chain of memory. In consequence her normal life has been forgotten, and she does not remember going to school, nor her teachers. She has to be reintroduced to her old schoolmates and other friends, for she thinks she has



never seen them before. It is therefore possible for any one to be only a fragment of the normal or perfect Ego, and this may account for the many variations in character which we meet.

In searching for sub-personalities amongst criminals, I have gone carefully into their past lives, to see if I could trace any gaps of memory. In the case of a man who is undergoing a life sentence for attempted murder, I found his memory far from a continuous chain. He can hardly give any account of his childhood, nor can he recall his marriage day. He with difficulty remembers the birth of his first child, and cannot say whether he or his father went for the doctor.

Surely amongst the 150,000 criminals in London there must be a few illustrative cases. I find the criminal usually occupies the position of the solitary black sheep in the family, and differs from the rest of his own folk. His personality has probably appeared abnormal even before the wrongdoing commenced. He seems to have been labelled from his early days. Is it not possible that some sub-personality has been at work from childhood, and that he starts ill-balanced? There are more opportunities in the humble walks of life for such defective states to occur, as they are especially prone in infancy to tubercular diseases, and to brain affections, being thus vulnerable at many points through malnutrition. Therefore, if nature at birth had equipped them like others, there would still be all these and other subtle forces working against them: forces which no human being is strong enough to withstand. Though we cannot always demonstrate these, yet abnormal sub-personalities may often be in possession where least suspected.

To demonstrate this I will give an instance of total destruction of the Ego or Personality.

A boy, born of very healthy parents in good social position, started fair both physically and mentally, until the age of 4, when he had a sunstroke in India. This accident retarded mental development, while physically he grew into a fine athletic young man. He was backward at school, dull, irritable, and suffered from night terrors. In his teens he was pressed

Crimin-  
ality very  
rarely  
due to  
Double  
Person-  
ality

Case of  
Total  
Destruc-  
tion of  
the Ego

in study and consequently broke down under the stress. The free use of beer and tobacco hastened the end, which necessitated placing him under care before he reached the age of 20.

The Ego is in this instance totally and permanently destroyed, for the body exists without the mind. He and many similar cases might, if taken early, survive mentally under modified conditions, by relieving the stress of competition. Such do well in the country, or in situations which do not require much responsibility. This case is a sad transition from good heredity and sanity to complete dementia, but between these extremes there are many stages. Such conditions are more easily brought about by poverty, with the increased struggle for existence ; or by the opposite, overstimulating diet among the rich, not to mention the baneful influence of alcohol, tubercle and other serious constitutional diseases.

Human-  
ity on an  
Inclined  
Plane

With these tremendous opportunities, possibilities, and chances, we see that humanity rests on an inclined plane. At the top in the region of perfection we find sanity, intellect, moral control, and wisdom, which represent the normal Ego. At the bottom lie the hopeless mental and moral wrecks, "the submerged tenth." Between the good and the bad some are slipping down, while many are struggling up. If we realize what this inclined plane means to ourselves and to others, it ought to stir us to do our duty.

The fact that many of us appear normal but are only average is no argument against the perfection of the normal Ego, for everything human tends to mediocrity, by the law of averages. It is our business to trace the cause in what appear to be abnormalities of the Ego, or sub-personalities. Environment strikes us as the most frequent cause, when we daily witness the great disadvantages which attend the poor in slum life : or in higher walks, where parents fail, through ignorance or sin, in the care and education of their children. How many bairns are unnecessarily soured and rendered peevish and irritable ! Their tempers are permanently broken, when they might have been happy and loveable. It is just the same, as we observe, with a horse badly broken in by an untrust-worthy groom.

Other cases seem to be abnormal from birth. The brain

may be injured at this period by prolonged or difficult labour, or by the unskilful use of instruments. Other causes may be alcoholism, tubercle, or syphilis, in one or both parents. Too rapid childbearing may have exhausted the maternal nutrition. In all these cases the physical habitation of the Ego is damaged, so that the normal Ego cannot develop. We see the counterpart of this, where an arm or leg never comes into use because the motor cells thereof are damaged.

There may be endless causes at work against the development of the Ego, so that the shattered Ego, which we see in many, is but a part of the original, and this accounts for many of the weaklings and degenerates. It also illustrates the compound nature of the Ego, or the division of the personality into parts. In isolated cases when the brain is attacked, we should do our best to restore the health, as there is no part of the body more capable of recovery than the brain and nervous system. It has a large reserve stock of "embryonic" brain nuclei or cells awaiting development. The results of careful and necessarily prolonged treatment and supervision are in a large measure successful. Many, however, are never the same after a serious nerve illness. If recovery be imperfect, the result is a changed disposition. Those who were bright and cheery may become dull, peevish and irritable.<sup>1</sup> Some lose their memory, or their application and mental vigour, others are affected in their sense of morals. The true balance of the Ego has apparently been disturbed and not properly readjusted, so that new sub-personalities, previously under guidance, lead and direct the individual. The Spiritists, in my opinion, wrongly describe it as the personality under control of an alien spirit from the outer world. It is I think the true Ego, the highest mental concept, dethroned, and a sub-Ego in control. But we are confronted with the difficulty of finding a limited definition of the Ego, or personality. Some speak of the Ego as consciousness, but is the Personality destroyed by death, or even absent during sleep or anaesthesia? No scientist could admit of such an opinion so long as the laws of conservation of energy rule the universe. Energy, muscular and nervous, are transformed from chemical

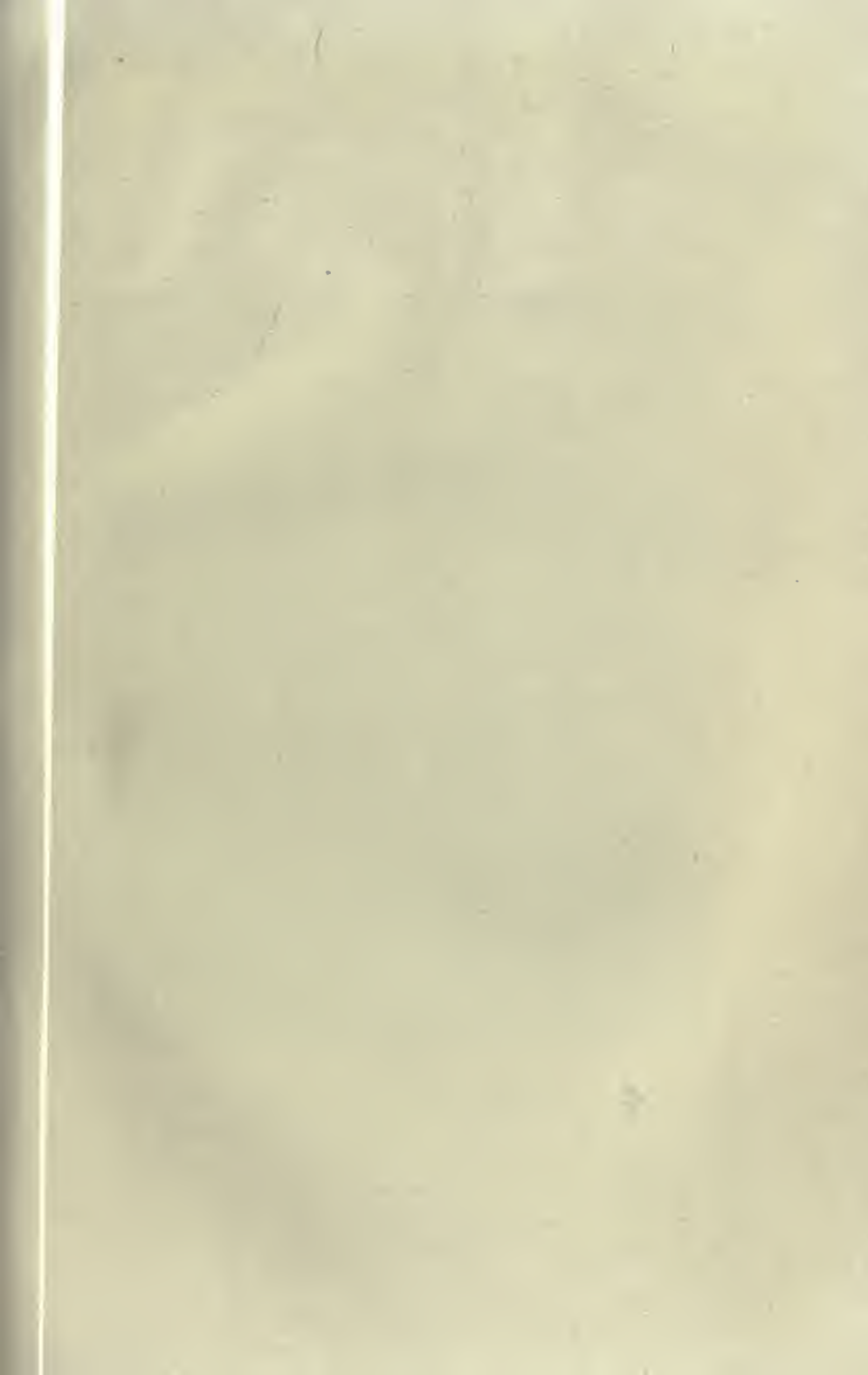
Constant  
Causes  
working  
against  
the Ego

<sup>1</sup> Read the cases for actual confirmation. See fig. p. 108.

energy ; but the subtle psychical forces which reign in or through mind are beyond our powers to measure. Surely they cannot be lost, but how they may be transformed will probably always remain a mystery. If we move from this position and allow that death ends all, we reduce the brain with its psychic functions to the position of a gland such as the liver ; only instead of secreting a chemical substance, as bile, it secretes something we know not how to analyse, namely, mind.

Science  
admits  
Unseen  
Forces

There is no scientific objection to an eternal force or power higher than mind, or above human conception or measurement. It is the experience of many that such an influence actually exists, and is no delusion. It follows likewise that the "Fruit of the Spirit" should blossom and ripen more fully in intellectual soil. Such we see in comparing the lives of intellectual men "spiritually minded," with those at the opposite pole, such as our poor "converted" criminals. The Ego or personality, even when shattered or poorly developed, is receptive of this higher influence. Perhaps the normal Ego presents variations, as in the case of man, betwixt giant and dwarf forms, with corresponding differences in strength and stability. This seems the only way of explaining the different effects of religion or ethics in different individuals, apart from evidence or suggestion of abnormal or sub-personalities. It also furnishes us with an explanation of reformed life in the illiterate, or the criminal, which may be regarded as a dwarf form in most cases, and answers the objection as to the genuineness of their conversions, and the permanency thereof. The Salvation Army and similar agencies experience many relapses, and consider it necessary to protect and hedge round these stunted growths. They might be called subnormal Egos, as contrasted with abnormal types and sub-egos, and furnish a correct basis for this part of the science of criminology. We must, however, on the plea of brotherhood, sink all social distinctions, or else cast religion to the wind, for a converted criminal is a valuable asset to society, and on practical grounds, apart from humanitarian principles, the work of the Salvation Army and other socio-religious bodies merits liberal support.





Assuming his former nightly attitude for sleep.

As an extreme contrast to the intellectual leaders of social reform, I might mention the case of one of our most dangerous burglars who received 400 lashes with the cat, and 40 years in prison. What the law could not improve or soften the Salvation Army accomplished by reaching his Ego or inner self, though it considered it necessary to watch over him till the end of his earthly career. Many of these converts, whom I have examined, have been physically degenerate, and some mentally weak, but religion appealed to the subnormal or stunted Ego which remained.

The following is a case of a stunted Ego reviving under conversion—a male, aged 40, who had been a lazy man all his life. He is a typical invert, passive, not energetic enough to do wrong; also he admits never having done a day's work before his conversion. All he aimed at was enough to pay for a bare allowance of food, and if possible a bed. He had, however, so often to sleep on a stair, that he lost the habit of assuming the horizontal position, and after his conversion for some time always slept on the bed in a sitting posture, leaning against the wall. He is rather a curiosity on this account. The Salvation Army were the means of his conversion, and his stunted Ego when roused exhibited new and more normal tendencies. He now works hard all day and feels happier than before. I regard this as a very practical conversion, for his work consists in scrubbing, which can afford no pleasure. It represents the awakening of a stunted uneducated Ego, which had loafed the streets for thirty years, in what some may regard as a form of somnambulism. Comparing his religion and ethical condition with that of the average man is like comparing the difference between a tallow candle and an electric light. It would take a volume to explain, so I can add no more, except that the light of a tallow candle is of use in some places.

Conversion, then, requires no premium of intellect, but resolves itself into a choice of two conditions; <sup>1</sup> and the resulting potentialities must depend upon the ability of the individual. We are all daily passing through minor conversions, which consist in comparing mental pictures of past and present

<sup>1</sup> "Therefore choose life and good."—*Deut.* xxx.

Contrast  
of the  
Law and  
Salvation  
Army in  
improving  
the  
Criminal

Religious  
Conver-  
sion  
Examined  
Scientifi-  
cally

circumstances with future prospects and possibilities. A conversion from one creed to another may be slow and require deliberation, whereas a conversion from evil to good should be decisive and rapid. We are aware that such is not always the case, when the distorted Ego clings hard to the distorting influences on the physical plane. As an example I might instance my own conversion to antiseptic surgery, when a fresh unbiased student, under the teaching of Professor, now Lord, Lister. It was decisive and prompt, whereas some of the mature and skilled surgeons resisted conversion for years, finding it so difficult to leave their old habits, and open up fresh channels in their mental neurons, much to the loss of their patients.

In religious conversion there must be several stages, as contrition and sorrow, followed by hope, with new desires and ideals. I take it that as brain is the physical basis of mind, so mind is the psychical plane in which the higher spirit manifests itself ; and as before said, the extent of the spiritual manifestation must bear some ratio to the amount of mental power and development. The order seems to be body, mind and spirit. The body is governed by chemico-vital forces : the brain evolves nerve force and mental energy : whilst the undefinable personality or Ego is in relation to the higher spirit, which we call God, and other races name Allah, or Great Spirit. If this view be correct, it is some plea for leaving other races to enjoy their own deities a little longer, until we get our own house into order.

Ethics  
versus  
Religion

In the disputes between ethics and religion, the latter has higher claims, being more expansive, as it allows for the existence of an unseen power. Science in every decade unfolds knowledge of fresh forces, and we cannot regard poor human intelligence as the acme of the 'Creation.' We are only on the edge of these great mysteries. To limit the conception of God is to place narrower limits to human understanding than should exist. To deny the influence of this Spirit on mind and character is to limit science. We know mind by its intellectual manifestations, how can we refuse to acknowledge the manifestations of the Spirit, which exists on a higher and non-material plane ? It is only a few years ago since



we thought that wood was opaque and glass transparent: now we find the reverse is equally true, in relation to X rays.

Knowledge and discovery are ever on the increase. We look on the past generation as behind the times, but I fear we shall be regarded in a similar unsympathetic manner by future generations. Therefore to suggest a present finality to knowledge, or to define the horizon of our mental operations, is a presumption which cannot be tolerated in any discussion on the subject of unlimited unseen forces or powers. Let me ask the physicist to extend and define the etheric vibrations beyond the red and violet in the spectrum or rainbow, and he shrugs his shoulders in despair. Twenty years ago he would have said that nothing existed beyond the red and the violet, but now we know quite differently. At the former time his intellect and imagination could not conceive the then hidden heat and light rays. At the present time he has no instrument by which to discover further new vibrations, so the attitude assumed is "agnosis."

The same position is taken up in religious matters by the Agnostic, who talks as if one should measure the vital forces with a perfect standard before he can believe in them. The  
Agnostic

Each science has its own formula for making estimates, and the psychical phenomena, bearing on the existence of an unseen power, are in one aspect a closed book. We are allowed to see the resultant manifestations, but the how or wherefore we cannot solve.

The scientific man cannot define life, except in commonplace and unhelpful terms. Yet he admits this unseen vital force in plants and animals, and in their seeds and germs. In like manner, there is no reason why there should not be another form of life associated with the mind which we call the soul.

Though we can measure nerve motion, and the rapidity of simple thought, or the delay and disturbance of thought by emotion, yet we have no apparatus that can disclose or explain mental energy, or its effects and changes in the cells of the brain. How then can we hope to acquaint ourselves with the soul?

We all know too well the limitations of power and existence to the human mind, and so far we may compare man to a Man  
like a  
Machine

machine, like, for instance, a watch. There are many watches which appear normal, but the machinery oft goes wrong as with many of us. Nor is the perfect machinery able to work beyond a certain time. Some are old at 50, while others last to 70 and 80.

These facts are not sufficiently considered in dealing with human wreckage, or we would make more allowance for bad machinery. Certainly we should cease from punishing old dotards of 70 or 80, whose "grinders are few." Instead of casting them into prison, with its shame and horrors, the State should care for them in homes, remembering in many cases they were useful and faithful citizens till they passed the stage of repair.

## CHAPTER XIX

### THE MORAL INVALID AND THE MENTAL CRIPPLE

**NECESSITY OF BEING ACQUAINTED WITH THE BRAIN MACHINE :**  
Criminal types—Object to analyze the criminal physically and mentally.  
—**MENTAL INVALID OR MORAL CRIPPLE :** Education has changed the criminal type—My experience at Dartmoor.—Deterioration now going on among the upper classes.—**BORDER-LINE CRIMINALS :** Parental duty—Don't force children or youths.—**SHIELD THE CHILDREN FROM THE KNOWLEDGE OF EVIL :** The effect of evil suggestion—Auto-suggestion—Cases.—**BAD LITERATURE :** Need of press censor—Duty of Government—No one can take the parents' place.—**DESIRE FOR WEALTH WITHOUT WORK :** Cases to illustrate the loafer—Bad companions—Laziness and drink—Lazy tramp—Lazy and gambler—Sad case of neglect : saved by good influences at pauper school—Knowing the difference between right and wrong.—**CRIMINAL RESPONSIBILITY :** Dr. Mercier's writings—Criticized.—**TO THE MORAL INVALID THERE IS NO FREE-WILL :** Compare with a physical cripple—Responsibility clear in complex purposive actions—Allowance for impulse—Correct for normal people.—**THE CRIMINAL MIND ABNORMAL :** Like an overgrown baby—Requires protection and compulsion—Follows the way of least resistance—Instincts of primitive man.—**THE COMMON THIEF A MORAL CRIPPLE :** Has never learned the principles which must govern Society.—**SALVATION ARMY GIVING THE EDUCATION THE STATE SHOULD HAVE GIVEN :** The legal profession is now sympathetic.—**MORAL SPLINTS REQUIRED :** The medical man required to elucidate these psychological problems—Crime like a moral cancer—We must aim at the cure of crime.

Ruskin said that "Punishment is the last and the worst instrument in the hands of the legislator for the prevention of crime."

A CLEAR understanding of the physical action of the brain ought to form part of the education of every criminal lawyer and jurist. Some of the mysteries otherwise unappreciated by the layman are thereby unravelled and explained.

Every intelligent parent can appreciate the importance of information concerning brain and mind with a view to the proper training of the young, for under better auspices many actual criminals would never have developed their evil tendencies. Some of those I have examined expressed a thirst for crime, usually theft ; some are attracted by the excitement of the life. In the former type we see rudiments of the unscrupulous

pulous acquisitive financial adventurer; in the latter a perversion of the spirit of adventure and sportsmanship of which the Briton is justly proud.

It is the object of this chapter to ascertain the physical and mental basis of the criminal. Is the defect in the association areas, so that he never sees life in the true perspective? There might be two causes; structural underdevelopment or decay, in which case he would be more or less insane, either ament or dement; or average structure might exist, but want of education would deprive him of the opportunity of distinguishing right from wrong, and giving each its proper value.

Moral  
Invalid or  
Mental  
Cripple

In these circumstances the criminal becomes a moral invalid, or a mental cripple. From whatever standpoint we view the criminal, we do not at present see him on his "native heath" *in situ*. We so abhor him as a species of leper that we are only too thankful to hand on our responsibilities to some one else, not grudging the big bill of costs necessary for imposing a barrier between him and us. But the criminal demands special treatment, first for the safety of the public, and secondly for his own protection against himself. The question is too serious to be ignored or pushed aside. Thirty years ago our prisons were occupied with much rougher men than now. Education has made the lower orders a little smoother externally, but more cunning, whilst the pace at which we live and the neglect of nature's laws has produced more pseudo-criminals or borderline cases among the respectable classes. I was struck, when going over Dartmoor, by hearing the chief warder speak of the prisoners as "gentlemen." He was describing the facilities of the library, and said, "A gentleman can get any book he wishes to read or study through the chaplain."

Our prisons have quite as many gentlemen as rough men. As the former are educated there must be some atavism or degeneration going on apace among better-class families. This is no imaginary picture, as every medical man of experience can testify. There is so much luxury, alcohol, and high living, plus a tremendous stress on the nervous system, that the marvel is there are not more degenerates.

There are, however, many more on the borderline than is suspected. They are weaklings, or mental cripples who will drift, if neglected, either towards insanity or crime. Their relations may not be alive to the danger until a catastrophe has happened, but often it is their indifference and lack of courage that prevent them from seeking advice in time to avoid such an event. If parental duty be observed and each child educated with due care, then if a catastrophe occur, it is modified. Medical men have occasionally to rescue unfortunate youths from the clutch of the law, or to place others of the same type and social condition in asylums. On the first there necessarily rests a shadow, whilst on the latter there is no dishonour to embitter the affliction. The difference would probably be due to environment, to the primary parental care. In order to avoid these social shadows parents must devote their lives, as a religious, moral, and social duty, to their children. They will in later years possess the filial affection, which is worth more than all the flattery of society or the fawning of inferiors.

Border-  
line  
Criminals

It is a very great error to ripen the children too soon. Let them enjoy childish innocence and simplicity, until they are quite strong enough to bear the yoke of youth, and allow them to enjoy the vigorous pleasures of youth, manly sports, brisk studies, and healthy hobbies, until they are equal to the burdens of adolescence. Life will then be a success to them, and what is worth more, an honourable happiness and satisfaction.

While some parents shield their children from all knowledge of evil, others seriously maintain that it is better for children to know the evil of the world, in order that they may the more easily avoid it. But when a child is familiarized with wickedness the brain is furnished with a series of evil mental photographs. However forcibly the evil may be denounced, the poisonous seed has been sown and may, nay will, probably germinate. On the other hand restrain such knowledge, and place life with its nobler aim in the true perspective before a child or youth, and all that is wrong or unworthy can only be reached by the pathway of a new experience. What is injurious or unwholesome is better kept out of the mind,<sup>1</sup>

Shield  
the Child  
from the  
Know-  
ledge of  
Evil

<sup>1</sup> Read *The Hygiene of Mind*, by Dr. Clouston.

lest it acts by suggestion as a stimulus to unwholesome acts.

Many of the criminals I have examined attribute their downward course to suggestion from bad companions. But they probably saw, even in infancy, a good deal more evil than people in higher walks of life. These influences would tend to lead them downward by suggestion, acting powerfully on their imagination.

A burglar says he associated with bad boys on the street and was a criminal at 15. He paid the heavy penalty of thirty years' penal servitude.

Another says he went wrong before 15, through bad companions. He had twenty convictions for stealing.

A third man, a receiver, had every chance in life cut off by bad companions leading him to gambling.

**Bad  
Literature**

It is too well known how many lads are now suffering the heartaches of prison, through reading polluted literature, in which every vice is suggested with stimulating and literary effect. There should be a Press Censor for the protection of the unstable, who are unable to choose wisely. A powerful Government control is urgently required. Surely it cannot be right for a Government to hang or imprison young people so long as it views complacently the wicked trash which it allows to be placed before them. If Government has the right to punish it has likewise the duty to protect the weaklings; otherwise its inaction degenerates into culpable ignorance, for the State has no excuse if it do not keep up with the times.

Nevertheless we are brought back to the fact that it is the parental duty to educate and equip the child mentally and morally. No State or institution can absolve parents from their responsibility. As things are, in all walks of life, parents, rich and poor alike, seem to neglect their duties. Those of us who realize this fact ought to lend our aid where possible. Grand opportunities arise for those who are charitably and devoutly disposed, by giving practical advice and keeping an eye on the children, watching and guiding them in youth and adolescence.

Above all things lead them on to industry; discourage idleness and the desire to get money without labour, which is a fertile cause of crime among all classes.

Take for instance the case of a man who is not a criminal, but an idle degenerate. He says he became a loafer at 24, but he got among bad companions at 17. Though under the care of the Salvation Army he has no desire to improve his condition. He is unconverted.

Another man got among bad companions when 21. He never kept a situation because of his laziness and drinking habits. He is now converted and his laziness has left him.

Another case was deserted by his drinking father when he was 8 years old. He was brought up by the Guardians. He became a lazy, obstinate tramp, but since his conversion is happy and enjoys working.

Again a young man was born in good circumstances. As a lad he was lazy, which led to a gay, gambling life. He had bitter experiences, and two imprisonments. He is now converted and hopes to work into a respectable position. And so on.

I had recently such an interesting case illustrating the opposite condition that I must quote it. A man 32 years of age, with tubercle of the larynx, was anxious for permission to marry. By the time he was nearly cured I gave my conditional consent, because he said he had never known what the word "home" meant. His mother died when he was an infant, and his drunken father left him in the street at midnight, when he was about 6 years old. He has been in one situation for eighteen years, and holds an excellent character. To what can this success be attributed? With such odds to fight against, one would have expected him to have joined the criminal ranks. He told me it was due to the splendid influence during the eight years that he was at the pauper school at Hanwell. He was there from the age of 6 to 14, and the education, though simple, was thorough. The religious training was good; they were taught prayers, hymns and the Scriptures, everything being carefully explained. Would he have received the same good influence in an ordinary non-religious State school?

I was much struck by D—— saying, "I knew the difference between right and wrong." The same expression is often used by the poorer folk, but they mean something more, namely, "I have a correct appreciation, or power of choice,

of good and evil, through my association centres." Reduced to simpler terms the meaning is, "I am a responsible being" or "My volitional power is normal, my powers of choice are equal to the forces of my desires, and I am capable of responsibility."

Criminal  
Respon-  
sibility

Dr. Mercier, in his classical work on *Criminal Responsibility*, has cleared the pathway of many of the weeds which obscured it, but I wish to pull up some more, which he purposely left behind, as his subject is strictly legal.

I wish to have this subject of free will and responsibility valued on a basis of common humanity.

To the  
Mental  
Cripple  
there is  
no Free  
Will

I venture to say that the mental cripple has no more power to go straight than the paralysed child, who cannot raise a foot or an arm. Nor can the moral invalid be upbraided for his degraded position, any more than the patient with locomotor ataxia for tumbling down in a crowded thoroughfare. Each of these can live under certain conditions, but neither of them is equipped for the battle of life as civilization has made it.

Dr. Mercier says (on p. 150): "In proportion as the will is engaged in that proportion is responsibility allotted," and (on p. 152): "Responsibility is the more undoubted, the more closely, the more deliberately and the more frequently the will is concerned in the act." The legal tendency is to lessen responsibility, when an act is so sudden and impulsive as to diminish the opportunity of the will to intervene, and direct a different course of action. Dr. Mercier supports this theory, and points out that where a criminal act is perpetrated after many successive minor acts, there are so many opportunities for the criminal's will power to have called a halt. He says later: "At each stage the exercise of will is necessary to carry him on to the next." Though correct with normal individuals, I think it will be generally admitted that "obsessed" lunatics (paranoiacs), or what may later be called "possessed" persons with fixed delusions of persecution, will effect their purposes, whatever complicated obstacles may be opposed to them.



Instability of purpose fortunately disarms most lunatics. But the criminal differs from both, for he is persistent, yet oftentimes quite as irresponsible. The criminal's mind is so absolutely different from the normal that he should not be judged by the same principles. Whatever the cause, he lives on a distinctly lower plane.

The  
Criminal  
Mind  
Abnormal

The mental association is crippled, perhaps never developed. The average criminal is like an overgrown baby, without power to use his knowledge to his own advantage. He may hate punishment and wish to do right, but like a naughty child must not only be protected, but forced to do what is proper. To will is present with him, but how to do he knows not, as St. Paul the psychologist wrote long ago. As there is no one to help him, he goes the way of least resistance, which is downhill. His instincts are those of primitive man, entirely egotistic, or, as we term them, atavistic, hence the ethics, and altruism, which are the development of religion and civilization, are unknown quantities in him. In pursuit of his selfish purposes he focuses his attention on civil law, leaving out of focus a blurred picture of the higher social and moral duties. Hence I contend, that many of these criminals as mental cripples cannot be held responsible, or credited with either clear judgment or free will.

What I have observed in the "up-to-date" criminal does not tally with the criminal of fifty years ago. Times change, so do environments, and so the law of adaptation alters the personality. The great Quaker philanthropist, William Tallack, has enrolled some interesting personal experiences. He says that in the United States the prison authorities are too lax, while in our country there is an inconsiderate severity and uncertainty. It is his opinion that the uncertainty and one-sidedness of British law are due to exaggerated caste and class distinction, and the survival of the military feudalism of the Middle Ages.

My observations among criminals seem to strengthen this view, that many of them are moral invalids and as such they must be treated. Even after their conversion they seem in no way anxious to compensate the owners for the property stolen. To us that would appear the first step, but in these

The  
Common  
Thief a  
Moral  
Cripple

moral invalids there is a failure to appreciate properly the problem and principles of society. In fact, nearly all the burglars seem quite satisfied that they have only robbed rich houses, and left the poor alone. They also consider that their term of imprisonment pays off the debt, and therefore restitution is not required of them.

Salvation  
Army  
giving the  
Educa-  
tion the  
State  
should  
have  
given

The Salvation Army and similar religious bodies are now giving these poor criminals the education which the State should have given them in their childhood. The State denied them this armour against crime, and now punishes them.

We have the sympathy of a large number of the legal profession, for they also look upon these social derelicts as moral invalids and cripples. But the profession cannot help as they would, for the cumbersome State machinery is so rusty and old, that no amount of oiling will make it move straight. We must have new State machinery and let the old be destroyed.

Moral  
Splints  
required

These moral cripples require moral splints, as much as do physical cripples; they demand suitable treatment and protection. There is great room for practical psychology, and in these matters law and medicine should stand shoulder to shoulder. The medical man can trace subtle mental degeneracies and aberrations, which require his technical knowledge. The doctor has no proper place in a trial as partizan, his high calling and technical knowledge should place him as an unbiased consultant. Should there be room for diversity of opinion, then a medical council should be held. A crime is like an abnormal growth, a species of moral cancer. While using the most vigorous measures to destroy it, the criminal should not be discharged uncured. At present nearly all cures are effected by religious bodies. Among many of those I have examined, the greater percentage could have been reformed at earlier stages. Meanwhile criminals and wrongdoers are very expensive to the country, as they stumble along the thorny path; many of them waiting for years, till the Salvation Army was permitted to hold out its helping hand.

## CHAPTER XX

### THE CRIMINAL

Virchow : quotation—Criminal masses rather than classes.—UNABLE TO DEFINE THE TERM CRIMINAL : Many sins or crimes protected by the law—Crime and privilege—Law *versus* justice.—THE CRIMINAL—CLASSIFICATION OF CRIMINALS—1. INSANE : Mentally weak ; the term criminal lunatic is contradictory.—2. BORDERLAND CASES : Equally among the rich ; Often the result of dissipation in parents ; Treatment ; Many are imbeciles.—3. SPORTS : Genii ; Family taints.—4. ACCIDENTS : Y.M.C.A. and the Polytechnic—Perverts active—Inverts passive—General Booth's treatment—Compulsory measures required—Mugs.—THEIR REPLICAS AMONG THE RICH : The criminal a sportsman—A-social, the enemy of society—His social rights—Recognizes no private rights—Never grateful.—CRIMINAL A SOCIALIST : The illicit financier *versus* burglar.—ONLY TWO KINDS OF CRIME : Illegitimate gain and illicit lust—Violence usually secondary—If primary due to perverted lust—Missionaries of empire.—OBJECT OF PUNISHMENT : Revenge and reform—Revenge of society—Reformation from prison methods nil.—THE INDETERMINATE SENTENCE : Later supervision advisable—The prisoner to determine his own sentence by his conduct—Probation, not freedom—Some convicts quite incurable—The Borstal system—Half of the boys should never be in prison—Punish the parents.—CORPORAL PUNISHMENT : Navy and Army should be open to these lads—Reformatory with indeterminate sentence—Remove the prison label.—“ JUVENILE ADULTS ” DWARFED IN PRISON : Better class of warders required for juveniles—Prisoner should pay expenses.—AN AFTER-CARE ASSOCIATION : Crime a parasite on society—Social dross.—MAN NOT FALLEN BUT RISEN : Quaker doctrine of the soul—Corroborated by Nature—Civilization still low down—The desire for wealth without labour.—THE LIBERTY OF THE SUBJECT IS A POPULAR DELUSION : Cases to demonstrate this fallacy—Inverts—State should be parent and guardian.—FERTILITY OF THE UNFIT : National protection—Cases—Sterilization the cure—Arnold White the pioneer.—THE KNOWLEDGE OF THE BRAIN IS THE KEY TO THIS GREAT PROBLEM : Defective construction in prefrontal area—The moral centre—The surface of the brain mapped out—Habit.—THE CRIMINAL MIND : “ Long timers ” quite “ broke.”—TREAT THE CRIMINAL SCIENTIFICALLY : Who is he ? and why is he ? His history before birth—His environment—Case—The poor want our personal interest—The criminal summed up.—WE ARE ALL POTENTIAL CRIMINALS : Fundamental criminals.—ADULTERATION OF HONESTY A FORM OF COMPETITION : Reactive criminals.

A BIOLOGICAL PROBLEM IN AN EVERCHANGING ENVIRONMENT.

A TREATISE such as this would be incomplete without a chapter on the criminal. Virchow wrote in 1892 : “ Every deviation from the type of the parent animal must have its foundation

in a pathological accident." Is not the criminal a psychological accident? As before stated, they do not form a species, a race, not even a class, but being drawn from all ranks should be spoken of as the "Criminal Masses." Their masses are so numerous that they are often described officially as the "criminal population."

Unable to  
Define the  
Term  
Criminal

At the outset I am disturbed by my inability to define the term "Criminal," because sin and crime do not run on parallel lines.<sup>1</sup> Much of well-recognized wrong-doing does not come within the power of the law, as in the wrongs done to young girls or children.

Other sins are protected by law. Thus in the company promoting business false and misleading statements, otherwise called lies, are permitted by the courts. The court allows gullible people to be deceived; but surely it ought to attach responsibility and liability for published statements; it also permits barbaric cruelty and oppression in connexion with money-lending and the "hire system."

Conversely, many crimes are technical and can hardly be called sins. Poaching is an example of this. Formerly the tenant-farmer had to submit to his landlord's game destroying his crops or food without redress; and if he destroyed the depredators, worth a few shillings, he was liable to penal servitude.

Crime too often indicates privilege; wealth, power, and class operating against the poor. It almost suggests that the law makers have in bygone days built up for themselves a heritage of ever-flowing wealth, when they enacted the various laws which make up the British Constitution. All we can say is that law and justice pursue divergent paths as a rule, but occasionally converge and even meet.

Law represents the will of the strong and too often leads to crime. Justice we can barely hope for, as it is a divine attribute. If true justice were dispensed by the State amongst her children, there would hardly be any place for the criminal.

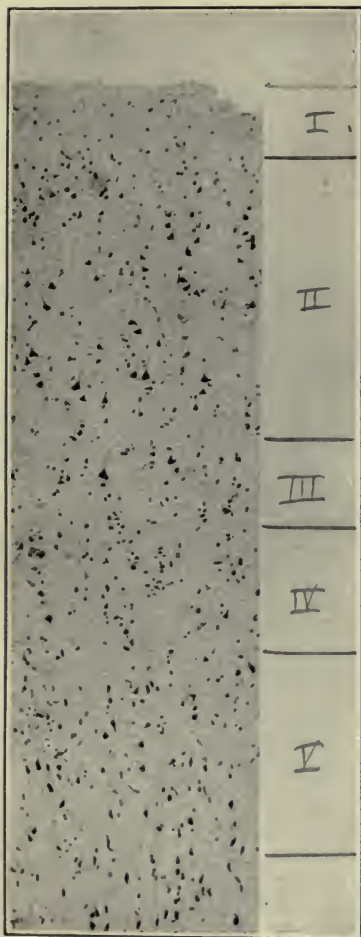
Classifi-  
cation of  
Criminals

I suggest the following classification of criminals:—

1. The insane and the mentally weak.
2. Those on the borderline.

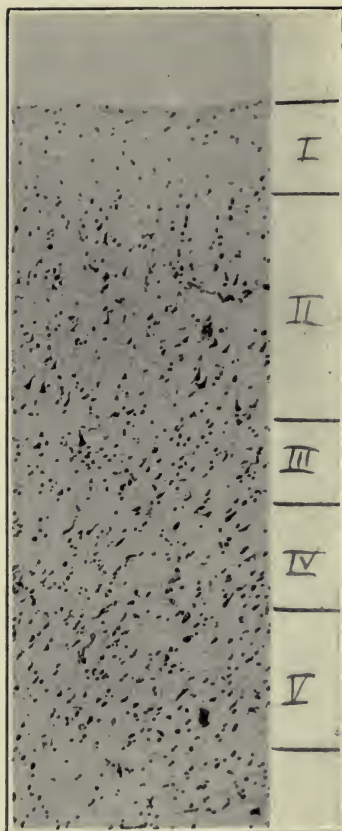
<sup>1</sup> Krimen; kri, to do. Sanscrit.

Prefrontal cortex of an imbecile.



Note how very shallow the 2nd or pyramidal layer is (often found in dangerous criminals.)

Prefrontal cortex of a hopeless idiot (*micro-cephalie*).



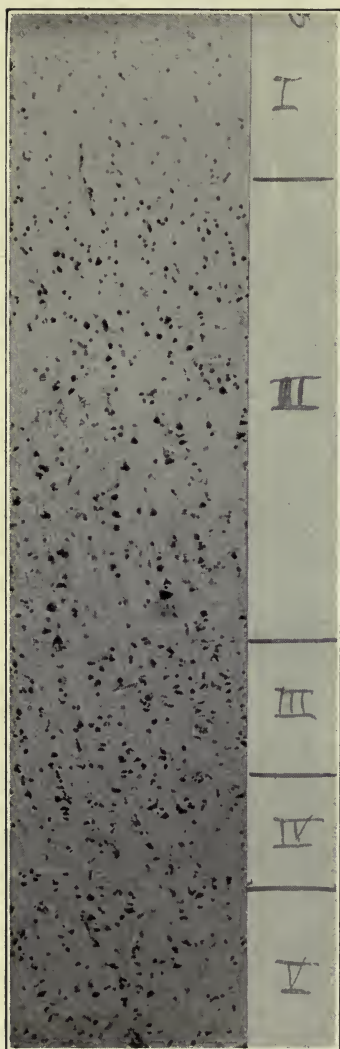
Note that the 2nd layer is only  $\frac{1}{3}$  of the normal depth.

I am indebted to Dr. Bolton for these photographs.



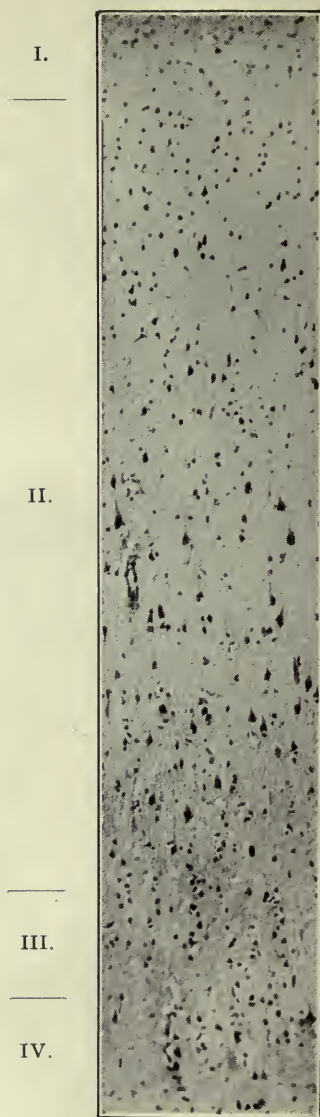


Prefrontal cortex of a dement.



Observe the wasting in II., the pyramidal layer.

Prefrontal normal cortex.



II. is the layer of intellect containing the pyramidal cells.



3. Sports or variations, due to heredity.

4. Accidents, due to environment.

The cause in the first three is internal while in the last it is external.

1. The relationship of insanity to crime is the happy hunting-ground for specialists. As yet only gross cases of insanity are recognized by the law, although in doubtful cases the judges and the jury are usually sympathetic. There are, however, many cases of incipient insanity, or loss of control, where the fate of the accused depends on the judge, and some judges are not educated up to psychology and deal with these cases on the theory of original sin. 1. Insane

The hundreds of prisoners, who are certified as mentally weak and are turned out on the streets, should for their own sakes and ours be collected into asylums or colonies, if they have no proper homes and no responsible relatives. Our medical officers are very much hampered in this detail. The results are very serious. As soon as insanity is diagnosed the stigma of crime should be removed, and the contradictory term "criminal lunatic" abandoned.

Insanity frequently is not recognized at the time when a crime is committed. Among the more usual "insane" crimes, if I may use that expression, are those of sudden impulse, often aimless, and also of extreme violence. Epileptics are liable to these explosions or nerve storms, but epilepsy may not be in evidence. Such might be described as suppressed epilepsy, and usually some neurosis or insanity will be found to have occurred in a branch of the family. A few years ago the *Lancet* reported eight murders in one year by lunatics recently discharged from asylums under an unfit Act of Parliament. These cases might however have been criminals before their mental diseases had developed.

One unfortunate man, who murdered his little daughter, and was reprieved, a year later in prison developed insanity which continued for many years!

Other forms of insanity are often passed over in dealing with a crime, especially imbecility and delusion. Of the latter, delusions of persecution obsess many an unfortunate being and end in serious crime.

One poor fellow is packed so full of delusions and clairvoyance that I can hardly understand his repeated convictions as an expert thief, and his fifteen years in prison. Now he is rescued by the Salvation Army and is a quiet, harmless delusional lunatic. He has no stigmata of degeneration, being a tall, broad, handsome man.

Another, a man of 30, should have been marked off as a lunatic during his fifteen years in prison. He is a middle-grade imbecile, but in spite of that, having escaped the destructive power of the School Board, can remember his life to the age of 4. If the School Board had captured him his memory would only have gone back to 10.

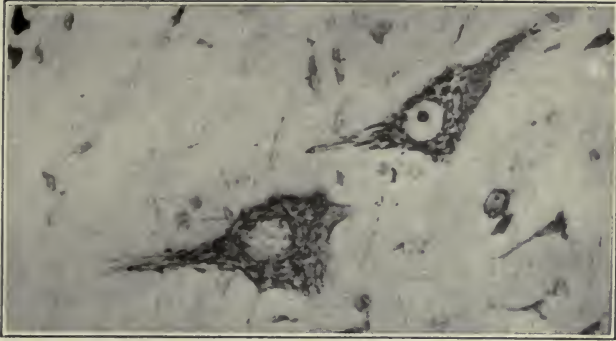
He was trained very thoroughly in a thieves' den and was a pickpocket when 7 years old, and was first charged in a police court when 8 years of age. This educational establishment is still in existence.

Saddest of all such cases are those of incipient general paralysis, when there is a great tendency to indecency, and this happens in the lives of those who normally would abhor such actions.

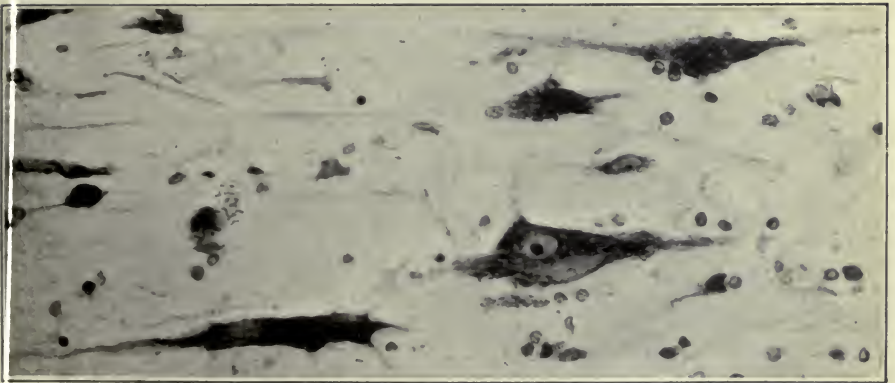
## 2. Borderland Cases

2. Borderland cases form a difficult class, both for diagnosis and treatment. They are as abundant among the well-to-do as among the poor, but are kept out of harm's way in the former.

They are not insane enough for asylum treatment, but are so unstable and neurotic as to be a continual source of anxiety to their friends. Among the rich their misfortune is often due to a parent's dissolute life. The same applies to the pauper cases, but here the dissipation and alcoholism continue, so that there is no proper home life, and they become wanderers or criminals. If these cases are sent to ordinary prisons they are almost certainly doomed. If they have not entered manhood they may be rescued by the Borstal method, and they have a still better chance if placed in such homes as those conducted by Mr. Wheatley of the St. Giles Mission. Mr. Wheatley tells me that very few of these "first offenders" run away. The reason is, that they have good shelter, nutritious food, and above all, sympathy; they realize that they could not improve their



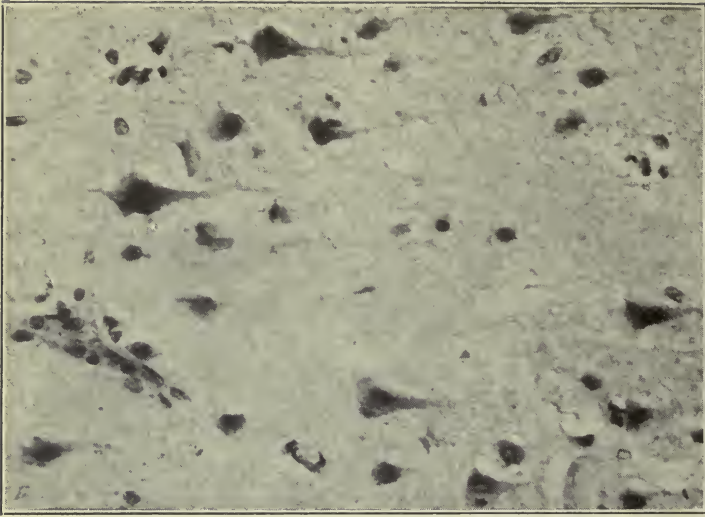
Betz or large motor cells, from the normal case.  
Observe the pattern.



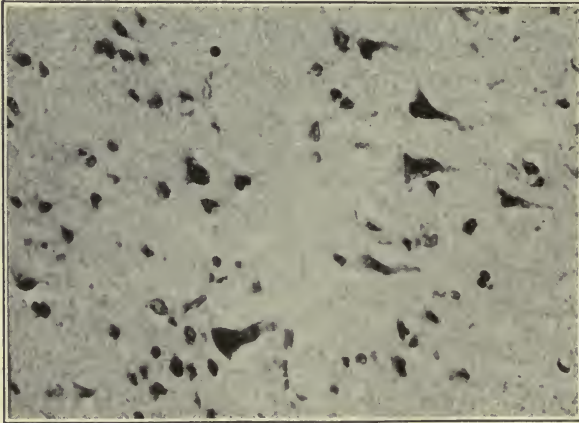
The same motor cells from the idiot.  
I am indebted to Dr. Shaw Bolton for the above 8 photographs.







Normal pyramidal cells from the prefrontal (the area of control).  
For a more correct idea of the normal cortex as regards the number of cells see  
p. 231, and compare with murderer's cortex, pp. 223 and 224.



Pyramidal cells from the prefrontal area of the idiot.  
These two photographs are lent by Dr. Bolton.

position; they do not commit crime for pleasure, but for a living. Most of these poor lads are quite willing to earn an honest livelihood if they are given the opportunity, although some of them are really "feckless" imbeciles. As a result of deprivation and want, their intelligence is poor, their memory is unreliable and does not extend far back, their tempers are very uncertain, and habits of cleanliness, industry or perseverance do not exist.

They are fitted for outdoor work, or where little skill is required. If they be put in positions of trust, or are subjected to competition or strain, they are very liable to fail and to come within the grip of the law.

It is often difficult to classify this group, so for temporary purposes I would suggest that imbeciles be divided into three grades.

(1) Low grades, practically brainless, which are obviously mentally deficient and also very depraved and vicious, with less intelligence than the brutes.

(2) Middle grade imbeciles, who cannot support themselves and require to be kept in institutions or under private care. Their brain cells are far below the average, and the convolution pattern very simple.

(3) High grade imbeciles, who may learn trades and be self-supporting, take their position in family life and society, and even rule kingdoms. This large class is the cause of much social disorder and they are uncertain on account of their instability. They are abundant among the leisured classes, being the product of dissipation and idleness. The influence of their wealth and position makes them a peculiar social danger, especially if they have power. While we have seen some on thrones causing international friction, at the other extreme we find our prisons half full of them, when they are the result of poverty, stress and too often enforced idleness.

3. Sports form the third class, and their origin has been fully discussed in Chapters II, III, IV and VI on variations and heredity. It would be well carefully to peruse the cases illustrating this class. 3. Sports

Human sports are found either high above the line of medio-

crity or else at very low levels. The former are mostly geni. Many geni are topheavy or unstable, and no event in their lives need occasion surprise.

There are many sports amongst criminals, and this is suggested by the fact that there is usually only one criminal in a family group. In some cases there is a visible family taint, some of the children being insane or eccentric, while another perhaps differs in being a criminal. Occasionally the whole family appears normal and one cannot trace the cause of the criminal. If we could ascertain more about the previous generation, we would probably find some evidence of instability.

#### 4. Accidents

Accidents form one cause of many falling into crime. Too often a child of good heredity is left an orphan and friendless, or placed in unwholesome surroundings and drifts into crime. Case 6 is a very good illustration. Many young men who are obliged to live from home fall into temptation for want of interested friends. The Y.M.C.A., the Polytechnic, and similar institutions may take credit for having saved thousands of young men from ruin.

The ultimate classification of criminals must be on simple, broad lines in the way I have indicated, but those who know more of them than I do will doubtless improve on my simple classification of

#### Perverts and Inverts.

The term pervert is to be applied in its widest sense to all who misuse or misapply their normal faculties. A pervert is necessarily anti-social; the idea of "common weal" never presents itself to him. The ultimate goal of selfishness for every wrongful action is a perversion of rectitude.

The invert is a passive wrong-doer, lacking energy, a sort of "born tired," or "can't worker," often "won't worker," and deficient in intellect. He is a bud that does not flower, sometimes cannot, usually will not.

General Booth sums up the correction and cure, by suggesting he should have a meal given him to start with, and a second one promised when a certain amount of work has been performed. If he does not work he must starve, and if he does not earn it for dinner let it wait for his supper, and if he



does not win it by the evening postpone it till breakfast-time next morning.

Mental evolution and physical energy can only be forced out of such by compulsory measures. The State should have the power to seize all loafers and "ne'er-do-wells" and force them into labour colonies until their reform is completed, and effectively restrain them from multiplying. They comprise a mass of unskilled criminals who are despised as "mugs" by the skilled upper-class of criminal.

These lazy and criminal inverts have their replica in the aristocracy and wealthy classes. Among the pure aristocracy intermarriage, indolence and dissipation have produced a large proportion of degenerates, whilst excesses among the *nouveaux riches* seem to result in rapid deterioration of their progeny.

Their  
Replica  
among  
the Rich

The socialist, of course, objects to see the pauper invert "moved on" from the street corner, whilst the wealthy invert "swells round" the parks. Though the wealthy invert does not annoy society by coming on the rates yet he may be a more dangerous criminal, for he often uses the power wealth confers for very evil and grossly selfish purposes.

In whatever manner we classify the criminal, we are always brought back to the fact that he is a "sportsman"; if I might be allowed a little extension I should say "the sporting gentleman." Some have told me that there is a real sport in crime and avoiding detection; that they had a genuine pleasure in the excitement.

If we study the criminal as he is, we not only get to like him, but desire to help him. A criminal usually takes a good deal of making; sometimes it is a laborious process. People apparently good do not suddenly go wrong; in their case the complaint has usually "been in the blood." If I risked a definition of the term "criminal," I should style it as "a person deficient in stereoscopic moral vision." The criminal sees life as on a flat plane, and his perspective is focussed on self, and self alone; the absence of stereoscopic relief debars him from comprehending the well-being of his neighbour or appreciating the result of his acts.

Being anti-social, the enemy of his fellows, the criminal considers he has full claims on society generally. If he is

caught and punished he boldly says that on his freedom he is entitled to make "his own back." These are his social rights, for he never realizes that he is a parasite on society; nor does he recognize the claims or rights of ownership, even when property is acquired by personal toil. On this account the criminal seldom feels gratitude for any kindness shown, nor does he consider it disloyal to injure those who help him.

Crimi-  
nal a  
Socialist

The criminal is a pure socialist, for he regards all earthly possessions as open to competition by fair means or by foul. In principle the skilled burglar does not differ from the astute and dishonest financier, some of whom are now hoarding up wealth in our land under the shadow and protection of the law, and moving in polite society. The burglar is superior to him, for his boast is that he never robs the poor, whereas the illicit financier goes for rich and poor alike, widow and orphan. Of the two criminals I prefer the burglar for sturdy manliness and a certain sense of honour, having had acquaintances among both classes.

What then do we expect to find in a criminal? Is he to be tall or short, of good or poor physique, handsome or ugly, attractive or repulsive?

The criminal world is full of surprises and you find what you least expect. Usually he is below the average in size and physique and shows many stigmata of degeneration; but the same may be found among non-criminals, even in the professions.

Is he repulsive? I don't think so. In meeting them both in and out of prison I see in the criminal eye deep-seated agony, despair, cunning, hopelessness and remorse; as the official approaches he takes on the character of a beast, fury controlled by fear. How different he looks when the doctor approaches, his chief friend in prison; but what a change over his whole expression when he spies the uniform of the Salvation Army! I have seen him cry with joy and the higher Ego, or what remains of it, comes into evidence.

Yes! poor fellow, he is a degenerate; often so in body, always in mind, and therefore we may safely infer in mental construction and brain pattern (*see* Chap. XXI). The criminal is often deficient in the finer perceptions of colour, touch, or delicate muscular movements. After all he is by

no means a bad sort, if handled with sympathy and love ; but don't expect too much of him or compare him with normal standards. It is his very instability which makes him a criminal. He is not necessarily insane, and certainly he is not sane. He enjoys a territory of his own, midway, in the regions of degeneracy. Don't blame him because he won't work. He may have tried honesty, but certainly he finds "dishonesty the best policy." He has not got it in him to do a full day's work ; application and industry are wanting. For his benefit the State should open self-supporting factories, compelling him to work on his release from prison, but giving wide latitude to a slow and uncertain rate of work and energy. He certainly should not be cast on the world in a mind-exhausted neurasthenic condition.

All crimes seem to fall under two headings :—

Illegitimate Gain and Illegitimate Lust.

Only  
Two  
Kinds of  
Crime

If one consults a book on criminal law, the numerous titles will adapt themselves under these two headings. Violence is frequently only a secondary crime depending on the above, and necessary for success. But cruelty and violence may occur primarily ; they are then perversions of depraved lust. This is a subject which cannot be pursued in a popular treatise, as it is too revolting a subject.

As the empire is made up of individuals good and bad, those who devote their time to good works among the latter are the true "Missionaries of Empire," a misused term, lately introduced for political purposes.

We have in London 150,000 recognized criminals, which works out at nearly 2 per cent. of our metropolitan population. The stream flows on. Private charity cannot stem it, and the State refuses to aid these disinterested institutions, and when individual Home Secretaries do grant financial aid, it is done under cover, as if they must not make it public.

The punishment of the criminal has two objects :—

Revenge and Reform.

Object of  
Punish-  
ment

Many will object to the former as too strong an appellation ; however, it is not the revenge of the individual, but the vindi-

cation of the rights of society. It is the vengeance meted out to the offender, in the hope that fear of the same will be an example to others as well as a future deterrent to himself. It is a poor form of revenge, as it accomplishes so little, while it fails in permanent improvement, for the reformation of criminals through prison discipline is practically nil.

The Inde-  
terminate  
Sentence

Prison would be curative if the indeterminate sentence were adopted, followed up by wise supervision. All hope of success, however, rests in that one word—wise. Most supervision is more or less of a terrorizing character, and in no way assists the criminal, but drives him to desperation

The ex-king of burglars, whose knowledge of criminals is very far-reaching, and who has tasted the bitter experience, says that when a prisoner is convicted the judge should say to him that no limited term of imprisonment shall be assigned, but he goes to prison to arrange his own term of penance. Thus prison would not be so hopeless, for the convicts would work out their own salvation, which would give them the impetus to reform. He also suggested the importance of the convict being liberated on probation, and only being declared a free man when he convinced a committee of supervision that he was capable of leading an honest life. Some men, he thinks, should never regain their liberty, being incurable, although from observation, I should regard no case as hopeless until the Salvation Army methods have failed.

Under the Borstal System much improvement occurs among the class of juvenile offenders. The Borstal Committee rescue or cure about 50 per cent. to 60 per cent. of these young convicts. This makes the work appear in glowing colours, but without detracting from their noble efforts, I suggest that at least one-half of these lads should never have seen the inside of a convict prison.<sup>1</sup> When poor boys allow their exuberant spirits to run riot they should have a little of the same for-

<sup>1</sup> Quite recently, 1906, two very decent lads were sent to one of our largest prisons in London for playing football on a highway.

About the years 1890-2 two boys, eleven and twelve years of age, were sent as convicts to Dartmoor. They were serving five years for incendiarism. The governor, Colonel Plummer, got them removed to a more suitable institution.





From left to right.

Ages  
 18½  
 17½  
 12½  
 22  
 16

Heights  
 5ft. ; -7in.  
 5ft. 1in. ; -7in.  
 4ft. 1in. ; +2in.  
 5ft. ; -8in.  
 5ft ; -4in.

Weights  
 8st. ; - 1st. 12lb.  
 7st. 3lb. ; -2st. 4lb.  
 6st. ; - normal.  
 8st. 6lb. ; - 2st.  
 6st. 7lb. ; - 2st.

bearance as is shown to "gentlemen's" sons. It must by force of circumstances be differently applied, for in the first place parental control must be insisted upon to the extent of punishing those parents who fail in their responsibilities.

The second stage for continued petty boyish offences, or even small crimes, should be corporal punishment, prompt and sure, without confinement. The navy and army should offer special advantages to lads who are forced to the borderline of crime, for they improve rapidly and straighten out under discipline, and, I am told, make brave soldiers.

For third convictions an indeterminate sentence to a reformatory or farm colony should be resorted to on the Borstal system, the label "prison" being removed. Poverty is hard enough to bear, and crime embitters the whole life, but to stamp out hope and self-respect by convict garb and harsh prison rules is the essence of inhumanity in the cases of developing youths.

Let us imagine the mental states of the "juvenile adults" as these youthful gaol-birds are called. A lad from sixteen to twenty-one is bursting forth into physical and mental energy in the same way as all nature blossoms out in spring. These unfortunate victims are cramped in every direction. Their mental ideation, which might be led or directed, has little chance of running on right lines, for the supervision of the present class of gaolers is not mentally refreshing or morally refining, but unfortunately much the reverse, while the hours they sit alone in their dismal cells sometimes only 5 ft. x 10 ft., is most pernicious. In order to educate these boys we must lead them out of themselves to higher spheres and levels of thought and ambition.

To effect this the care of these lads should be entrusted to men of a much higher grade, both intellectually and morally.<sup>1</sup> Oh! that an enlightened government would hand them over

<sup>1</sup> At one of my evening visits to a London Mission I found a boy in their charge, who was one of a very dangerous gang of hooligans. Dame Nature equipped him for the honest toil he is now pursuing. He is rapidly improving under the treatment of the Mission; whereas his mate, after lying in prison for ten years, will be turned out a hopeless derelict, and will then have cost the country about £500.

Corporal  
Punish-  
ment

Juvenile  
Adult  
Dwarfed  
in Prison

to socio-religious agencies, or to the Salvation Army, which has come to stay.

A far better system than the present is to place the boys out on farms singly. There are many farmers who would be willing to take these boys into their families, and the lads could be passed on to our colonies. A small fraction of our heavy taxation might be very usefully spent in this direction.

Juvenile criminals are often mere social dislocations ; when matters are properly readjusted, the term criminal no longer applies.

In all prison systems, the prisoner should be detained till he has paid for his maintenance, including the proportion necessary for administration expenses. William Penn started this system in Pennsylvania, and the effect was very deterrent. If every man knew this system to be enforced, he would think twice before committing crime, as it would be too annoying to him to help in the support of even the Governor and his family !

An After-Care Association

For all prisoners, from juveniles to chronics, there ought to be provided an After-Care Association. At present the Salvation Army, the St. Giles' Mission, and several other philanthropic bodies fulfil these requirements. It should be worked by the State, and every prisoner on his discharge from gaol should be compelled to pass through such an institution till his character is thoroughly established and he is saved socially.

Society never faces this parasitic disease of crime. It is accepted as a part of our civilization, and the purer (?) or higher (?) this becomes, the more dross or scum is to be thrown off. Yet all scum carries away with it a certain amount of good material, and if we examine our social scum we can pick out much which is there by accident.

Man not Fallen but Risen

The popular view with some is that man has fallen ; whereas he has risen stage by stage from the lower creation, hence his fallibility and perversity. This evolution is clearly set forth in the first chapter of Genesis, and has since been confirmed by Darwin, by Hugh Miller, and many other scientists.

Nevertheless some theologians see Christ in every fallen woman and depraved man, which is improbable for the many



reasons given in this paper. Doubtless the Quaker doctrine is the more probable: that every man contains the germ of spiritual life in a dormant or latent condition. The natural seed requires warmth and moisture to germinate, and, after sprouting, light to favour growth. Plants grown in darkness are pale and weak, like our slum children. Does not the spiritual germ in the human "heart" require the warmth of love and charity, and the Water of Life (Isa. lv.) and for growth the Divine Light? We cannot cure our poor dear waifs and heal the sores our methods have caused in any other way. Even the hardest and most dangerous of criminals will soften, as in the instance of Case 6, the most dangerous criminal of the Victorian era, whose conversion is recorded. If law, punishment and treatment were built upon this knowledge, we should at once successfully grapple with crime.

At present civilization has not reached a level of godliness, purity, or altruism. There is a warfare between the classes and the masses.

The desire to grow rich without honest toil is a form of involution or inversion, which both encourages and is encouraged by the system of speculating and gambling, ruining hundreds of thousands every year, and drawing much money from the honourable pursuit of commerce.

The liberty of the subject is a popular delusion, fostered by public opinion. Does a man with small-pox enjoy this liberty, so that he may walk the streets? No, because he is a danger to the public. Why then do the degenerates and inverts have the same liberty as the thrifty; their unwholesome lives and acts spreading more ruin and disaster than any epidemic of plague? Why is this liberty extended to the "can't worker" and "won't worker?" They ought to be deprived of their liberty, as they are social outcasts. It is the duty of the State to collect them as derelicts for special care and treatment at the outset of their career. They are suffering from disease of intellect and morals, requiring as much attention as do wandering lunatics.

The time has now arrived when Intelligence should replace Sentiment, and the State should act as parent and guardian rather than as policeman and gaoler.

The  
Liberty  
of the  
Subject  
is a  
Popular  
Delusion

Are we not wicked and heartless in calmly watching the prolific increase of unhealthy beings? Is it right to allow the starved and stunted offspring of the drunkard to arrive? Is it not our higher and Christian duty to prevent these lives of misery? If the public knew what it meant, they would insist on "National Protection," for the numerical growth of invert and unemployables is a problem which must be faced sooner or later. Here are four cases, not specially selected—

1. A feeble-minded man at the age of thirty-eight was father of nineteen defective children.

2. A father, who was in reality a high-grade imbecile, was father of twelve deficient children.

3. A feeble-minded maternal grandmother, an epileptic mother, and a shiftless father, are responsible for seven idiot children.

4. The famous Jukes family in 100 years produced from five degenerate sisters no fewer than 1,200 descendants, in whom degeneracy and criminality preponderated.

There are also on record alarming accounts of the large families criminals have. There is no question that a number of criminals' children might be saved,<sup>1</sup> being manufactured by their surroundings, and as alcoholism enters so largely into the question, the State could quite well dispense with these families. Hence sterilization is the wisest, most economical, and most righteous procedure. Certain States in America are making it legal and compulsory, subject to a civil and medical advisory committee. It should be applied to both sexes, for the operations are safe.

The results in America amongst deficient, quarrelsome, lazy and epileptic individuals give encouragement.

It is the cure for hooliganism, lust, and laziness, without impairing energy or mental stability. The effect of castration on bulls is known by all; and in the case of stags, the horns do not grow after the operation. We could tolerate the hooligan without his horns.

<sup>1</sup> Dr. Lojacono, of the hospice of S. Martino in Palermo, has followed for twenty years the careers of 400 children whose parents were "criminally insane," brigands (who are but sportsmen), or belonged to the worst class of criminals. Almost all of them through healthy environment are doing well.—Bianchi on *Psychiatrie*.

It is frequently practised on women for medical reasons, and only in a few cases is there any mental impairment. The national ability and quality would improve by throwing out unwholesome breeders. The country, however, does not yet appear ripe for cures. The subject was, however, fully discussed in "The Problems of a Great City," by Arnold White, in 1886, and he was the first to apply the term "Sterilization of the Unfit." There is little to add to what he has already written, except in the way of accumulative evidence. What he prophesied twenty years ago we are now realizing as painful facts.

The key of the situation in the case of the ordinary criminal is to be found in the study of the brain. In a previous chapter I have given a short account of some of Shaw Bolton's researches where he has proved beyond all doubt the deficiency in pyramidal cells in aments or defectives, especially in the pre-frontal association area. This is the seat of control or inhibition, and therefore what we may call the moral centre. It is also the commander or general directing all the mental operations. We can realize the disorderliness of an army under an incompetent general, and that is exactly what we have going on in the brains of the criminal and the degenerate.

We have already read in earlier chapters that the surface, or the cortex, is mapped out into districts or areas—

1. Sensory.
2. Motor.
3. Association.

The sensory stimulate the motor, and the association area switch up endless communications between the two. When the current of thought runs continually through one set of neurons, the route opened up is easier to travel along each time. This is the explanation of the power of habit, the ease with which it is pursued, and likewise one can imagine the difficulty it is to switch off.

Knowing this, we must not expect too much of the habitual criminal, whose whole mind lies in one bent, like the crooked tree leaning in the direction of least resistance. It shows also the advantage of sheltering the criminal, and hedging him

The Knowledge of the Brain is the Key to this Great Problem

The Criminal Mind

round as the Salvation Army do. It is the only way, for he cannot go straight if left to himself.

The ex-burglar king tells me that men who have been seven and ten years in prison are quite "broke." They lack enterprise, intelligence and guiding power, being partly demented by prison life. But, he says, they are so used to prison that they do not dread it, and many men, after ten years, would as soon stay on another ten years as go out and face the world.

What opportunities are lost, and how many souls forced on to perdition and destruction, by the thoughtlessness of the rulers of the Empire!

Treat the  
Criminal  
Scientifically

When a criminal is caught, he should not be treated like a hunted animal, but like a diseased organism, or even as a psychological problem. His case should be sifted from before the time when he saw daylight. It matters little if a man has had fifty convictions or none, or even if he has been in prison twenty years. The questions to settle are—

Who are you?

How are you?

Why are you?

What are you?

We have to see where Nature handicapped him before birth; what civilization did to prevent his normal development; how society tried to crush him and tread on him. We cannot blame him for being anti-social and a parasite, as it is a matter of reciprocity; but we should assume control in such a way that he would no longer annoy society, or injure himself, or leave a legacy to the population. Some will willingly go to honest toil, some must be forced to it, while many who do not like to soil their fingers and hang back, will have to be segregated.

I recently got employment for a young man who had been in prison for a year for obtaining money by false pretences. His employer, who is much interested in social work, found him satisfactory at first, but after a time he flagged in interest, and required some rousing. He was partly a "born tired" and his undeveloped cortex lacked application. This is the great difficulty with that class, but there is a physical cause

for this incapacity. At first he gave satisfaction; but, alas, the bad brain machinery could not hold out long, to our bitter disappointment.

We can often act for these people, whether criminal or otherwise, in advising them. The poor are conspicuous in their lack of judgment, which is due to the want of proper education. It is within the opportunity of all of us to supply their need with our better intellect and mentation, and help those with whom we may be brought into contact: and very frequently we may keep one or another from taking the wrong turning.

To sum up, the criminal has the body and physique of a man, the impulse and disregard of consequences which belong to the period of youth, whilst their control and intelligence date back to childhood.

We can from these facts clearly see that the term "Potential Criminal" is applicable to each of ourselves, so that we must not despise the fallen ones. Sin is universal, but crime is a manufactured article, not for the benefit of the masses only, but also for the convenience and pleasure of the classes. Clearly this should not be so.

**We are all  
Potential  
Criminals**

Unrighteous power and class legislation have resulted in what might be termed "Fundamental criminals." They are all respectable, and their crime is avarice, the undue hoarding of wealth, which in a wholesome community would be handed round. Vast sums of money and property are acquired by skill, and more often by dishonesty. It is against God's law that the strong should override the weak or live on the misfortunes of the poor. Yet such is in strong evidence to-day, so that the poorer middle class are jammed tight between monopoly above and trade union tyranny below. It all comes back, however, to "the sporting" instinct, which began in the Carnivora.

The noble career of John Bright is marked by only two incautious statements, and these were the result of his commercial education. The one referred to child labour, and the other was involved in his statement that "adulteration is a legitimate form of competition." His eyes were fixed on his carpets, which would be as durable but cheaper, with a little

more cotton. Neither he nor others could foretell how chemistry would open the door for adulteration of food.

Adultera-  
tion of  
Honesty a  
Form of  
Competi-  
tion

Adulteration of honesty is, however, a form of competition which has been forced upon the poor by the powerful class of "Fundamental criminals." "Action and reaction are equal and opposite" is an old law in physics, and it has some truth in Sociology. Consequently, at the opposite pole of fundamental criminality we have "Reactive criminals"; those to whom crime is almost, if not quite, a necessity.

We are trying to cast out the latter, which is an impossibility as long as "fundamental crime" persists.

Democratic Socialism is no assistance, as it levels down, confiscates, and encourages lawless idleness, in addition to ignoring all religious truths and moral ideals.

Success can only follow strict Biblical lines, and that will never be attained. We must therefore be content to work on the fringe of crime, saving and helping a few.

If we choose to be practical, we must fall back on the sporting British instinct and look on passively, watching class tread on mass, and occasionally a smart *contre-coup* from mass to class.

But it is very sad that things should so remain. God help the poor!





The Author, Brigadier Playle and their friends who have been sentenced to 96 years in prison.



## CHAPTER XXI

### EX-CRIMINALS I HAVE KNOWN

(A) The haunted murderer—(B) Birdie : the little born criminal—(C) Joe Smith : the king of burglars : a social accident and a fine personality. His conversion in his own words—The murderer's brain.

I WAS led into the investigation of the criminal mind by the remarkable changes of personality shown by Mary Barnes, and reported in the *Journal of Mental Science*, October, 1904, and briefly alluded to in Chapter XVII. I anticipated finding some cases amongst criminals, but was disappointed, after examining more than 200.

I visited the Salvation Army Bureau in Whitechapel, and was most courteously received by Commissioner Sturges, who gave me every facility. I was fascinated by the work, and saw the criminal to the greatest advantage. The criminal is so cunning and so deceptive that those who naturally have to do with him, from policeman to judge, can never get at his real nature. Far different is it when he tastes the genuine sympathy of the philanthropist.

The Salvation Army supplied me with the best material for my purpose, because they take men of any age, and however helpless in body, mind or spirit. The Army throw a bridge across that fathomless abyss which separates the fallen from the fortunate. It is a noble work, which does not require a long experience to arouse enthusiasm and a desire to assist, however feebly, in helping this class.

It is very curious that the two extremes of society are seldom traversed by the average man. The one is the upper ten, and the other is the submerged tenth. Though so much apart, they have much in common. They each receive notice of their movements from the daily press, and feel neg-

lected if such do not occur. Both classes are remarkably selfish and self-concentrated, and each are well supplied with "inverts," and their intelligence is low. The aristocrat speaks of himself as "we," while the criminal speaks of himself as "us." Thus every class in Society has its special features, but the submerged tenth is not so depraved as is commonly supposed. Poverty and immorality are not always companions, and there are some crimes, common in high life, which are unknown even among the ordinary criminals. The emotional criminal is very good to his pal in trouble, even though, as often quoted, there is no honour among thieves.

It must not be thought that rescue work is easy or even hopeful. The disappointments are very great, and until a criminal reaches a certain stage or experience, reform appears to be out of the question. I daresay it would be quite different if they were treated more sensibly from the commencement. It seems as if the starting of a criminal, his departure from the ranks of Society, only commences when he loses sympathy with his environment. It then becomes very difficult for him to get into touch again with normal surroundings.

The formation of the criminal from the cases to be quoted now show four causes. These are, the culpable indifference of the State ; the neglect of parents ; the callousness of Society ; and the loneliness of city life.

Though the State is more than indifferent towards her children, yet those who are actually in power, from the Home Office to the constable in the street, are very considerate to the criminals. Whilst improving legislation on this subject, the State should show some courage and make the parents responsible for their children's conduct. Not only should the parents be punished for their children's sins, but if they cannot offer better material for the next generation, they should be further punished by losing their voting privileges.

It is to be hoped that Society will no longer withhold its interest from this vital and national question. Let us join in a campaign for the cure of crime, and treat this social plague as we have already treated epidemics and pests which attack large communities.

## A

"Blood, blood, blood."

"There's no blood, man. What are you talking about? They'll send you to Parkhurst if you go on like that."

The first speaker was a man of slight build, nervous and restless. He was always looking at his fingers, as if he saw something that should not be there, and then rubbing them hard on his convict garb. Now and again he would repeat the above words, and would rub, rub, rub, but still the blood would not come off. He suffered agony mentally. The casual onlooker would pity him; but how often we pity those who are reaping from the whirlwind what they have sown to the wind. Looked at in this way the sympathy seems misapplied, and ought rather to be replaced by indifference, or still better by an effort to prevent the continuance of these things. We are all to be pitied at some period, and usually for the fruit of our own folly, or error.

"Give me a large stone. I can do it. It will make me forget myself."

"What do you take on like that for?"

Aside in a low whisper, "Did you ever do a murder?"

"No, but I was very close to it."

"I dun un," was the barely audible reply.

This unique episode happened in the stone-cutting yard on Dartmoor, where the material for some of our handsome Government buildings in Whitehall was being prepared. The actors were convicts. One was in charge of a small gang, a tall, fine-looking man, born for a general, but his social evolution had "missed fire." Still he was a commander intellectually, and in some respects morally; though a social dislocation, as much as geologically were the granite tors and twisted rocks amongst which he was compelled to dwell.

The ordinary reader may protest against such a blood-curdling story; yet much of the popular taste is for novels of a worse description, while to this there is a moral, nay, several. This terrible man in the seventies had for the purpose of robbery, murdered a helpless old lady, and to avoid detection, committed a second murder of her daughter, equally brutal. The author of this double tragedy was in a convict prison to hide from the police, and they never traced him.

It may seem strange, but nevertheless it is true, that after the murder he committed a crime, knowing that with his previous record he would get penal servitude. What the cause of this inhuman disposition was I could not trace. The punishment was severer than human law could mete out. His life was ever haunted and hunted, for he never could wash those cruel stains off his fingers. The awful fear pursued him relentlessly, lasting for years, to end in insanity; but still the cry for vengeance continued, and the last words as the troubled soul tore itself from its "earthy" tenement were, "Blood, blood, blood."<sup>1</sup>

Could hell be worse? Or could any hell be bad enough for such a demon in human form? Amidst just wrath and vengeance we must be fair. If we reflect that this man had a drunken father, which is all the history I can obtain, then we have a scientific explanation for this painful and shocking incident. It is hardly necessary for me to repeat what I have written; but it demonstrates that a new era of treatment is necessary. We must isolate degenerates as soon as they are diagnosed, and not wait for a tragedy. In other words, do to them as we do to lunatics who may become dangerous.

## B

Birdie is a bonny bairn, but alas! she is a born thief. Fancy a child of 7 as a criminal! Such she undoubtedly is, and this fact being known, she has been turned away from the social work of the Mission on account of others, and has to be regularly searched at school. When she grows up, she will probably pursue an evil course, and make the acquaintance of Holloway prison in her teens. It is a very sad thing, and it is difficult to help in any way, for the State gives full

<sup>1</sup> This man committed a double murder, an old lady and her servant, in Hyde Road, Hoxton, in the early seventies. No one was ever prosecuted for this crime. For years, when not in prison, he used to visit the street daily, and stand for hours looking up at the windows of the rooms where the awful deeds were perpetrated. He was sentenced to ten years' penal servitude for burglary, but before the period expired he was the most pitiable object Joe Smith ever beheld.

liberty, and visits her vengeance after the event. The State never inquires as to previous history, or seeks to prevent or anticipate these social catastrophes. The State says she must not interfere with the sacred liberty of the subject, but it is her duty to protect the young, as the hen does her chickens.

This little person is bright and pretty, has refined, delicate features, but a cunning, alert expression.

The father is supposed to be a good man ; but the mother not only has a shady past, but condones the offender. Hence a new element is brought in, namely, surrounding influences. The sins of the parent are often transmitted in the shape of arrested development. A person may be morally bad, but if he is physically fit, there is a reasonable chance for the offspring. If alcohol and dissipation have sapped the nervous system of the parent, then may God have mercy on the child.

Birdie stands 3 feet 2 in., which is 2 in. above the average, and her weight is 2 stone 5 lb., which is 1 stone below normal.

We cannot put her down as degenerate in form, for she can see and observe better than most children of her age, but when it comes to choice she fails. We have seen in Chapters IX and X that one part of the brain serves perception ; another part is connected with the desires and lower instincts ; whilst a third part analyses or chooses, and compares the present with past experiences. The defect lies here. It may be rectified by careful education ; gaining the child's confidence and affection ; teaching her wisdom ; dragging her gently up the hill out of the mire ; and starving the ideas and thoughts which are of a selfish character. Common sense dictates that as soon as a school finds a child like this, a thief, she should be removed to an industrial home for the sake of the other children. If by the age of 15 she is normal, let her take a situation under the supervision of a committee. If she is not cured at 18, keep her till she is 20. If she is an incurable criminal, it is kinder and cheaper to detain her always than to have her hunted about the streets, alternately in crime and misery, in workhouse or in prison.

But what committee exists to help ? Ah, reader, we are on the eve of a grand social earthquake. The change in thought is chiefly due to the personality of the late Queen,

her sympathy with suffering, whether moral or physical, for when she ascended the throne the criminal was sport to layman and lawyer.<sup>1</sup> Society is at last ready, and now waiting, for Science to elucidate the whole subject, and dictate treatment.

## C

CASE 6 (Joe Smith). "Quite right, doctor, I see your point, the public don't like us chaps in their houses at night. Crime must be punished. I quite agree. But let me tell you, doctor, the public have no sympathy for criminals, and it is society what makes us poor fellows." So spoke the king of burglars, a fine-looking man, standing erect, six feet, with a well developed head, good features, and powerful frame. "I was the strongest man that ever went into her Majesty's prison. They tested me in the granite quarries at Dartmoor, and I did more rock-drilling than any one else had ever done."

Twenty years at one stretch is a big hole in a lifetime, and now he is broken down with heart disease, partly due to his life of romance, and partly to the hardships of prison.

He would have gone straight once, he says, after a seven years' sentence; only when he called for help on a well-known missionary, he was repulsed and advised to commit another crime, and get a longer sentence. This may seem strange, but the missionary was probably very despondent through his many disappointments during a long record of patient and useful service. I quite believe the burglar's story. He was so upset that it stirred up the devil in him, and though just out of prison that day, he went straight off to commit another burglary the same night.

It so happened that the governor of X Prison was unduly severe, and owing him a grudge, the burglar determined to wipe off old scores. Purchasing a "barker" (revolver), he went off by train at 11 p.m. on his lonely mission.

The circumstances leading up to the incident are very pathetic. Whilst serving his sentence in X Prison, he was occupied one morning painting in the governor's house. The pretty

<sup>1</sup> Captain Griffiths records the case of a girl aged 9, who was hanged in the year 1833 for stealing two pennyworth of paint.





XH 511. Joe Smith. The most notorious and dangerous burglar of the Victorian Era, with the brain of a Cabinet Minister. The Nation's loss. Now an author and a religious man. Well preserved for 56.

*Facing page 218.*



flaxen-haired daughter, fourteen years of age, asked him to carve her something out of bone. This request was fulfilled, and brought a severe rebuke from the governor, her father. A little later the sweet child, pitying the prisoner, got cook to give him a nice meal. Being discovered, the poor man was ordered forty-two days bread and water, which includes one dinner every fourth day; a terribly severe and unjust sentence. A third time the little maiden met the prisoner and spoke to him. The warder interfered, but who can resist an innocent child of angelic purity? On hearing this cruel sentence, she burst into tears and spoke to her father about it. This harsh man confined the prisoner to his cell for fourteen months, till he was removed to Dartmoor. No wonder military men are sometimes unpopular as governors. Now the burglar was going to settle matters with his old enemy. He arrived outside the house about midnight, and timed the sentry's march round the prison. Selecting his opportunity, he got in by a small window, and went straight to the daughter's bedroom. The gas was sufficiently alight to allow him to gaze in reverent worship on the beautiful face of his little friend. Her gold watch, chain and jewellery were within his grasp, but too sacred to be touched by him. He then proceeded to the governor's room, intending to shoot him if he made any resistance. Having closed the door behind him, and raised the gas, his "barker" ready, there he saw a corpse on the bed, and raising the coverlet he recognized his oppressor.<sup>1</sup>

Sentiment accompanies adventure. He gazed on the face and thus addressed the corpse, "You treated me most brutally when I was in your power, but death covers all animosities." Replacing the sheet, he took £14 in money, and the governor's gold watch, and made his exit. This happened at an unlucky moment, for his foot caught in the ivy, and he fell. The guard was opposite and fired, he replied, and the fusillade awoke other warders, but he escaped into the woods and was never caught; some years later he met the same warder at Portland, and discussed this incident.

"Never shot but two policemen, sir, and a buckle saved one and the other recovered in a few weeks. I am very

<sup>1</sup> See *Manchester Umpire*, 1906.

sorry I hit him, as he was not chasing me." Joe was always quite cool, giving good warning, and usually found that when the "barker" came out, all opposition disappeared. He never was without his loaded revolver, and was regarded as one of our most dangerous burglars. Being of a fine appearance, he improved it by wearing evening dress, as most of his burglaries were in the houses of the wealthy. He often went in by the roof, and out by the front door. His adventures would make a romantic novel, and he has published a few of them.<sup>1</sup>

Our young friend was by no means a "mug," and received part of his professional training under the notorious burglar, Charlie Peace, who was finally hanged for murder. He was cleverer than Peace, more sporty, and at the same time more generous towards his fellow-men.

Listen to one story.

Peace and Joe Smith were to do a "job" together at a wealthy nobleman's, 200 miles north of London. The mansion was well protected against intruders, yet the two divined a novel mode of entry, by climbing a tree and dropping from a projecting branch to the roof. The return journey was along another tree. They studied the house for weeks before effecting their purpose. Having secured a valuable haul, they hid in some woods, and Charlie suggested to his younger mate to depart for the sake of safety, after showing him a spot where the stolen treasure should be buried. Burglars never trust each other, and Joe stealthily returned, to ascend a tree and watch operations. Not at all surprised, he saw Charlie busy at an adjacent pond, and, as may be imagined, descended when sure that he was alone, and got all the treasure out of the water. This in his turn he hid again, and for perhaps the only time in his life Peace met his match. Needless to relate, some time after Charlie asked Joe to go with him to dig up the "oof." Charlie feigned great surprise that it was apparently gone, and so did Joe. But Joe kept his eye on Charlie, and a few nights later followed him into the wood, and from his tree watched with much merriment how Charlie almost dragged the pond without any success. The situation

<sup>1</sup> See *The People*, 1906.

was comical; Joe let the subject drop, and Charlie dare not allude to it, for the slightest suspicion of treachery meant a duel, and for one of them to "go under."

Joe is a good man now, and does much to help his class. His mind is well balanced, and he has a fine personality. He would have made a good Prime Minister, or General, if society had given him the opportunity. I asked him how he came to be a criminal, and he replied that he began when he was thirteen. His history was shortly this. His father, bailiff to Lord K. in the Midlands, was killed when he was three months old, and his mother died when he was seven. God help the orphans, for mankind too often neglects them. How often I have been moved at a mother's death-bed, thinking of the future of the young children! Our poor friend was taken charge of by his grandparents. The grandmother was good and kind, but the grandfather was a brutal drunkard, and this poor fellow's limbs and wrists are covered with broad white scars where his grandfather thrashed him.

One day his grandfather behaved extra cruelly, and the child jumped into bed beside his grandmother, who was powerless to assist, having been called to another world. He as a child "did not understand death," and one of the blows fell on the face of the corpse. This was too much for Joe, and he attacked his grandfather, knocking him down and breaking his leg. He then belaboured him, leaving him apparently dead; and taking £75 and a gold watch, started for Liverpool at the age of thirteen on a long criminal career. He received one sentence of seven years and another of twenty years, but he was never caught by the police, being always "given away" by "pals."

He has been out of prison seven years, and is converted, and the chief loser by his mistaken career has been the British nation.

Listen now to the history of his conversion in his own words.

"After hearing me speak, a gentleman asked what I meant by conversion. The question is best answered by an account of my own.

"Nine months subsequently to my life sentence, I was reputed the most dangerous criminal alive, and sent to Dartmoor with especial regulations for my treatment. An at-

tempted suicide in Newgate, an endeavour to escape from Portsmouth, and many acts of violence towards officials induced the Home Office to direct that every opportunity of communicating with any fellow-prisoners should be guarded against, and no warder should enter my cell alone.

“Deprived of human intercourse, my soul became that of an animal, untamable, yet powerless to burst the bars of its cage. Often seven or eight times a day I was stripped to the shirt and rubbed down by two men. The degradation brutalized me.

“Three years passed. A new deputy governor, Colonel Plummer, was appointed. One night, to my amazement, he entered my cell unaccompanied. He spoke of religion. I retorted that he should practise the gospel of love before preaching it. I denounced him as a hypocrite. I poured forth a flood of grievances. My outlook was hopeless, an unvaried round of misery. Nobody else, even in that wretched place, was treated as badly as I was. Why, my name had been down for work in the cook-shop for two years, but dozens of prisoners had been passed over my head, and there was no chance of my getting there.

“My visitor reminded me that my position was not his fault, nor that of the other officers, who must act under the Home Secretary’s instructions. Despite myself, the gentleness of his demeanour impressed me. He promised to see what he could do about the cook-shop.

“When he was going out, he could not find his key to unlock the door, and I asked mockingly, “What if you should lose the keys of the Kingdom of Heaven?” He replied, pleasantly but seriously, “Oh, I cannot do that, however clumsy I am, because Jesus keeps them for me.” He turned and quoted two verses from the Bible, which from that date have never left my mind.

“‘Verily, verily, I say unto you, the hour is coming and now is, when the dead shall hear the voice of the Son of God, and they that hear shall live.’—(St. John v. 25.)

“‘Marvel not at this, for the hour is coming in the which all that are in their graves shall hear His voice.’—(St. John v. 28).

“I went to work in the cook-shop, but the knives were

kept out of my way, and the head cook, not liking the trouble of a dangerous prisoner, incited a man called D—— to provoke a row with me. One day he suddenly without a word struck me a violent blow in the face, and I retaliated by throwing him into the steamer, where we had been boiling puddings. But, the truth becoming known, I was not removed from the cook-shop nor severely punished.

“In the autumn of next year, my conduct continuing good, I was shifted to Portland. There, while cutting stone, God’s message to me, through Colonel Plummer, frequently recurred. But I was as yet far from conversion. Being tempted, I joined with others in a plot to escape; we were detected, and I got the credit of being the instigator. Back I went to Dartmoor with a worse record than ever.

“From the isolation and despair which followed this episode sprang the greatest blessing of my life. I began to see what it all meant—how I was spiritually dead. The better thought, which I had entertained but stifled at Portland, returned with renewed force. Conversion ensued, and, upon an announcement of the approaching visit of the Bishop of Exeter, I applied to be confirmed by him.

“The greater part of my life sentence was yet to run, but in retrospect it seems immeasurably shorter than that which preceded it. Conversion alters everything. I no longer felt rebel at heart. Whether in prison or elsewhere I must work with God and not against Him. I had my work to do; life seemed no longer aimless. Many a time I sinned and repented, but that did not change the attitude of mind which constitutes the converted as opposed to the unconverted state. Alleviation of the lot of the criminal is good. My own conversion was due, under God, to Colonel Plummer’s behaving to me kindly instead of with the harshness to which I had become inured. But whatever the means, conversion is the end.

“The permanent reform of the criminal can be attained only by the death unto sin and the birth unto righteousness, which we name conversion.”

## THE MURDERER'S BRAIN

Hark! What is that troubled sound? Listen, it is the wail of the murderer. What agony and disappointment it expresses! There it is again. It cries for vengeance on society, who wronged him by misinterpretation of facts, and even killed all hope before he saw the light of day.

Nevertheless he was a sheer brute. The judge had pity, but no compassion. The foreman of the jury said it was the most brutal crime he ever heard of. Another juryman longed to hang him. There was no disagreement; if ever a man wanted hanging it was this man; Only one juryman condoled, saying, "Poor devil, the odds were against him." How true this was death alone could reveal. Yet the Good Queen, who loved her sinners as well as her saints, reprieved him.

For some years he passed twenty-three out of the twenty-four hours in a dark dingy cell 6 feet by 12 feet (some were 10 by 5 at Dartmoor). No wonder he thought he "was going dotty," and after some years the doctor marked his card, W.M. (weak-minded). He never complained of those in charge. The governor was always jolly, and at times slipped "a chew" into his hand; while the doctor made the most of all his ailments, and the warders almost petted him. Years slowly rolled on, five, ten, nay twenty before he saw the world again as a free man. The old world was, however, all changed, and he felt lost, and longed in misery and loneliness to rush back to his dismal cell. But he had not many months to wait before death released him.

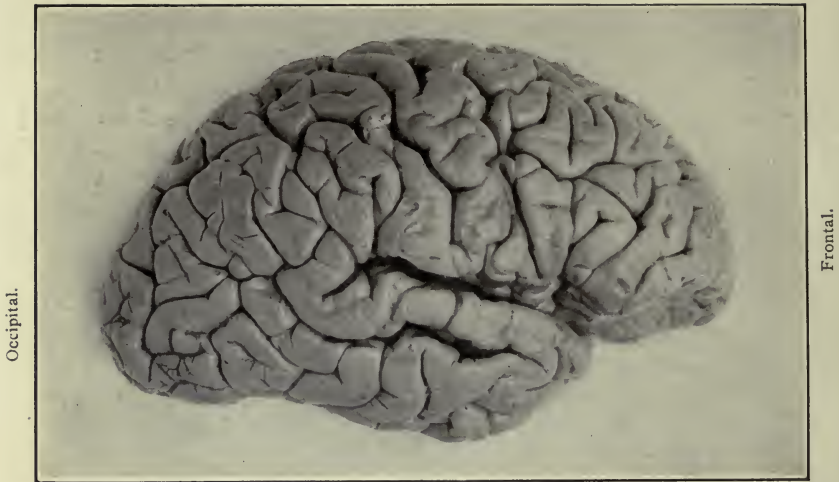
Behold now the key to the problem! Here is his brain.

To the casual observer he was an ordinary man with average shape and size of head. But to those who study these matters there were sundry indications during life of an abnormal evolution.

He was a short, broad man, good-looking but with small irregular and somewhat asymmetrical features. The ears



Right hemisphere.



The brain of an insane woman, aged 56. There is slight wasting. The convolutional pattern is below the average, but much higher and better than that of the murderer.

The brain of a degenerate.



Observe the plainness of pattern, the absence of secondary and tertiary grooves, and large coarse convolutions.

For microscopic structure see pages 222 to 227.

*Facing page 219.*



were large, fleshy and spread out. The forehead was square, and the skull rose to a peak behind, after the Mongolian type. The facial architecture being broad, the palate, so often used as a test, was normal.

His father, and father's father were both heavy drinkers ; thus nature was thwarted and deviated from her plans.

We have here a clinical study which should have been placed before a medical council.

But what revelations from the brain ! The skull is normal, but its lining membrane, the dura mater, was adherent by old inflammation, dating from childhood, perhaps related to a period of cruelty and neglect.

The brain was large, full weight, 49 oz., but the pattern was plain, showing a poor intellect, enough perhaps for lowly surroundings, and probably more adapted to country than to town. There was, however, one very marked defect, enough to bring disaster. The two halves at the posterior poles, instead of meeting in the middle line, were separated by nearly two inches, exposing the cerebellum below. Moreover, these occipital lobes mainly devoted to sight, are small and shrunken. This condition is described by many as of imbecile pattern.<sup>1</sup> We might express it thus in Biblical language as, "Seeing he could not perceive." He could not mentate or analyse what he saw ; therefore he was at once out of joint with his environment. As an example, if you or I see any one in distress or trouble, we hurry up to aid or rescue. But if a low-grade, such as this man, be similarly placed, it expresses to him an opportunity to attack, rob, or slay, just as we see in the brute world.

Nature then was cheated in her materials and so she could not construct this brain, as she had intended.

His ordinary (sensory) vision was normal, (the calcarine fissure) : but his mental vision, or as we call it his visuo-psyche area, (the surrounding occipital convolutions,) was extremely deficient. His parietal association area which represents intellect or intelligence was fairly developed ; but what service could it render to him ? The man started always on wrong premises, through the above structural defect, there-

<sup>1</sup> See Ireland on Mental Diseases.

fore his conclusions or arguments must always be wrong. This is self-evident, and I trust that this brain may be the apex of a vast pyramid of research in criminology. May the legal profession, and all who have to do with criminals, seriously take this lesson to heart.

Clearly all our present legal machinery which we have accepted from the Persians, through the Romans, ought to be swept away. The system evolved by semi-barbarians 5,000 years ago cannot apply now.

If this man had been hanged, we should have slain a mental cripple. Is that justice, revenge, or sport?

Without going further we have enough to account for any crime, although in addition his prefrontal cortex, or seat of control, was of very lowly structure. But for a more technical, scientific description, including my examination of the cell layers microscopically, I must refer the interested reader to the smaller type.

‘Civilized’ Humanity can be divided into three distinct classes, which however shade off into each other. They are:—

A. Normals.

B. Insane.

C. Degenerates.

A. Under this heading one must make a broad middle line to embrace all those of average intelligence and morale. But we must recognize that really normal beings are super-average; whilst there are numbers below the average who do not fall into either of the other two classes.

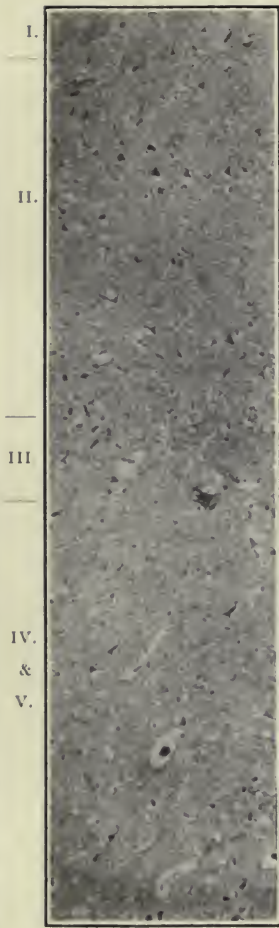
B. The insane may be most easily summed up under Bolton’s classification of aments and dements.

C. The degenerates demand some special description. To commence with, this term is applied in a very loose manner to all who are cast down in mind or morals. This is wrong. A normal may fall into the lowest social ranks from ill luck or from his own indiscretions, but he is not therefore a degenerate. He is a derelict. If his proper environment were restored, he would again demonstrate his normal characters. This is

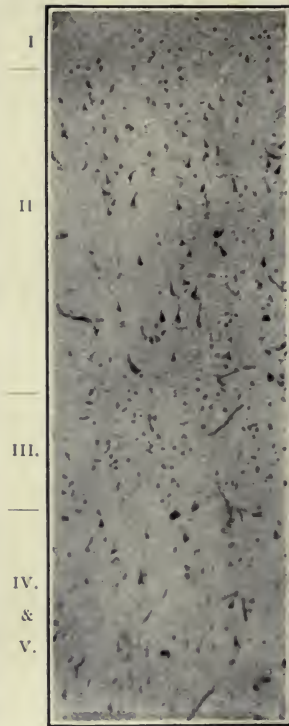
Cortex of  
Drunkard.



Cortex of  
Murderer.

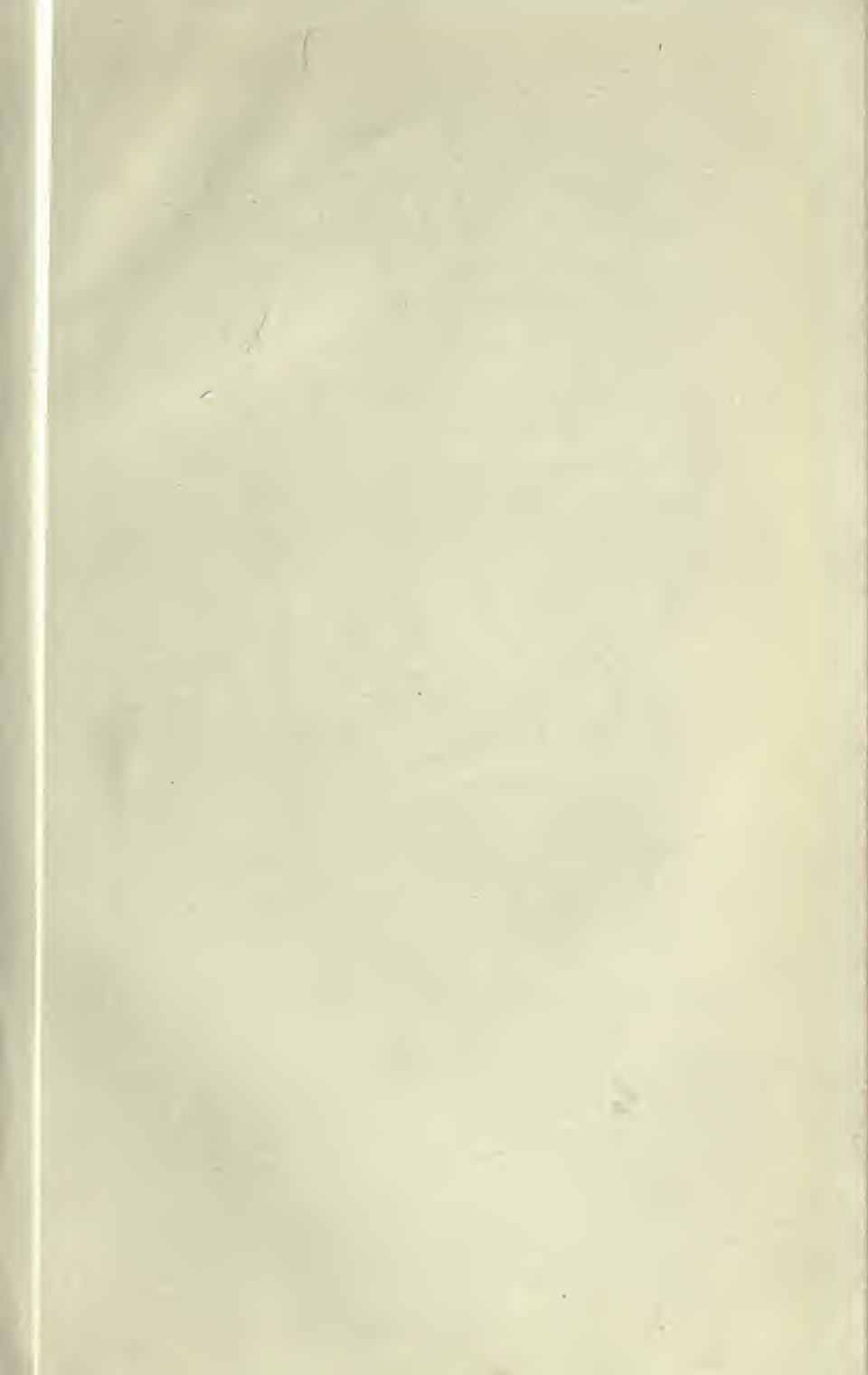


Cortex of  
Insane. A dement.



Compare the pyramidal layers in the three states. Each from the 2nd frontal. The degenerate (the central column) is very deficient, as he was built; whereas the dement represents destruction of cortex, as does the alcoholic in lesser degree.





Microscopic representation of the pyramidal layer.



The central column is from a normal brain, on each side from the murderer's brain. Observe the great deficiency in pyramidal cells; in the left column above are numerous undeveloped nuclei as seen in the new born infant. This arrested development and deficiency forms the physical basis of degeneracy.

Drawn by Miss B. Wilson. Magnified about 300 times.

abundantly seen in rescue work, chiefly amongst the young but also among the aged.

External stigmata help us a little, but only a little, in diagnosing a degenerate. Lombroso greatly exaggerates their importance. As before said, external stigmata are probably due to maternal malnutrition; though the nose may be malformed, yet the ribs may be normal, and so if the skull vary from the usual type, still its contents may be good, and vice versâ.

The degenerate represents a piece of bad cerebral architecture; whereas the insane may have good architecture which decays, or a throw back towards the higher apes, or absence of parts as in aments. I must, however, acknowledge a difficulty in separating the degenerate from the imbecile. At present we describe the insane and especially the imbeciles as degenerates. Scientifically, this is wrong; and this murderer's brain, with its massive weight and plain pattern, its large convolutions with very shallow grooves, and its shrunken visual cortex, supports my statement.

Herein lies the key to the criminal problem and its treatment, which must be on a rational and scientific basis, with due regard both to the offender and those who have been injured. In this particular case, ought we then to swing him by the neck, suspended to a beam, into mid-air, or is such treatment as barbarous as it is unscientific?

Permanent isolation for all degenerates, as for chronic lunatics, is the only correct method. Destruction, as a matter of economy and utility, may be considered, but the process should not partake of the nature of cruelty, sport, or revenge.

What are you going to do in this pressing and important matter?

Though this report might have been placed in a purely scientific journal, yet I feel to omit it here is to impoverish this work, which I trust may be interesting to many of the medical profession.

The skull measured  $7\frac{1}{2} \times 6$ , cranial index 80, circumference of base 22 in., lateral arch  $12\frac{1}{2}$  in., antero-posterior arch  $12\frac{3}{4}$ . Shape, square, Mongolian, rising upwards almost to an angle in the parietal region. The skull was of average thickness. The dura mater was adherent over the fronto-parietal vertex and thickened. The falx cerebri diverged at the occipital pole for  $1\frac{1}{2}$  inches. The pia mater was slightly adherent over the right parietal region. The brain weighed  $49\frac{1}{2}$  oz.

The following notes were made after a careful examination of the brain in the fresh condition; and later after hardening it in 10% formol:—

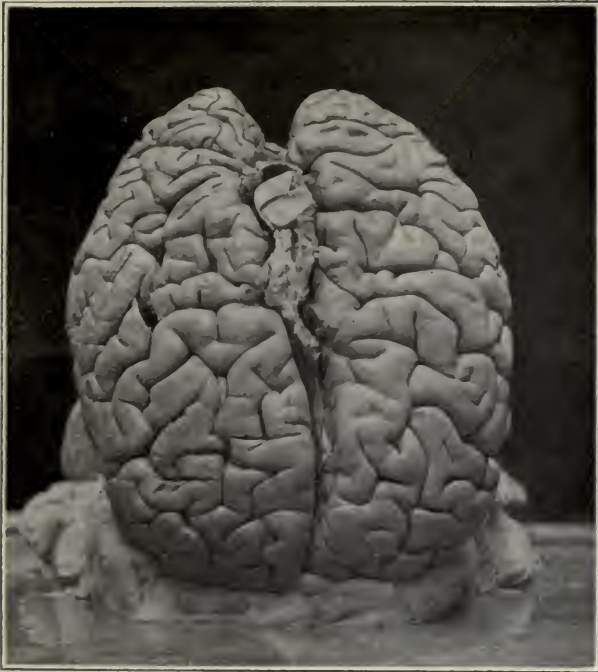
The striking feature of this massive brain was the plainness of its pattern; and the left side plainer than the right. The convolutions were large, broad, coarse, while the sulci or grooves were shallow, and in the fresh state gaping and wide. In this early condition when the pia mater was stripped, the grooves or sulci opened out so wide that I thought the brain would become one plain smooth surface. This is clearly represented in the first photographs, where I had indeed to prop it with pads of wool to show the convolutions. I have observed that in the normal infant's brain, the sulci are excessively deep in proportion to the external surface of the gyri or convolutions.

Moreover the sulci contain a shallower layer of pyramidal cells, but a greater depth and number of nuclei, or neuroblasts. Hence we may infer that as growth proceeds these sulci come up to form a larger external surface, affording room for the neuroblasts to develop into neurons, other conditions being favourable. This poor man had shallow sulci, and a deficient reserve of neuroblasts when he began life, hence he is a degenerate, or a mental cripple. He is not a lunatic and he is far remote from the normal standard.

Dr. Watson, an authority on lunatic brains, says he should not have looked upon this man as a lunatic degenerate, for there is no cerebral wasting such as one would expect from a lunatic degenerate of his age (62).

On further examination it was at once evident that the occi-





**THE MURDERER'S BRAIN.**

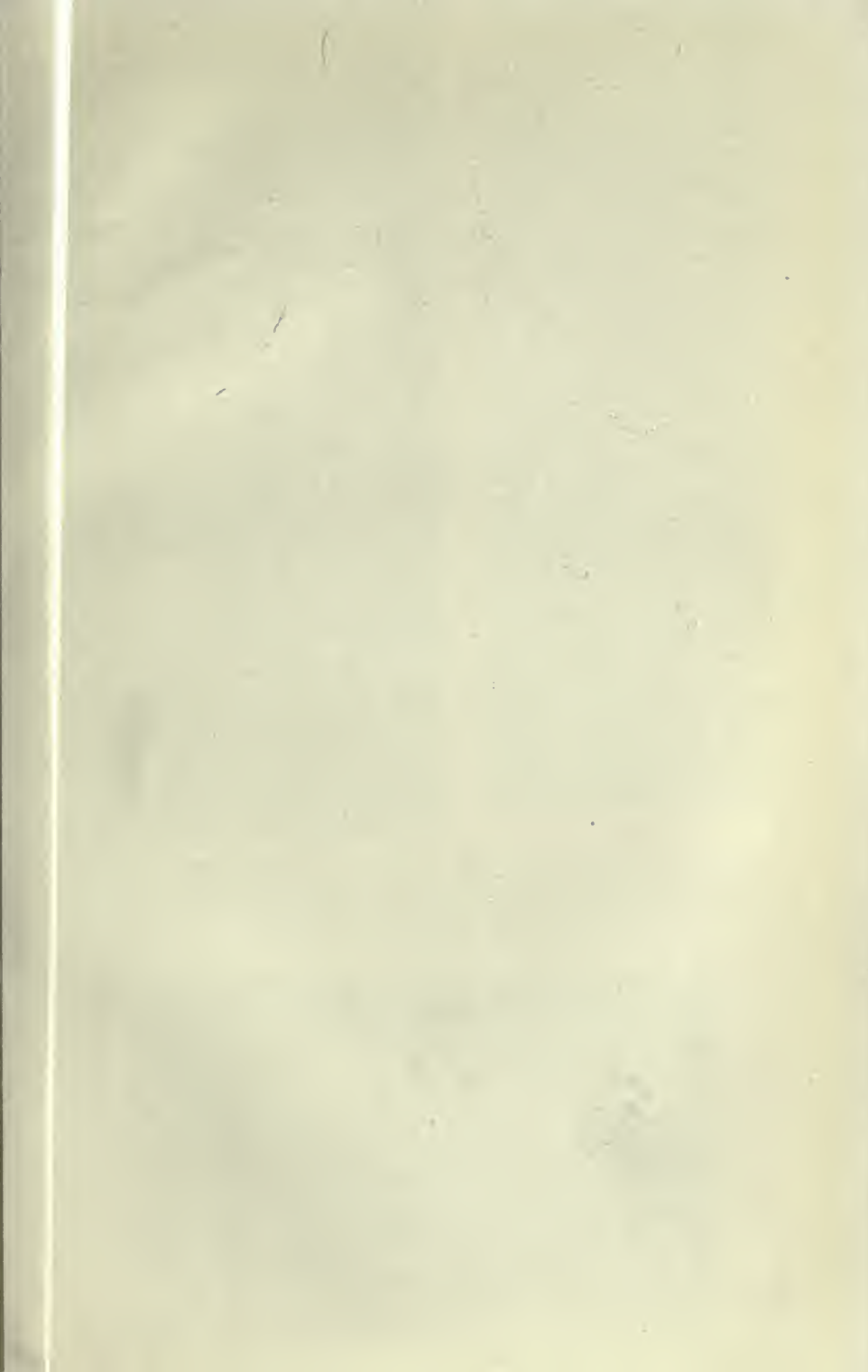
Resting on the frontal poles; observe the small shrivelled looking occipital poles, which also diverge from the centre. The plain pattern of the convolutions is well demonstrated.



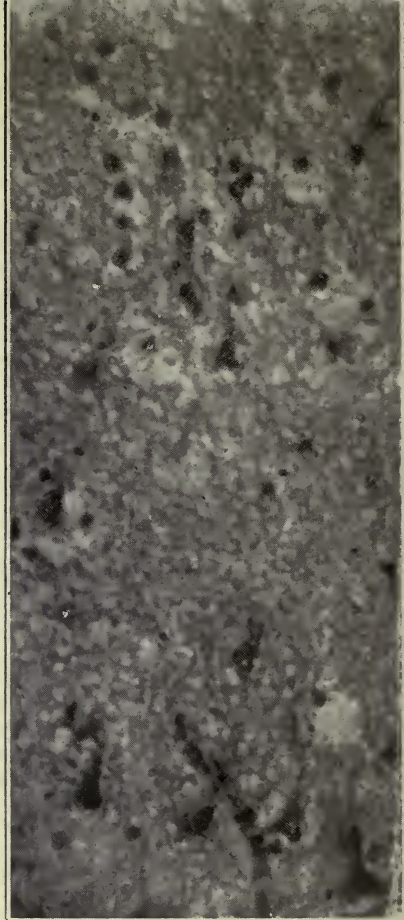
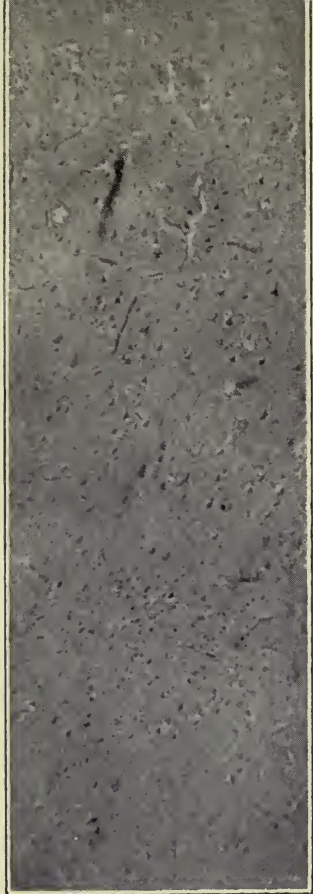
Observe the large coarse convolutions, the shallow grooves and the plain pattern with very few secondary or tertiary markings.

*Facing page 222.*



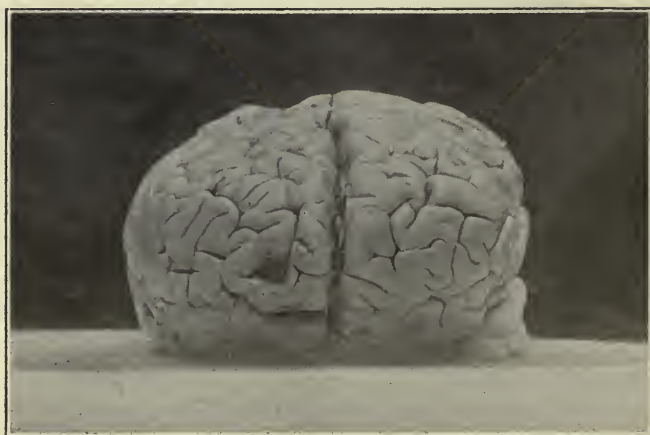


I.  
Nuclei.  
Pyramidal Layer.  
II  
III  
IV.  
&  
V.



Nuclei undeveloped.

The prefrontal cortex which under the low power appears fairly good ; but the high power (fig. on the right) shows a great scarcity of pyramidal cells and many undeveloped nuclei. The layer of pyramidal cells, II. (according to Bolton), the seat of control is of good depth. But what is the value of control when his first ideas or premises are contorted ? see the shallow occipital cortex layer II. and the scarcity of cells in the plate to the right (page 224). Dr. Bolton's photographs (page 191) are magnified about  $\frac{3}{4}$  to  $\frac{1}{2}$  more.



occipital lobes were smaller than normal and out of proportion, so as to present a shrunken appearance. The two poles did not lie parallel to each other in the middle line, but were separated by a gap of nearly two inches, exposing the cerebellum below. The cerebrum, however, covered the cerebellum; there was no want of overlapping as in some idiots and in the ape tribe. In spite of this the occipital lobes were somewhat complex in pattern, although the convolutions were very small.

Taking another look over the pattern, the frontal lobes seemed paler than the parietal. The latter are almost normal, showing that the intellectual faculty of analysis or thought was provided for architecturally in this parietal area. The suggestion of a very limited visuo-psychic region was evident to any expert by the shrunken appearance of the occipital cortex. The calcarine fissure was normal, so his visuo-sensory faculty was not interfered with. He saw but perceived not.

The Sylvian fissure is short and the angle is acute.

The fissure of Rolando is also short and bifurcates on the right side at the lower end.

The Frontal region.

Left hemisphere. The precentral sulcus is in three simple divisions. The sulcus rectus of the inferior frontal is very simple, bifurcating anteriorly, while in front of it the lateral fronto-marginal is long and simple.

The superior frontal sulcus is likewise long and simple, in two divisions, with but few secondary sulci. The region between this and the mesial edge is simple.

The paramedial sulci are shallow. The mid-frontal sulcus is very poorly represented near the anterior pole, by a very shallow simple groove or sulcus, which bifurcates anteriorly.

The fronto-marginal sulcus of Wernicke, which Dr. Bolton regards as constant and uses as his guide for prefrontal measurements, consists of two shallow sulci. So the criminal at once presents a variation from both the normal and the lunatic.

The Right frontal region shows much the same type as the left, but the mid-frontal sulcus is longer and more complex. There are rather more secondary and tertiary sulci.

The Prefrontal is very simple on both sides, but more so on the left.

The Parietal region is more complex than any other part of the brain, the right side being the better of the two. The secondary and tertiary sulci are more in evidence and deep, but not so deep as in normals.

Technical  
Details

The rami ascendens, descendens and horizontalis are separate and split up on both sides.

The Occipital regions present striking abnormalities, the key to this criminal's mind, one of the reasons why he was a criminal.

The whole region behind the parieto-occipital fissure is imperfectly developed. There is a shrunken appearance, for the cortex lies below the general level. The pattern is fairly complex, more so on the left side, but the gyri are small and the sulci shallow.

The calcarine fissure, the area of sensory vision, is normal, ending within the mesial aspect and not passing on to the dorsal surface, as in the higher apes or in some insane. This latter condition is fully described by Dr. Mott in the Bowman lecture for 1904 (*see Archives of Neurology*, 1907). On each side there is a sulcus lunatus (Elliot Smith). In addition the arrangement of the parieto-occipital fissure extends far on to the dorsal surface as described by Elliot Smith in aboriginal races low down and Egyptian, Chinese and others, and even in 20 per cent. of the insane (Mott and Watson). I give Dr. Watson's description of this fissure in his own words:—

“The region of the parieto-occipital fissure, a late development in the primate brain, is of great interest.

“On the left side its dorsal portion (i.e. the ramus parieto-occipitalis sulci intra-parietalis) extends for a European brain for an extraordinary distance on to the dorsal aspect.

“On the right side apparently both the dorsal and ventral portions of this fissure extend over the dorsal surface to a lesser degree. Between them there is a large widely exposed arcus occipitalis (arcuate gyrus). The latter in most well developed brains is deeply hidden in the lips of the fissure.”

I find the following abnormalities of brain recorded by Lombroso (*L'homme criminel*, 1887).

In the case of Guiteau, the assassin, there were irregularities of the fissure of Sylvius, the transverse occipital and interparietal. There was atrophy of the right parietal area, and the paracentral lobule was very small. The postcentral convolution was shrunk to a quarter its size. The island of Reil showed seven grooves on the left and five on the right (Mendel, *Neurol. Centralbl.* 1882).

Broca (*Bulletin de la Société d'Anthrop* 1880) found in the assassin Prévost, that the first part of the occipito-parietal fissure was deep on each side; that the internal occipital sulcus was continuous with the external: also the occipital lobe was more separate, as in the apes, in the form of a “calotte,” thus somewhat resembling my murderer. On the left side, the second temporal and the third occipital sulci formed one sulcus without interruption right across.



The Murderer's Brain. The occipital pole.  
It has a shrivelled appearance and the lobes diverge.

Low Power.

High Power.



Sections from the occipital region. Note the shallowness of layer II. (intellect) and the increased depth of layers IV. and V. (instinct). The fig on the right shows the paucity of cells. Compare it with the Mangaby's occipital cortex (page 227).





Huschke found in a ferocious murderer that the left anterior parietal convolution was interrupted in the middle by an osteoma. Professor Villigk (*Viert. Jahreschr.*, Prague, 1876) found in a Jew, who was robber and murderer, and who "finit pendu," that the corpus callosum was shorter than normal; the first frontal convolution was increased in width in front, narrower behind; nor did it join with the second, as is normal, thus resembling, according to Ecker, the cercopithecic monkeys. The calcarine fissure also was abnormal. Hanot (*Gaz. Med.*, 1880) found a doubling of the middle frontal convolution in four out of eleven criminals.

Benedikt (*Anat. Stud. an Verbrech. Geh.*, Wien, 1879) found an increased confluence or anastomosis of fissures in criminal brains; four convolutions in the frontal lobe occurred in twenty-seven out of eighty-three criminal brains; six times he found the cerebellum uncovered: once the calcarine fissure was after the ape type.

But Giacomini (*Var. d. circonvol. cereb.* 1882, p. 133) upsets most of these ideas by showing a number of anomalies in those who were not criminals. Thus, in 164 brains of honest folk, he describes 47 abnormalities of the frontal lobe against 8 in 56 criminals' brains.

It is only fair to seek adverse criticisms, but these honest people may have been degenerates, though not criminals. A degenerate may exist honestly amidst simple surroundings. It is the complex of civilization that makes him a criminal. Max Nordau (*Degeneration*) describes degenerates among artists, literary and other intellectual men. I imagine he is dealing with what I term sports, for degenerates appear to live on quite a lower plane intellectually.

Ferrier (*Arch. neurol.*, 1882) describes the brain of a woman who was criminal and "trabadique," who had the right hemisphere smaller than the left, and doubling of the left internal frontal fissure. The fissure of Rolando was also deformed: other abnormalities in fissures were present.

Benedikt in 1883 describes abnormalities of the left parieto-occipital fissure in the assassin Dobrowicki. Clearly again, like any murderer, the architecture of his intellect was at fault.

Anomalies of the cerebellum are also described by Lombroso (p. 192).

*Microscopic examination of the cortex.*—I was placed at a disadvantage, being unable to remove the brain until forty-eight hours had elapsed. On this account allowance must be made for absence of Nissl bodies in many of the cells. But it makes no difference to

the number of the cells, which is of the very greatest importance.

In broad outline I may state that the sensori-motor areas, ascending frontal and parietal convolutions were practically normal, whilst the other areas were very deficient in the shapes and numbers of the cells.

But the most striking feature was the number of undeveloped nuclei at the cortex of which I have made some diagrams and for comparison drawn an intermediate column from the second frontal convolution of a normal and very intellectual man. What I have described is at once apparent. I have added an infant's cortex before birth.

One would expect the prefrontal cortex to be specially affected, but here the cells were better shaped and more numerous than in the other areas to be described.

Nevertheless, the depth of the cortex was about  $\frac{2}{3}$  of the normal, while conspicuous on the surface was the number of undeveloped nuclei, showing an arrest of development at, and possibly before, birth.

It is a scientific corroboration of my dictum that the criminal has only the control of a child. It gives a physical basis for the establishment of the degenerate as a class, distinct from the insane and the normal.

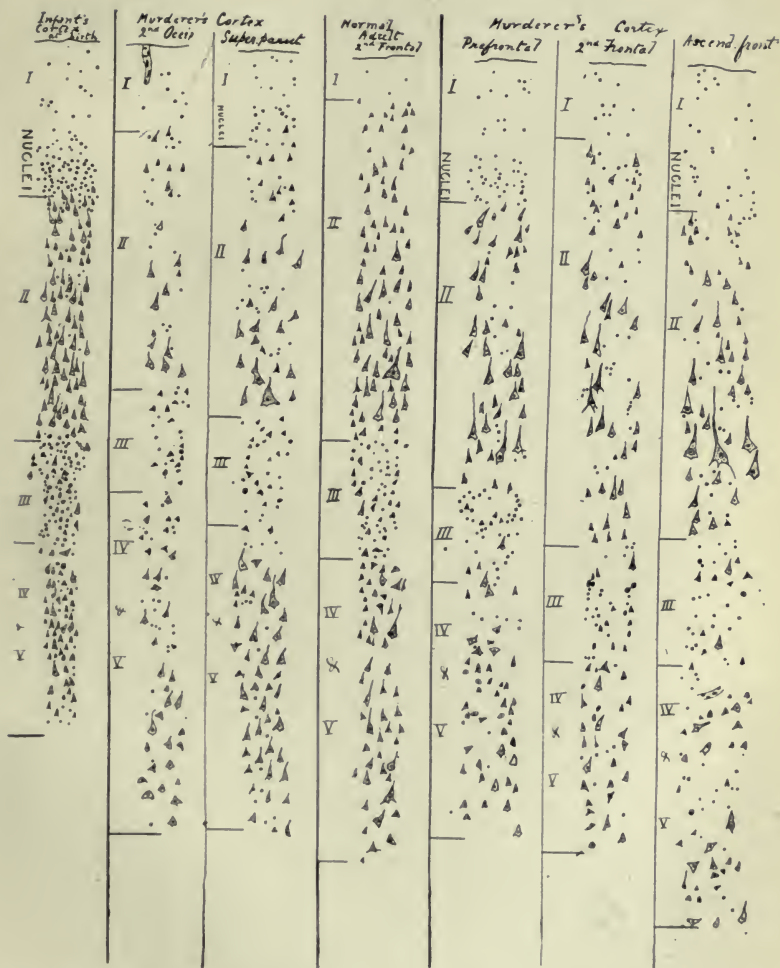
The first frontal was particularly barren of pyramidal cells. In one field, using an  $\frac{1}{8}$  power of lens, there might be only five or six pyramidal cells, whereas in the corresponding normal there were at least twenty cells. There were many undeveloped nuclei, lying chiefly near the surface. The thickness of the pyramidal layer was  $\frac{2}{3}$  to  $\frac{3}{4}$  that of the normal. Curious to relate the fourth and fifth layers (Bolton) polymorph, or layers of instinct, or Watson's infra-sensory layer, was much thicker than the average, and its cells appeared normal. The man was well provided as regards instincts, but his psychic machinery was affected.

The pattern of the parietal area was the best of the whole brain, therefore one would look for an approach to normal. Such was not the case. There were more pyramidal cells, and better shaped, but again nuclei were too abundant.

The second occipital, or visuo-psychic area, was the most undeveloped, and likewise  $\frac{2}{3}$  of its normal depth. Even the granular, third or sensory layer was thin. The number of pyramidal cells in layer II was very much reduced. Nature had left him almost untouched on this part of his architecture; hence he was a degenerate, and society made him a criminal.

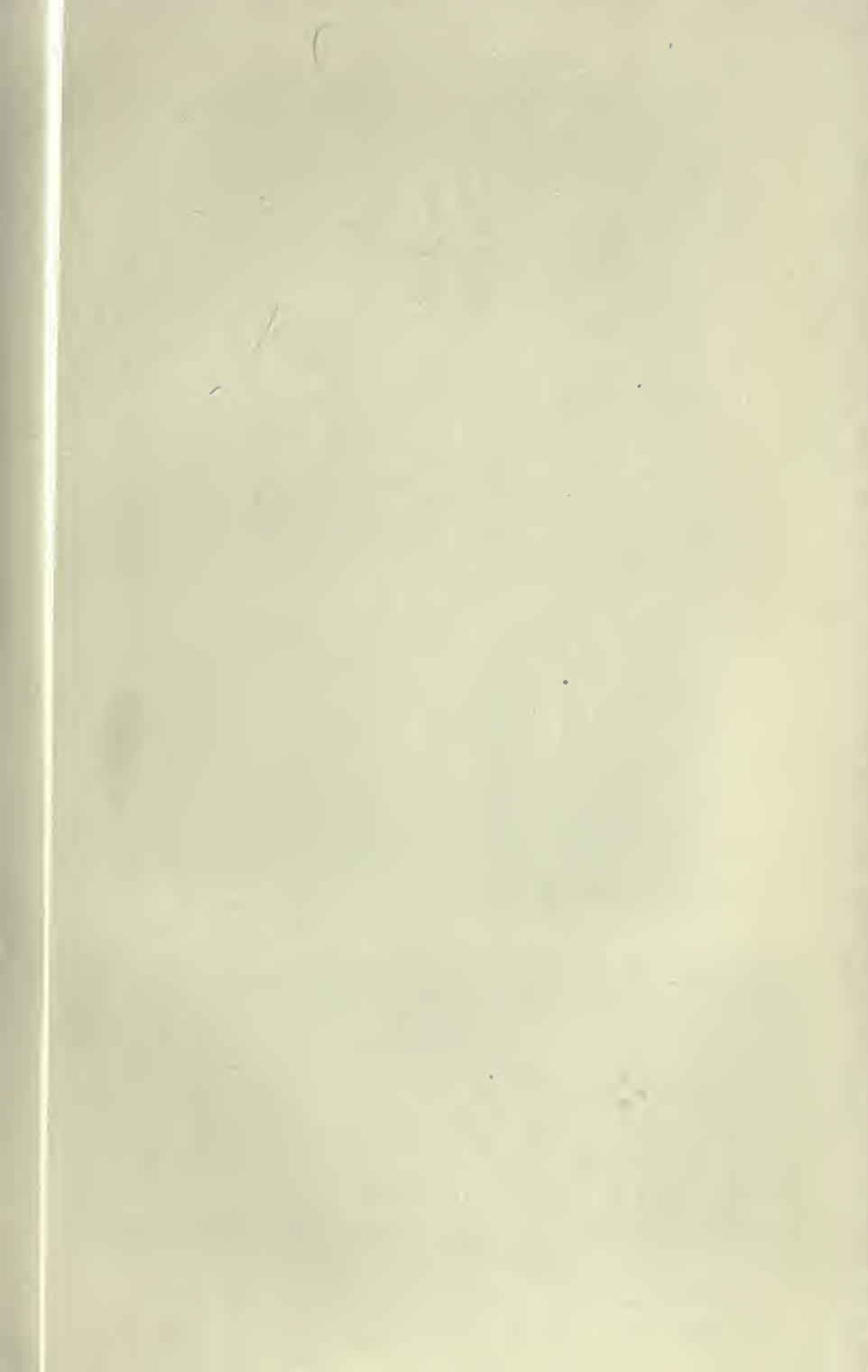
To sum up, what is the general inference and how much importance must we attach to these nuclei? We recognize them in the

The Cortex of the Degenerate.

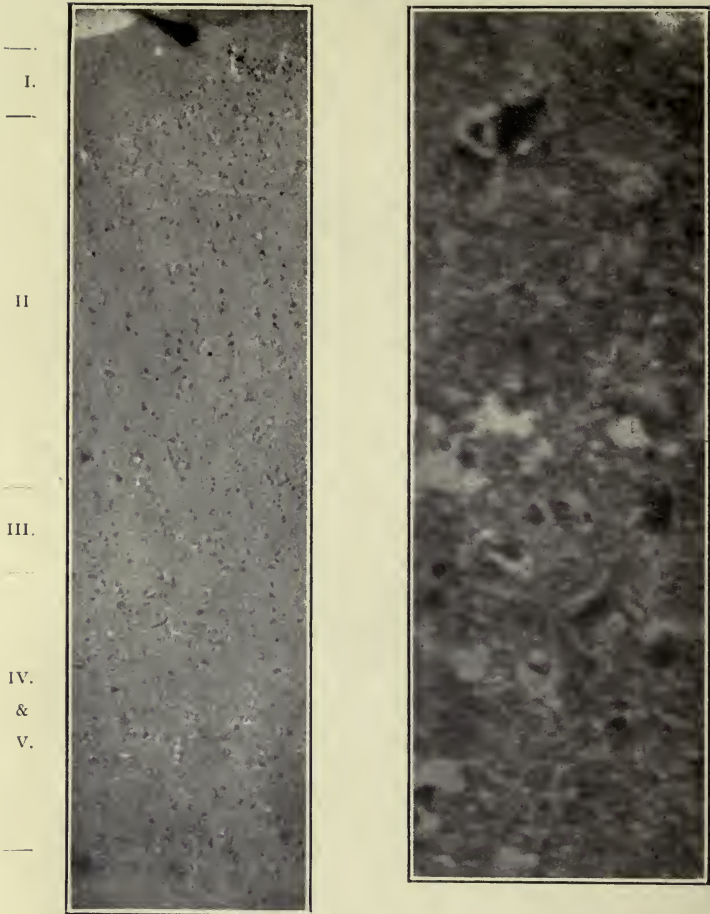


Drawn with the camera lucida,  $\frac{1}{2}$  obj., from different parts of the murderer's brain, with a normal in the centre and unborn babe on the left.





The Murderer's Cortex, Parietal.



The parietal might be termed the area of intellect and here it is remarkably poor.



The occipital cortex of the Mangaby. Compare with the degenerate (murderer) on page 224.  
*Facing page 227.*

foetal brain as neuroblasts, the forerunners of the neuron, and we meet them later in the infant's brain, chiefly at the surface of the pyramidal layer. In this brain, however, we meet them both at the surface, as on the day he was born, and also scattered throughout. It is a condition of the natural development being arrested before birth, and we know that this is caused by the toxin of syphilis and tubercle, or by malnutrition. The bodies of the cells, or cytoplasm, are also deficient in amount, showing that the neuroblasts of the foetus were unable to build up the nerve cells.

It is remarkable, however, that the layer of instinct and the sensory layer, both very ancient in time, are well developed.

The storm has blasted the psychic or mental machinery, and put him on a level far below the average man, or even the insane. He might have been able to hoe potatoes, and it is notorious how many country labourers are on his level; but when he comes to the city, with its whirl, its drink saloons, the changing of night into day, the struggle for the bare necessities of life, he falls to pieces as a mental wreck, frequently becoming what society terms a criminal. In any case he is a degenerate, a bad machine from the very beginning. He never could have been normal, but he is not insane; he has a psychic territory or position of his own. The microscope shows that his cortex has fewer cells than a normal unborn babe; that the cells are less perfect in form; that the nuclei placed in reserve for further evolution have continued in that undeveloped condition. Would you call him an agenerate or a degenerate? He has degenerated from the normal standard, but is an agenerate from the individual standpoint. I think we had better not *load* the English language with a new term, and I have no vanity to gratify; but let it be distinctly recognized that the degenerate is as separate from the normal as the insane; and we must not speak lightly of individuals as degenerate any more than we should of insanity. Unfortunately, if a man be degenerate he is hopeless, as there is nothing to work upon, but we must not mistake a normal gone wrong for a degenerate. The only righteous procedure for a degenerate is a simple environment or, if troublesome, painless extinction. We are now faced with a new biological problem. Is the degeneracy transmissible to the offspring; or is the degenerate a sport, whose germinal units will return to mediocrity under favourable conditions? If the former, he is like a permanent variety, and the only correct treatment is sterilization or extinction; if the latter, Society is failing in its responsibilities towards this large and increasing class.

Non-technical and Important Degeneracy

## CHAPTER XXII

### RESPONSIBILITY

Ruskin's misconception.—LIBERTY OF THE SUBJECT AND RESPONSIBILITY: Dr. Mercier's writings—Desire and conduct—One primitive craving—Instincts and lower cortical brain centres—Conduct satisfies desire—Volition—All connected in the higher association centres—Choice determines responsibility.—THE OBSTRUCTING "IF."—PHYSICAL SEAT OF WILL: The prefrontal cortex: Bolton's researches—The last to develop—Explains late arrival of wisdom—Refutes the theory of "previous existence"—The only layer which varies in ordinary brains—Disease and failure to live properly.—THE UNDEVELOPED OR UNEDUCATED PREFRONTAL: Case to illustrate.—DR. MERCIER ON SELF-CONTROL.—MORAL INSANITY: The criminal is bad throughout.—PHYSICAL RELATION BETWEEN MIND AND BRAIN: Desire and subsensory cortical layers—Choice and the association centres—Volition and inhibition: I will and I won't—Prefrontal and senile decay in disease or alcoholism—Slight alcoholism in the young—Deficient brain cells or amentia.—FREE WILL: NON EST.

"But he that knew not  
And did commit things worthy of stripes,  
Shall be beaten with few stripes."

*Christus.*

WHEN a leader like Ruskin writes, "The plea of ignorance<sup>1</sup> will never take away our responsibilities," it becomes necessary to correct the inferences and opinions which might arise from such gross error, especially when applied to the poorer classes. A Spanish proverb which says that "Every one is the son of his own works," falls into the same mistake. Unfortunately we are all, without exception, primarily the sons of our ancestors for many generations back, and according to their legacies and our later environment after birth, so is our capability for undertaking the responsibilities of life.

The responsibilities of a general could not be undertaken by a subaltern, however well instructed in military duties the latter might be. And so in the warfare against self and sin, mere knowledge gives no responsibility, nor yet experience without the psychic equipment behind it, which has been so

<sup>1</sup> If the term "neglected opportunity" were used instead of "ignorance" I think we might agree.



poetically described by the psychologist, Saint Paul, as "the whole armour of God."

But apart from the spiritual or higher responsibilities, there are those of a somewhat lower grade in our every-day social and moral duties. Few attain to the spiritual, though unfortunately many profess to do so; but the lower duties are expected of all, and if not acted up to result in the curtailment of liberty.

The question of the liberty of the subject brings up that of responsibility, which has led to many lengthy volumes. Responsibility involves self-control, wherein may come a conflict between morality and intellect.

Liberty  
of the  
Subject  
and Re-  
sponsi-  
bility

I should like to quote from the work of one of our greatest writers, Dr. C. Mercier, on *Criminal Responsibility*, in which he analyses the subject more scientifically than most. He has so fully digested the classical writers who preceded him, that it is unnecessary for me to prolong the discussion by referring to them. He describes (pp. 104-5) the human mind as "an incident in, and a means toward the achievement by man of his purposes." Or is mind the man himself, the captain of the ship, or the general of the army, dictating the purposes to be achieved? If the mind be associated with purpose, then the body is the means of achievement.

"Man is ever striving," and the fundamental attitude of mind is called desire. Desire is the motive of all conduct. "Inherent in human nature are certain deep-rooted desires whose derivation may be traced to one primitive and fundamental craving, which lies at the root of all human, as of all animal dispositions." This is a most important statement, so often overlooked, although expressed long ago by Schopenhauer as the will to live. It is represented on the physical side by the term instincts, in the lower subsensory stratum of the cells of the brain cortex, the polymorph layer, as proved by the researches of Dr. G. A. Watson, who compared the brains of animals with humans. (See diagram and Chap. XI.) "Conduct is the means by which we satisfy desire. All conduct is the production, the modification and the prevention of movement." Mercier describes the interchange of movement between the individual and the surrounding

world, which consists in receiving sensory impressions, arranging them or sorting them by the lower and higher association centres, thus distributing and emitting motion, which in its finality involves volition or the will to act. It is my opinion that Dr. Mercier and others do not seem to attach sufficient importance to the power, influence and education of the association centres. To my mind it is the pivot round which these psychic problems revolve. They consider that following on desire comes choice, whether to do or not to do, and what to do, and that if the choice is wrong or evil, responsibility attaches. To this I will make objection later on.

On page 147, Mercier writes :

“Desire antecedes choice and *a fortiori* antecedes volition.”

“On this showing there can be no responsibility for desire . . . but only with the means for giving effect to it.”

The  
Obstruct-  
ing “If”

“If there be responsibility it arises at some stage of choice, intention, or act, subsequent to desire. If there be no disorder of will or intelligence, then I think responsibility attaches as soon as desire obtains the sanction of the will.”

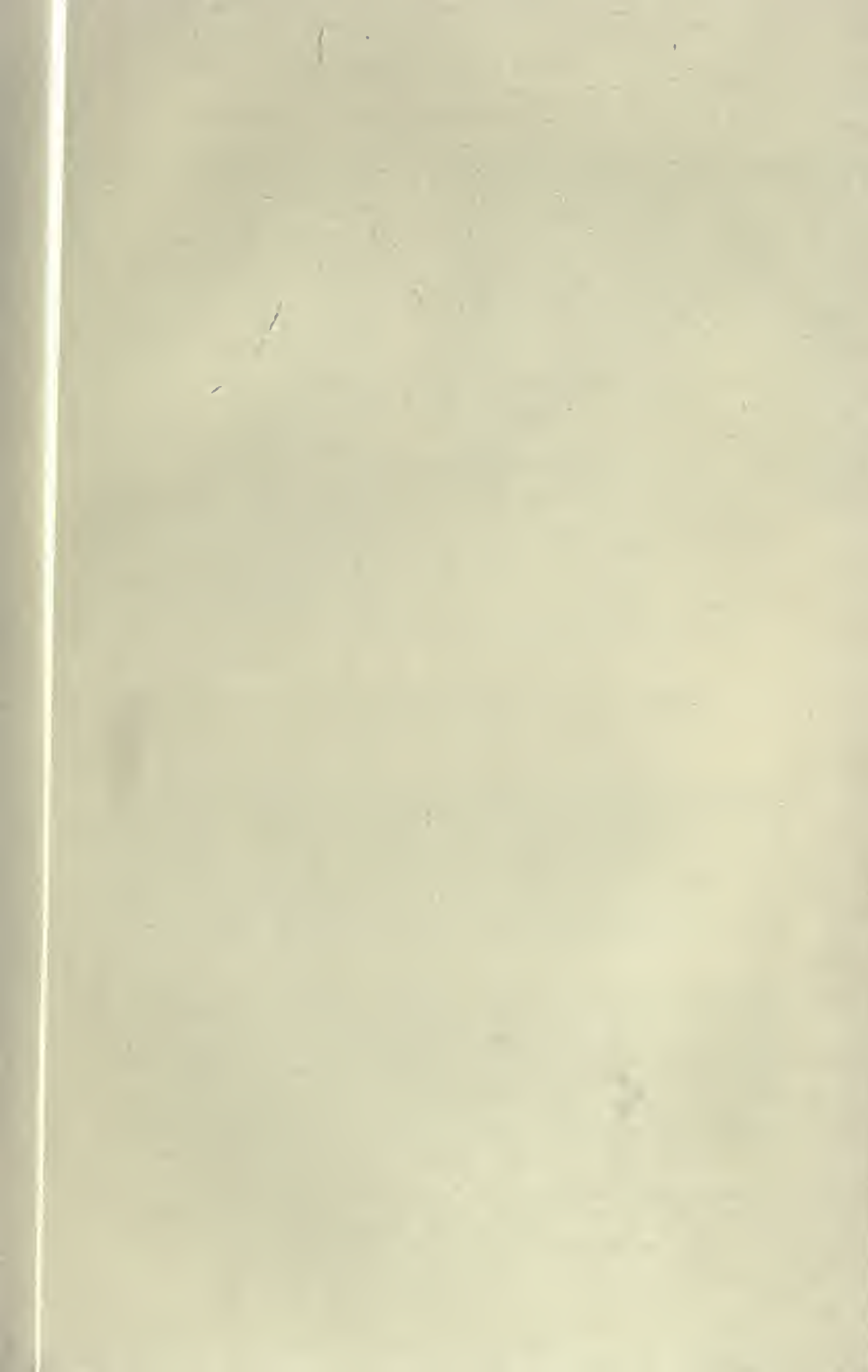
This is a very clear and fair exposition of the case. Where delusions, fixed ideas, or obsessions exist and are distinctly evident, propelling to illegal acts, there can be no doubt or hesitation in arriving at a fair judgment. But Dr. Mercier is dealing with two distinct factors, intelligence and will.

Intelligence is represented by the associations of the sensori-motor mechanism, probably the adjacent centres, parieto-occipital and temporal.

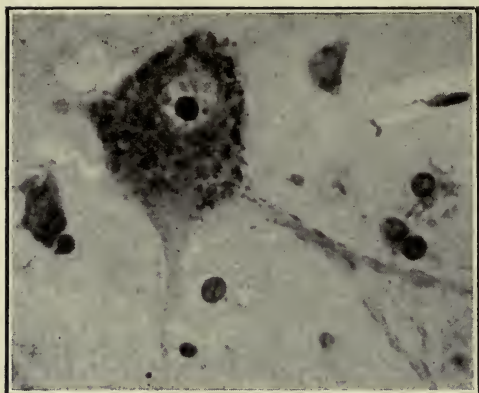
Physical  
Seat of  
Will

Will stands on a higher plane from the physical aspect. Experiment, pathology and evolution afford strong evidence of its origin in the prefrontal cortex. If this be correct an entirely new opinion must be held with regard to ethical or moral qualities.

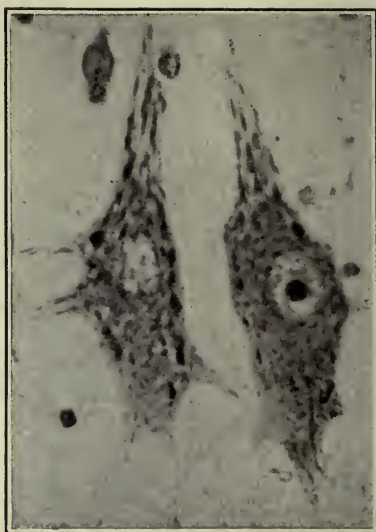
Dr. Shaw Bolton has added to our knowledge of the function of the prefrontal lobes. The research was carried out in the laboratory of Claybury Asylum. Dr. Shaw Bolton observed in the early stage of general paralysis wasting of the anterior two-thirds of the first and second frontal convolutions, and the anterior one-third of the third convolution in the



Normal brain cells.

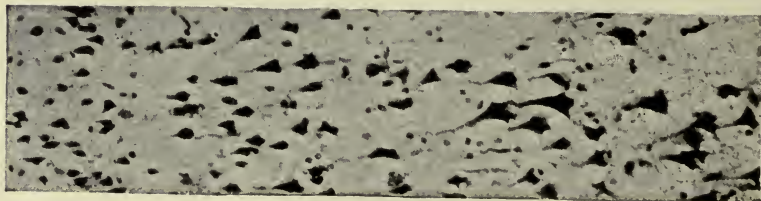
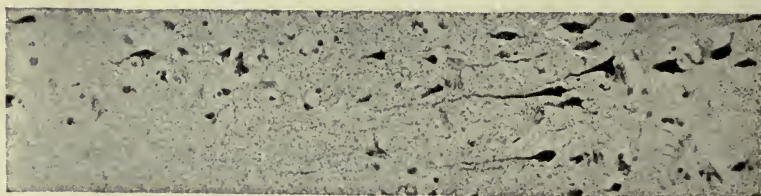


The axon or exit fibre below.



The axons below.

I am indebted to Dr. John Turner, of Brentwood, for these beautiful photographs.



The lower photograph represents the supply of brain cells in a normal cortex, while the upper shows the supply in a case of juvenile or inherited general paralysis of the insane.

Kindly lent by Dr. Mott.

same lobe. The actual location in the popular mind of this important area is the anterior pole of the brain, or that part immediately above and behind the eyebrows.

It is at this stage of general paralysis that so many good people go wrong. They become vain, or quarrelsome, or extravagant, and too often immoral. There is a close physical relationship of cause and effect which, alas! has often brought ruin instead of sympathy.

J. Shaw Bolton says—

“In all cases the depth of the pyramidal layer of nerve cells in the prefrontal region varies directly with the mental powers of the individual.”

“The pyramidal layer of the prefrontal is the last cell layer of the cortex to develop during the process of lamination, and it is also the first to undergo retrogression in dementia.”

This declaration as to development is the explanation of the proverb “Old heads are not placed on young shoulders.” It explains how and why judgment, control and wisdom come in adolescence and not in childhood. It also refutes the doctrine of “previous existence.”

Bolton adds concerning this layer—

“It is the only layer which appreciably varies in depth in normal brains.”

The prefrontal association area “is the region concerned with attention and the general orderly co-ordination of psychic processes.” These solid facts are the key to the variability of normal persons in their higher mental functions.

All other layers in the brain have their average thicknesses, which are much the same in every one. One object is black to all, another is white, one line is straight and another crooked. Every one sees and infers or judges alike. There is no room for opinion or doubt.

But when we come to ethics, we all know how moral strength and vision vary in different persons, even of the same family. Bolton tells us why. The depth of their pyramidal layers in the prefrontal varies, and “the co-ordination of their psychic processes” depends upon the thickness and stability of the former.

We now understand the good clergyman assaulting children when his prefrontal cortex was decaying from dementia during

the early stage of general paralysis. We also understand the brutality of the rough and ready degenerate whose prefrontal cortex has never developed. The former has lost what he once had in abundance, namely, power of will; while the latter never possessed the machinery whose product is moral control, I will or I won't.

In the study of responsibility, these facts must be closely applied to every problem; such knowledge is the true measure of morality.

When the steering gear of the mind is gone, then many sad episodes follow. Integrity, probity and virtue slowly disappear, instinct and desire being unopposed. The public look on aghast, the jury follows in ignorance, and the judge often reluctantly condemns.

The Un-  
developed  
or Unedu-  
cated Pre-  
frontal

But we have another class to deal with. Let us call them hooligans. They are devoid of all moral sense, lustful, cruel and avaricious. Many of these are partial aments. A few of them reach the asylum, and after death the prefrontal area is found very deficient in cells and fibres.<sup>1</sup> The equipment of these people is far below the average, though a few may be normal; but both have been reared under such unfavourable surroundings that their association areas have never received even the rudiments of moral education. This class is more correctly described as amoral, though the results may be immoral. Morality is to them an unknown quantity. These people may know right from wrong, and the consequences of evil acts by observation and experience on the sensori-motor part of the brain, but be quite deficient in the higher association areas, and therefore in all ethical knowledge, or inhibition, and consequently their choice is wrong.

This lengthy explanation is but an extension of Dr. Mercier's "If."

Thus, when I asked a lad why he stole a bicycle and sold it for half-a-crown, his answer was: "Dunno." Asked if he knew it was wrong, he said "Yes." His sensori-motor and lower association areas were in working order, but the

<sup>1</sup> *Vide Bolton's writings on Amentia in Journal of Mental Science.*

higher association which should direct his choice was undeveloped, so that he could not appreciate the importance of his crime.

With this preface Dr. Mercier continues on pp. 194 and 195 :—

Dr.  
Mercier  
on Self-  
Control

“By self-control I mean the power of foregoing immediate pleasure for the sake of greater advantage in the future. This is not a power of the intellect. It is often possessed in large measure by the dull, and may be wanting in the brilliant. It is a moral, not an intellectual quality. It is a matter of will, not of reasoning.”

I think that this statement is misleading, for want of definition of the term intellect. We must admit that intellect may be a quality rather than a property. One may own property in the shape of a knife, but unless it has the quality of sharpness it is no knife at all. The steel may be soft, incapable of sharpening, or it may be structurally deficient in the process of manufacture. If we follow on these lines, the brain is but a machine which may be perfect, imperfect or deficient.

I can only suggest by way of explanation that the dullard probably has an all-round poor brain machine of low potential, but in proportion has just enough prefrontal to guide him straight. He, moreover, may not be persecuted by too strong desires, and probably has no ambitions.

This is corroborated by what we see amongst the educated who have good brain machines, at high potential. In some cases their desires are so strong as to get out of hand: their ambitions are for the present, trusting to their abilities in the future if cornered. Behind all there may be a deficiency in the small prefrontal cortex. In this way only can I explain the erratic progress of many great and noble men, and of the few public men who finally fail in their trust; though with some their errors may be due to senile decay. These suggest to me the powerful battleship from which much is expected, but which in the hour of trial disappoints all our hopes, simply because its steering gear, through one small flaw in construction, is unreliable. Like the prefrontal area the steering gear is but a fraction of the whole.

Moral  
Insanity

Dr. Mercier describes moral insanity as a degree of vice, pushed to such an extreme as to become evidence of insanity (p. 198). Such exaggerated degrees of amorality or degradation would probably reveal a decided amentia or deficiency in the higher association centres. One gets support for this idea from Dr. Mercier's earlier chapter, where he ignores the theory of partial insanity, which is an epoch-making suggestion, as it clears the air in appreciating criminality—and it is to be hoped that the state will some day wake up to its responsibilities, and rely on knowledge and not on tradition. He says a delusion is the symptom of insanity of the whole individual.

I must add that the unstable and uncontrolled, or immoral, are not partly bad and partly good, like a mental mosaic, but bad throughout. Many persons like to regard themselves as moral mosaics, casting up the whites against the blacks, and thus permit themselves a few sins. The intellect may be very good, as with expert criminals, including the kings of illicit finance, but the higher associations must be wrong, as they show direct evidence of an absence of moral sense. A moral insanity is perhaps a diseased or deficient prefrontal.

The world loses a great deal by clipping the wings of the medical profession. We ought to have every criminal brain to examine. Fancy what we might find in the hands of experts. Some perhaps perfect structure, till we got to the prefrontal, and then found a shallow layer of cells and fibres, when all is explained; supra-ability—infra-morality.

Physical  
Relation  
between  
Mind and  
Brain

We have, therefore, three mental states with these physical representations in the brain cortex.

(1) The lowest is desire or animal craving, which is represented in the subsensory or polymorph layer of brain cells. As we would expect, it is as well developed in some of the lower mammals as ourselves. Its use is self-protection and propagation of species, while its abuse is selfishness and viciousness in various ways. Its existence in the human brain is proof of our evolution from below, as is indicated in a previous chapter, and a complete refutation of the opinions of some that man is potentially divine, and came from above.

(2) Choice, as Mercier points out, follows desire. Choice



is not a character of the lowest animals, where the immediate gratification of desire or impulse is constantly observed; yet in the higher mammals, especially the domestic dog, choice does obtain in a large degree. Choice is represented in the human cortex at the association areas; and these are being discovered in some mammals.

It consists in the comparison of experiences or memories. The primary object of choice in the human family is chiefly for self, and we see this manifested among the savage races and the degenerates, who seem like brutes when compared with civilized mankind.

(3) The highest mental conditions are volition and inhibition, I will or I won't; which in other words is self-control; and here must rest the faculty of responsibility.

Its physical counterpart is in the highest association centre which we may consider as now proved to be the prefrontal. Its representation in the higher mammals must be very rudimentary, if it exists at all, and its existence is not yet proven. According to the physical condition of this prefrontal area, so is its energy indicated in the degree of wisdom or folly, self-control or responsibility. In the senile condition the brain is shrinking, and the cells are slowly dropping out of action. Hence the scientific objection against old men being placed in control of national affairs. They are useful as critics, and valuable for experience, but in a measure irresponsible. This partly explains our many blunders.

Where disease invades this part in younger brains or in slight forms of alcoholic poisoning, the more vigorous sensorimotor area being uncontrolled, deviates from rectitude; and again justice ignores the cause. It is demonstrated elsewhere (Chap. XIII) that in alcoholism the delicate machinery of the prefrontal is the first to be paralysed. When this occurs people make mistakes which they regret later. There is, however, the other condition of want of development; the brain cells never having had an existence, or their numbers being reduced. We call this Amentia. (Fig. p. 191.) In gross cases, where the whole brain suffers, we have speechless idiots; in minor states we have imbeciles, who are often criminals and unjustly punished.

Free Will  
Non Est

If these facts be true, and they are supported by observation and experiment, there is for some people no such thing as responsibility or free will. Normals, who are few, have it, as their brain machines are perfect. The deficient are, however, more numerous than would appear, and require careful examination when in trouble, not by the police, the lawyer, or even the judge, but by the expert psychologist, to see exactly what amount of workable machinery they possess. Till then many will be incorrectly credited with free will and punished, where will paralysis, or absence of will, robs them of place of responsibility.

The terms free-will and responsibility must be considered in the light of fresh knowledge. We are but machines, of varying potential endurance and capability, and according to the quality of the mechanism so we should be judged.

## CHAPTER XXIII

### EMPIRE BUILDING

A bold White's dictum on the future—Simile of the Empire to a sick man—The Colonies his children—The Empire's heart.—EMPIRE BUILDING : What is it?—Altruism.—BRITON A SPORTSMAN : Lower brain cortex—In evolution pyramidal cells control—Sport in politics.—LAW IS AN INTELLECTUAL SPORT.—SPORTING INSTINCT ANCESTRAL FROM INSULAR BRITONS : Division of labour, hunters and warriors, or army and commerce—Each keep to their own speciality.—CONSCRIPTION : The nation : its available energy dealt with numerically—No energy to spare from science and commerce for military purposes—Military spirit a lower instinct—Our empire too intellectual to foster the lower instinct.—THE NATION BLEEDING TO DEATH : The neglected "Juveniles"—The future results from these 16,000 "juvenile adults"—The State as "guardian" : a new role—Surround the juveniles with motives, not walls—The shameful neglect of the poor.—THE TRUE VALUE OF THE BIBLE : Charitable works—Salvation Army—A SKETCH OF SOCIAL WORK AMONGST YOUNG PEOPLE : Deserted children—Good Magistrates—Stratford, E.—The phases of child life—Neglected infancy—The value of good milk.—A TYPICAL SLUM FAMILY : The early teens—Overstrain—The poor look-out for girls.—THE BOYS, WHEN HOMELESS, AS SEEN IN INSTITUTIONS : Mental and physical condition of these lads—Very poor memory as in criminals also—School standards.—ST. GILES' MISSION : The first offenders—Have been driven into crime—Alcoholic parentage.—THE EFFECT OF STATE "EDUCATION" : (A) The uneducated rover develops normally—(B) The best educated boy, the more stupid and immoral.—DEFICIENCY IN WEIGHT—REPORT OF BOYS IN WESLEYAN HOMES—REPORT ON WORKING LADS IN THE VICTORIA CLUB, WHITECHAPEL—THE DIFFERENT TABLES OF PSYCHIATRY AND COMPARISON WITH NORMALS—CRANIAL MEASUREMENTS : No difference outwardly between merchant prince and criminal—But between the better class lads and young criminals, there is physical deficiency in the latter—Growth of skull—Cases to illustrate—Is the rising generation inferior?—Skulls in family groups—Effect of deficient physique.—SIDELIGHTS FROM THESE FACTS ON THE PROBLEM OF EDUCATION : Starved body, starved brain—The effect on intelligence.—and on morale.—THE NATURAL TENDENCY IS ALWAYS THE WAY OF LEAST RESISTANCE.—THE PREDICTIONS OF MALTHUS A CENTURY AGO ON OVER-POPULATION : Of Darwin ; of Herbert Spencer—Two kinds of check : Natural and artificial selection—The question presses us now—John Stuart Mill's dictum—Lord Derby's sayings—Positive and preventive checks—Eight children weigh 21 stone instead of 31 stone : A social crime.—THE CRY OF THE CHILDREN : Against parent, society, and State—INFANT MORTALITY, NATURE'S TOLL : There is no true love in our hearts, only "sentiment."—THE STERILIZATION OF THE UNFIT, SUGGESTED BY ARNOLD WHITE, IS THE ONLY CURE—Those who require and demand sterilization—No inter-

ference with the liberty of the subject until it be forfeited.—BERNARD SHAW'S OPINION: Social happiness would result.—AN IDEAL COMMONWEALTH: Males, females, neuters—No more classes against masses—Mental disease less—Then Euthanasia—Neuters will decrease—Normal family life.

Arnold  
White's  
Dictum  
on the  
Future

TWENTY years ago, Arnold White wrote: "As the rich grow richer the poor grow poorer. Between Dives and Lazarus the great gulf fixed becomes deeper, wider and blacker, month by month and year by year."

As Empire builder, he wept over the coming decay, which was most evident in the large cities. The process steadily continues.

The rich do not feel it, for they can still feast upon the ruins with the power and opportunity that wealth confers; but the middle class are now feeling the cruel chill blast which has worked wreckage at the base of the Empire.

It may seem feeble to resort to simile for descriptive purposes, yet one can often drive a truth home with more clearness in this manner. The Empire is like a prosperous man whose end is drawing near. His children, the Colonies, are floated and self-supporting.

Serious indeed is the condition of the heart of the sick Empire. The life<sup>1</sup> stream is oozing therefrom, and if it continue must hasten the end. The head<sup>2</sup> is clear and the arms<sup>3</sup> are strong, and so a false security exists, but the body appears to be failing fast.

Empire  
Building

Empire building is the main object of every true Briton, and our rising generation must be educated up to it.

What is Empire building?

Is it Conscription? or Protection, or Education, or Religion, or Emigration, or any other "ions"?

These are but feeble tonics, of which none cures.

There is only one way of Empire building, and that is altruism<sup>4</sup> toward the masses, instead of the egotism of the classes. The increased Empire wrecking is due to egotism, and that alone.

<sup>1</sup> The starving poor, the future strength of the nation.

<sup>2</sup> Science.

<sup>3</sup> Commerce.

<sup>4</sup> *Alter*, another. The thinking of others; loving our neighbours.

As already pointed out the Briton is essentially a sportsman, retaining an ancestral instinct, necessary to primeval man ; perhaps inherited from the carnivora ; and engrained, in both, in the lower cortical strata of the brain. It rests with the evolution of the higher cortical layers, the pyramidal cells, to control and guide this dominant killing instinct.

Briton a  
Sports-  
man

Is not this sporting instinct the source of all political passion and strife ? It is the essence of courtship, marriage, commerce, and efficiency.

I should be very sorry to stir up the wrath of the legal profession at a period when we want their sympathy and assistance, for we are entirely in their power, and absolutely at their mercy. Nevertheless, if I quote one of their noblest members, Sir Edward Clarke, I shall obtain support for the course I am taking.<sup>1</sup> At a dinner of the Medico-Legal Society (1907), he compared the doctor, toiling for love in the slum, with the barrister at work in his luxurious chambers ; and further enlarged on the disappointment that a sensitive and honourable lawyer must feel at the results and character of legal methods. It is, however, only an excess of the sporting instinct, perhaps unguided by and beyond the control of the true or higher Ego.

Law is an  
Intellec-  
tual Form  
of Sport

There is constant evidence of this instinct in the desire of counsel to win their client's cause, whatever justice demands. The same temptation to err from rectitude does not obtain among the ordinary pursuits of the doctor, for, as Sir Edward Clarke said, he " was always on the right side, working for the cause of suffering." The lower hunting instincts of the doctor are, however, painfully revealed when he is drawn into legal work, and the way in which two doctors will swear to diametrically opposite opinions is a mystery to the intelligent public.

The late Lord Brampton, Sir Henry Hawkins, was a keen sportsman, and I observe a quotation from his *Reminiscences*, which demonstrates how this ancestral hunting instinct may dominate the Ego and subjugate the higher *morale*.

" One of the least known stories, but at the same time one of the most characteristic, was recounted by him in his *Reminiscences*. Hawkins had made a touching speech, and had succeeded in getting a prisoner acquitted on a charge

<sup>1</sup> See *Transactions of Medico-Legal Society*, vol. iv, p. 107.

of murder by exhibiting in court the children of the accused dressed in black clothes, and sobbing as though their hearts would break. The sequel is thus described—

“‘You made a touching speech, Mr. Hawkins,’ said an old inhabitant of the village.

“‘Well,’ I answered, ‘it was the best I could do under the circumstances.’”

“‘Yes,’ he said, ‘but I don’t think you would have painted the little home in such glowing colours if you had seen what I saw last week, when I was driving past the cottage. No, no ; I think you’d have toned it down a bit.’

“‘What was it?’ I asked. ‘Why,’ said the old inhabitant, ‘the little children who sobbed so violently in court this morning, and to whom you made such pathetic reference, were playing on an ash heap near their cottage, and they had a poor cat with a string round its neck, swinging backwards and forwards, and as they did so they sang—

This is the way poor daddy will go !  
This is the way poor daddy will go !

Such, Mr. Hawkins, was their excessive grief.’

“‘Yes, but it got the verdict.’

As this is but a type of what occurs in our Courts of Justice, one can only deplore the want of relationship between Law and true Justice which includes truth, righteousness, and the public “weal.”

Considering that the legal profession always includes some of the noblest and most intellectual men of the age, it is extraordinary that such conditions continue. Let us, at all events, hope that the sporting pendulum does not swing too far in the opposite direction, to the danger of the innocent.

Sport thus uncontrolled and unguided, tends towards depravity and inefficiency in rich and poor alike.<sup>1</sup>

Sporting  
Instinct is  
Ancestral  
from  
Insular  
Britons

It is often asked why the Franks, Latins, Russ, or Teutons, have nothing equal to the Briton’s sporting qualities.

The reason is clearly the isolation of our ancestors ; which insularity sharpened their propensities for protection and

<sup>1</sup> For further light on this subject read Arnold White’s book, *The Problems of a Great City*, which ought to be carefully studied in the hope that the next generation will get the Empire on its feet again.

preservation. Whereas on the vast continents, if food failed in one area the tribes could wander to another. They were like the less energetic herbivora; whereas we were obliged to be always on the look-out, like the carnivora.

Such was evidently our type, and being conquered, we absorbed the better qualities of our conquerors, but this ancient instinct continued to assert itself.

Ancient Britons would by division of labour necessarily form two classes; the warriors, and the suppliers of food, hunters and pastoral workers. We have built our social system on the same plan. We have our army and our commerce. Even the scientist is a hunter, seeking for useful knowledge and truth.

In ancient Britain there were many clans, and if the hunters went to war famine followed; or if the warrior left to hunt, the internecine enemies invaded their territory.

Hence each had his office, and so it should remain. The hunters of commerce and science build up a complex system, which to be prosperous requires all their time and energy. The warriors quite justly receive a liberal portion of what the hunters acquire in return for peace, protection and opportunity for progress, or even for stealing their weaker neighbours' territory.

But the warrior must not hunt, lest the enemy attack us; nor can the hunter leave his work to do what falls to the lot of the warrior. This principle must guide us in national politics, and if followed might save us from panics.

Conscription ?

As with the body we have head, arms, legs; so the nation in health relies upon science, commerce and stability, which cannot be parted or separated. A human being is capable of a certain or limited amount of energy. If, by way of illustration we represent that energy as 1,000 units, a conscript at the "foot" of the Empire will use up 600 units to become a reliable soldier. If, on the other hand, we take the same number of units from the brain worker, who requires that amount for his own purposes, the loss falls on the nation. Similarly the nation's hands, as types of her commerce, cannot spend two-thirds of their energy on military affairs without losing in skilled industry.

The military spirit, essentially sporting, belongs to the lower instincts. Far preferable is the activity of the upper cortex, which would quell jealousy, and lead to friendly intercourse amongst all peoples. Our Empire is the highest amongst nations, and its fighting instincts have in recent years wasted in consequence ; we must not now stoop to others, but rather draw them up to our level.

The  
Nation  
Bleeding  
to Death

Where we are gradually bleeding to death is in our neglect of the poor, especially the children. There pass through our prisons every year more than 16,000 bright, intelligent, promising young lads. These are the future hope of the nation, perverted and perhaps alienated, but yet capable of salvation by wise methods.

It is not their fault. It is your fault and my fault. We are the criminals, they are the sufferers. Perhaps it would be more correct to lay the chief blame on the State, which is paramount to saying that it is the chief offender against justice and humanity.

We cannot ignore the very simple arithmetical facts that the boys of fifteen lying in misery in our gaols will be twenty-five in ten years. They will then reach maturity and the stage of procreation. Let us make the modest calculation of three children to each grown up man, and we have 50,000 British subjects of a soiled and probably soured inheritance from these 16,000 young convicts. It is clearly an unwise policy to grind the poor, and such a policy must bring a reaction. What a different feeling these young convicts would bear towards the State if they were sent to reformatories in serious cases, and in minor cases to institutions which might be called "National Schools," and carry no stigma. The state as guardian would be tied by no limited period, and be bound to apprentice them, guarding them till at the age of twenty-one their intellectual neurons were developed. William Tallack, the prison reformer, would surround these poor boys "with motives, not walls."

The nation is undoubtedly on a downward track if it persists in this shameful neglect, and allows the good Samaritan to work unaided ; it now even puts obstacles in his way as he endeavours to rescue the perishing.



To sum up, humanity in ancient days received a chart to guide a clear course over the troubled ocean of life. Some say this chart was inspired, as it has stood the test of time and criticism, for it is as applicable to-day, as when it was written. Man has not changed. His cortex was the same in the days of Moses as now. He was as capable of wisdom and altruism then as to-day.

Let us turn with more hope and cheer to see what the lovers of mankind are doing for the Master's sake.

Conspicuous among all stands the Salvation Army. Some don't like their ways; I am always glad to hear people run down the Army, because it is opposition which gives strength, and helps to show the enormous work they are doing. These operations and methods will stand the closest inspection. The more the blast rages, the tighter do the mountain pines cling to the rock.

Among the other numerous agencies and individuals hard at rescue work of all kinds which attracted me, and which I shall now describe, were the Homes for homeless lads in London; the St. Giles Mission, which takes juveniles from the police courts and prisons; the Wesleyan Homes for orphans; and, finally, the work of the Jews amongst their own juveniles.

They are all Empire builders, and those of us who love the Empire must not forget them.

Few people have any idea how many children are deserted by their parents. The cases are very seldom brought to light, for the children are oft-times absorbed by other families of the same class, or at once commence a career of their own in the tender teens. If thoroughly down on their luck, the state thoughtlessly charges them with the crime of poverty, or with wandering. Many cases are sent to prison, sometimes several times over, and the evil associations inside the gaols usually end in an apprenticeship to some hardened criminal.

Many of these children are rescued by the court missionaries and placed in homes, where they settle down contentedly, are found situations amongst kindly disposed employers, and turn out remarkably well.

There are many courts where the magistrates have sympathy with the poor. Conspicuous amongst these is that at

The True  
Value of  
the Bible

A Sketch  
of Social  
Work  
among  
Young  
People

Stratford, where the magistracy has been for long years inoculated with Quakerism. I am told that for many years no boys have been sent to prison at this court; the magistrates deal with them on humane lines, and seek normal shelter and healthy influences for them.

Among the poor, child life passes through many phases; some are brought up on gin, others on beans and bacon. When attached to a children's hospital as physician, I found the usual answer of mothers as to dietary was, "Baby has the same as we have." As a consequence of the deficient supply of milk, rickets and tubercle are very common amongst them. In Chapter IV development and growth are referred to as depending on the healthy nerve nuclei of the brain. These nuclei take up soluble phosphates and leicithin<sup>1</sup> from the milk, just as the chick absorbs it from the yolk. No leicithin, no growth. In America they are now trying to cure rickets by the employment of leicithin. The poor, therefore, should have the opportunity of getting good milk and plenty of it.

A Typical  
Slum  
Family

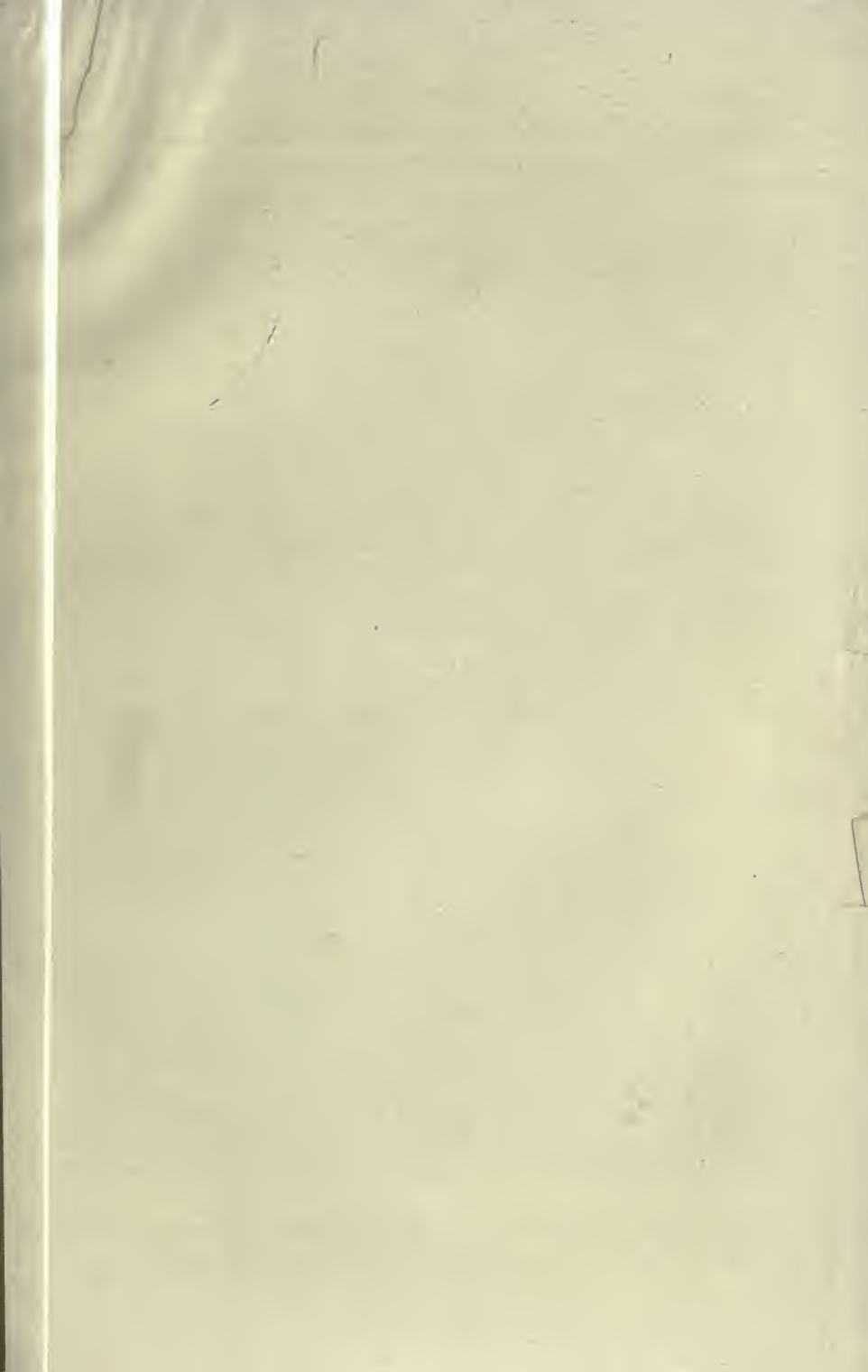
The children of the poor are horribly neglected. How they struggle through their first dozen years is a mystery. Take one typical family under my own observation, honest, but terribly poor. Here is the list of the eight children, who with their parents sleep in two small rooms.

The family consists of three boys and five girls, as follows—

	Sex.	Age.	Height.	Deficient.	Weight.	Deficient.
			ft. in.	ins.	st. lb.	st. lb.
1	F.	14	4 9	2	4 10	2 0
2	F.	13	4 7	2	4 0	2 3
3	F.	11	4 2	3	3 10	1 2
4	F.	9	3 9	3	3 2	0 12
5	M.	6	3 3	4	1 12	1 4
6	M.	4	2 9½	4	1 8	1 1
7	M.	3	2 5	6	1 4	1 2
8	F.	6 months	2 3	—	0 9	0 5
			27 11	2 ft.	21 1	10 1

From these figures it is apparent that there is not enough

<sup>1</sup> Leicithin is a complex neuro-phosphate.





From left to right.

Ages

15 $\frac{7}{2}$

14 $\frac{5}{2}$

17 $\frac{1}{3}$

15

Heights

4ft. 7 $\frac{1}{2}$ in. ; - 8in.

5ft. 4in. ; + 3in.

5ft. ; - 6in.

4ft. 6in. ; - 8in.

Weights

4st. 10lb. ; - 3st. 8lb.

8st. 12lb. ; + 1st. 12lb.

7st. 9lb. ; - 2st.

5st. ; - 2st. 5lb.

food to go round, and only two thirds of the children should have been born. Don't let us, then, fight the Almighty on the question of infant mortality.

A second period of helplessness seems to occur in the early teens. By that time they have almost finished their "education," and with what little intelligence the overstrain has left they are cast out to seek their fortunes or misfortunes, which ever may come first.

In this second period you meet the boys in the many "Homes" provided for them by free offerings. There are not so many facilities for young girls, who usually go out as drudges, or into factories, or make their living on the streets, as we in hospitals know too well.

I will give details of a fair sample from the *Homes for Working Boys in London*.

There are about seven of these, accommodating sixty to ninety boys in each home. Specially interesting is the home life in Haddo House, 88, Blackfriars Road, under the anxious and loving care of Mr. and Mrs. Harrison. It does one good to see the happy faces, however grimy, after they have had supper, and are seeking some innocent fun. These poor lads are picked off the streets, being usually too microscopic to attract the attention of the police, and are of very poor physique, frequently of very low morality. I examined fifty-six boys. Of twenty-two boys aged 15 and under; I found the weight deficiency to be 22 per cent. The deficiency among twenty-eight boys aged 16 and 17; was 23 per cent; while six boys ranging from 18 to 20; showed a loss of 20 per cent. Compare these with the Jews. Their intelligence is low, and I have been specially struck as to their memories. Few can remember any event before they were 5, and many can only remember to the ages of 8 or 10. This same mental oblivion is very conspicuous amongst criminals, and has been fully discussed in Chapter IX. A few may have had sober parents, but the rule is drunkenness in one or both parents. At school very few got beyond the fourth standard. (See Tables IV.)

The Boys,  
when  
Homeless,  
as seen in  
Institu-  
tions

Another typical institution is St. Giles' Mission, which has been conducted by Mr. Wheatley for many years. Few people

St. Giles'  
Mission

can estimate by reports the valuable work done here. In the department I examined there are about 100 boys, well fed, clothed and housed. This is the physical side or attraction to the boys, let us call it the practical method of reform.

The boys, formerly outcasts, appreciate these healthy surroundings; therefore, there is no difficulty in detaining this body of "juvenile or first offenders," as they are called. They have been driven into crime; some are only charged with the crime of poverty or "wandering," the causes of which are bad homes, cruel step-parents, fathers, or even mothers.

Alcoholic parentage figures largely; and syphilitic in a few. The table of twenty-five cases which I have submitted must be a study for any thoughtful reader. (See Table III.)

The Effect  
of State  
"Education"

Let us here consider State Education, and see how it acts. Case — was the least educated, only reaching Standard I, which means simply infantile spelling and monosyllables. This boy, a rover, freed from the exhausting state method, attains normal height and weight. He was driven to thieving by starvation, and received a month in prison. He, alas! never knew a father, and his mother had left him. He is described as intelligent, that is, though deficient in "education," his association, or higher intellect, has evolved by environment.

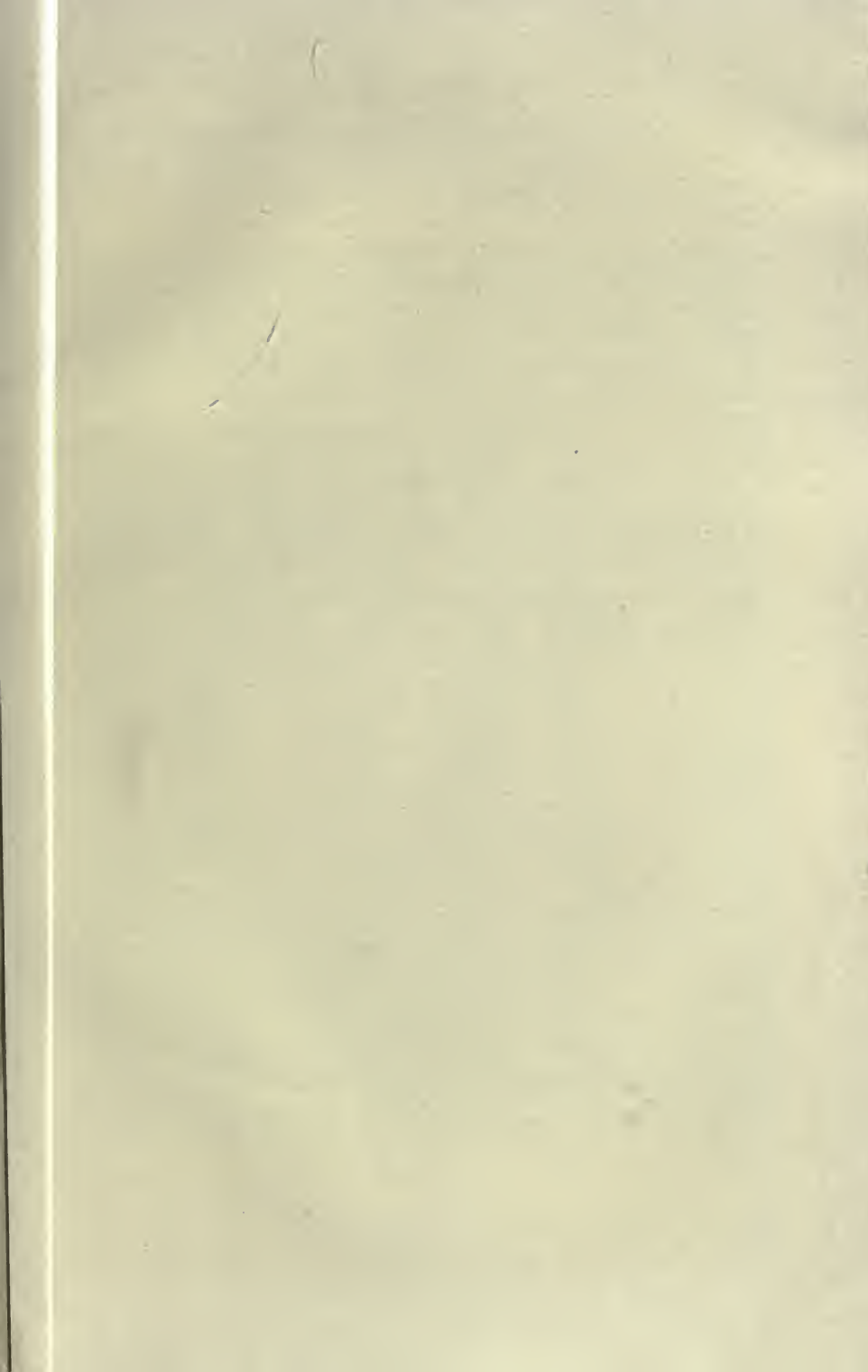
Let us go to the other extreme, and take Case —, who rose as far as was possible, learning science in the Ex-VII Standard. This boy was handicapped by the ante-natal poison of syphilis from one or other parent, and presented many stigmata of degeneration. He went wrong, having robbed his employer; but Mr. Wheatley saved him from prison through the kind intercession of the injured employer. Intellectually he is dull and deficient, having evidently poor association centres. He is like a sponge, absorbing knowledge quickly, but unable to use it, and not necessarily retaining it.

Deficiency  
in Weight

These unfortunate lads show great deficiency in weight; their bodies are unable to nourish their brains.

The worst specimen, Case 55, at the age of 17 was  $4\frac{1}{2}$  stones too light. Nature resents civilization and pays back tit for tat, turning him into a degenerate and deficient.

These juvenile first offenders afford a most interesting





From left to right.

Ages

12 $\frac{3}{4}$

17 $\frac{1}{2}$

15 $\frac{1}{2}$

20 $\frac{1}{2}$

16 $\frac{1}{2}$

Heights

4ft. 11in.; +2in.

4ft. 7in.; -1ft

5ft. 4in.; normal

5ft. 7in.; average

5ft. 2in.; -4in.

Weights

6st.; normal

6st. 11lb.; -3st.

8st. 4lb.; normal

9st. 2lb.; -1st. 2lb.

8st. 5in.; -1st.



object lesson, for they show that want of nutrition and evil nature go together.

Thus the twelve worst, really bad boys, should weigh 109 stones, but only weigh  $86\frac{1}{2}$  stones; showing a deficiency of 21 per cent.

The thirteen less criminal, some of them "good" boys capable of improvement, should weigh  $117\frac{1}{2}$  stones; but only weigh  $98\frac{1}{2}$  stones; showing a deficiency of 16 per cent.

When the twenty-five are put together they show a deficiency of  $18\frac{1}{2}$  per cent.

The same class of boys among the Jews, due to family care and religious training, do not sink into this state of immorality, and their weight deficiency is only  $8\frac{1}{2}$  per cent.

#### THE CHILDREN'S HOME AND ORPHANAGE.

This institution, whose headquarters are at Bonner Road, Victoria Park, shelters and protects 1,850 children in its ten branches. The Principal is the Rev. Dr. Gregory. Having been consulted professionally many times during the last twenty-five years, I am competent to criticize their methods. They are, to my mind, perfect Empire builders, for they take in children at any age, and never leave go until they reach adolescence and are able to stand alone.

They are homes in the best sense of the word. The sexes are not separated; the children are clean, well clothed, and have close personal supervision. Body, mind, morals and religion all meet with close attention. No happier children can be met with.

They have many invalids and cripples, but it is home for them; they know they will never be turned out. The sisters are refined ladies of various Protestant denominations.

The religious training is strictly evangelical (Wesleyan), and the results seem good, for they effect cures among many "born" criminals.

The clever boys are taught trades, according to their abilities. Others are emigrated to Canada, and carefully guarded there until established.

I examined thirty-one boys out of 300 children at Bonner Road, and asked for the best, the worst, and a fair sample.

A Short  
Account  
of the  
Wesleyan  
Rescue  
Work

The girls do well there, up to their teens ; they are stronger, healthier, and plumper than the boys.

The material is extremely valuable as a fair test for board school methods. Those so educated show less of infantile memory, whereas those taught in private and Church schools, on more reasonable, humane, and intelligent lines, retain infantile memory to the ages of 3 and 4.

Ten of the worst boys ranging in age			
from 9 to 20 weigh collectively	.	52 st.	1 lb.
Instead of.	.	66	„ 11 „
Showing a deficiency of	.	14	„ 10 „
		or about $\frac{1}{5}$ (20 per cent.).	

Only one boy was normal weight ; none were above normal.

One boy, aged 14, was 2 st. below normal. The inference is that three too many came into the world.

In regard to intelligence, eight were called dull, but were in reality middle grade imbeciles, and if cast on the world must become criminals.

Four were of weak morals, but are recovered or recovering under the religious influences, which include sympathy.

There was no necessity for them to pilfer, as amongst many of the poor, hence their pilfering shows an inborn instinct. The starving poor have of course a moral right to pilfer the necessities of life, as long as superabundant wealth is permitted.

Memory : Only one boy can remember to the age of 4, but he was brought up at a Church school. He is the most intelligent of those examined, but also weak morally.

The other nine were all State educated, and the abnormal pressure on their weak brains had destroyed their little intelligence.

One boy, aged 15, can only remember to 9.

Another, aged 17, can only remember to 12.

Their parentage was not so bad as in other homes I visited. Many of their parents had been good, but were unfortunate in their worldly concerns.

Eleven of the best boys give us more cheer. Their ages range from 14 to 20. They should weigh collectively 98 to

99 stones, and reach 96 stones, showing only a deficiency of 2 to 3 per cent.

None of these are deficient. They will compare with the most favoured middle class, either in mind, or physique, and probably better in morale owing to their religious training. The two boys who are the most underweighted are the illegitimate children of a lady by different fathers.

This group shows the advantage of private schools over board schools.

One, a country lad, remembers to 3, and three others, also at private schools, remember clearly to the age of 4.

Two boys, one a half negro, remember to 4 though at board schools.

The other five go back to 5, and were board school children.

The ten of fair average range in age from 10 to 19. They weigh collectively 71 st. 4 lb., but should weigh 79 st. 4 lb.; hence they are about  $\frac{1}{10}$  too light (10 per cent.). There are among these three weak morally, all recovered, and three mentally deficient.

Here again we see the effect of the intelligence-destroying Board School machine, for two of the boys, aged 17, having been to a private school, can remember to three, while at the other extreme one, aged 16, can only remember to eight.

Space prevents more detail being given to this splendid work, but a further perusal of the notes will well repay the intelligent philanthropist.

Barnardo's work is too well appreciated to require special notice, and while he was perhaps the greatest Empire builder of his time, yet the nature of the gigantic work prevents us from gathering statistics for psychiatrie.

It, however, emphasizes the fact that environment equals heredity either in the making or the saving of the criminal.

As an evidence of his work, I append a letter, quite fitted for a museum, from one of his lads in Canada, a young Empire builder working hard to rescue his four younger brothers and sisters—

Barnardo's  
Homes

Interest-  
ing Letter  
of a  
Barnardo  
Boy in  
Canada

August 14, 1907.

DEAR SIR MR. ALBERT WILSON,—

I have received A letter from Mr. C. Harrison, and he tells me that he took my brother Edward to you exsamon to see if he was fit for Canada and you said he was OK, and I am pleased to here that nou Der Sir there are five of us and we are all alone in the world to get a home for our selves nou, our mother ran away from us when we were quite young and our father pade our way for two years, and then he went to and then I was put in Dr. Barnardoes Home and from there I was send to Canada and I was 13 years old then I have been out here 3 years last april, and I hays pade my sister way out last Oct. 1906 she is working at the same place as I am and I have got a good place for Edward when he comes out, and I have my outhter brother John in the English wafes and straves and if I can get hem out here my Boos would be pleased to get hin for 3 or 4 years on reasionerbal terns and my sister lillie is som were else and I will get her out to because Canada is the place for a poor person I am trying to do the best I can and a little help Meanes a lot to me and I thank you very much four whot you have don.

I remain your furind

E.C., Ont. Canada.

Social  
Work  
Among  
the Jewish  
Poor

The purport of this chapter would not be complete without a visit to Whitechapel, where destitute Jews are so numerous.

The Jews by their intermarriage are the most prepotent race in the human family. Their racial peculiarities or national characteristics are thereby strengthened, otherwise they could not have survived such ages of persecution.

I am indebted to Mr. Stephany, Secretary of the Jewish Board of Guardians, for valuable information of the way in which they manage their affairs. The Board, which is entirely supported by voluntary effort, administers outdoor relief. It is very rare that they have a case of poverty due to drink. Would that such an experience might be ours! On the opposite side of the street was a long queue of destitute degenerates waiting admission to the Salvation Army Shelter, and drink was plainly written on each face.

The sin of the Jew is gambling, while the sin of the Gentile

is drink. I might almost say the sin of the Christian, for nearly all are baptized into the Christian Church, and much of crime and wrong-doing is due to the apathy of professing Christians.

The Jew is no lover of alcohol, and they tell me that the rich Jew is no judge of good wine. He goes by the label. But the Jews are fond of good eating, and blend a lot of fat and oil with their food.

They are very particular about the meat, as a matter of ritual; less so about the milk, which is just the opposite of our way of thinking. The poor also are more particular than the rich as to the ritual. In addition to draining the blood, they have their own inspectors, who cut out whatever is suspicious, or "blemished." In the case of our ordinary butchers, what is obviously bad is removed, but that which is merely suspicious is too often left. The Jews do not specially partake of porridge or of lentils or peas.

The Jewish criminals are subtle and cunning, as contrasted with the Gentile criminals, who are violent and sporty. The Gentile acts as burglar, while the Jew will play the part of receiver. There are very few Jews in prison. In 1905 there were only about ninety women in Holloway, and 400 men in other prisons. This is a small percentage in so vast a community. It works out at  $\frac{1}{2}$  per cent., as compared with 2 per cent. for all London.

The Guardians regret that there are, as with us, so many early and thriftless marriages. Their poor, like ours, are also very reckless as to the size of their families.

While we are struggling through entanglements of red tape to obtain health inspectors, the Jews have for long had paid officials for this purpose, visiting the consumptives and others and applying up-to-date hygienic methods.

They endeavour to enforce inter-marriage, as they usually suffer nationally by mixed marriages as the children go with the majority. From all I have seen I think we would profit by these mixed marriages; we would gain in temperance and in intelligence, which would lead to a higher domestic ideal and thus a stronger race. I don't think they would suffer, but might gain in other ways. The religious and national feeling is, however, very strong among the Jewish people, who are a law-abiding, peace-loving folk. If their influence

was extended to other nations, it would all make for universal peace.

The Boys'  
Club

My chief inquiry was in regard to the young, and I am indebted to Mr. H. R. Levinsohn and Mr. Ernest Lessor for affording me help and supplying me with cases from the Victoria Club for working lads. I was much struck with the very cheery and frank manners of these lads. There was nothing servile or degraded or slouching among them. They seemed more manly than the corresponding class amongst Gentiles, having all through been brought up better.

To begin with, the Jewish woman is "lazier" than the Gentile. It is very rare that they go out to work. The men, on the other hand, are much more industrious than the Christians, and have always the desire to better their positions. The men are, in addition, very temperate. A Gentile workman getting 30s. a week will often spend 5s. or 6s. in the public house; nothing of this sort occurs among the Jews.

As the mothers nurse the children and stay at home, there are fewer infantile diseases and a lower mortality.

Jewish parents, like the Scotch, are very keen on education, and encourage the children at school. In addition they feed them during the play hours. In every way, then, the Jewish child at the Board school stands a better chance than the Christian. There are about 20,000 of their children at the Board schools, and about 6,000 at their own Free Schools.

Appren-  
tices

As soon as they leave school, they are carefully looked after. Both boys and girls are apprenticed, the Guardians have now about 800 lads and 200 girls, for whom they have advanced sums of £10, £15, or £20 each as premium. This is repaid by the lads or their parents.

Both boys and girls are attracted to their clubs, of which the boys have four or five and the girls three in London.

This healthy *morale* results in producing fine sturdy, yes, noble young men out of the same class which furnishes the hooligans and juvenile offenders among the Christians.

There are very few degenerate, deficient or dullards among the young Jews, in consequence of the careful and practical home influences. This was so much of a surprise that I

several times asked for bad boys, but they could not supply them, nor could I find any.

I carefully examined thirty-three lads, varying in age from 14 to 21. Some were born in England, most abroad. Nearly all were of foreign parentage, but none had drunken parents. There were several much under weight. One, a dwarf (No. 254), but very intelligent, weighed 4 stone 11 lb. too little at the age of 17. Many lads were over weight.

The thirty-three lads should have weighed . . . . . 275 st.

But actually weighed . . . . . 252 ,,

Showing a deficiency of . . . . . 23 ,,

Or only 8 per cent.

This compares well with the lads in the Wesleyan Homes, who are exceptionally well cared for.

The effect of the State "Education" is not so disastrous on them as on Gentiles. The Gentiles have also to contend with malnutrition and parental alcoholism. Consequently one-third of these children can remember to the age of 3, and only one-sixth are so dull as to remember only as far back as 5, 6 or 7.

In examining Table XI, one is struck with the comparative width of skull; only one-fifth had a cranial index below 80. They average higher than the Gentiles. On the other hand, the heads are smaller, only one-fifth exceeding 22 ins. at the base. The skulls recede slightly, after the Eastern type.

Religion plays a very important part in the child's life, and shows its effect later, especially in national unity and comity. We have a great deal to learn from this powerful people, and we are doubtless much indebted to them as Empire builders, for the young people are trained to loyalty to the British flag.

I am providing four sets of tables:—

One (Series IV) represents 55 boys taken as a fair sample from different Homes for Working Boys in London.

Another (Series III) consists of boys, some of them in Mr. Wheatley's home: all of these are first offenders technically, though some not actually criminals. They are a fair sample of the city sparrow in his upper teens.

The third collection of tables (Series V, VI, and VII.) is for reference as to middle class averages met in every-day life.

The  
Different  
Tables of  
Psychia-  
trie and  
Compari-  
son with  
Normals

As there have been no markedly adverse conditions, height and weight are not recorded.

The fourth set (Tables I) shows delinquents and (Tables II) tramps and "drunks" for comparison with average middle class (Series V, VI and VII) in relation to cranial measurements. Tables VIII refer to the respectable poor. Tables IX show measurements under the age of 12. Tables X are taken at the Wesleyan orphanage, and Tables XI from Jewish working lads.

**Cranial  
Measure-  
ments**

Cranial measurements, like statistics, are of very little value. Statistics are like potters' clay, and can be moulded in any direction to suit any opinion. Cranial measurements cannot be moulded, but they are of some little comparative value. It is as if you had two boxes of different sizes, and had to say what the value in each was. One might contain gold and the other rubbish, but the size would not indicate anything. Thus it is that within certain limits size shows nothing. On the other hand, if the large box contained the gold and the small box the rubbish, the value would be enormous, and such may also happen with brains. As the subject is of interest to many, I have given a wide selection.

If we compare these measurements of the merchant princes and successful city men with the adult criminals we find no difference.

For further comparison I have placed good intelligent lads of the better middle class alongside the unfavoured poor. In cranial measurements there is nothing to choose, but the difference is very evident when we compare weights and heights. These are not recorded in the better class, but it is safe to take these as equal to or above the average, which is a low one. The poor lack terribly in weight, which shows brain starvation. What can we expect from such conditions?

There are five cases in one family of healthy boys where I measured the skulls seven years ago and again recently. It is interesting to observe the increase.

It is the opinion of many that this generation and the rising one are inferior in limb, bone and skull to the last two generations. The size of the skull is stated by hatters to be smaller now than thirty or forty years ago. The cause of such, if



it do exist, is easily explained as the degeneracy in physique due to the ease of civilization.

It is, however, interesting to compare a few family skulls, and so I have placed those I have collected in a separate table.

Deficient physique implies correspondingly less endurance. If this pass like a wave over the nation, as it must do, what is the outlook for our children and grandchildren? We are their trustees.

The mysteries of the education problem may receive some important side-lights and shocks from these and similar collections.

Our elderly criminals present a better physique and cranial measurements than those growing up to take their places. This is a general statement with many exceptions, but I have been led to it by seeing criminals in prison and elsewhere.

Wise education would tend to the decrease of crime; but stupid laws, where creed and party squabbles overrule wisdom and honour, regardless of the sacred trust, can only end in disaster for the children. See then the result. The poor infant under 12 or 13 receives barely enough nourishment for the body, as proved by the "short weight" in such a large percentage of cases.

What is the brain to do, which requires the best of subtle food compounds? Body first, then brain. Starved body, weakened brain.

This is perceptible among the children after the State has finished with them.

What does the superintendent of the Boys' Home in Spital Square say? He says that these State-educated poorlings would as soon group round a bed of thistles as a bed of roses, and not appreciate the difference.

How is the *morale* affected, and how will it be affected when Bible teaching is banished? Think of a minister of religion defending an atheistic father who claims the right to train his child to atheism. Give him the right to poison his child's mind, might he not equally claim the right to starve his child's body? On the contrary, every child belongs to the nation, which should be best able to judge when parents

Side-  
Lights  
from these  
Facts on  
the  
Problem  
of Educa-  
tion

And on  
Morale

deviate too far from mediocrity. Already a very heavy percentage of these children pilfer at home, as well as outside. In their teens it is a toss up which way they go, right or left. It will be in the direction of least resistance, which is downhill, or down the stream, unless powerful social and religious agencies rescue them.

The Pre-  
dictions of  
Malthus

Malthus, in 1798, said that the increase of population tends to outrun that of subsistence. Forty years later Darwin corroborated the above, and in 1852 Herbert Spencer came to the same conclusion.

Malthus said that the increase was liable to two kinds of check, positive and preventative; while Darwin pointed out the struggle for existence which was involved, and propounded the doctrines of Natural and Artificial Selection as remedies.

Malthus saw the dangers then unborn, and wrote in 1806 that to a rational being the prudential check to the population ought to be considered as equally natural with the check on poverty and premature mortality.

The practical object of Malthusian principles includes celibacy, late marriages, and self-control; but experience shows that unnatural effort leads most certainly to vice.

The question is too pressing to be delayed, and its growing importance is being recognized by the ordinary lay folk.

In 1872, John Stuart Mill said that little improvement can be expected in morality until the production of large families is regarded in the same light as drunkenness, or any other physical excess.

Lord Derby, 1879, suggested that it was better to have thirty-five millions of human beings leading useful and intelligent lives, rather than forty millions struggling painfully for a bare subsistence.

No thoughtful person can disagree with such simple statements, especially when we are now realizing the effects.

Positive checks, such as epidemics, are now counterbalanced by medical science. Preventative measures are already being considered by sober-minded, thrifty people of the middle classes with visible effect.

Look at the list of eight children on p. 244; they should weigh together 31 stone, but only reach 21 stone. It

means that the environment, or surroundings, could only support five children instead of eight. Consequently it is a crime against society, an injustice to the offspring, and sin against God, to allow eight children to be born, instead of five.

The supply of food is not equal to the demand. It is not in existence, therefore infant mortality must continue, in spite of philanthropic effort, which deals with effects rather than causes.

Hear ye now the "Cry of the Children." We clearly recognize a rebuke to the parents for their want of thrift, foresight and self-control. There is in that long wail a reproach to society, for not interfering earlier to prevent so many disasters. A stifled protest is raised against the state, which grinds the poor, punishes and tortures the weak and helpless, without providing facilities for rescue. The horrors of their present misery are as nothing to the criminality of their origin.

The Cry  
of the  
Children

Nature endeavours to cope with the difficulty by means which bear the label "infant mortality." She does not intend every seedling to fruit, nor every living thing to struggle through the storms of existence and arrive at maturity. In our efforts to thwart nature we are more actuated by superstition and false sentiment than by charity. If love prompted us, we would not rest satisfied at the mere prolongation of life, but should not cease until life was made worth living. "Infant mortality" is Nature's toll on reckless over-production. It would be wiser to let it continue, and improve the condition of the juveniles who survive the struggle.

"Infant  
Morta-  
lity" is  
Nature's  
Toll

The sterilization of the unfit, which was first advocated by Mr. Arnold White in the "eighties," is a part of such prevention. The public flatly refuse even to consider this subject, as they do not understand either its application or its limits. It should be employed only under the guidance of a select and disinterested committee of medical and lay men.

The Steri-  
lization of  
the Unfit  
Suggested  
by Arnold  
White is  
the Only  
Cure

To illustrate the types, knowing the effect of alcohol on the

offspring (Chapter IV), we would select the hopeless chronic alcoholics who loaf around the public houses. We should sterilize the hopeless ruffians and hooligans, who are a terror and expense to the community.

Some of the insane, who are granted freedom, partially cured, would come under consideration. Chronic irrecoverable criminals would also receive sympathetic consideration.

These finite measures would not apply as a punishment for poverty, for many of the poor are physically and mentally the finest in the race. But we must remember that among the poor the sports, perverts, inverts and all who make up the mass of degeneracy, tend to sink to the lower end of the inclined social plane.

There would be no need to interfere with the liberty of any man or woman, rich or poor, until their presence became a menace or a burden to their neighbours. When that happens, those who now have to submit tamely to the licence of a few should have a right to assert their power in the interest of the majority.

Bernard Shaw, in *Man and Superman* (Chap. XXIII) says that "being cowards we defeat natural selection under cover of philanthropy ; being sluggards, we neglect artificial selection under cover of delicacy and morality."

Society would be happier. The hornless hooligan would be lovable, the lazy tramp would now be an industrious labourer. Degeneracy would in many cases be succeeded by regeneracy.

Until the will of the people is in favour of limiting the output, let us deal more justly and sympathetically with those who should not have been born.

Behold, a Commonwealth, or an ideal healthy Society, should consist of males, women, and neuters.

The males would be tall, athletic, handsome, with strong features and good growth of hair.

The women would be graceful, fresh, of perfect form and feature.

The neuters would be a very heterogeneous group ; but, while docile and unassuming, they would not be cowardly ;

Bernard  
Shaw's  
Opinion

An Ideal  
Common-  
wealth

they would also be free from vice, contented, and industrious. The neuters would represent both sexes ; some having been thereby cured of disease, others of uncontrolled passion ; and some of inertia, oftentimes called indolence, by arresting an abnormal drain on their vitality. The neuters would be mightily happy ; no care, anxiety, or worry would be written on their faces ; they would toil and be thrifty, more healthy and vigorous than the present average, and deeply interested in social questions, and even in family life. The struggle of the classes to tread down the masses would be no more. The wealthy aristocratic, neuter, who in the old Empire was an invert, selfish and cruel, would be busy and happy in the new Commonwealth assisting the pauper neuters. Greed and selfishness would be no part of his nature, reason and sympathy having replaced them.

Melancholia would decrease, for quietness and confidence is the strength of the weak, and mental disease would be of rare occurrence. Things would move along smoothly. The hand of time would beckon the neuters at a ripe old age, and they would depart with a feeling of satisfaction that the battle of life had been honourably fought. Friends would mourn, but also rejoice that the continuity of the chain of life had for necessary reasons been interrupted in their case. As generations roll on, the population of neuters would rapidly decrease, but there would always be some, for nature, in the inter-crossing of races and mongrels, throws off some sports, or produces inverts or involuted forms, from maternal exhaustion and unwholesome amphinixis.<sup>1</sup>

Family life would again be resumed, the normal mother nursing her child and looking after all the little creature comforts, so that the young life would have nothing to disturb its normal growth and evolution. The clubs would be deserted by the fathers, because the wives fulfilled their duties. There would be but few waifs, and child murders would not be tolerated by the Commonwealth. Alcoholism would become an extinct disease. The few would not be allowed to fatten on the misfortunes of the many.

Society would improve in many ways. The numerous

<sup>1</sup> *Amphi*, both ; *mixis*, a mixture. The fusion of the two kinds of germinal matter.

deaths from over-eating would also be few, for abnormal desires disappear from those who are neutered. The rich would no longer be too rich and the poor too poor, as Ruskin described society. But, alas, the dream is not yet.

## APPENDIX

### ALCOHOLIC CURES UNDER THE SALVATION ARMY (ALL MALES)

#### CASE 30.

Good heredity—no stigmata—of noble birth. Began as a moderate drinker, became chronic, and brought to lowest depths of poverty. Converted through the Salvation Army four years ago. No craving after the first few days.

#### CASE 25.

Both grandfathers moderate drinkers. Father a drunkard. A clever well-educated lad, became a reporter and editor. At 19 tasted wine at a political banquet, and gradually became a drunkard. Reduced to lowest state; converted through Salvation Army; subject to relapses.

#### CASE 26.

Both parents drunkards. Brought up on gin, been a heavy drinker, and in prison six times. Recently converted through Salvation Army, and lost the craving at once.

#### CASE 27.

A country lad, with drunken parents and himself often drunk before he was 10; very clever at school, but had to leave and lost a scholarship through excessive drinking when 14; converted through Salvation Army, and at once lost the craving. Now an officer in God's Army.

#### CASE 28.

A grandmother, father, and mother all drunkards. He drank as a child and was often dead drunk before he was 10. Prison three times for drunkenness. Converted through Salvation Army, six years ago. The craving lasted some time, but he conquered. "His Father will keep him."

## CASE 31.

Good heredity. Began to drink at 20, at 30 a heavy drinker; wife and child had to leave him. When 40 belonged to the submerged tenth, but under the Salvation Army was converted. He had three or four periods of temptation, but conquered. He heard "Rock of Ages" sung at a Salvation Army meeting, and it awoke faded mental pictures of childhood, which led to the change. This solid fact might be well considered by those who wish to banish religion from the State schools. The circumstances which brought him in contact with the Salvation Army are very interesting. One day when he had spent his last sixpence on food and was walking along the Strand, wondering where his next meal was to come from, a beggar asked him for a copper. He replied that if he were offered a "fiver," he could not produce a halfpenny. The beggar was evidently himself not needy, but a professional, for he sympathized with our friend, and said that if matters were really so serious he had better go to the Salvation Army shelter at Blackfriars. This advice was promptly followed, food and shelter being at once given. It was a haven of rest, with more to follow. It did not begin with preaching, nor condemning, for the Salvation Army never condemn any one. Their religion is practical, a universal brotherhood of love.

## CASE 29.

Both grandfathers, father and mother, all drunkards. His three sisters and one brother are steady. He never learned to read or write, though he went to school till he was 13. He was a poacher and a drinker. He began drinking at 4 and was frequently drunk. He had forty convictions from the age of 12 upwards. He was recently converted through the Salvation Army. Where was the State all this time?



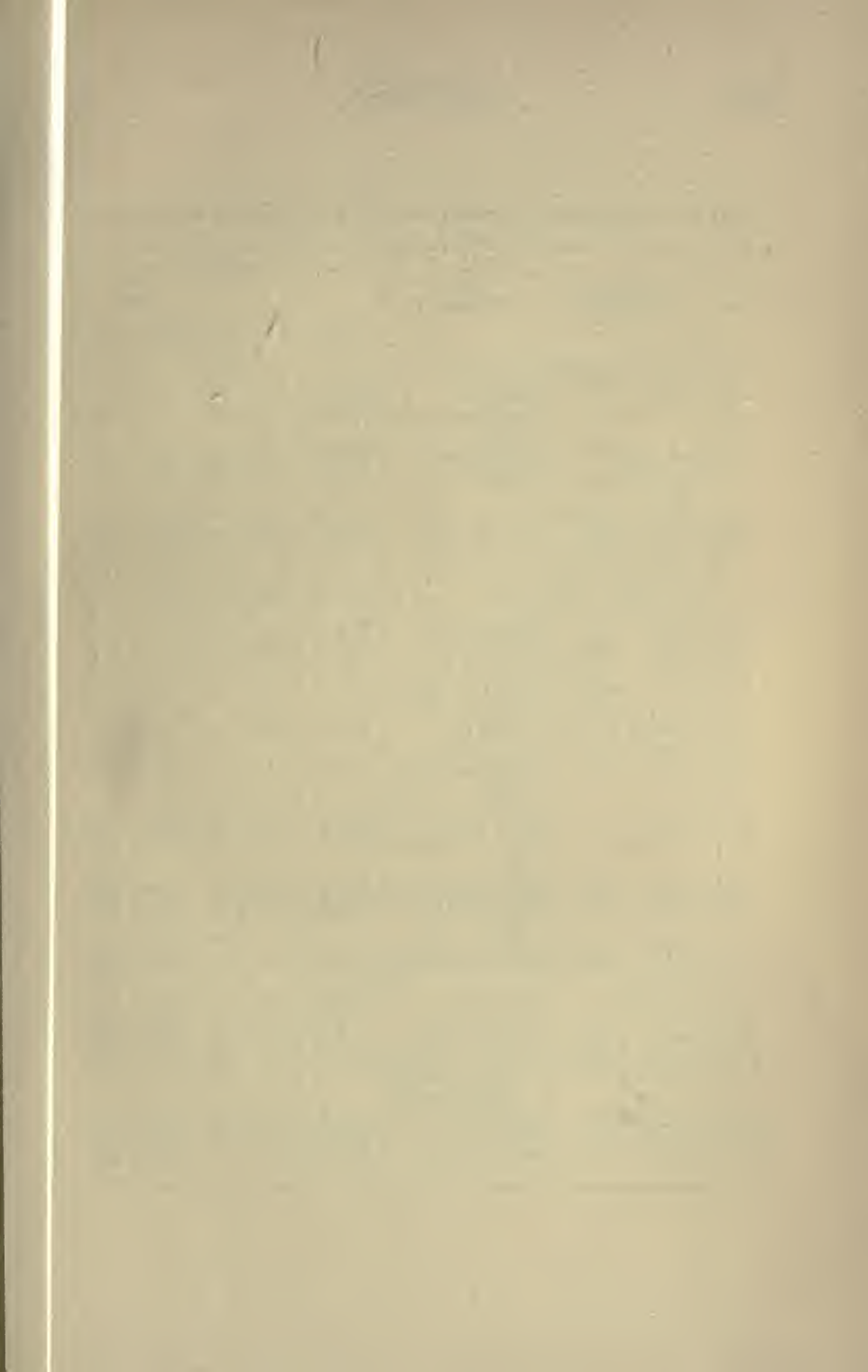


TABLE I. EX-CRIMINALS UNDER THE CARE OF THE SALVATION ARMY.

No.	Heredity. Alc.=Alcoholic. Tub.=Tubercular.	Speciality.	Cranium.				
			Size.	Index.	Circ.	Arches.	
						Ant. Post.	Lat.
1	Good. Peasants	Murderer . .	$7\frac{1}{2} \times 6$	80	$22\frac{1}{4}$	13	14
2	" "	Murderer . .	$7\frac{3}{4} \times 6\frac{1}{8}$	79	$22\frac{3}{4}$	$13\frac{3}{4}$	$14\frac{1}{4}$
3	" "	Attempted murder	$7\frac{3}{8} \times 5\frac{1}{2}$	$74\frac{1}{4}$	$21\frac{1}{8}$	$12\frac{3}{4}$	$12\frac{3}{4}$
4	Very good . .	Blackmailer . .	$8\frac{3}{8} \times 5\frac{7}{8}$	70	$23\frac{1}{8}$	$15\frac{1}{4}$	$14\frac{5}{8}$
5	Tradespeople. Good	Burglar . . .	$7\frac{3}{8} \times 5\frac{7}{8}$	77	$21\frac{3}{4}$	$13\frac{1}{4}$	$13\frac{1}{2}$
6	Good. Peasants	" . . .	$7\frac{5}{8} \times 6\frac{1}{8}$	$80\frac{1}{2}$	22	$12\frac{1}{2}$	$13\frac{1}{4}$
7	Middle class. Good	" . . .	$7\frac{1}{8} \times 6$	84	$21\frac{3}{4}$	$13\frac{1}{4}$	$13\frac{3}{4}$
8	Bad. Father alc.	" . . .	$7\frac{1}{2} \times 6$	80	$21\frac{3}{4}$	$13\frac{3}{4}$	$13\frac{1}{2}$
9	Grandfather and F. alc.	Thief . . .	$7\frac{1}{2} \times 5\frac{3}{4}$	$76\frac{2}{8}$	22	$13\frac{1}{4}$	$13\frac{1}{4}$
10	F. alc. . . .	Burglary . . .	$7\frac{1}{2} \times 6$	80	$21\frac{3}{4}$	$12\frac{3}{4}$	13
11	Good middle class	Receiver . . .	$7\frac{3}{4} \times 6\frac{1}{4}$	$86\frac{2}{8}$	$22\frac{3}{4}$	14	$14\frac{3}{4}$
12	No parents known . . .	Skilled pick- pocket	$7\frac{5}{8} \times 6$	$78\frac{2}{8}$	$23\frac{1}{8}$	$12\frac{3}{4}$	14
13	Alcoholic and neurotic	Theft ?? . . .	$7\frac{5}{8} \times 6$	$78\frac{2}{8}$	$21\frac{7}{8}$	14	14
14	F. alc. . . .	Tramp and petty thief	$7\frac{1}{8} \times 6$	84	$21\frac{5}{8}$	$13\frac{1}{4}$	14
15	M. tub. . . .	Invert. One theft	$7\frac{3}{4} \times 6$	$77\frac{1}{2}$	$22\frac{1}{2}$	$13\frac{1}{2}$	14
16	F. alc. . . .	Petty thief . .	$7\frac{3}{8} \times 6$	81	$21\frac{3}{4}$	$12\frac{1}{4}$	$13\frac{1}{2}$
17	F. M. alc. . .	Stole "materials"	$7\frac{1}{4} \times 6$	$77\frac{1}{2}$	$22\frac{1}{2}$	$12\frac{3}{4}$	14
18	Good . . . .	Petty thief . .	$7\frac{5}{8} \times 6$	$78\frac{2}{8}$	22	$13\frac{3}{8}$	$13\frac{5}{8}$
19	F. alc. . . .	Captain of hooli- gans	$7\frac{3}{4} \times 6$	$77\frac{1}{2}$	22	13	$13\frac{3}{4}$
20	M. tub.	Common thief .	$7\frac{3}{4} \times 6\frac{1}{8}$	79	$22\frac{5}{8}$	$13\frac{3}{4}$	14
21	Good. Presby- terians	Professional thief	$7\frac{5}{8} \times 6$	75	$22\frac{3}{8}$	$13\frac{1}{4}$	$14\frac{1}{4}$
22	M. and F. alc. .	Petty thief . .	$7\frac{3}{4} \times 5\frac{3}{4}$	$74\frac{1}{2}$	$21\frac{3}{4}$	$13\frac{1}{2}$	14
23	F. alc. . . .	"Sleeping out"	$7 \times 5\frac{3}{4}$	82	21	$12\frac{1}{2}$	$12\frac{3}{4}$
24	Good . . . .	" "	$7\frac{1}{4} \times 5\frac{5}{8}$	$77\frac{2}{8}$	21	$13\frac{3}{8}$	13
199	M. drunken prosti- tute	Getting board and lodging by false pretences	$7\frac{3}{4} \times 5\frac{7}{8}$	$75\frac{1}{2}$	$22\frac{5}{8}$	14	$14\frac{1}{4}$
200	F. drunkard . .	Coiner . . . .	$7\frac{3}{4} \times 6$	$77\frac{2}{8}$	22	$14\frac{1}{4}$	14
281	Alcoholic . . .	Murderer . . .	$7\frac{1}{8} \times 6$	80	221	$12\frac{3}{4}$	$12\frac{1}{2}$
308	Good . . . .	Petty thief . .	$7\frac{3}{4} \times 5\frac{1}{2}$	71	2	$13\frac{3}{4}$	$13\frac{3}{4}$

TABLE II. SOME OF THE DRUNKARDS AND INVERTS UNDER THE CARE OF THE SALVATION ARMY. MANY CURES.

No.	Heredity. Alc. = Alcoholism. Tub. = Tubercular.	Speciality.	Cranium.				
			Size.	Index.	Circ.	Arches.	
						Ant. Post.	Lat.
25	Both grand- parents and F. drank	Alcoholism	$7\frac{7}{8} \times 6\frac{1}{4}$	$79\frac{1}{2}$	$22\frac{1}{2}$	$14\frac{1}{4}$	$14\frac{1}{4}$
26	F. alc. . . .	"	$7\frac{7}{8} \times 5\frac{7}{8}$	$74\frac{1}{2}$	$22\frac{1}{2}$	$14\frac{1}{2}$	14
27	F. and M. alc.	"	$7\frac{3}{4} \times 5\frac{3}{8}$	73	$21\frac{1}{4}$	13	$13\frac{3}{4}$
28	F. and M. alc.	"	$7\frac{5}{8} \times 5\frac{3}{4}$	$75\frac{1}{2}$	$22\frac{1}{4}$	$13\frac{1}{4}$	13
29	Grandparents and F. alc.	"	$8 \times 6$	$78\frac{2}{8}$	$22\frac{1}{4}$	14	14
30	Very good . .	"	$7\frac{1}{2} \times 6$	80	$21\frac{3}{4}$	$13\frac{1}{4}$	14
31	Good . . . .	"	$6\frac{3}{4} \times 5\frac{3}{8}$	$79\frac{3}{8}$	20	$12\frac{1}{2}$	$12\frac{1}{4}$
32	F. and M. alc.	"	$7\frac{3}{4} \times 5\frac{7}{8}$	$75\frac{3}{4}$	22	$13\frac{3}{4}$	$14\frac{1}{4}$
33	Good . . . .	"	$7\frac{1}{2} \times 6$	$57\frac{1}{2}$	$22\frac{1}{2}$	14	14
34	Good . . . .	"	$8 \times 6$	75	$22\frac{1}{2}$	$14\frac{3}{8}$	$14\frac{3}{8}$
35	Good . . . .	"	$7\frac{3}{4} \times 5\frac{7}{8}$	76	$22\frac{7}{8}$	$13\frac{1}{2}$	$14\frac{1}{2}$
36	Good . . . .	"	$7\frac{5}{8} \times 6\frac{1}{8}$	$80\frac{1}{8}$	$22\frac{1}{2}$	$13\frac{3}{4}$	$13\frac{1}{2}$
37	F. alc. . . .	"	$7\frac{1}{2} \times 6\frac{1}{8}$	$81\frac{2}{8}$	$22\frac{1}{4}$	$13\frac{1}{4}$	$13\frac{3}{8}$
INVERTS.							
39	F. alc. . . .	Lazy tramp	$7\frac{5}{8} \times 5\frac{7}{8}$	77	$21\frac{1}{8}$	$14\frac{1}{4}$	$13\frac{1}{4}$
40	Pat. G.M. Tub. F.	Laziness . .	$7\frac{1}{4} \times 5$	$77\frac{2}{8}$	$21\frac{3}{8}$	$13\frac{1}{2}$	13
41	Nil . . . .	Once the lazi- est man in London	$6\frac{7}{8} \times 5$	$72\frac{2}{8}$	$20\frac{1}{4}$	$12\frac{1}{4}$	$12\frac{1}{2}$
42	F. tub. and alc.	Tramp . . . .	$7\frac{1}{2} \times 5\frac{3}{4}$	$76\frac{2}{8}$	$21\frac{3}{4}$	13	13
43	Nil . . . .	Tramp . . . .	$7\frac{1}{2} \times 5\frac{7}{8}$	$78\frac{1}{8}$	$21\frac{3}{4}$	$13\frac{1}{2}$	$13\frac{3}{4}$
44	F. alc. M. tub.	Lazy invert	$7\frac{3}{4} \times 6\frac{1}{8}$	79	$22\frac{1}{2}$	14	$13\frac{1}{4}$
45	M. and F. alc.	Invert . . . .	$7\frac{1}{2} \times 5\frac{7}{8}$	$82\frac{1}{2}$	21	13	14
46	F. alc. . . .	Lazy invert	$7\frac{1}{2} \times 6$	80	$22\frac{1}{4}$	13	$13\frac{1}{2}$
267	F. alc. . . .	Lazy invert	$7\frac{3}{8} \times 6\frac{1}{8}$	$80\frac{1}{4}$	22	$14\frac{1}{4}$	14

TABLE III. FIRST

*The first twelve represent a fair sample.*

No.	Age.	Stand- ard at School.	Alco- holic Parent- age.	Cranium.		
				Length and Width.	Index.	Circ.
47	15½	IV	F.	7½ × 5⅝	75	21⅓
48	16	IV	F. M.	7⅜ × 5¾	78	21¼
49	16¾	VI	F. M.	7⅞ × 5¾	80⅓	21
50	16½	VI	F.	7½ × 5½	76	20½
51	16	III	F. M.	7 × 5½	78½	20
52	17	IV	—	7½ × 5¾	79⅓	21½
53	17	V	F.	7¼ × 5½	76	20½
54	17	III	—	7⅝ × 5⅝	72	19¾
55	17	VI	F.	6¾ × 5⅝	79½	19½
56	17	VI	—	7½ × 5¾	76⅔	21½
57	18	VI	F. M.	7½ × 5¾	74⅔	21¼
58	19	IV	F. M.	7⅝ × 5⅝	76¼	21⅝

The above were bad boys.

59	15	V	F.	6⅞ × 5½	74½	19¾
60	15	I	—	7¼ × 5⅝	77½	21
61	15	VI	F. M.	7⅜ × 5⅝	76¼	21
62	16	IV	—	7¼ × 5⅞	80⅔	21⅝
63	17	VII	—	7⅜ × 5⅝	76¼	21½
64	17	V	F. M.	7¼ × 5½	75¾	20¾
65	17¾	III	—	7¼ × 5⅝	77½	21
66	18	III	F. M.	7 × 5¾	82⅞	20¾
67	18	VII(X)	—	7¼ × 5½	73⅓	21¾
68	18	III	F.	7⅜ × 5⅝	74½	21¼
69	19	III	F. M.	7⅜ × 5¾	78	21½
70	19	IV	—	7¾ × 5⅝	75¾	22¾
71	23	V	F. M.	7⅞ × 6	78	23

These boys should weigh 227 stones, but only weigh

The 12 worst boys, markedly deficient should weigh 109 st. 5 lb., 2 per cent.

The 13 better lads should weigh 117 st. 7 lb. but only weigh 98 st. 9lb.

OFFENDERS.

The last thirteen represent the superior types.

Cranium.		Age limit of Memory.	Height.		Below Normal.	Weight.		Below Normal.	
Arches.									
Ant. Post.	Lat.								
13	13	3	ft. 5	in. 1½	2	st. 6	lb. 10	0	6
13½	13½	10	5	0	4	8	5	—	—
12¾	14	4	5	3½	—	7	11	1	0
12½	13	8	5	0	4	6	0	3	0
12⅝	12¾	8	5	1	4	5	11	3	0
13	13¾	7	5	1½	5	7	5	2	0
13½	12¾	5	5	0	6	6	0	3	5
13	12⅝	6	5	1½	5	7	5	2	0
11¾	12	3	5	2	4	5	10	4	7
14	14½	8	5	6	—	9	3	—	—
14	13¾	6	5	6½	—	8	11	1	0
13½	12⅝	5	5	0	7	7	7	2	7

Those below are better boys.

11¾	12½	4	4	7	7	5	0	2	4
13¼	13¾	5	5	2½	—	7	2	—	—
13	13½	—	4	9½	5	6	10	0	6
13	13¾	4	5	2	2	7	10	0	9
14¼	13¼	5	5	7½	—	7	2	2	4
13	13½	3	5	0	6	7	4	2	2
12¼	13½	3	5	3½	3	7	4	2	2
12½	13½	5	5	3½	4	7	10	2	0
13¾	13½	6	5	7	—	7	9	2	0
12½	13	4	5	1	6	7	0	2	10
13½	13½	5	5	3	4	8	12	1	0
14	14¼	8	5	8	—	9	5	0	7
14	14	5	5	6½	2	9	11	0	10

185 stones, showing a deficiency of 18½ per cent.

but only weigh 86 st. 8 lb., showing a loss of 22 st. 11lb. or a ratio of showing a deficiency of 18 st. 12 lb., or a ratio of 16 per cent.

TABLE IV. BOYS FROM

No.	Age.	Stand- ard at School.	Alco- holic Parent age.	Cranial		
				Length and Width.	Index.	Circ.
72	13	VII	0	$7\frac{3}{8} \times 5\frac{7}{8}$	$79\frac{2}{3}$	$20\frac{1}{8}$
73	14	IV	F. M.	$7\frac{1}{2} \times 5\frac{3}{8}$	$73\frac{2}{3}$	$20\frac{3}{8}$
74	14	VI	F.	$7\frac{7}{8} \times 6$	$78\frac{2}{3}$	$21\frac{1}{8}$
75	14	IV	—	$7\frac{1}{2} \times 5\frac{3}{4}$	$76\frac{2}{3}$	$21\frac{1}{4}$
76	14	IV	F. M.	$7 \times 6$	$85\frac{2}{7}$	$19\frac{3}{4}$
77	15	VII(X)	0	$7\frac{1}{2} \times 5\frac{1}{4}$	$73\frac{2}{3}$	$20\frac{1}{2}$
78	15	VII	F. M.	$7\frac{3}{4} \times 5\frac{1}{2}$	71	$21\frac{3}{4}$
79	15	—	M.	$6\frac{3}{4} \times 5\frac{1}{4}$	$77\frac{2}{3}$	$19\frac{1}{4}$
80	15	IV	M.	$6\frac{1}{2} \times 5\frac{1}{4}$	$80\frac{3}{4}$	19
81	15	V	—	$7\frac{7}{8} \times 5\frac{5}{8}$	$71\frac{1}{2}$	$21\frac{1}{4}$
82	15	—	0	$7 \times 5\frac{1}{4}$	75	20
83	15	VI	—	$7\frac{3}{8} \times 5\frac{5}{8}$	$76\frac{1}{2}$	$21\frac{1}{4}$
84	15	VI	M.	$7\frac{3}{8} \times 6$	$81\frac{1}{8}$	22
85	15	IV	F.	$6\frac{3}{4} \times 5\frac{1}{8}$	76	$19\frac{3}{8}$
86	15	V	F.	$6\frac{3}{4} \times 5\frac{3}{8}$	83	20
87	15	VII	F. M.	$7\frac{1}{4} \times 5\frac{7}{8}$	81	21
88	15	IV	F.	$7 \times 5\frac{1}{2}$	$78\frac{2}{3}$	$20\frac{3}{8}$
89	15	VI	F.	$7\frac{1}{4} \times 5\frac{3}{4}$	$80\frac{2}{3}$	$20\frac{3}{4}$
90	15	IV	F. M.	$7\frac{1}{2} \times 6$	80	$20\frac{1}{2}$
91	15	IV	—	$7\frac{3}{8} \times 5\frac{1}{2}$	$72\frac{1}{8}$	$21\frac{3}{8}$
92	15	VI	F.	$7\frac{1}{2} \times 5\frac{1}{2}$	$73\frac{1}{8}$	$20\frac{3}{4}$
93	16	IV	F.	$7\frac{1}{2} \times 5\frac{3}{4}$	$76\frac{2}{3}$	$21\frac{3}{8}$
94	16	VII	M.	$7\frac{3}{8} \times 5\frac{7}{8}$	$79\frac{2}{3}$	$20\frac{3}{4}$
95	16	V	—	$7\frac{1}{8} \times 5\frac{1}{4}$	$73\frac{2}{3}$	$19\frac{1}{4}$
96	16	III	—	$7 \times 5\frac{1}{4}$	$73\frac{1}{4}$	$19\frac{1}{4}$
97	16	III	F.	$7\frac{7}{8} \times 6\frac{3}{8}$	81	$23\frac{1}{2}$
98	16	IV	M.	$6\frac{7}{8} \times 5\frac{1}{2}$	80	20
99	16	—	F.	$7\frac{5}{8} \times 5\frac{3}{4}$	$75\frac{1}{2}$	22
100	16	V	F.	$7\frac{7}{8} \times 5\frac{3}{4}$	77	—
101	16	—	F.	$7 \times 5\frac{5}{8}$	84	$20\frac{7}{8}$
102	16	III	F. M.	$7\frac{1}{8} \times 6$	$80\frac{2}{3}$	21
103	16	VI	F.	$6\frac{3}{8} \times 6$	91	$19\frac{1}{2}$
104	16	VI	F. M.	$8 \times 5\frac{3}{4}$	72	$22\frac{1}{4}$
105	16	III	—	$7\frac{1}{8} \times 5\frac{1}{2}$	$80\frac{2}{3}$	21
106	16	—	—	$7\frac{1}{4} \times 5\frac{1}{2}$	76	$20\frac{3}{4}$

## DIFFERENT HOMES IN LONDON.

Measurements.		Age limit of Mem- ory.	Height.		Below Nor- mal.	Weight.	Below Normal.			
Arches.			ft.	in.				in.	st. lb.	st. lb.
Ant. Post.	Lat.									
13 $\frac{1}{4}$	13 $\frac{1}{2}$	7	4	10 $\frac{1}{2}$	4	6 0	1 5			
12 $\frac{3}{4}$	12 $\frac{3}{4}$	5	5	4 $\frac{1}{2}$	7	4 8	2 0			
13 $\frac{3}{4}$	13 $\frac{3}{4}$	2	4	9 $\frac{1}{2}$	2	6 1	0 7			
13 $\frac{1}{4}$	13	4	4	9	2	5 4	1 4			
12 $\frac{3}{4}$	14 $\frac{1}{4}$	4	4	4	7	5 8	1 0			
13	12 $\frac{3}{4}$	7	4	7	7	5 6	2 0			
14	13 $\frac{3}{8}$	6	4	9	5	5 5	—			
11 $\frac{3}{4}$	11 $\frac{3}{4}$	7	4	1 $\frac{1}{2}$	13 $\frac{1}{2}$	4 5	3 7			
12	12 $\frac{1}{2}$	3	4	6 $\frac{1}{2}$	8	5 0	2 4			
13 $\frac{3}{4}$	14 $\frac{1}{4}$	3	4	7 $\frac{1}{2}$	7	5 11	1 5			
12 $\frac{3}{4}$	12 $\frac{1}{4}$	3	4	9	5	5 4	2 0			
13	13 $\frac{3}{8}$	4	4	10 $\frac{1}{2}$	4	6 1	1 3			
13 $\frac{3}{4}$	14 $\frac{1}{2}$	7	5	1 $\frac{1}{2}$	—	7 7	0 3			
11 $\frac{3}{4}$	12	3	4	6	8	4 11	2 9			
12	13	3	4	4	10	4 8	2 12			
13 $\frac{3}{8}$	13 $\frac{3}{4}$	6	4	3	11	5 10	1 9			
12 $\frac{5}{8}$	12 $\frac{5}{8}$	4	5	0	2	6 5	1 0			
12 $\frac{1}{4}$	12 $\frac{5}{8}$	5	5	1	—	7 5	—			
14 $\frac{1}{4}$	14 $\frac{1}{4}$	7	4	9 $\frac{1}{2}$	5	6 6	1 0			
12 $\frac{1}{2}$	12	7	4	8	6	5 10	2 2			
13	13	9	4	11	3	4 6	3 0			
13 $\frac{1}{4}$	12 $\frac{3}{4}$	5	5	3	—	8 1	0 6			
12 $\frac{3}{4}$	13 $\frac{3}{4}$	3	5	4 $\frac{1}{2}$	—	7 6	1 0			
12 $\frac{1}{2}$	12 $\frac{3}{8}$	8	4	11	5	6 0	2 7			
12 $\frac{1}{2}$	13	4	4	9	7	4 11	3 10			
14 $\frac{3}{4}$	15 $\frac{3}{8}$	6	5	8	(+4)	10 12	(+2 5)			
13 $\frac{1}{2}$	15	4	4	11 $\frac{1}{2}$	6	6 11	1 10			
14 $\frac{1}{4}$	13 $\frac{3}{4}$	8	5	1 $\frac{1}{2}$	4	7 11	1 0			
—	—	8	5	4 $\frac{1}{2}$	—	7 4	1 3			
13	13 $\frac{3}{4}$	6	5	2 $\frac{1}{2}$	2	7 5	1 2			
12 $\frac{1}{2}$	13 $\frac{3}{4}$	9	4	5	11	5 0	3 7			
12	12 $\frac{3}{4}$	5	4	7 $\frac{1}{2}$	9	5 0	3 7			
13 $\frac{1}{2}$	13 $\frac{3}{4}$	7	4	8 $\frac{1}{2}$	8	6 2	2 5			
13	13	11	4	7 $\frac{1}{2}$	9	6 0	2 7			
12 $\frac{3}{4}$	13	—	5	2	2	6 8	2 0			

TABLE IV—

No.	Age.	Stand- ard at School.	Alco- holic Parent- age.	Cranial		
				Length and Width.	Index.	Circ.
107	16	V	—	$7\frac{5}{8} \times 5\frac{1}{2}$	72	$21\frac{1}{2}$
108	16	VI	F. M.?	$7\frac{1}{8} \times 5\frac{5}{8}$	79	$20\frac{1}{2}$
109	16	IV	M.	$7\frac{1}{4} \times 5\frac{1}{2}$	76	$20\frac{3}{4}$
110	16	VI	—	$7 \times 5\frac{1}{2}$	$78\frac{1}{2}$	$19\frac{3}{4}$
111	16	VI	—	$7\frac{3}{4} \times 5\frac{1}{2}$	71	21
112	17	VII	M.	$8\frac{1}{8} \times 6$	74	$23\frac{1}{4}$
113	17	IV	M. F.	$7\frac{1}{4} \times 5\frac{3}{8}$	74	20
114	17	IV	M. F.	$7\frac{1}{4} \times 5\frac{3}{8}$	77	21
115	17	IV	F. M.	$7\frac{1}{2} \times 5\frac{3}{4}$	76	$21\frac{1}{8}$
116	17	IV	F.	$8 \times 5\frac{1}{4}$	72	$22\frac{1}{4}$
117	17	IV	F. M.	$7\frac{5}{8} \times 6\frac{1}{2}$	$85\frac{1}{4}$	22
118	17	VII	—	$7\frac{1}{8} \times 5\frac{1}{2}$	77	$19\frac{3}{4}$
119	17	IV?	F. M.?	$7\frac{3}{8} \times 5\frac{7}{8}$	77	$22\frac{1}{4}$
120	17	IV	F.	$7\frac{1}{2} \times 5\frac{3}{4}$	$76\frac{2}{3}$	$22\frac{1}{4}$
121	17	VII	F.	$7\frac{5}{8} \times 5\frac{1}{2}$	$75\frac{1}{2}$	21
122	18	IV	M.	$7\frac{1}{2} \times 5\frac{7}{8}$	$78\frac{1}{3}$	$21\frac{5}{8}$
123	18	VII	F.	$7\frac{1}{2} \times 6\frac{1}{4}$	$83\frac{1}{3}$	$22\frac{1}{2}$
124	19	VI	F.	$7\frac{1}{4} \times 5\frac{7}{8}$	$81\frac{1}{3}$	$21\frac{1}{4}$
125	19	VII	—	$7\frac{3}{8} \times 6$	$81\frac{1}{3}$	$21\frac{3}{4}$
126	20	II	F.	$7\frac{3}{8} \times 5\frac{1}{2}$	$74\frac{1}{2}$	$21\frac{1}{2}$
127	20	VIII	—	$7\frac{1}{2} \times 5\frac{3}{4}$	$76\frac{2}{3}$	$21\frac{1}{4}$
128	13	VI	—	$7\frac{3}{8} \times 5\frac{7}{8}$	$79\frac{2}{3}$	$21\frac{1}{2}$
129	16	(VII X)	F. tub	$6\frac{7}{8} \times 5\frac{3}{8}$	78	20

ANALYSIS OF 22 BOYS AGED 15 AND UNDER.—They should weigh or nearly 22 per cent.

RESUMÉ OF 28 BOYS AGED 16 AND 17.—They should weigh 263 st. 12 lb., a loss of 23 per cent.

RESUMÉ OF 6 BOYS AGED 18 TO 20.—They should weigh 60 st., but of 20 per cent.



(continued)

Measurements.		Age limit of Mem- ory.	Height.	Below Nor- mal.	Weight.	Below Normal.
Arches.						
Ant. Post.	Lat.					
			ft. in.	in.	st. lb.	st. lb.
13 $\frac{3}{4}$	13 $\frac{1}{2}$	—	4 6 $\frac{1}{2}$	10	5 1	3 6
12 $\frac{3}{4}$	13 $\frac{1}{4}$	—	5 0	4	6 8	2 0
12 $\frac{3}{4}$	12 $\frac{3}{8}$	7	4 8 $\frac{3}{4}$	7	5 1	3 6
12 $\frac{1}{4}$	12 $\frac{3}{8}$	—	4 8 $\frac{3}{4}$	7	4 10	3 11
13 $\frac{1}{4}$	13	9	4 10 $\frac{1}{4}$	6	6 1	2 6
14 $\frac{3}{8}$	13 $\frac{3}{8}$	3	5 9	(+3)	6 3	3 2
12 $\frac{3}{4}$	12 $\frac{1}{2}$	5	5 0	6	6 0	3 5
12 $\frac{3}{4}$	13 $\frac{1}{4}$	—	5 0	6	6 5	3 0
13 $\frac{1}{4}$	13 $\frac{1}{4}$	7	5 0	6	7 0	2 5
14 $\frac{1}{2}$	14	5	5 11 $\frac{1}{4}$	(+5)	10 11	(×1 6)
13 $\frac{1}{2}$	14 $\frac{1}{2}$	7	5 2 $\frac{1}{2}$	4	7 7	2 0
13	13 $\frac{1}{2}$	—	5 2	4	6 4	3 0
14 $\frac{1}{4}$	14	3	5 0	6	7 0	2 5
13	14 $\frac{1}{4}$	4	5 2 $\frac{1}{2}$	3	8 4	1 0
13 $\frac{1}{4}$	13 $\frac{3}{4}$	3	5 1 $\frac{1}{2}$	5	7 7	2 0
14 $\frac{1}{4}$	14 $\frac{3}{8}$	6	5 4 $\frac{1}{2}$	2	8 2	1 9
13 $\frac{5}{8}$	14 $\frac{3}{8}$	5	5 7 $\frac{1}{2}$	—	9 11	—
13 $\frac{1}{8}$	13 $\frac{1}{4}$	4	5 0	6	6 7	3 6
13 $\frac{1}{2}$	13 $\frac{3}{4}$	4	5 4	3	7 12	2 4
13 $\frac{1}{2}$	13 $\frac{1}{2}$	7	5 4 $\frac{1}{2}$	3	8 4	2 0
13 $\frac{1}{2}$	13 $\frac{1}{4}$	4	5 4 $\frac{1}{2}$	3	8 0	2 4
13 $\frac{1}{4}$	13 $\frac{3}{4}$	4	4 11	3	5 8	1 9
12 $\frac{1}{2}$	13 $\frac{1}{4}$	5	5 3 $\frac{1}{2}$	2	6 2	3 2

57, st. 2 lb., but do weigh 123 st. 3 lb., showing a deficiency of 34 st. 9 lb.,  
 but actually weigh 201 st. 9 lb., showing a deficiency of 62 st. 3 lb., or  
 actually weigh 48 st. 8 lb., showing a deficiency of 11 st. 6 lb., or a loss

TABLE V. GOOD MIDDLE CLASS

*From the ag*

No.	Age.	Heredity.	Occupation.	Cranium.				
				Size.	Index.	Circ.	Arches.	
							Ant. Post.	Lat.
130	60	Good . .	General . .	$8\frac{1}{4} \times 6\frac{1}{4}$	$75\frac{2}{3}$	$23\frac{1}{4}$	$13\frac{3}{4}$	$13\frac{3}{4}$
131	60	„ . .	Merchant . .	$8\frac{3}{8} \times 6\frac{3}{8}$	76	$23\frac{3}{4}$	$14\frac{1}{4}$	$13\frac{1}{4}$
132	50	„ . .	„ . .	$8\frac{1}{4} \times 6\frac{3}{8}$	$77\frac{1}{4}$	$23\frac{1}{4}$	14	$14\frac{1}{2}$
133	70	Good . .	Director . .	$8\frac{3}{4} \times 6\frac{1}{2}$	$74\frac{1}{4}$	$24\frac{1}{2}$	15	$14\frac{1}{2}$
134	40	„ . .	„ . .	$7\frac{3}{4} \times 6\frac{1}{4}$	81	$23\frac{1}{2}$	$13\frac{1}{2}$	$14\frac{3}{8}$
135	70	„ . .	„ . .	$8\frac{1}{4} \times 6\frac{3}{4}$	82	$24\frac{3}{8}$	14	$15\frac{3}{8}$
136	20	„ . .	Architect . .	$7\frac{3}{4} \times 6$	$77\frac{1}{2}$	22	$13\frac{1}{4}$	$13\frac{1}{2}$
137	40	„ . .	Scientist . .	$7\frac{1}{2} \times 5\frac{5}{8}$	75	$21\frac{3}{4}$	$13\frac{3}{4}$	$13\frac{3}{4}$
138	26	Neurotic .	Artist . . .	—	—	$20\frac{1}{2}$	$12\frac{3}{4}$	$13\frac{1}{2}$
139	36	Good . .	„ . . . .	$7\frac{5}{8} \times 6$	$78\frac{4}{5}$	$22\frac{1}{8}$	$13\frac{1}{2}$	$13\frac{1}{2}$
140	35	„ . .	Manufacturer	$7\frac{5}{8} \times 6$	$78\frac{4}{5}$	$22\frac{1}{4}$	$13\frac{1}{4}$	14
141	34	Half German Good	Banker . . .	$8 \times 6\frac{1}{8}$	$76\frac{1}{2}$	23	$14\frac{1}{4}$	14
142	36	Tub. father Good	Stockbroker's clerk	$7\frac{7}{8} \times 6\frac{1}{4}$	$79\frac{1}{8}$	$22\frac{3}{4}$	$13\frac{3}{4}$	$14\frac{1}{4}$
143	37	Northum- brian	—	$8\frac{1}{8} \times 6$	$73\frac{3}{4}$	23	$14\frac{1}{4}$	14
268	50	F. clergyman Good	Critic and author	$7\frac{1}{2} \times 6\frac{1}{8}$	$81\frac{2}{3}$	$22\frac{1}{4}$	$12\frac{3}{4}$	$13\frac{3}{4}$
269	50	Good . .	S. A. officer .	$7\frac{3}{4} \times 5\frac{7}{8}$	$75\frac{3}{4}$	$22\frac{1}{8}$	$13\frac{1}{2}$	$13\frac{3}{4}$
276	50	„ . .	Merchant . .	$7\frac{3}{4} \times 6$	$77\frac{1}{2}$	$22\frac{3}{8}$	$13\frac{1}{2}$	$13\frac{1}{2}$

MOSTLY OF GOOD AVERAGE.

of 25 upwards.

C C

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Remarks.

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Exceptionally good position socially and in City.

Very successful in life and supra-intelligent. See 2 children, 192 and 193.

Had hydrocephalus as a child. A merchant prince.

5 ft. 4 in. 9 stone. 3 in. too short and 3 stone too light. Intelligent in his profession. Been in asylum.

An author and artist.

Remembers to 3.

5 ft. 10½ in. 10½ stone. (When 17, 5 ft. 8 in. and 10 stone).

Tabercular disease of brain and cord (tabes).

6 ft. 11 st. 4 lb. (when 20, 11½ st.). Remembers to 2.

Supra-intellectual.

Intelligence above the average.

Remembers to 3. Father of Nos. 159 and 160.

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TABLE VI. FAMILY GROUPS FROM

No.	Age.	Heredity.	Occupation.	Cranium.				
				Size.	Index.	Circ.	Arches.	
							Ant. Post.	Lat.
144	50	Good. Country	Manufacturer	$7\frac{7}{8} \times 6\frac{5}{8}$	$84\frac{1}{8}$	23	15	$15\frac{1}{4}$
145	18	M. . . .	—	$7\frac{3}{4} \times 5\frac{7}{8}$	$75\frac{3}{4}$	$22\frac{5}{8}$	$14\frac{1}{4}$	$14\frac{1}{4}$
	25		—	$7\frac{7}{8} \times 6$	76	$22\frac{3}{4}$	"	"
146	16	" . . .	—	$7\frac{5}{8} \times 6\frac{3}{8}$	$83\frac{3}{8}$	$22\frac{1}{4}$	$14\frac{1}{4}$	15
	23		Manufacturer	$7\frac{3}{4} \times 6\frac{3}{8}$	$82\frac{1}{4}$	$22\frac{3}{4}$	$14\frac{1}{4}$	15
147	15	" . . .	—	$7\frac{5}{8} \times 6\frac{1}{4}$	$80\frac{1}{8}$	21	14	$14\frac{1}{2}$
	21		Solicitor . .	$7\frac{3}{4} \times 6\frac{3}{8}$	$82\frac{1}{4}$	$21\frac{1}{2}$	15	$15\frac{1}{8}$
148	12	" . . .	—	$7\frac{1}{2} \times 5\frac{5}{8}$	75	$21\frac{3}{4}$	14	14
	19		Student of Agriculture	$7\frac{7}{8} \times 6\frac{1}{4}$	$79\frac{3}{8}$	23	$14\frac{5}{8}$	$14\frac{3}{4}$
149 150	60	Bad . . .	Merchant . .	$7\frac{1}{2} \times 6$	80	$21\frac{3}{4}$	$13\frac{1}{4}$	13
	16		Clerk . . .	$7\frac{1}{2} \times 5\frac{3}{4}$	$76\frac{3}{8}$	$21\frac{1}{4}$	13	13
	21		" . . .	$7\frac{1}{2} \times 6$	80	$21\frac{1}{2}$	13	$13\frac{1}{2}$
151 152	45	Good . . .	Scientific instrument maker	$7\frac{5}{8} \times 6\frac{1}{8}$	$80\frac{1}{8}$	$22\frac{1}{4}$	$13\frac{5}{8}$	14
	13		Tuberculous Son . . .	$7\frac{1}{2} \times 5\frac{3}{4}$	$76\frac{3}{8}$	$20\frac{3}{4}$	$13\frac{1}{2}$	14
153	40	Good . . .	Merchant prince	$7\frac{7}{8} \times 6$	$76\frac{1}{8}$	$22\frac{1}{2}$	$14\frac{1}{4}$	$14\frac{1}{4}$
154	7	" . . .	Son . . .	$7\frac{1}{8} \times 5\frac{5}{8}$	79	$20\frac{1}{2}$	$12\frac{3}{4}$	$14\frac{1}{4}$
155 156	40	" . . .	Merchant . .	$7\frac{5}{8} \times 6\frac{1}{8}$	$80\frac{1}{8}$	$22\frac{1}{4}$	$13\frac{1}{2}$	$13\frac{1}{2}$
	8		Son . . .	$6\frac{3}{4} \times 5\frac{1}{2}$	$81\frac{1}{2}$	$19\frac{3}{4}$	$11\frac{3}{4}$	13
	14		" . . .	—	$7\frac{1}{4} \times 5\frac{3}{4}$	79	$20\frac{3}{4}$	$12\frac{1}{2}$
270 271	43	Good . . .	Artist . . .	$7\frac{3}{8} \times 6\frac{1}{4}$	$80\frac{3}{8}$	$23\frac{1}{8}$	$13\frac{3}{8}$	$13\frac{3}{8}$
	17		Son . . .	$7\frac{5}{8} \times 5\frac{7}{8}$	77	22	13	$13\frac{3}{8}$
134 192 193	40	Good . . .	Merchant . .	$7\frac{3}{4} \times 6\frac{1}{4}$	81	$23\frac{1}{4}$	$13\frac{1}{4}$	$14\frac{5}{8}$
	1		—	$6\frac{5}{8} \times 5\frac{5}{8}$	85	$19\frac{3}{8}$	$12\frac{3}{4}$	$13\frac{3}{8}$
	7		—	$7 \times 6\frac{1}{8}$	$87\frac{1}{2}$	$20\frac{3}{4}$	$13\frac{1}{2}$	$14\frac{5}{8}$
132 194	50	Good . . .	Merchant . .	$8\frac{1}{4} \times 6\frac{3}{8}$	$77\frac{1}{4}$	$23\frac{1}{4}$	14	$14\frac{1}{2}$
	10		Son . . .	$7\frac{5}{8} \times 5\frac{5}{8}$	$73\frac{1}{2}$	$21\frac{1}{2}$	15	14
277 159	50	" . . .	Merchant . .	$7\frac{3}{4} \times 6$	$77\frac{1}{2}$	$22\frac{3}{8}$	13	$13\frac{1}{2}$
	14		—	$7\frac{1}{2} \times 6\frac{1}{8}$	$81\frac{3}{8}$	$21\frac{1}{2}$	$13\frac{3}{4}$	$13\frac{1}{2}$
	20		Med. stud. . .	$7\frac{3}{4} \times 6\frac{1}{8}$	$79\frac{3}{8}$	$22\frac{3}{8}$	14	$4\frac{1}{8}$
160	17	" . . .	—	$7\frac{1}{2} \times 6$	80	$21\frac{1}{2}$	$13\frac{1}{2}$	14
	21		Merchant . .	$7\frac{1}{2} \times 6$	80	$21\frac{3}{4}$	$13\frac{1}{2}$	$14\frac{1}{4}$

Note the alteration of cranial indices

## GOOD MIDDLE CLASS.

## Remarks.

Father. Intellectual, but a bad memory for prose. All the sons clever.

Eldest son	}	5 ft. 7 in. (normal).	8 st. 12 lb.
		" "	10 st.
Second son	}	5 ft. 9½ in. (5 in. above average).	10 st. 11 lb. (2 st. above average).
		5 ft. 11 in. (3 in. " " ).	11 st. 4 lb. (1st. " " ).
Third son	}	5 ft. 5½ in. (4 in. above average).	9 st. (1½ st. above normal).
Fourth son.		5 ft. 9 in. (2 in. above average).	11 st. 8 lb. (1½ st. above average).

Father. Grandfather committed suicide. Father died in asylum.

Eldest son	}	Son imbecile, high grade ament.

Mother consumptive before his birth. Starved neurotic, but intelligent.

Very intelligent father.

Son supra-intelligent, but not precocious. Married and three children.

Bullet-shaped forehead. Head well developed. Successful city merchant. A middle grade imbecile. Supposed cause, bad midwifery. Forceps.

Broken leg, etc. Could not walk nor talk till 3. 4 ft. 1 in. (2 in. too tall). 3 st. 8 lb. (5 lb. too little).

When 14, 5ft. 2 in. (3 in. too tall). 5 st. 10 lb. (12 lb. too little).

Both supra-intelligent, but physically very inactive.

Supra-intelligent. Broad head.

Well developed.

Mentally brilliant.

Shrewd and unintellectual.

Clever boy.

Father intellectual.

Sons clever.

Ditto.

TABLE VII. FAIR SPECIMENS FROM WELL-TO-DO

No.	Age.	Heredity.	Occupation.	Cranium.				
				Size.	Index.	Circ.	Arches.	
							Ant. Post.	Lat.
157	19	Cousins. Both good	None . . .	$7\frac{1}{2} \times 6\frac{1}{2}$	$81\frac{2}{3}$	$21\frac{3}{4}$	14	14
158	18	Good . .	Architect . .	$8 \times 6$	75	23	$14\frac{1}{4}$	$14\frac{3}{4}$
159	14	" . .	—	$7\frac{1}{2} \times 6\frac{1}{2}$	$81\frac{2}{3}$	$21\frac{1}{2}$	$13\frac{3}{4}$	$13\frac{1}{2}$
	20	" . .	Medical student	$7\frac{3}{4} \times 6\frac{1}{2}$	$79\frac{1}{2}$	$22\frac{3}{8}$	14	$14\frac{1}{2}$
160	17	" . .	See Father, 375	$7\frac{1}{2} \times 6$	80	$21\frac{1}{2}$	$13\frac{1}{2}$	14
	21	" . .	Merchant . .	$7\frac{1}{2} \times 6$	80	$21\frac{3}{4}$	$13\frac{1}{2}$	$14\frac{1}{4}$
161	20	" . .	Lloyds . .	$8\frac{3}{8} \times 6\frac{1}{2}$	73	$23\frac{3}{8}$	$14\frac{1}{2}$	14
162	21	Good. German	Electrician . .	$7\frac{7}{8} \times 5\frac{7}{8}$	$74\frac{2}{3}$	$22\frac{1}{4}$	14	$13\frac{3}{4}$
163	22	Good . .	Accountant . .	$7\frac{1}{2} \times 6\frac{1}{2}$	$81\frac{2}{3}$	$22\frac{1}{8}$	13	$13\frac{3}{4}$
164	22	" . .	—	$7\frac{1}{8} \times 6\frac{5}{8}$	93	22	14	$13\frac{1}{2}$
165	17	" . .	—	$7\frac{1}{2} \times 5\frac{1}{2}$	$79\frac{1}{2}$	21	13	$13\frac{1}{2}$
166	13	" . .	—	$7\frac{1}{2} \times 6\frac{3}{8}$	85	22	$14\frac{1}{2}$	15
278	15	" . .	Father barrister	$7\frac{3}{8} \times 6$	$81\frac{1}{2}$	$21\frac{1}{8}$	$13\frac{3}{4}$	$13\frac{1}{2}$

## MIDDLE CLASS FROM AGES OF 13 TO 25.

## Remarks.

Middle-grade imbecile, and dangerous. Unable to work.

Good intelligence. Slow to learn. A little above average height and weight.

Brothers. Very intelligent. High morale. Medical student remembers to  $2\frac{1}{2}$ . Private school. His skull has grown more than his brother's. Is this due to study?

Merchant, remembers to 3.

Supra-intelligent. High morale. Largest head in the family. Typical fair North German. Supra intelligent.

Very intelligent.

Hydrocephalic. Took  $7\frac{1}{2}$  size. Four years later took 8. Middle-grade imbecile, too neurotic to continue in business.

Development arrested physically and mentally at 12. High-grade imbecile. 5 ft.  $3\frac{3}{4}$  in. (deficient 3 in.). 7 st. (deficient 2 st.). In one year height 5 ft.  $6\frac{1}{2}$  in., which is about normal. 8 st. 0 lb. (1 st. 12 lb. deficient).

Hydrocephalic imbecile. Supposed cause, blow on head when 2 years old. Good disposition. Cannot be educated. 3 ft.  $11\frac{1}{2}$  in. (9 in. too short). 5 st. 12 lb., normal.

5 ft.  $3\frac{1}{2}$  in. (1 in. above normal). 5 st. 8 lb. (1st. 10 lb. below normal. Father very thin). Remembers to  $2\frac{1}{2}$ .

TABLE VIII. FAIR SPECIMENS FROM

No.	Age.	Heredity.	Occupation.	Cranium.					
				Size.	Index.	Circ.	Archea.		
							Ant. Post.	Lat.	
167	13	Non alc.	Slummer	$7\frac{1}{4} \times 5\frac{5}{8}$	$77\frac{1}{2}$	21	13	13	
168	16	—	Hall boys in large hotel	$7 \times 5\frac{3}{4}$	82	$20\frac{3}{4}$	12	$13\frac{1}{4}$	
169	16	—		$7\frac{1}{2} \times 5\frac{7}{8}$	$82\frac{1}{2}$	$20\frac{3}{4}$	13	13	
170	16	—		$8 \times 6\frac{1}{8}$	$76\frac{1}{2}$	$22\frac{3}{4}$	14	$13\frac{3}{4}$	
171	17	—		$7\frac{5}{8} \times 5\frac{1}{2}$	72	$21\frac{1}{2}$	$13\frac{1}{4}$	$12\frac{1}{2}$	
172	18	Tub.	Postman	$8 \times 5\frac{7}{8}$	$73\frac{1}{2}$	$22\frac{1}{2}$	$14\frac{1}{2}$	$14\frac{1}{2}$	
173	20	Good	Elect. engineer	$8 \times 6$	75	$22\frac{3}{4}$	$13\frac{1}{2}$	$14\frac{1}{8}$	
174	21	Bad	Sailor in navy	$7\frac{1}{8} \times 5\frac{3}{8}$	$75\frac{1}{2}$	$20\frac{3}{4}$	$13\frac{1}{4}$	$13\frac{1}{2}$	
175	21	Good	Porter	$7\frac{1}{2} \times 6\frac{1}{4}$	83	$22\frac{1}{4}$	15	$13\frac{3}{4}$	
176	13	"	Shopboy	$7 \times 5\frac{5}{8}$	$80\frac{1}{2}$	$19\frac{3}{4}$	13	$13\frac{1}{2}$	
177	19	"	Clerk	$7\frac{3}{4} \times 5\frac{5}{8}$	$72\frac{1}{2}$	$22\frac{1}{4}$	14	$14\frac{1}{4}$	
178	25	No parentage	Tailor	$7\frac{3}{8} \times 5\frac{3}{8}$	73	21	13	13	
179	50	Tub.	S. A.	$7\frac{1}{4} \times 6$	$82\frac{2}{8}$	$21\frac{1}{2}$	$13\frac{1}{4}$	$13\frac{3}{4}$	
280	24	Half German	Factory hand	$7\frac{1}{2} \times 5\frac{7}{8}$	$78\frac{1}{8}$	$22\frac{1}{4}$	$13\frac{1}{4}$	$13\frac{1}{2}$	
180	19	Good	Zoological Gardens	$7\frac{1}{8} \times 5\frac{1}{2}$	$77\frac{1}{5}$	$21\frac{1}{4}$	$12\frac{3}{4}$	$12\frac{3}{4}$	
181	20	—	" "	$7\frac{3}{8} \times 5\frac{7}{8}$	$79\frac{2}{8}$	$21\frac{3}{8}$	$12\frac{3}{4}$	14	
182	26	—	" "	$7\frac{1}{8} \times 6$	84	$22\frac{1}{8}$	$13\frac{1}{2}$	$14\frac{1}{2}$	
183	28	—	" "	$7\frac{1}{2} \times 5\frac{3}{4}$	$76\frac{2}{8}$	$21\frac{3}{4}$	13	$13\frac{1}{2}$	
184	40	Father a carman	Managing clerk	$7\frac{1}{2} \times 6\frac{1}{8}$	$81\frac{2}{8}$	22	14	14	
185	50	Father art printer	Salvation Army	$7\frac{1}{4} \times 6$	$82\frac{3}{4}$	$21\frac{1}{2}$	$13\frac{1}{4}$	$13\frac{3}{4}$	
186	17	Good	Lab. assistant	$7\frac{3}{4} \times 5\frac{7}{8}$	75	$21\frac{7}{8}$	$14\frac{1}{4}$	14	
272	19	F. tub. and alc. M. alc. & prostitute	Groom in Salvation Army	$7\frac{3}{8} \times 5\frac{7}{8}$	$79\frac{2}{8}$	$21\frac{1}{2}$	$13\frac{1}{4}$	$13\frac{1}{2}$	
274	30	F. alc.	Clerk	$7\frac{1}{2} \times 6\frac{3}{8}$	85	22	14	14	
275	52	F. alc.	S. A. officer	$7\frac{1}{4} \times 6$	$82\frac{3}{4}$	21	$13\frac{1}{4}$	$13\frac{3}{4}$	
273	39	Country	Prison warder	$7\frac{5}{8} \times 6\frac{1}{4}$	82	$22\frac{1}{2}$	$13\frac{5}{8}$	14	
279	13	Son of 273	—	$7 \times 5\frac{3}{4}$	82	$20\frac{1}{8}$	13	$12\frac{7}{8}$	



## RESPECTABLE POORER CLASS OVER 12.

## Remarks.

4 ft. 5 in. (deficient 4 in.). 3 st. 10 lb. (deficient 2 st. 2 lb.). Miserable home. Supra-intelligent. A good boy.

VIII Standard. Remembers to 2½. 4 ft. 7 in. (deficient 9 in.). 4 st. 2 lb. (deficient 4 st. 5 lb.). Intelligent.

V standard. Remembers to 4. 5 ft. (deficient 4 in.). 5 st. 10 lb. (deficient 2 st. 10 lb.). Poor intellect.

VI standard. Remembers to 3. 5 ft. 3 in. (deficient 1 in.). 7 st. (deficient 1 st. 7 lb.). Neurotic and stupid.

VII standard. Remembers to 2. 5 ft. 4 in. (deficient 2 in.). 6 st. 10 lb. (deficient 2 st. 9 lb.). Very intelligent.

Good intelligence. High morale. Slight hydrocephalus. 5 ft. 5 in. (2 in. below average). 9 st. (11 lb. below the average).

Good intelligence.

Very stupid and deficient and ill-nourished but good morale.

Not under developed. Dull intellect. Good morale.

Cretinoid. 4 ft. 6½ in. (deficient 3 in.). 5 st. (deficient 12 lb.).

Height, 5 ft. 7 in. (normal height). Weight, 8 st., 2 st. 12 lb. too little.

Very well balanced mind.

Good morale. Medium intelligence.

Can remember to 3. Very intelligent. VI standard. 9 st. 6 lb. (deficient 6 lb.). 5 ft. 7 in. (normal).

Been a sailor. Intelligence moderate.

" " " "

Remembers to 3. 5 ft. 5 in. 9 st. 12 lb. (was 9 st. 8 lb. when 20). He died shortly after from a nerve disease from overstrain.

Medium intelligence. Memory poor as to childhood.

Height 5 ft. 5 in. (deficient 1 in.). 8 st. 8 lb. (deficient 11 lb.). Very intelligent.

Remembers only to 6. Very bad heredity, mentally deficient. 5ft. 6 in. 8 st. (2 st. too little). A degenerate saved by the S. A.

Remembers to 3. Church school. Risen from lower ranks and unequal to the strain.

Remembers to 4.

Remembers to 3. Church school. 5 ft. 10 in. 14 st.

5 st 5 lb. (7 lb. below normal). 4 ft. 11½ in. (2 in. above normal). Remembers to 2 (Church school).

TABLE IX. AVERAGE

No.	Age.	Heredity.	Occupation.	Cranium.				
				Size.	Index.	Circ.	Arches	
							Ant. Post.	Lat.
187	4	Good . .	{ Father a merchant prince }	$7\frac{3}{8} \times 6$	$81\frac{1}{8}$	$20\frac{1}{4}$	$13\frac{1}{2}$	13
	11	" . .					$21\frac{1}{4}$	$13\frac{3}{4}$
188	2	" . .	{ Father a merchant prince }	$7\frac{1}{8} \times 5\frac{3}{4}$	$80\frac{2}{8}$	$18\frac{1}{2}$	12	12
	9	" . .					$20\frac{3}{4}$	$12\frac{1}{2}$
189	$4\frac{1}{2}$	" . .	Daughter of 140	$6\frac{5}{8} \times 5\frac{1}{2}$	83	$19\frac{7}{8}$	13	$13\frac{1}{4}$
190	$2\frac{1}{2}$	Tuberculous	Father a clerk	$6\frac{3}{4} \times 5\frac{1}{8}$	76	19	$11\frac{1}{2}$	12
191	7	Scotch.	Working class	$5\frac{1}{4} \times 4$	76	$15\frac{1}{2}$	9	9
192	1	Good . .	{ Father a merchant No. 134 }	$6\frac{5}{8} \times 5\frac{5}{8}$	85	$19\frac{3}{8}$	$12\frac{3}{4}$	$13\frac{3}{8}$
193	7	" . .					$7 \times 6\frac{1}{8}$	$87\frac{1}{2}$
194	10	" . .	Son of 132 .	$7\frac{5}{8} \times 5\frac{5}{8}$	73	$21\frac{1}{2}$	15	14
195	$7\frac{1}{2}$	" . .	Father a merchant	$6\frac{5}{8} \times 5\frac{3}{4}$	$86\frac{5}{8}$	$19\frac{1}{2}$	$13\frac{1}{2}$	14
196	5	—	—	$6\frac{3}{4} \times 5\frac{1}{4}$	$77\frac{2}{8}$	$19\frac{1}{2}$	13	$12\frac{1}{4}$
197	$4\frac{1}{2}$	Tubercular	{ Parents of working class }	$7 \times 5\frac{3}{4}$	82	$20\frac{1}{2}$	$13\frac{3}{4}$	14
	$6\frac{1}{2}$	" . .					$7\frac{1}{8} \times 5\frac{3}{4}$	$80\frac{2}{8}$
198	8	Bad . .	A thief . .	$7\frac{1}{8} \times 5\frac{3}{4}$	$80\frac{2}{8}$	$20\frac{3}{8}$	$12\frac{1}{2}$	$13\frac{1}{4}$

## CHILDREN UNDER 12.

## Remarks.

Large hydrocephalic head. Very intelligent.  
 4 ft. 5 $\frac{3}{4}$  in. (normal). 4 st. 2 lb. (1 st. too little). Remembers to 2.  
 Father large-headed.

Appears normal.

4 ft. 11 $\frac{1}{4}$  in. (2 in. too little). 4 st. 2 lb. (normal). Remembers to 2.  
 Infantile paralysis of left leg, but supra-intelligent.

A fine little girl.

Width of parietal region behind, 4 $\frac{3}{8}$  in.

Head appears normal. Father No. 134. Tendency to hydro-  
 cephalus.

Conspicuously large. Slightly hydrocephalic. Supra-intelli- } Brothers  
 gent. 3 ft. 9 in., or 7 in. above normal. 3 st. 10 lb., or }  
 1 st. above normal.

Both parents large heads and intelligent.

Markedly hydrocephalic, supra-intelligent. Transverse parietal diameter,  
 5 $\frac{7}{8}$  in., anteroposterior diameter through frontal tuberosities, 6 $\frac{7}{8}$  in.,  
 $\frac{1}{4}$  in. more than through brow.

An idiot.

Delicate, slight hydrocephalus, dull, neurotic. Brain crises with a  
 temperature. 3 ft. 7 $\frac{1}{2}$  in. (5 in. too tall). 2 st. 15 lb. (5 lb. too heavy).  
 4 ft. 2 in. (6 in. too tall). 3 st. 13 lb. (8 lb. above average).

A slum child. Very intelligent, 3 ft. 11 in. (normal). 3 st. (about 10 lb.  
 below average).

TABLE X. BOYS FROM AN ORPHANAGE

No.	Age.	Parentage.	Years at the Homes	Cranium.		
				Size.	Index.	Circ.
201	12	F. syph. ? . . .	1½	6⅞ × 5⅞	82	20
202	11½	Good . . . .	1½	7¼ × 5½	76	20⅞
203	12	None ! . . . .	1½	7 × 5⅞	80½	21
204	9	F. a drunkard. M. died of tu- bercle	4	7 × 5½	82	20¼
205	10	F. soldier . . .	4	7½ × 5½	80½	20¼
306	14½	F. carman. M. washerwoman	7	7⅞ × 5½	74½	20¼
207	15½	F. died of brain disease	3½	7¼ × 5⅞	77½	20¼
208	17	F. tubercular .	7	7⅞ × 6	81½	21⅞
209	17	F. alc. and tub. M. insane	4½	7½ × 5½	73½	20½
210	15	F. tub. M. in- sane	10½	7¼ × 5½	79½	21½
The above are the 10 worst boys in the Home. They should weigh 67 stones.						
211	14	Good . . . .	3½	7⅞ × 6¼	84½	22½
212	15	. . . .	11	7 × 5⅞	80½	20⅞
213	15	Both dead . . .	11	7¾ × 5⅞	76	22⅞
214	15	M. and F. tub. . .	11	7¼ × 5⅞	81	21½
215	18½	Good . . . .	9	7⅞ × 5½	79½	20¼
216	18½	„ . . . .	8½	7⅞ × 5⅞	79½	21½
217	18	„ . . . .	7¼	7¼ × 5½	79½	22
218	19	„ . . . .	9½	7⅞ × 5½	75½	20¼

## IND HOMES FOR CHILDREN.

Cranium.		School Stand- ard.	Mem- ory.	Weight.	Deficient	Height.	Deficient	Chest Mea- sure- ment.
Arches.								
Ant. Lat.	Lat.							
12½	13½	I	7	st. lb. 4 3	st. lb. 1 4	ft. in. 4 1	ft. in. 0 6	in. 25
13½	13	I	6	3 9	1 9	4 0	0 6	25
13½	12½	II	7	4 1	1 2	4 1½	0 5	25
12½	13	I	7	4 5	—	4 4½	0 2½ above normal	26½
12½	13½	III	4	4 3	0 8	4 3	—	25
13	13½	V	5	5 12	2 0	4 11	0 3	29
12	13½	V	8	7 0	0 12	5 1	0 2	29
14	14	III	12	8 3	1 2	5 6	—	34½
13	12½	IV	9	5 6	4 0	4 11½	0 7	29½
13½	13½	V	9	5 12	1 6	4 8	0 6	—
but actually weigh 53 stones, showing a deficiency of about 20 per cent.								
13	14	VII	5	8 6	+1 10	5 0	—	32½
13	13½	VII	5	6 2	1 2	4 10	0 4	30
13½	13½	VIIx	4½	7 3	—	5 3	—	33
12½	13	VIIx	4	7 4	—	5 1½	—	35
12½	13	VIIx	5	10 1	×1 3	5 7½	—	35½
13	13½	VII	4	9 4	0 8	5 3½	0 4	34
12½	14	VII	4	9 4	0 8	5 6	0 1	37½
13½	14½	VIIx	4	8 0	—	5 4	—	33

TABLE 3

No.	Age.	Parentage.	Years in the Home.	Cranium.		Circ.
				Size.	Index.	
219	19½	F. W. Indian negro. M. white	7½	7½ × 6	76½	22½
220	20		13½	7½ × 5½	74½	22
221	20	Good . . .	8	7½ × 6	80	21½
<p>These boys should weigh about 96 stones, and actually weigh 94 stones,            These are the best 11 boys. Note the deficient weight in the 2 illegitimates,            processes.</p>						
222	11	F. and M. negroes	10½	7½ × 5½	79½	20½
223	10	M. drunken pro- stitute	6	7½ × 5	63½	20½ 20
224	14	M. tub. F. tub. and alc.	5½	7½ × 5½	79½	21½
225	14½	None! . . .	5	7½ × 6½	86	21½
226	15	Good . . .	7½	7½ × 5½	76½	21
227	16	„ . . .	7	7½ × 6	81½	22½
228	17	F. tub. . . .	4	7½ × 5½	76½	21½
229	17	M. tub. A ser- vant	7½	7½ × 5½	77½	21
230	17	M. tub. F. tub. and alc. Same as 324	6	7½ × 5½	81	22
231	19	Good . . .	11½	7½ × 6	78½	22½
<p>These are a fair average. They should weigh 77 stones, but</p>						

X—(continued).

Cranium.		School Standard.	Memory.	Weight.	Deficient.	Height.	Deficient.	Chest Measurement.
Arches.								
Ant. Post.	Lat.							
14	13½	VIIx	4	st. lb. 10 5	st. lb. ×0 5	ft. in. 5 6	ft. in. 0 1	in. 36
13½	14	VIIx	5	8 4	2 0	5 2½	0 5	33
13½	14	VII	3	9 12	0 6	5 5	0 2	38½

showing a deficiency of only 2 per cent.

also observe the improved memories in 221 and others where no Board school

13½	13½	IV	4	4 6	0 10	4 1	0 4	25½
14	12	IV	6	3 6	1 6	4 0½	0 5	22½
12½	13½	VI	7	7 7	×0 13	5 2½	0 3	32
13	14	IV	5	8 4	×1 6	5 6½	×0 6	32
12½	12½	VIIx	7	6 2	1 2	5 1½	—	33
13½	13½	VII	7 or 8	8 6	—	5 5½	×0 1	33½
13	13½	VIIx	3	9 3	—	5 9½	×0 3	33
14	13½	VII		6 2	3 2	5 1½	0 5	31½
12½	13½	VII	6	8 2	1 3	5 4	0 2	32½
13½	14½	VII	5	9 8	0 5	5 4½	0 3	36

actually weigh 71 stones, a deficiency of 8 per cent.

TABLE XI. JEWISH BOYS FROM THE

No.	Age.	Parentage.	Born in	Occupation and Remarks.	School and Standard. B. = Board. J.F. = Jewish Free.
232	12	F. English. M. Pole	London .	—	VII B.
233	14	Polish . . . Non-Jewish features	Poland .	Errand boy . . .	VI B.
234	14½	English . .	Aldershot .	Office boy . . .	VIIx B.
235	14¾	F. Russian. M. Austrian	France .	Compositor . . .	VII B.
236	14¾	Austrian. Features non- Jewish (Ger- man)	Austria .	Furrier . . . . .	VII B.
237	15	Austrian	Austria .	Woodcarver . . .	VII B.
238	15	Poland. Fea- tures non- Jewish	England .	Photographer . . .	Private & VII B.
239	15	Holland . .	London .	Printer's reader . . .	VIIx B.
240	15	Russian . .	Russia .	Errand boy . . .	VII B.
241	15	Polish . . .	London .	Furrier . . . . .	VII B.
242	15	Polish . . .	London .	—	In second- ary B. school. Won a scholar- ship
243	15½	Polish . . .	London .	Compositor . . . . . (Came to England when 9 and in 4 years though a foreigner reached VI Standard)	VI B.
244	15¾	Hungarian .	London .	Clerk . . . . .	VIIx B.
245	15¾	Polish. M. tu- bercular. No Jewish fea- tures	London .	Teacher . . . . .	VIIx B.
246	16	Russian . .	London .	Shipping . . . . .	VIIx J.F.
247	16	Polish . . .	Poland .	Tailor . . . . .	VII J.F.
248	16	Austrian . .	Austria .	Office boy . . . . .	VII B.
249	16	German . .	England .	Ladies' tailor . . .	VII J.F.
250	16	Russian . .	London .	Office boy . . . . .	VII B.
251	16	English. Not of Jewish type	England .	Packer . . . . .	V B.



VICTORIA CLUB IN WHITECHAPEL.

Mer- ory	Cranium.					Height.	Variation.	Weight.	Variation.
	Size.	Index.	Circ.	Arches.					
				Ant. Post.	Lat.				
4	7 $\frac{1}{4}$ × 5 $\frac{7}{8}$	81	20 $\frac{3}{4}$	12 $\frac{1}{2}$	13 $\frac{1}{4}$	4 11	+0 4	5 8	+0 2
5	7 $\frac{1}{8}$ × 6 $\frac{1}{4}$	87 $\frac{2}{3}$	21 $\frac{1}{4}$	12 $\frac{3}{4}$	14 $\frac{1}{4}$	4 7	—	5 6	—
4	7 $\frac{1}{8}$ × 5 $\frac{3}{4}$	80 $\frac{2}{3}$	20 $\frac{1}{2}$	13	12 $\frac{3}{4}$	4 7	-0 4	5 3	-0 4
3	7 $\frac{1}{4}$ × 6	82 $\frac{2}{3}$	21 $\frac{1}{4}$	12 $\frac{1}{2}$	14	4 9 $\frac{1}{2}$	-0 3	6 6	-0 8
3	7 $\frac{1}{2}$ × 6	80	21 $\frac{3}{4}$	12 $\frac{1}{2}$	12 $\frac{3}{4}$	5 1	+0 1	6 7	-0 7
3	7 × 6 $\frac{1}{8}$	87 $\frac{1}{2}$	21	12	13 $\frac{5}{8}$	5 4	+0 2	7 6	+0 2
4	7 $\frac{1}{4}$ × 6 $\frac{1}{8}$	84 $\frac{1}{2}$	21 $\frac{1}{2}$	12 $\frac{1}{4}$	13 $\frac{5}{8}$	5 2	—	6 12	-0 6
5	6 $\frac{7}{8}$ × 5 $\frac{1}{2}$	76 $\frac{1}{3}$	20 $\frac{1}{4}$	11 $\frac{1}{2}$	12 $\frac{1}{2}$	5 3	+0 1	7 4	—
4	7 $\frac{3}{8}$ × 6 $\frac{1}{8}$	83	22	13 $\frac{3}{4}$	13 $\frac{3}{4}$	5 2	—	8 7	+1 3
4	7 × 5 $\frac{3}{4}$	82 $\frac{1}{7}$	20 $\frac{1}{2}$	12	13	4 11	-0 3	5 6	-1 12
4	7 $\frac{1}{4}$ × 5 $\frac{7}{8}$	81	21 $\frac{1}{4}$	13	13 $\frac{3}{8}$	5 5	+0 3	8 11	+1 7
6	7 $\frac{1}{8}$ × 6	84 $\frac{1}{3}$	21 $\frac{1}{8}$	13	13 $\frac{1}{2}$	4 9	-0 6	6 7	-1 4
4	7 $\frac{3}{8}$ × 5 $\frac{7}{8}$	79 $\frac{2}{3}$	21 $\frac{5}{8}$	12	13 $\frac{1}{4}$	5 1 $\frac{1}{2}$	-0 2	7 12	-0 2
6	7 $\frac{1}{4}$ × 6	82 $\frac{2}{3}$	20 $\frac{1}{4}$	12	13 $\frac{1}{4}$	5 1	-0 2	6 0	-2 0
4	7 $\frac{1}{4}$ × 6	82 $\frac{2}{3}$	21 $\frac{1}{4}$	13 $\frac{1}{4}$	13 $\frac{3}{8}$	5 2 $\frac{1}{2}$	-0 2	8 4	-0 3
4	7 $\frac{3}{8}$ × 6	81 $\frac{1}{3}$	22	13	14	5 3 $\frac{1}{2}$	—	9 2	+0 9
3	7 × 6	85 $\frac{1}{7}$	21 $\frac{3}{4}$	12 $\frac{3}{8}$	13 $\frac{5}{8}$	4 10	-0 6	6 7	-2 0
5	7 $\frac{1}{8}$ × 5 $\frac{7}{8}$	82 $\frac{1}{2}$	21 $\frac{3}{8}$	12 $\frac{1}{2}$	12 $\frac{3}{8}$	5 2	-0 2	7 3	-1 4
3 $\frac{1}{2}$	7 $\frac{1}{2}$ × 6 $\frac{1}{4}$	81 $\frac{2}{3}$	22 $\frac{1}{2}$	14	14 $\frac{1}{4}$	5 4	—	7 6	-1 1
5	6 $\frac{7}{8}$ × 5 $\frac{1}{4}$	72 $\frac{2}{3}$	19 $\frac{1}{4}$	12 $\frac{1}{4}$	12	4 9	-0 7	7 4	-1 3

TABLE 3

No.	Age.	Parentage.	Born in	Occupation and Remarks.	School and Standard. (B = Board. J.F. = Jewish Free.)
252	16½	Polish. Not of Jewish features	Poland	Compositor. . . . .	V B.
253	17	F. Russian . M. English	England	Tailor's cutter . . .	Secondary VIIx
254	17	Polish . . . .	London	Tailor. A dwarf and hydrocephalic, but very intelligent	VIIx B.
255	17	F. Roumanian. M. Pole. No Jewish features	London	Tailor . . . . .	VIIx B.
256	17	Russian . . .	London	Photo-case maker . .	VII J.F. & B.
257	18	Polish . . . .	Poland	Engineer (16 years in England)	VIIx J.F. & B.
258	18	F. Russian . M. English	London	Piano maker . . . .	VII J.F.
259	18	M. Jewish prostitute	London	Won't settle to any industry. A degenerate, not deficient. The only troublesome lad	VII B.
260	19	Polish . . . .	Poland	Tailors' mechanic . .	VI B.
261	19	Russian . . . .	Leeds . . . .	Cabinet maker . . . .	VII B.
262	19	Polish . . . .	London	Tailor's machinist . .	VIIx B.
263	21	Russian . . . .	London	Wood carver . . . .	VIIx B.
264	21	German . . . .	London	Cabinet maker. Brother to 249	VII J.F.
				st. lb.	
Total weight . . . . .				252	5
Should be. . . . .				274	13

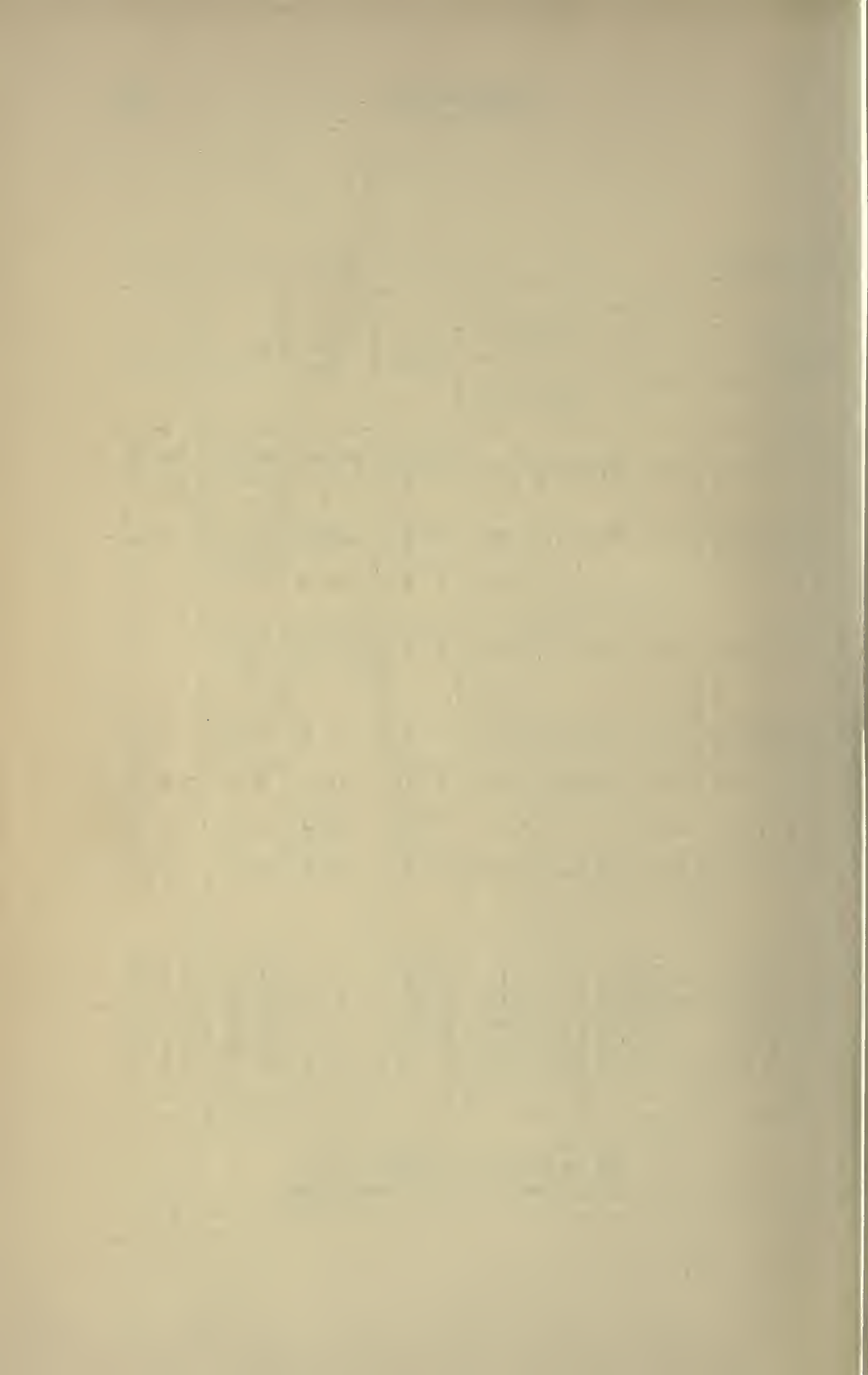
XI—(continued).

Men- ory	Cranium.					Height.	Varia- tion.	Weight.	Variation
	Size.	Index.	Circ.	Arches					
				Ant. Post.	Lat.				
5	$7\frac{1}{4} \times 6\frac{3}{8}$	88	22	$13\frac{1}{2}$	$14\frac{3}{4}$	ft. in. 5 4 $\frac{1}{2}$	ft. in. —	st. lb. 8 5	st. lb. -0 2
3 $\frac{1}{2}$	$7\frac{1}{4} \times 5\frac{7}{8}$	81	$21\frac{3}{8}$	$12\frac{1}{2}$	$13\frac{1}{4}$	5 3	-0 3	7 6	-2 0
6	$7 \times 5\frac{7}{8}$	84	21	13	$13\frac{1}{2}$	4 4	-1 2	4 8	-4 11
4	$7 \times 5\frac{7}{8}$	84	$20\frac{3}{4}$	$12\frac{1}{4}$	$13\frac{1}{4}$	5 4	-0 2	7 12	-1 7
3 $\frac{1}{2}$	$7\frac{5}{8} \times 5\frac{7}{8}$	77	$21\frac{3}{4}$	$12\frac{3}{4}$	13	5 4	-0 2	7 13	-1 6
5	$7\frac{5}{8} \times 6\frac{1}{8}$	$80\frac{1}{8}$	$22\frac{3}{8}$	14	$13\frac{1}{2}$	5 1 $\frac{1}{2}$	-0 6	9 9	-0 2
3	$7\frac{1}{8} \times 5\frac{5}{8}$	79	21	13	13	5 5 $\frac{1}{2}$	-0 1	8 8	-1 3
3	$7\frac{1}{8} \times 5\frac{3}{4}$	$80\frac{3}{8}$	$20\frac{3}{4}$	$12\frac{3}{4}$	$13\frac{1}{4}$	5 3	-0 4	7 6	-2 5
3	$7\frac{1}{2} \times 6\frac{1}{4}$	$81\frac{2}{8}$	$22\frac{1}{4}$	13	14	5 5	-0 3	11 7	+1 7
3	$7 \times 5\frac{5}{8}$	$80\frac{1}{8}$	$20\frac{3}{4}$	$12\frac{1}{2}$	$12\frac{1}{2}$	5 6	-0 2	10 0	—
3	$7\frac{5}{8} \times 6\frac{3}{8}$	$83\frac{3}{8}$	$22\frac{3}{4}$	$13\frac{1}{4}$	$14\frac{1}{4}$	5 8	—	10 5	+0 5
7	$7 \times 6$	$85\frac{5}{7}$	$20\frac{3}{4}$	$11\frac{1}{2}$	$12\frac{5}{8}$	5 3	-0 5	8 8	-1 11
4	$7\frac{3}{8} \times 6\frac{1}{8}$	83	$21\frac{5}{8}$	$12\frac{3}{4}$	$12\frac{3}{4}$	5 4 $\frac{1}{2}$	-0 4	10 7	+0 2

st. lb.

22 8 net below normal.

Percentage—8 $\frac{1}{2}$  below the average.



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