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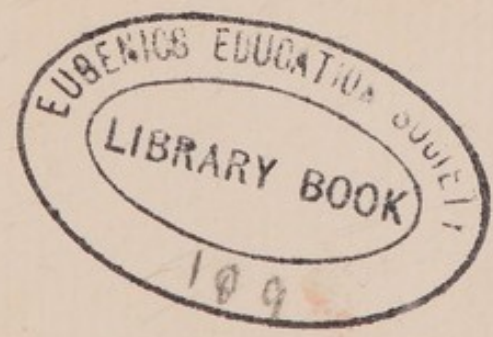
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ASPECTS
OF
SOCIAL EVOLUTION

‘To promote the increase of natural knowledge, and to forward the application of scientific methods of investigation to all the problems of life to the best of my ability, in the conviction which has grown with my growth, and strengthened with my strength, that there is no alleviation for the sufferings of mankind except veracity of thought and action, and the resolute facing of the world as it is when the garment of make-believe by which pious hands have hidden its uglier features is stripped off.’

THOMAS HENRY HUXLEY : *Autobiography*.

‘Among the delusions which at different periods have possessed themselves of the minds of large masses of the human race, perhaps the most curious—certainly the least creditable—is the modern *soi-disant* science of political economy, based on the idea that an advantageous code of social action may be determined irrespectively of the influence of social affection.’—JOHN RUSKIN : *Unto This Last*.

‘. . . that which is surely coming, the new co-operative art of life.’—WILLIAM MORRIS : *The Arts and Crafts of To-day*.

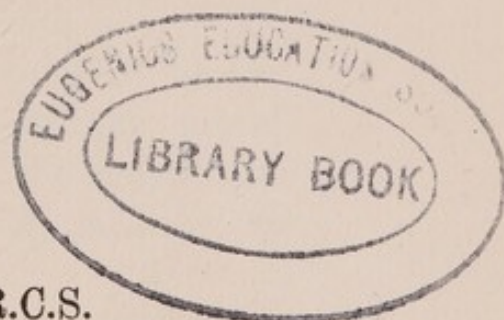
ASPECTS
OF
SOCIAL EVOLUTION

FIRST SERIES

TEMPERAMENTS

BY

J. LIONEL TAYLER, M.R.C.S.



WITH TEN ILLUSTRATIONS

LONDON
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1904

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GENERAL PREFACE

As society grows more complex, it inevitably must leave behind the simplicity of primitive life with which it, in its early period, is associated.

But this simplicity of individual relation in the social group has a correspondingly simple moral code. This, with the departure of the conditions which gave birth to and supported it, falls by its inapplicability to newer surroundings.

As a consequence in all evolving aggregates there is a constant need for displacement of old primitive ideals by others newer and more advanced, lest, when the old forms fail, a period of anti-social laxity result until the difficulty experienced in realising in one aim what is socially valuable in the State, and what is morally desirable in the individual, is overcome. Changing conditions of life *necessitate* alterations in the limits which every national growth imposes on its citizen members, and individual freedom is as necessarily curtailed in some directions as it is expanded in others.

New kinds of subordination are required generation by generation, and it is the duty of each individual to adapt himself or herself loyally to them.

Moreover, in these forms and ceremonies philosophic rules and abstract generalisations true for any one man or woman living independently do not apply. The individual gain ought never to be permitted at the social loss. The right of the one must at times be overridden to prevent the many suffering, and the one ought to be willing to sacrifice in some degree *minor* individual advantages to the major social ends looming forth on the horizon. If anyone is not willing to sacrifice so much *for the common good*, he should be compelled.

Not less emphatically has collective life certain imperative obligations. For the State to expect, or, what is infinitely worse, to force, individuals to subordinate themselves to a class, or classes, holding by persistence of obsolete customs or parasitic existence, or more often on account of both, powers to which they are not entitled, is equivalent to raising under advanced conditions an ideal of irresponsible class Nihilism similar to that of early savage life without the justification that the cruder method of existence affords. In fact, such practice is social stultification, because it places low-class before high communal standards, and is therefore incapable of rational or moral justification. Yet such failure of the State to enforce only those laws which serve common ends, and which actively check privilege, is the marked characteristic of modern civilisation.

Mob rule is dangerous because it assumes equal fitness in all individuals, and takes little heed of the widely divergent physical and mental capacity in different men and women. But for a precisely

similar reason any scum control, *independent* of any selective test, is certainly not less prejudicial. The refuse of social activity exists in the upper- as well as the lower-most layers of civilisation, and floats to the top as frequently as it tends to sink. In every trade, in every profession, the loafer abounds, and is characterised not by marks of poverty, but by lack of purpose, generally by inefficiency, and almost invariably by moral imbecility, as well as criminal disregard of social well-being.

These are platitudes, of course, stale platitudes that have been preached for generations with an ever-growing consensus of opinion of wisdom and justice against folly and arrogance, but they are nevertheless disregarded to-day as if such truths had never been recognised, or if recognised not felt.

With the specialisation of industry groups of men and women in different industrial classes are increasingly losing touch with each other — are meeting only in the common highways of life, and know only by hearsay what other human beings are doing in that one transcendently important part of each person's life, the home. To a large extent this tendency, being a necessary one in social evolution, is unavoidable, but it must not be allowed to make us careless of the responsibility that we all owe, as citizens of one State, of one race, and one wider brotherhood, to each other.

Think of the poverty, the wretchedness, the vulgarity, coarseness, and brutality, the arrogance, and worse than all the utter indifference, manifested in the lives of the people to-day. Past evils were

terrible, and other countries may be even worse in many respects than our own. But to share abuses with others does not make them less. This is *now* our atmosphere, and *we*, the living citizens of a living nation and empire, are, in large part, directly responsible for it. What do we do? How do we act?

We know that our industry depends on others; that, therefore, a spirit of co-operation rather than antagonism ought to be fostered; we know that physical conditions—that favour degenerate half-starved animals in deformed human forms—are irrational, and, what is worse, immoral; yet we allow individuals to oppress other individuals, make little effort to check sweating in trades, overcrowding, public-house monopolies, and scum supremacy.

We know that to be mothers of a healthy race our womanhood must be healthily environed, and that both parents must be moral, temperate, and intelligent, yet we permit women to be foully underpaid, inviting them to choose between vice and comfort, and virtue and the barest, meanest, and most sordid existence. While, by allowing unjust privilege to monopolise the gains of labour, difficulties, well nigh insurmountable, are placed in the way of marriage, and we understand all the while that by so doing true love, the foundation of collective life, is destroyed, and mere lust, the blight that has fallen on and disorganised nation after nation, is favoured.

Think of the lives that are daily ground down

and debased by our social system. Has the State *no* responsibility? There is scarcely a home, however debased, even in the lowest of the dreg classes, that does not bear some testimony of some effort, slight though it often is, for a higher and more beautiful life. A few little ornaments, very often of the crudest design, or a coloured print in a gaudy frame—nevertheless, these mark incontestably the fact that at one time in their lives something more than an eating and drinking house was, in some degree, desired. How has Society treated this little human spark in an otherwise brutal nature? It has allowed landlords to charge rents for single rooms, for two rooms, for three rooms, that many a wealthy man would decline to pay for an equal accommodation. It has allowed citizens to be paid a starvation wage, and then invited them to drink away their miserable pittance by fostering public-house licences. It says to them, in language plainer than any tongue can speak, ‘Your higher life is nought to me,’ and it stifles it, remorselessly, devilishly. *Society has duties, and it must perform them*, before it takes the Anarchist to task for neglecting his.

The teaching of evolution has proved beyond doubt that the higher the social life the more the need is felt for combined effort and combined help. We all know and feel this to be the true spirit which helps a nation forward, even without scientific knowledge. Yet we are coldly indifferent to all around us. Ruskin was right, by fact as well as

morally, when he urged that love is the basis of all collective life. It is 'otherdom,' more than 'selfdom,' that makes for social development.

From the mother's sacrifice and love, out of which family and manly and womanly love has become possible and grown strong, from the unselfish reformer's patriotism and the persecuted pioneer's faith, from these great feelings that are slowly welding all the higher tendencies into an ordered whole the power of the modern State has sprung. The stockbroker with his ill-gotten millions, the fraudulent tradesman, are so much dust that time sweeps aside. We as a nation shall survive and grow strong, or become deadened and diseased, in proportion as we value or despise love for the great things in life. Some day, perhaps, future ages may answer that old question, 'Am I my brother's keeper?' with another—'Am I his seducer?'

The crying need of the times is for clear *mental* vision controlled by scientific method and illuminated and directed by the widest and most intense human sympathies. There are too many sycophants, too many charlatans, too many common-sense 'philosophers,' and too few men and women who, loving humanity, truth, and progressive life, are willing to give, patiently, consistently, and intelligently, as far as lies in their power, *their* quota of knowledge, skill, or honest labour to their country and the world; determined to resist to their utmost power any assumption of superiority in those naturally their inferiors, in so far, and only so far, as they are inferior, whatever their social position may be;

accepting willingly subordination to those naturally capable and more moral.

At the present time, the world, and perhaps the English-speaking part of it most of all, is saturated with the dead weight of custom. We are progressive, and yet strangely loth to drop, not only what was noble—for this is understandable—but also that which is hideous and evil. No one seriously doubts, who has even the least knowledge of the laws of progress, the advantages of stability in social development, but it is none the less true that its excess means as a first step stagnation, and as a final one retrogression. Our danger in this respect is far from imaginary.

To see clearly our position is, therefore, the first need of our times; the second, that of acting humanely and checking brute rule, substituting for it the dominion of what is essentially manly and womanly. To act in the darkness which present and past conditions have produced, by roofing us in with false habits which have obscured the natural light of advancement, without realising that we are so confined, is to court failure. We must discover our true whereabouts, and then proceed to destroy what is valueless or harmful, and help in building up a social structure suitable for ever-growing and extending needs. We must know life as it is; we must be undeceived by what is merely outwardly beneficial, but in real aim and intent pernicious. We must be dissatisfied with every representation of what is going on around us that is not rigidly truthful. And, in order to do this, it is necessary

to picture life realistically, in terms of higher and lower, impersonally and without prejudice. This is the first step towards right understanding and, ultimately, towards right acting.

With this idea of excluding the falseness to which habit has accustomed us as a fundamental basis on which any after-structure must rest, we may begin to re-examine the different aspects of social life.

Before everything, it is absolutely imperative rightly to classify and label that which we see around us. The House of Lords is clearly mainly a barbaric survival of a barbaric age, a persistent feudal institution having a social value *proportionate to the feudal element still remaining in the population*, and beyond this of insignificant importance, except for certain parasitic qualities which it has acquired.

The House of Commons, since a monetary qualification is the most important essential of membership, is largely representative of wealthy interests in the nation, and in no sense fit to discuss authoritatively those greater life questions which require greater mental powers to adequately appreciate them. It is, therefore, mainly a commercial institution tainted with the lower morality and the superficiality of commercialism and uncontrolled by greater life ideals.

It must be understood that this is largely their present value. Their past has been bound up with the greatest chapters in our national history, but they have both ceased to represent higher life in

proportion as monetary standards have persisted and feudal customs now harmful have not been repealed.

The Catholic and Protestant religious organisations are to an even greater degree little more than survivals. No great artistic movement is now bound up with them, no musical life comparable with what they once could honestly be proud of. Their religion is dead, and a new one fitted for our greater needs must spring up before these bodies can ever be national again and inspire creative emotional life to fresh effort. While science and philosophy have been in the main antagonistic to their dogmas for centuries, this ought not to be, for truth ought to be worshipped and not apathetic priestcraft.

It is necessary, therefore, to look to the great leaders outside these recognised institutions, to the intellectual and emotional forms of genius which appeal to the *cultured* and independent middle-class portion of the nation; to those, in fact, who are the acknowledged inspirers of men and women, who are neither enervated and corrupted by wealth nor made coarse or despondent by privation.

It would have been better if those who actually do lead the progressive part of the community had frankly and fearlessly, while not interfering with honest lower effort and amusement, definitely classed it as inferior and subordinate to higher ends. There would then have been less chance of the merely wealthy asserting themselves and interfering in spheres for which they have neither natural ability nor worthy interest. Aptitude and honest aim

ought to be the sole determining factors in all cases.

At present, owing to the *relatively* unfit occupying posts of importance in the State, views too crude to merit serious treatment are discussed and tolerated, and the general public have become so bewildered that they either look upon all as experts or believe all to be alike valueless, for position does not signify capacity.

The tendency manifest among the richest and poorest classes to pass judgment on the most diverse and technical subjects with little or no previous study is a disgrace to modern methods of life. Some unscrupulous shrewd stockbroker, whose sense of morality is little, if at all, higher than some less intellectual criminal sentenced in our law courts, may express his views on justice without the least fear of public opinion. A cabinet minister, holding his position mainly on account of the possession of great wealth and unjust class influence, without even any proof of talent in his own field, may freely criticise some great naturalist of giant powers and immense patience in observation without running the smallest risk of losing his unearned reputation; nay, worse, ignorant people may seriously think that his statements have some weight.

As in thought, so in emotional power, the vulgarian, whether rich or poor, should not be permitted to stand among cultured high-feeling people on an equal footing. It should be quite impossible for those who are incapable of valuing what is beautiful to intrude their lower standard upon those

who can. Good music, good art, is debased by being placed in a lower atmosphere, and lower people must first be raised to a higher level before they have a right to claim that the nobler aspects of life should be free to them. In the great temple of humanity there are chambers which are in the one true and only sense consecrated, and it is sacrilege to allow them to be opened by impious hands.

Amusements and educational work for the commoner coarser minds there must always be. It is inconceivable that grades and various classes for various individuals will disappear from human life. The science of evolution teaches, in fact, the contrary; but it teaches also, and this in unmistakable manner, that they must be *natural*, and that the inferior must be subordinated to the superior. We ought to *know* what is actually beautiful, noble, intellectual, even where, as in most cases, it is not possible to *feel* that sympathy of mind which thus proves its right to share in greatness. Until the true perspective of life is in some measure understood by all, it is hopeless to expect any worthy realisation of the existence that is around us.

To free ourselves from the tyranny of custom is of primary importance in helping us towards a scientific appreciation of the movement that we are all, with or without willingness, bound to take some significant or insignificant part in.

With this ideal of clear, unbiassed truth as our aim, it is possible to survey Nature with less fear of completely missing her dominant characteristics, and with more hope of avoiding the pitfalls that

man himself places in the pathways of his fellow-men in their endeavours to reach the road leading to all sound advancement.

Once the need for avoiding the bias which our own surroundings are apt to give to our outlook is recognised, one is able to realise more clearly the extent of the vast country over which the mind would desire, but can never hope, to travel. This only makes the help of other travellers more welcome ; and, as the sense of our own littleness grows with our knowledge, it creates an intense longing for the companionship of fellow-students, and thus abolishes the petty differences which even at the present day harm and degrade advanced thought.

Broadly, existence presents itself under two aspects—lower nature without man's guidance, and higher where his mind stamps its marks on all that it comes in contact with, and thus changes the character, not only of man's own environment, but also that of all other living forms.

Nature without man's interference wears a uniformly beautiful aspect. Ugliness does not seem part of her plan. Moorland, woodland, mountain and valley, lake, river, and ocean, under cloudy or clear sky, may frown or smile, be winsome or awe-inspiring, or even simply terrible, but the colours and tones are blended, the forms graceful or grand, and the contrasts imaginative, and the whole effect harmonious. Beauty indescribable, real, and absolute, evident to any who have sense and power to appreciate is the one great feature of our world

when uninterfered with by her youngest and highest child, man.

Not less evident, however, is a less pleasant feature.

The history of past evolution has been a history of carnage, of destruction of living by non-living causes, of one form of existence by another. No method is too cruel, *if it be efficient*, to succeed; no form of life, however beautiful, too high to die. From the destruction of the older reptilia to the extinction of mammoth and arrival of man himself hideous brutality has been one all-pervading feature. If Nature is always beautiful, it is no less certain that she is always, to outward appearances, *non-moral*.

Yet as a counteracting fact of vast significance it must be remembered that, so far, science has to record in the main only one long evolution, *never* a general devolutionary movement.

We are, too, in an ordered world, moving in an ordered manner and in a fixed direction. If this were not so, science would have no existence. What is the meaning of this cosmos? Whither is this progressive development tending? Born deep down in all of us is a sense of purpose. Why is it there? We cannot divest ourselves of its influence; without it life would be meaningless and ridiculous. The savage expresses his sense of destiny in his worship of carved images, of animal or tree, and by mental imagery; the Roman Catholic in his crude faith in symbols and ceremonies; while higher thought and feeling believe in some cause that moves towards

some unknown end. This feeling *must* in part be derived from nature.

Beauty, the lack of any immediate moral direction, and the apparent presence of an ultimate purpose, are the three abstractions that stand out everywhere in this nature now disappearing, in moulding which human influence has had no part.

When, however, the passage is made from consciousness to self-consciousness; when that feeling of will to do becomes associated with a sense of power, which all humanity practically accepts as being in some way a real control of force somewhere, there grow up on the earth, side by side with this growing evolution of human self-consciousness and human self-assertiveness, new features—*the presence of definite ugliness*, and, not less definitely, the *conception and appearance of absolute evil-doing*, surely both alike witnesses of some new force.

Just as the characteristics of nature in the earlier stage are wondrous consonant beauty, pervaded, on closer examination, by an unmoral series of forces achieving a certain end by apparently universally unmoral means, so the not less striking characteristics of the human later stage are repulsive ugliness, relieved by occasional glimpses of beauty, and an even more repulsive immorality, with an occasional gleam of sublime moral grandeur.

There is not one aspect of human life in which these two dominant appearances are not evident. The rows of hideous brick buildings that deface town-life, the factory chimneys, the railway stations with their shrieking locomotives, the ugly vehicles

that move along the ugly roadways, the peculiarly inartistic dress of the people; from the filthy slum to the gaudy assertive mansion there is wherever the eye looks ugliness. Yet a little old forgotten nook, or some attempt at better things, may occasionally be seen; but, generally, beauty has little to mark its existence in the modern movement. It would seem that as man increasingly acquires control over his environment, so does he proportionately make it unrestful and offensive to the sense of higher harmony. The clatter of machinery and roar of town displace the music of bird-life and running stream, and the smoke of the factory the blue of the fathomless sky.

And when one looks deeper the impress of evil is seen almost luridly. The mother's love, the troth of one man and one woman to each other, the overmastering feeling of patriotism, of righteousness, the steady pursuit of knowledge, are found only as rarest exceptions to an otherwise general rule.

Every age has its martyred great men whose lives have been blackest tragedies. And history records mainly one long list of tyrannies, of those that have tyrannised, and of the low, contented, apathetic victims at last driven into revolt by iniquities that a true man would have died rather than submit to. Over the past and present life of man hangs a black cloud of evil, reflecting itself alike in the selfish debased rich and the debauched poor.

Unselfish love, honesty, knowledge—for the many these are but useful names to hide evil with;

for the few only are they something real, noble, divine.

Yet the world *does* progress. The slave becomes emancipated, law gains its victory over chaos, the names of womanhood and manhood grow to have purer meaning. Brute force gives place to mental force, and ignorance to knowledge. Life, in becoming more complex, becomes also fuller of higher meaning. The desire to do something, to attain some end, gains ground, even though it be slowly; and man is gradually awakening his mind to that expression of infinite purpose that is found in nature itself.

Amidst a beautiful unmoral world, being made hideous by man, with evil in the ascendant in the present, and yet under all a deeper progressive note of good to which the greater, and finally also the lesser, minds respond, the material for the newer social science must be sought; unblinded by custom, unbiassed by flattery, undismayed by difficulties, patient, methodical, truth-loving, the new sociologist will record what is high and what is low, and on his judgment and honesty future progress must largely depend.

To avoid the danger of interpreting Nature or Man in terms of the other; to avoid mistaking what is only prominent for what is good or powerful in man's evolution; to read and describe faithfully what I see, in the hope that it may be of some value to others, has been my main, and I hope not altogether purposeless, object.

J. L. T.

PREFACE

TO

THE PRESENT VOLUME

IN the present volume it has been my object to attempt to consider briefly some of the principal factors that form a rational basis for a scientific appreciation of the forces which govern the evolution of all social entities.

As Virchow pointed out in biology that the cell—the smallest and simplest living unit, possessed of all the functions of life—is the only safe foundation upon which the study of all multicellular organisms may be built, so in social evolution the growth of any complex or even simple state can only be understood if a study of the single units of which it is made up—i.e. individual men and women—is the first introductory consideration to the later secondary problem.

To know something of *heredity* in order to understand how the individual has been developed, of *temperament* in order to grasp what may be done with the adult man or woman after being modified or selected, of *environment* so as to realise how the growing, and fully grown, individual reacts to surroundings, are therefore the necessary preliminaries to the study of the actual course which collective development has taken in the race.

The drift of reform and of retrogressive influences can only be understood when the relation of these different influences is interpreted by the actions they induce in the many varieties of citizens that make up any given tribe, nation, or empire.

Preliminary individual study and then the chief aggregate resultant tendencies of all the individuals acting as a whole, and, lastly, the local and general atmosphere which such collective life and collective habits produce, are the *natural* order by which social problems may be considered, and it is therefore the one which I shall endeavour to follow.

Now, it happens that there is one other science besides sociology that is based on the peculiar characteristics of individual man. Medicine deals in many respects with the individual aspect of the same problem that sociology considers collectively.

The medical practitioner ought to understand a good deal about the properties of cell life, of the effect of local surroundings on different cells, of the various organs of the body made up of cells of a special character or type in relation to the whole individual, and, finally, of how individuals differently organised, owing to the varying development of the various bodily organs, are affected by varying surroundings. Upon this knowledge rational treatment of disease should rest, and this same basis must support scientific sociology.

Not only so, but medical conclusions must tend progressively to guide sociological tendencies. In the mapping out of streets, in allotment of air spaces, in the hygiene of school and industrial, as well as

of home life, in determining the fitness or unfitness of given persons for given employments, medicine must have a steadily and increasingly powerful voice. Besides, therefore, the fact that the two sister sciences arise from a common parent stem, there is also to be taken into consideration the complete dependence of the one on the other.

Biological conclusions ought, therefore, to be considered in relation to their twofold application to individual medical and collective social problems. *Nor can either set of deductions be satisfactorily divorced from the other, for the two sciences are complementary, and cannot, therefore, be studied independently.*

In the seven following chapters that form the present volume I have attempted to deal briefly with the leading conclusions of biology, in so far as its teachings tell the student something definite and important of the nature of individual man and woman, and to point out how this knowledge affects social and medical sciences.

I have, however, purposely limited myself to little more than a mere statement of the facts that have some bearing on these subjects, only incidentally mentioning the deductions which may be drawn from them. In future volumes I hope to be able to amplify these preliminary statements, firstly, in reference to the more strictly social side, and, secondly, where distinctly medical questions are involved.

My firm belief is that neither social development nor medical progress will ever make satisfactory

advancement until the vast importance of the trained medical practitioner, *working among the people*, with his power to forward or retard industrial and home evolution, is recognised by the nation, singly as a mass of separate individuals, and collectively as the State as a whole; and until the principles of State development in relation to human health and disease, and the value of environment in selecting a higher or lower type, are appreciated and taught in the various medical schools throughout Great Britain and the Empire.

This, with the reorganisation of the present pernicious cram system of examination, which absolutely destroys both the humanitarian spirit and the scientific desire by which alone men are induced to look at the larger problems of their work; and the limiting of the general practitioner's field of activity (by accustoming him to regard eye, ear, and obstetrical cases, and also those entailing greater surgical knowledge, as being outside of his more general practice), will give him both the power and the opportunity to pursue his calling intelligently and devote a large portion of his energies to public, trade, and home health problems, which he now almost entirely, and quite unavoidably, disregards.

The medical man of the future must in all advancing countries take a progressively more prominent part in directing life towards higher ends, and because of this growing responsibility he must be less of a charlatan in his everyday practice.

Much of the matter here treated was outlined in a paper read before St. Thomas's Hospital Medical

and Physical Society (January 1897), entitled 'Evolution and its Application to Medicine.' In this lecture I considered my subject mainly from three aspects: firstly, the need for understanding, as far as known data would allow, the laws of heredity; secondly, the necessity of properly appreciating the importance of the question of temperaments, considered from this heredity basis, and studying them not only in relation to predisposition to disease, but also in regard to health, insisting that the whole problem ought to be examined from the modern human racial and higher evolutionary standpoints; thirdly, and lastly, I dwelt upon the need for grappling with the facts relating to environment in its power of favouring certain disease-producing organisms and certain types of individuals more or less resistant to them.

My views of heredity were afterwards published in 'Natural Science,' more particularly in an article on 'The Scope of Natural Selection,' in Volume XV. of this periodical, and the first chapter of the present work is mainly reprinted from this. The other chapters have hitherto been unpublished.

The illustrations have been very kindly prepared for me by Miss Minna Tayler, and are intended to be mere impressions. They have been reproduced without colours in order that the physical characteristics may be better appreciated. It must also be borne in mind that the temperaments portrayed are everywhere *accentuated* groups of characteristics found in different individuals. They were obtained by studying and noting down common characters existing in faithful portraits of earlier times, and from either

photographs or reliable collotype reproductions for savage, disease, and civilisation physiognomical peculiarities of the present day.

They are thus *extreme* forms which should suggest the direction, by resemblance to any one or more types, of any given individual's organisation, and must not be expected to give detailed information in reference to minor peculiarities.

Further circumstances relating to habits of life must always be considered as either checking or accentuating natural tendencies, and therefore occupation, slum, scum, and middle-class surroundings must always be taken into consideration in estimating the powers of each individual.

Those readers who are little interested in questions of biological importance will find that the drift of Chapter I. may be appreciated if only the conclusions beginning at p. 60 are read, as the earlier part is devoted to advancing evidence in favour of the position finally adopted.

In the fifth and sixth chapters I have tried to emphasise the close dependence of Medical and Sociological sciences upon each other, and in the seventh to give a résumé of the chief impression of the book.

The second and third volumes will be devoted to social problems considered from the outlook of the principles here adduced, and I hope subsequently to deal with the medical position.

J. L. T.

SUMMARY

GROWING complexity of modern life, multiplication of trades and industries, and desires for mental realisation in musical, scientific, artistical, and literary fields among the masses are the prevailing features of developing social existence. This necessitates in all pursuits, and in that of politics, perhaps, most of all, a much more sensitive and complex moral code. National as well as individual moral standards are required for crimes mainly against the State, on account of this greater complexity.

The problem of heredity is that on which medical and social work must alike rest. An examination of this subject shows that the individual cannot be modified by his environment, and therefore the all-important question to consider is the natural power of the individual, and to determine what relation the environment has to the type or types existing under it. Temperament is, therefore, the fundamental basis of the sociologist.

Evidence is adduced that the human form is not fixed, but is physical in its desires in a primitive environment, on account of its being coarsely organised, and mental in an advanced group of

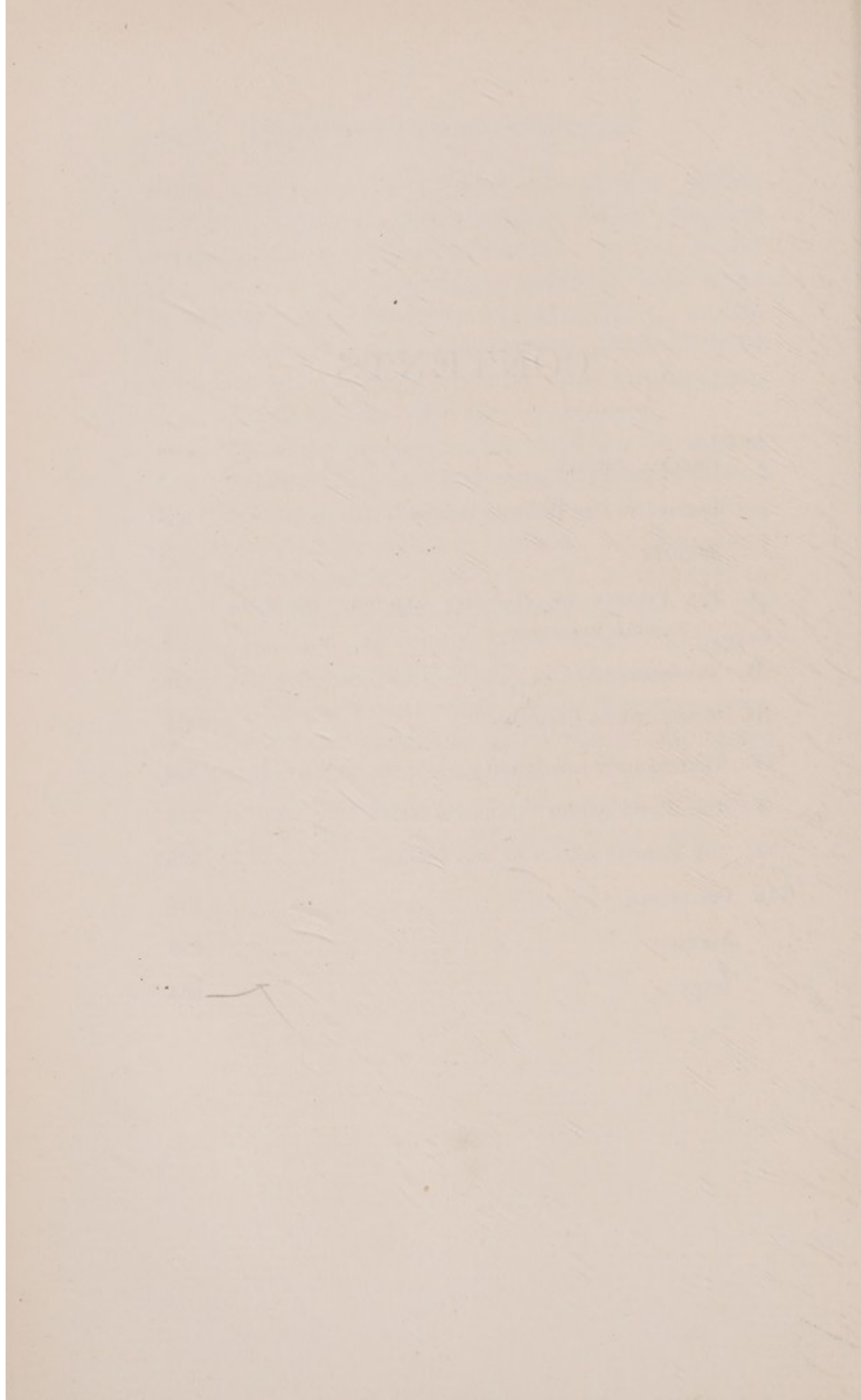
social conditions, on account of *natural* higher powers. Physical environments select physical types, mental environments mental. In Art, therefore, there is not one perfectly beautiful ideal to be considered, nor in Medicine one standard of health, but the ideal of beauty and the estimation of what is healthy will vary with the individual temperament to be considered, and with the environment.

Temperamental science is emphatic in stating that advanced and primitive forms have always existed and will always exist. The question for the medical man is how these stand to disease; for the educationist, what different methods will be required to educate these different organisations; and for the sociologist, do the higher types hold the higher positions in the nation? While artist, musician, and scientist must see that their ideals of beauty, feeling, and truth conform to the needs of the higher and not the lower temperaments.

A social *atmosphere* favourable to the advancing portion of the community will thus be evolved.

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THE HISTORY OF THE

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ASPECTS OF SOCIAL EVOLUTION

TEMPERAMENTS

CHAPTER I

THE PROBLEM OF HEREDITY AND THE SCOPE OF NATURAL SELECTION

IN considering the problem of heredity I shall throughout follow Lloyd Morgan, Mark Baldwin, and others in the precise usage of the terms variation, modification, adaptation, and accommodation.

Variation will apply to changes which are of germinal origin.

Modification will apply to changes which are impressed on the 'body' or soma in the course of individual life.

Adaptation will apply to those changes which have been produced by the selection of favourable variations.

Accommodation will apply to those alterations which have been produced by the reaction of the soma to environmental conditions.

We may seek to interpret the facts of organic evolution by resting wholly or in part upon one, or

a combination of more than one, of the following assumptions :

1. That organisms have evolved along definite lines, wholly or chiefly dependent upon the nature of each organism, developing either completely or partially irrespective of the peculiarities of the environment. On this view the more or less unsuitable organisms are simply eliminated ; but this elimination is of little or no importance in development, the assumption being that every organism that is not exterminated evolves at its own rate, and that its development is neither retarded nor accelerated by the presence or absence of other organisms.

2. That organisms are modifiable by environment and that modifications so produced are inherited, the hereditary relation being subservient to the action of the environment. This assumption has to be considered under two heads.

- (a) Accommodations which are the direct result of environmental influence.
- (b) Accommodations which result from the activity of the organism itself in response to its environment.

It is obvious that these two classes, though not usually so considered, are in reality fundamentally distinct. Class (a) includes the only kind of inherited characters that can be truly called acquired. Class (b) includes what are in reality merely developments of already existing somatic tendencies, which some biologists believe may, and others that they may not, become germinal. In any case there must

be an elementary something which can be developed by use or there would obviously be no development, but rather the formation of a *new* character, and the accommodation would then have to be classed under (a). In class (a) the influence of the environment in producing a modification is one of primary cause and effect; in class (b), on the other hand, the influence of environment is secondary, it is the indirect cause of the degree of the response, but not of the capacity of responding which exists in the particular form of protoplasm itself. Class (a) is incompatible with selection, for in proportion as direct modification is able to occur, the less is the necessity of selection, and this direct climatic influence must obviously be also inversely proportional to the power of heredity. Class (b), on the other hand, is not necessarily in opposition to the selection theory because within certain limits the more responsive the organism the greater the rapidity of development, selection would become simply more rigorous, the selection value would be raised, the less responsive organs being weeded out.

There are thus two separate questions in this division to be answered:

1. Does a direct somatic alteration of structure ever occur as the result of climatic or other physical influence, and if so, how frequently and under what conditions? Do these alterations become germinal? or
2. Do all, or any, somatic modifications in response to environment arise as developments

of a pre-existing element in protoplasmic structure? If so, do somatic responses ever become germinal? For a clear statement of the Lamarckian position it is necessary to determine the relation, if any exists, that class (*a*) has to class (*b*).

3. By the selection of organisms which possess favourable variations, and by rejection of those which have unfavourable, the offspring resulting will tend to reproduce the favourable variations of their parents, and the selection being continued in every subsequent generation, so long as conditions remain fairly constant, there must inevitably result an organism which tends to vary more and more definitely.

To determine how far evolution has been dependent on one or more of these three factors, it is necessary to estimate—

- I. The direct accommodative power of environment over protoplasm, if it exists.
- II. The power existing in protoplasm of responding to conditions which favour its activity, and the relation, if any, that somatic response bears to germinal in multicellular organisms.
- III. Whether the responsive power (II.) or the direct influence of environment (I.) is altered in relation to present by past accommodations or variations, or both; and, if so, the relative importance of the character, intensity, and persistency of these past con-

ditions in producing more or less permanent or transitory modifications or variations in organisms.

It follows from the preceding argument that it is necessary to understand the theoretical capability of each of these three sets of factors to account for the process of evolution, and to endeavour to form some estimate of the probable primitive material from which the present forms of life have proceeded.

In this chapter I propose to examine this question from three aspects: first, the theoretical capability of natural selection; secondly, some of the chief difficulties advanced against this principle; and, lastly, a few of the more general properties of protoplasm and the inferences which these main characteristics appear to justify. Incidentally, it will, I hope, become evident that while the responsive power of protoplasm must be admitted, yet the *direct* action of environment and the assumption of a definite self-evolving principle in life must be given up.

The Limitations of the Principle of Natural Selection

Ever since the publication of the 'Origin of Species,' in 1859, there have been steadily rising into greater prominence two lines of thought which seem to lead to fundamentally opposite conceptions of the principles which underlie the process of organic evolution. One tendency manifests itself in

an increasingly marked disposition to minimise the claims of—use and climatic—inheritance, and to explain the course of evolution by the single principle of selection and certain fundamental properties of protoplasm. The other school of thought tends as emphatically to disregard this selection principle, and to rely on the responsive power of protoplasm and the influence of environment as the main causes of evolutionary development. Some of the members of this school also add to these assumed properties of protoplasm other innate tendencies by which protoplasm is supposed to be capable of developing along definite lines which are independent of environment.

In the one case the supporters of selection maintained that, as no case of supposed use-inheritance had ever been brought forward which could not be as easily, or even more easily, accounted for by the single principle of survival of the fittest and elimination of the less fit, they were justified in considering natural selection to be the main or sole principle in species formation. In the other Neo-Lamarckians based their objections to natural selection on the assumption that modifications in nature were always, or nearly always, definite; that definite modifications were admittedly unexplainable on the selectionist theory. It therefore followed, as nature could produce definite modifiability without the aid of natural selection, that, unless some special and additional reason could be found for its existence, the selectionist principle must be regarded as wholly subsidiary in nature, and that it could only be

regarded as a species-former in the limited field of the domesticated organisms which were under the direct influence of man. Neither position could be regarded as satisfactory, since each school of thought was apparently supported by some facts, while negatived by others.

Professor Lloyd Morgan, in an article contributed to 'Natural Science' in 1892, altered the whole force of the arguments advanced on both sides by demonstrating the fact that, if natural selection acts at all, it must tend, under moderately constant conditions, to produce definite variability through survival of the favourable line of inheritance and extermination of the unfavourable. This corollary to the principle of selection he has further expounded in his work on 'Habit and Instinct,' in a chapter entitled 'Modification and Variation.'

In an article published in 'Natural Science,' April, 1898, I contended that natural selection was capable of producing in the whole organism a general definite variability under relatively constant conditions. I was at that time unaware that Professors Lloyd Morgan and Weismann¹ had both in large part anticipated me.

The former writer's views may be summarised briefly as follows :

The theory of natural selection involving as its fundamental principle the assumption that an organism survives solely because it has certain favourable elements in its nature which give it certain

¹ In his theory of 'Germinal Selection' put forward in September 1895, at Leyden.

advantages in the competition for existence, the less favoured organisms being eliminated, it follows, in so far as parental characteristics are able to influence those of their offspring, that the progeny of successful parents will be likely to inherit a higher average of adaptability to their environment; and, as this average adaptability will keep rising so long as selection lasts, it will tend, under more or less constant conditions, to produce more or less definite variability. Definite variability is not, therefore, necessarily inconsistent with the principle of selection. If it exists only where the conditions are such that the principles of the theory would lead any impartial biologist to expect such definite variability, it will be strong confirmation of the truth of the theory in question.

Every living organism may be considered from two aspects: (1) It tends to develop and maintain its own structure; (2) it tends to reproduce, under suitable conditions, other organisms more or less similar to itself. We have, therefore, to consider every living form from a somatic and a germinal side. Both somatic and germinal aspects exhibit two tendencies which are differently proportioned in different organisms—(1) to remain constant in spite of variable external conditions, (2) to manifest certain changes of structure. According as one or other of these tendencies predominates, the organism will develop and reproduce definitely or indefinitely. In both somatic and germinal development natural selection will tend to favour the requisite definiteness or indefiniteness of structure. The inheritance of

somatic characters does not appear to have been established in any one of the many alleged examples. The evidence, therefore, that up to the present time has been collected would seem to favour the conclusion that if accommodations are ever inherited, it is an event of extreme rarity.

Yet in spite of the lack of evidence in support of the inheritance of acquired characters, there seems to be a considerable mass of evidence in favour of the contention that germinal variations often correspond in their tendencies to somatic accommodations.

Definite variability corresponding to environmental accommodation might, however, be acquired in the following way. It has already been noticed that every organism, both from its somatic and germinal aspects, exhibits two tendencies, one towards definiteness, the other towards indefiniteness; somatic indefiniteness appears to be able to be modified by environmental influences, therefore those organisms whose somatic tendency is predominantly plastic will survive under altered conditions of environment where those organisms of a less easily modifiable tendency will be eliminated. Now if somatic characters rarely if ever become germinal, the modifications of the parental organisms cannot be transmitted to their offspring, but those offspring that happened to be endowed with variations in the same direction as the acquired but not transmitted modifications, would start their life with a predisposition favourable to their environment, and therefore favourable to more complete modification

of the somatic side of the organism; this tendency being accumulative under constant conditions, coincident variability would arise by the process of selective elimination and preservation, *without* the need for the assumption of use-inheritance, which assumption facts appear to negative.

Coincident variations would thus have a better chance of survival simply because they would be present in the surviving organisms, but the principle of selection would be the same whether the variations were coincident or not.

It follows from the preceding argument that definite variability is a logical necessity, under certain conditions, if the principle of natural selection be allowed to be a factor of considerable importance in organic evolution. So far all facts point to the conclusion that variations under stable conditions are definite, under unstable conditions indefinite, and this definiteness and indefiniteness occur under precisely those conditions which the theory of natural selection would lead one to expect; hence, unless definite variability can be shown to occur under conditions which selection could not have produced, the facts adduced by the Lamarckian School are favourable rather than otherwise to the Neo-Darwinian position.

To realise how far the theory of selection is capable of explaining the facts of organic evolution, it is necessary to bear in mind the postulates on which the theory is founded.

1. It is obvious that Natural Selection can only act by preserving or eliminating the complete

organism. Selection must therefore be organismal. This Darwin and other selectionists have clearly recognised.

2. As the whole organism must survive, if the favourable variation or variations are to be preserved, it follows that certain minor unfavourable variations may also be preserved if they happen to exist in an individual which survives on account of its major favourable variations. And since no individual is completely adapted to its environment, it follows that there must be always a variable amount of residual unfavourable variability in every organism.

3. This residual unfavourable variability may be of considerable utility under changed conditions.

4. Complementary specialisation of parts, as Spencer has shown, is favourable to successful competition, and as it is the whole organism that is selected or eliminated, it follows that any weakness of one specialised part, since it would disturb the balance of all, would be detrimental. The more complex the organism, the more specialised the structures, the more dependent one part will be on the others for its existence, hence a complementary specialising tendency will be favoured by selection, and therefore all struggles of one part of an organism with another will be reduced to a minimum.

It is clear that there must be some underlying criterion which determines whether any given organism shall be selected or not, and that criterion must be the net result of its adaptability to its environment. One organism may conceivably survive, by its possession of a large number of small

favourable variations, while another may survive in virtue of a single valuable one, but in each case it would be the *whole value* of that organism which determined its survival. This fact is continually disregarded by opponents of the Neo-Darwinian position, yet this selection of the organism as a whole is the fundamental postulate from which the theory of selection starts. Thus it is not uncommon to read criticisms bearing on the early development of some organ, in which the inadequacy of selection is supposed to be proved by the writer demonstrating, or believing he has demonstrated, the fact that the particular variation in question must have been too small to be by itself of selection value. In many cases the particular variation would, no doubt, if taken alone be, as the objector asserts, too unimportant to be selected, but as it is the whole organism that is selected, it is not logical to make an artificial separation and study the development of one organ or structure irrespective of the other organs with which it is in nature associated. *Every organ in its evolution must be considered in relation to the whole of the particular organism in which that particular stage of development of that organ is found.* Starting therefore with this fact, that the net value of adaptability of the whole organism to its environment must be the basis which determines selection or elimination, it will follow that certain lines of development will result from the application of this criterion. In a series of organisms placed under new conditions, elimination will proceed along lines essential to bring about a proper adjustment to the new con-

ditions. If the offspring of these adjusted organisms merely repeated in their generation the characters of the exterminated as well as of the surviving organisms, that temporary adjustment would be permanent as long as the conditions were unchanged. But since the offspring are produced only by the surviving organisms, selection is continually raised to higher and higher planes of adaptation, and therefore, as long as conditions remain constant, the tendency of selection must be, as Darwin clearly saw, cumulative. He did not, however, apparently see that from this cumulative tendency definite variability must arise out of indefinite.

Selection in direct relation to climatic conditions is, therefore, of very minor importance, while selection among the members of a species and all forms of inter-organismal selection is of infinitely more importance, since it is this interaction, produced by the offspring in different degrees inheriting the advantages of both parents (both of whom have survived on account of certain advantages), that leads to the cumulative development and never-ending struggle for survival. Darwin came very near to this conception of definite variability when he pointed out that 'if a country were changing the altered conditions would tend to cause variation, not but what I believe most beings vary at all times enough for selection to act on.' Extermination would expose the remainder to 'the mutual action of a different set of inhabitants, which I believe to be more important to the life of each being than

mere climate ;' ¹ and as 'the same spot will support more life if occupied by very diverse forms,' ¹ it is evident that selection will favour very great diversity of structure.

Bearing in mind this cumulative action of selection, it will follow that under constant or relatively constant conditions the struggle for successful living will become more and more selective in character, even if the actual number of inhabitants remain more or less the same as when the struggle first commenced. The selection of variations will thus tend to pass through certain more or less ill-defined but nevertheless real stages. In proportion as the struggle becomes intense, either from the number or from the increasing adaptability of the organisms, or both, certain major essential adaptations, which were necessary for the climatic and other more or less comparatively simple conditions, will be supplemented by minor auxiliary variations which in the earlier stages would not have appeared. And still later as more and more rigorous conditions of life were imposed the advantage would tend to rest with those organisms which possessed highly co-ordinated adaptations, since this would entail more rapid responsiveness to environment.

As evolution advances from the unspecialised to the specialised, and higher and higher forms of life come into being, with increasing complexity and specialisation of parts entailing an increasingly delicate adjustment of those parts to each other's

¹ From Poulton's *Charles Darwin and the Theory of Natural Selection* (Abstract of Darwin's letter to Professor Asa Gray).

needs, the relation of each part to the whole organism becomes of more and more importance, and it follows that selection must become more and more generalised in its action. No single variation could be of service to any of the higher forms of life unless it was in more or less complete harmony with the whole tendency of the individual. The adjustment of parts and their mutual inter-independence make it essential for adaptation that the relation of parts be preserved; consequently, correlated minute favourable variations will tend to be more and more selected as evolution passes from the unspecialised to the specialised forms of life. This response of the whole organism should be still more delicate in those forms of life that are continually subjecting themselves to changed conditions; hence this delicacy of adjustment is far more necessary in the higher forms of animal life than in the more stationary plant organisms, and in the developing nervous system of animals we have just the central adjusting system that is required for these conditions. *With evolution of type there will thus be an increasingly definite tendency given to organic, especially the animal, forms of life, if the acting principle of evolution has been selectional.* Selection is therefore able to account for the steadily progressive tendency of life as a whole without calling to its aid any unknown and doubtful perfecting principle.

To summarise: Natural selection, acting on the whole organism, tends to produce more and more definite tendencies in all surviving forms of life, which tendencies are progressive and continuous in

character. Variable conditions, by partially altering the line of selection, induce a temporary indefiniteness. And, lastly, the process of selection being itself able to be the indirect, though not the direct, cause of those favourable variations, which it subsequently selects from, is able to dispense with any subsidiary factors, provided it has a certain number of elementary properties of life which afford sufficient material to work with.

Objections to the Theory of Natural Selection

Keeping constantly in view the leading principles of the selection theory, I believe it will be found that the facts adduced by the more scientific opponents of this theory can, when the importance of the corollary put forward by Lloyd Morgan, and after him by Weismann, is considered, be easily accounted for, and that as they then fall into line with its legitimate deductions they increase the strength of the theory by showing it to be a more and not less important principle than Darwin and even Wallace were led to believe.

1. *Variations are definite and not indefinite in nature.*—This objection has already been met in the preceding part of this chapter, and as selection is able to explain the indefinite variability which arises from variable conditions, crossing, &c., and the constancy of type from rational inbreeding, it is in more complete accord with facts than any mainly Lamarckian or Orthogenetic theory.

2. *That Natural Selection cannot be the cause of*

New Characters—*The alternative must be present before the selection can commence.*—If any character or variation can be shown to have been produced which differs qualitatively, not merely quantitatively, from its parental forms, which is not to be explained by incomplete development, atavism, or degeneration; if any variation can be shown to arise which has not some pre-existing though less or more differentiated counterpart, it would form an objection of considerable magnitude. But as no case of the kind has been put forward which Neo-Darwinians have felt bound from the strength of the case to accept, this objection may be disregarded until such case arises.

3. *The difficulty of the chance variation appearing at the right moment* is largely met by the fact that selection tends to induce determinate variability; this objection is still further weakened by the fact that even relatively rapid changes in nature are, as a rule, long in proportion to the life of the individual, and afford considerable opportunities for selection working through somatic accommodations and later coincident germinal variability to produce the required change.

4. *That the earliest forms of variations must have been too small and insignificant in character to be of selectional value.*—This objection appears to me to be one of the most weighty of all the objections which have been raised to the selectional hypothesis, and it is further an extremely difficult objection to reply to satisfactorily; first, because it is almost impossible to say in what form of organism

the earliest variations appeared, and without this no judgment on the value of any small variation can be of use; secondly, it is equally essential to know the kind of environment which such an organism was living in; and, lastly, if we were fully acquainted with the character of the organism and its environment, it would still be difficult to form any adequate opinion on the value of such a variation, owing to the fact that this apparently simple organism would differ so widely from our own functional activity and life that any conclusions formed on comparative methods of testing its powers, &c., would be extremely likely to be fallacious. If, however, we keep in mind the facts that (1) the whole and not merely a part of the organism is selected, and that therefore each variation does not require to be of the same value as if selection depended on it alone; (2) that specialisations are largely quantitative, between man at one extreme of development and a simple unicellular organism at the other, the difference, though very great, is mainly due to the fact that man is a huge multicellular colony; this difficulty will be much simplified. To estimate the qualitative difference it is necessary to endeavour to determine the specialisation of an individual cell in one of those collective specialisations or organs: the difference between a cell in, for instance, the cerebral cortex of man and the character of an amœba is no doubt great, but the amœba reacts to stimuli, though in a less specialised form, just as the cortex cell does; in the same way the reaction to light in the mammalian eye is not a new development—it has its beginnings

in the preference for light or darkness shown by many unicellular organisms. These two points, that selection is organismal, and that specialisations are as, or more, largely quantitative than qualitative, weaken, if they do not abolish, all arguments against natural selection that are founded on this objection; and it is further necessary to recollect that no specialisation has yet been found which has not a primitive counterpart in the earliest known forms of life.

5. *The Imperfections of the Geological Record.*—This is obviously a much less important objection than the preceding one. The very large areas of the world that have yet to be examined tend very much to weaken any objection founded on imperfections and absence of links. And as with increasing research these missing links are being steadily filled in, it follows that this objection has become weaker and not stronger with advancing knowledge.

There are, however, certain points which it is essential to recollect in any consideration of the imperfections arising from this cause. Lloyd Morgan has pointed out that, as the tendency of natural selection is to favour, under appropriate conditions, definiteness both in the soma and in the germinal structures, the geological record should not be expected to provide evidence that does not correspond to this definite line of development.

There is also another point which does not appear to me to have been sufficiently emphasised. In the earlier part of this chapter I drew attention to the fact that Darwin considered the mutual action of a

different set of inhabitants arising from the birth of a new generation to be of more importance than the mere conditions of climate, &c.; and inasmuch as climatic selection will largely cease acting as soon as organisms, capable of surviving at all under these altered conditions, are produced, it follows that inter-organismal action, which is continuous, must be of more importance in species formation and differentiation of structure. But as organisms which cannot survive under these altered conditions will be eliminated, it follows that the more obvious structural changes will be largely produced by this temporary climatic selection, and this form of selection will be remarkably rapid in its action relatively to the inter-organismal selection. Hence the obvious structural changes induced by climatic selection will have less chance of leaving a geological record behind them than the less obvious variations induced by inter-organismal selection. For this reason certain imperfections in the record are likely, and should be expected, to arise, in addition to imperfections due to adverse conditions for fossil formation and preservation.

6. *That the period of time is too short for such great alterations of structure to have taken place.*—As the rapidity or slowness of structural alterations will depend on the local surrounding conditions, it follows that, until some fairly complete record of these local conditions is obtainable, no objection as to time limit can be logically raised.

7. *The co-ordination of parts necessary for the development of favourable adaptations.*—Spencer has

pointed out that co-ordination of many parts to form one adaptation is based on a different principle from the cumulative results of many different variations, each of which is of selective value, and urged that natural selection is powerless to explain this co-existent adaptation.

Wallace, in referring to this subject, says: 'The fact, that in all domestic animals variations do occur, rendering them swifter or stronger, larger or smaller, stouter or slenderer, and that such variations can be selected and accumulated for man's purpose, is sufficient to render it certain that similar or even greater changes may be effected by natural selection, which, as Darwin well remarks, "acts on every internal organ, on every shade of constitutional difference, on the whole machinery of life." The difficulty as to co-adaptation of parts by variation and natural selection appears to me, therefore, to be a wholly imaginary difficulty which has no place whatever in the operations of nature.'¹ This criticism does not appear to me to do justice to Spencer's objection: he would no doubt agree with Wallace that these accessory variations can be developed by selection, but he would go one step farther back and ask why it is that the accessory variations happen to be there to be selected from at all. He would agree to the fact that selection must act on the whole machinery of life, but he would still urge that he is unable to see how it is that all these numerous accessory variations which are necessary to the working of one variation happen to be present at

¹ *Darwinism*, p. 418.

one and the same time. His difficulty, therefore, does not appear to me to be answered by Wallace.

Weissmann,¹ admitting the objection of Spencer as having a real existence, attempts to answer it by the tendency of natural selection itself to induce definite variability. This answer does not seem to me to be much more satisfactory than Wallace's, for the point of the argument is, that as the accessory variations are necessary to the proper working of the primary, they must be present from the first selection; and as determinate selection can only appear after selection has been continued for some generations, it must be unable to explain this occurrence of co-ordinated parts which occurs prior to the action of selection.

Mr. Lloyd Morgan, in the December number of 'Natural Science' (1898), deals with this difficulty in a manner which appears to me to be much more satisfactory. We have seen, in the brief summary of his views, that he draws an important distinction between somatic response to environment and the selection of germinal variations; that under altered conditions of environment he considers somatic plasticity to be one of the principal determining causes of selective preservation; and, as he admits the action of use-modification on the somatic structures, those organisms whose somatic structures are sufficiently plastic to allow of this newer co-adjustment to the newer conditions will survive on account of their plasticity, and this will continue to happen over one or more generations until chance variations

¹ *Germinal Selection.*

happen to make their appearance in the same direction as the environment; then the offspring of this organism or these organisms will start life with a slightly favourable predisposition to their environment, which, in addition to somatic plasticity, will give them a slightly better chance than those without this predisposition. Hence by the fostering power of body response a co-ordinate structure might be formed through cumulative coincident variability. This objection, therefore, does not apply to the theory of Natural Selection modified as above.

Keeping in view this theory of coincident variability, there is another consideration which will also tend to weaken this objection. As selection must be from the first organismal, and as adaptation to climatic conditions must be absolute, as far as it is capable of exercising a selective action, a certain common tendency will be present in all more or less similar organisms living under these more or less similar physical conditions. This primitive climatic basis will give a certain direction to the subsequent inter-organismal selection; and we have seen that with progressive evolution the necessary specialisation entails an increasingly definite tendency in the organism as a whole, owing to the increasing dependence of one part on another. Hence it will follow that all variations will tend to become increasingly co-ordinated as they become increasingly specialised, and they will also become increasingly so as we pass from the lower to the higher forms. There will thus be very little tendency for

inco-ordinated variations to appear, and this tendency will diminish with evolution of type.

8. *That organisms not uncommonly exhibit a more perfect organisation than their environment demands.*—This statement is frequently associated with other similar objections, some of which, such as definite variability, and varying degrees of capacity to vary in different animals, have already been met. It is also asserted that animals sometimes manifest at the earlier periods of their lives a higher condition than at a later period, and that this higher earlier condition cannot be explained by any assumption of reversion in the later stages of growth. Thus it is asserted that the infant ape is much nearer to man than the adult ape, &c.

All these assumptions have as a basis the conscious or half-conscious belief in some unknown internal force which is capable of producing evolution of type independently of environment. To Lamarckian and selectionist theories alike any such force, were it proved to exist, would be largely fatal.

It has been shown that an increasingly definite tendency in organisms evolved through the principle of natural selection is what, on theoretical grounds, one would be led to expect ; that the preservation of a definite relation of one part to another becomes of increasing importance with increasing specialisation. That this is actually the case the facts associated with 'internal secretion' in man and the higher mammals clearly prove. The thyroid, kidney, liver, pancreas, testes, ovaries, &c., have been shown to exert some remarkably important influence

on the nutrition of the whole body ; and this influence in the case of the thyroid, and less certainly in other organs, has been found to be produced through the throwing off of certain products into the circulation which are necessary to the metabolism of the whole body.

On any theory of complementary specialisation of parts such facts are easily understandable. A chemical circle of nutrition would be the most economical way of maintaining tissue activity. If each organism can act chiefly on some particular substance, one organ or tissue requiring a more complex food material than another to carry on its metabolism, then the waste product of one organ might be used as a food product by the next in this food series, until the last organ of this series, having obtained all the energy from this material, excretes this simpler substance, which cannot be further utilised by the body, into some channel where it is got rid of. Some such hypothesis is necessary to explain the facts, and the increasing series of progressively simpler products, although still incomplete, that have been obtained, which are allied to uric acid and other substances, lends considerable support to this theory. There would be thus a serial specialisation of food supply among the tissues of each organism which would be as economical as the specialisation of food supply among individual organisms competing in nature. Now this close relation of one part to another which is characteristic of the adult organism is also equally characteristic of the developing one ; and, keeping this sequence of

nutrition in view, each organism, starting from a more or less quantitatively generalised substance, is evolved to a quantitatively specialised structure, in the building up of which every antecedent stage of development is necessary, and forms a basis for the later stages. It will follow that a definite regular order will be developed; *and hence definiteness in growth and development is as essential as definiteness in the relation of one part of a specialised organism to another.* That this necessary sequence in development is no mere unsupported conjecture is shown by the fact that the relation of parts alters with growth: an organ occupying a first place in activity at one period may become second or third at another. This alteration of the relative size of different organs to the whole body at different ages must be of some value to the whole organism, or it is unlikely that it would be perpetuated. The thymus gland affords a typical example of this. It appears in some way to be associated with development; it reaches its maximum size in man about two years after birth, and then slowly shrivels up. The presumption is that at that period it had some function to perform which ceases to be required. If we assume a metabolic sequence in structure we explain this varying relation of parts, and we explain its definite character, and this sequence, as in other specialisations, would be subject to the influence of natural selection; so far preservation of different stages of growth can be easily accounted for on a selection hypothesis if this necessary chemical sequence is assumed, and without it no theory has as yet explained the facts.

There thus remain from this objection only those cases where there is an apparent or real foreshadowing of a higher evolutionary type. Now before this foreshadowing can be used as an objection, it has first to be determined how far it is real or not. It is well known that the ovum of one animal resembles another considerably, and that the higher animals, as they pass through successive stages of their development, resemble more or less incompletely certain lower forms of adult organisms, and this has led to the assumption of the recapitulation theory. Were it possible to reverse the order of evolution and proceed backward, we should find all types converging towards unity, and while this applies to the whole line of development, it equally applies to lesser portions of it. As the infant ape is less specialised than the adult ape, it is more likely to present similarities to man, not on account of an actual foreshadowing, but simply because, being more generalised in structure, it is less easy to mark off differences; for precisely the same reason a human child might appear nearer to some ideal and higher type of man.

Until this fictitious resemblance is dealt with this objection can be disregarded. Further, as many biologists have already pointed out, there is always a certain excess force, which would be fostered by selection, sufficient to provide for emergencies.

9. *Rudiments and their disappearance.*—It is assumed that there will come a point where the rudiment will be of such slight significance that it will no longer be of selection value, hence it is urged that

the fact that rudiments do tend to completely disappear, is against any purely selectionist principle. Leaving out of consideration the possibilities of reversal of selection, panmixia, &c., it appears to me that there is a comparatively simple cause for this disappearance. George Henry Lewes, Wilhelm Roux, and more recently Weismann, have all fallen back on the assumed necessity of applying the principle of selection to the several parts and specialisations of the individual organism, in addition to the action of selection on the whole organism. The last writer in particular, in his 'Germinal Selection,' suggests that a struggle among the different parts of the germ-plasm may account for the complete disappearance of rudiments, this germinal selection thus supplementing the action of panmixia, personal or organismal selection, &c. Now the necessity for increased co-ordination of parts with increasing specialisation, entailing, as it necessarily must, an increasing mutual dependence of each part on the others, must lead as the type advances to diminished opportunity for any struggle of parts in the organism; consequently, if such a struggle exist at all, it must be limited to the most undifferentiated organisms. I do not therefore see how this principle can explain the disappearance of rudiments in any of the more specialised organisms, hence it does not seem to be sufficient answer to the above-mentioned difficulty. In the development of the individual we see a disappearance of structures, which appear to become with advancing development useless, almost parallel to the gradual disappear-

ance of rudiments, &c., in the history of the evolution of species. And a common explanation for both of these series of phenomena can, I believe, be satisfactorily found in the known facts of nutrition. Growth of any tissue would seem to depend on three conditions : a stimulus of the part adequate to promote functional activity, a proper food supply, and efficient removal of products produced by that particular tissue's activity. There is abundant evidence to prove that the tissue tends to degenerate if its own excretory products are not removed ; the evil effects produced by fatigue products in muscle and other tissues on the activity of the tissue itself prove that this factor must be of great importance wherever it is found to occur. Just as the growth and development of bacteria are interfered with, and finally altogether checked, by the accumulation of products of their own activity, so a tissue in the higher organisms has its activity impaired and its power lessened when for some reason diminished elimination of its own metabolic products occurs. Now both in the development of the individual and the race we see an alteration of structure, a gradual transition from the less to the more specialised, and in this gradual transition there must be, as I endeavoured to prove in my answer to the last objection, an alteration in the line of functional activity of the parts. Owing to this fact, a tissue that was necessary in the earlier stages, becomes less and less so as specialisation advances, the whole tendency of the specialising organism being continually and increasingly against the earlier, less specialised, stages.

It will thus happen that every structure which is becoming useless owing to its deficient specialisation, whether in the history of the race or the individual, will have two adverse sets of conditions to contend with—one, defective elimination of its own tissue products, owing to its becoming increasingly removed from the growing organismal specialisation of food products, while secondly, for this same reason, its own food supply will become less and less suitable. This theory would apply equally to germinal and somatic development and atrophy of structure ; there would thus, through the alteration of functional activity of the whole organism, be brought about elimination of all structures not in the line of evolution, and therefore organismal selection alone, if this theory is sound, would be able to explain the complete disappearance of rudiments, the various forms of development and atrophy, without calling to its aid climatic inheritance, panmixia, and germinal or any other form of particular selection.¹

The only two other important objections against the principle of selection are : (1) those cases where it is assumed that automatism produced by habit has become hereditary (instinctive),² an assumption which an examination of the facts does not appear to warrant, and (2) those cases which are supposed

¹ The atrophy by loss of food supply has its counterpart in social evolution in failure through changed direction of financial support. An institution like a tissue not functionally active in relation to the *whole* social body must degenerate or be healthily modified or become parasitic. It cannot simply persist.

² See Lloyd Morgan's *Comparative Psychology* and *Habit and Instinct*, and Mr. E. L. Thorndike's experiments, &c.

to be examples of experimental demonstration of acquired inheritance.

In the best known of these experiments, particularly those performed by Brown-Séguard, we have certain facts which appear to show that under very exceptional conditions somatic injuries may affect germinal structures. Assuming that reliance may be placed on this interpretation of these experiments, an interpretation which future facts might conceivably negative, there are other facts associated with the relation of environment, alcohol, &c., to crime and insanity which would seem to offer some slight confirmation of this view.¹ If further investigation proved the possibility of somatic responses affecting occasionally the germinal structures, it would only affect any theory of heredity which was based on the assumption that somatic and germinal elements were completely isolated. The purely selectionist position would remain intact unless direct climatic accommodation could be also proved to be a factor of importance. The objections to the selectionist theory do not appear, therefore, when examined, to be valid.

Finally, in support of the selection principle, certain positive considerations deserve to receive attention.

Firstly, there can be no doubt that selection by

¹ Alcohol seems to cause disorganisation of tissue, and mentally leads to crime through destruction of the higher brain centres. It is physically evidenced by gouty, fatty, and cirrhotic changes. Some of these defects seem to be inherited, but this is clearly not an example of use-inheritance but of tissue destruction 'followed, on account of this destruction, by non-inheritance.

man has been a most potent factor in adapting animal and plant characteristics to certain requirements, and no other similar principle has been or is now practically available for the same end.

Secondly, the opportunity for selection is universal, as universal as the evidence of evolution is, and this again can be said of no other theory.

Thirdly, no other principle is capable of being applied universally.

Fourthly, the action of selection cannot be excluded from any experiments, however made; for it manifests itself in so many forms that even food and inorganic environment are subject to its influence.

Fifthly, the resemblance between sociological and biological development is explainable if selection has been the guiding principle in both.

There would seem, therefore, to be no reason, theoretical or practical, for introducing any other theory to explain known facts.

The Primitive Characteristics of Protoplasm

In this section I wish to briefly recapitulate a few well-known facts and generalisations, which appear to me to lead to the conclusion that natural selection acting on variations has been the sole means of producing divergence and evolution in the organic world, that protoplasm is never really modifiable, although it may be and has been adapted to a marvellous degree.

In the evolution of organisms certain generalisations have been shown to be in the main true. From

the lower to the higher forms organisation tends to grow more complex and also more specialised ; this development consists in a qualitative and a quantitative change. In estimating the value of any theory which claims to be able to largely explain the process of evolution, this quantitative, as well as the qualitative, change must be kept in mind. If a study of the lower forms of life leads to the conclusion that even here elimination brings about adaptation, and that there is little or no evidence for modification of structure, while when we compare the higher and lower forms we find that the differences are very largely due to an increase in complexity, and that the qualitative difference is merely a further development or accentuation in the more advanced organism of a property which is always present in the less advanced, then it will be evident that the facts are largely in favour of a purely selectionist theory of evolution. That a study of the facts does lead to such a conclusion I shall now endeavour to demonstrate.

In the lowest forms of life we are confronted with a kind of substance (protoplasm) which manifests certain peculiarities which appear at first to distinguish it sharply from inorganic material. Protoplasm from its commencement, as far as we are able to examine it, appears to exist in two more or less distinct forms ; these forms are not sharply marked off, but more or less shade into each other, yet still are sufficiently clear and distinct to have led apparently to widely different results. These two forms have developed on their separate lines and

have resulted in the most important divisions of organic life, the animal and vegetable kingdoms; and the most marked difference between these two kinds of protoplasm appears to lie in the fact that one has to exist on comparatively complex foods, the other on comparatively simple. Excluding this and other differences, for the moment, from consideration, there remain three peculiarities which distinguish protoplasm from inorganic material: (1) It is extremely complex in structure; (2) it is remarkably unstable; and (3) it has the power, when placed under suitable conditions, of building up from its environment material similar to or identical with its own.

Lewes, Spencer, and, in a crude unscientific form, many early writers, have noticed certain resemblances between some kinds of dead and living material; these resemblances have steadily multiplied in number, while they have become far more forcible in character during the last forty to fifty years, so that many, perhaps most, scientists are beginning to assume, consciously or unconsciously, that purely physical and chemical causes are or soon will be sufficient to explain the lower and possibly also the higher forms of life.¹ Let us take first the peculiarities of protoplasm which are apparently most allied to chemical and physical phenomena, its extreme instability and complexity. Making a general statement of the characteristics of the chemical elements, it appears that they may be

¹ Verworn, in his *General Physiology*, gives a fairly complete summary of this position.

grouped into three more or less ill-defined divisions—those with marked affinities, others with very ill-marked tendencies, and a third intermediary division. Stability is usually associated in chemistry with simple molecular structure and satisfied affinities; compounds are generally stable when they are made up of elements which exhibit strong mutual affinities, combined in such a way that each tendency is more or less completely balanced by others. The more perfectly the elements are brought into contact, the more combination of these elements is accelerated, and, finally, there is an evolution of energy whenever the less stable passes into the more stable.

Chemical instability, on the other hand, is associated with weak affinities, great complexity, and a combination of elements in a form which by readjustment might lead to the formation of simpler and more stable compounds. As there is always an evolution of energy when the less stable passes into the more stable, there is manifestly a storage of potential energy in the unstable forms. The instability and complexity of protoplasm is therefore really not a difference from, but a resemblance to, non-living substances, because its instability and complexity apparently exist under similar, though accentuated, conditions to those cases where the complexity and instability are purely chemical. The distinctive characteristic of living as opposed to non-living substances, therefore, must be found, if it exist at all, in some other property of living matter, and it may possibly lie in the third feature that has been noticed, its power of maintaining

a constant mass of unstable substance under conditions which appear to make for disintegration of the substance; and we notice in addition another fact—namely, that while life lasts a continuous series of chemical changes, at some periods less active, at others more, but never entirely ceasing, are always present. Now in this perpetual chemical change some energy is wasted, and passes off into the environment in the form of heat, motion, &c. How does the organism get sufficient extra energy, not merely to maintain but even to frequently increase its complex and unstable substance? The extra energy might obviously be obtained if the organism continually assimilated more complex and unstable food than the ultimate products into which this disintegrated protoplasm broke down. In confirmation of this position it is noteworthy that plant tissues which have reached a much lower point of evolution than animal, and whose tissue change is less active, require less complex food than animals. For synthesis energy is required, and this could be obtained as above from the food material; in addition it would be necessary to have a very slightly conducting substance, such as we have in protoplasm, to prevent energy from being too rapidly dissipated, while every chemical reaction must be extremely rarefied, as any marked evolution of energy would obviously lead to the destruction of the whole organism. The essentials for the physical aspect of protoplasmic life would therefore appear to be, a certain small but constant amount of surplus energy which leads to a very gradual substitution of the

less complex into the more complex, and then the gradual breaking down of the more complex protoplasm thus formed, by equally gradual stages, into simpler products than those which had been utilised as food.

It seems, therefore, conceivable, supposing chemical and physical conditions to be favourable, that a purely chemical product might be found which would, if situated in a suitable medium, manifest synthetical and analytical changes without any additional force being required. As further movements somewhat analogous in character to the amoeboid have been shown to be obtainable by chemical and physical conditions alone, as in the experiments of Quincke, Bütschli, and others, and also the various phenomena associated with chemiotaxis, phagocytosis, &c., appear to lead to the same conclusions, it would seem that the earliest forms of life might be accounted for on an entirely physical basis.¹

In many forms of bacteria, almost all the above conditions are complied with; they do not include any special phenomena of movement, or show any marked reaction to stimuli. There is usually a special temperature at which they grow most perfectly, while below and above this their growth and metabolism tend to cease, and they will only grow on or in certain media. From a purely chemical standpoint, there is, therefore, nothing in proto-

¹ I have purposely excluded psychical phenomena from this consideration, as I know of no reliable standard, materialistic or non-materialistic, by which these can be estimated.

plasmic activity which suggests any new element; that bacteria thrive under certain conditions but not under others, being dependent on their powers of combination and subject to the laws of chemical change, is consequently easily explainable. It may, however, be urged that, while it is true that bacteria are sometimes influenced by some slight alterations in their environment, they are often capable of standing great extremes in other directions, and in this respect do not resemble unstable and complex chemical compounds; even this difference, however, does not hold, since there are many chemically complex and unstable compounds which appear relatively stable under certain conditions, while they are equally unstable under others. There are, therefore, a set of conditions associated with early primitive life, which—except for the phenomena of fission, which, Spencer has shown, is, like the other properties of early protoplasm, capable of a physical explanation—are all explainable by the laws of chemical change, osmosis, diffusion, &c.

There are, of course, many fallacies to which one is liable in dealing with such a question; thus the extreme minuteness of the organisms, and our necessarily imperfect knowledge of their life-history and structure, make it probable that any present-day explanation will be incomplete.

I only wish to note that this resemblance is likely to be at least partially true. That this apparent closeness of connection between chemical change and bacterial metabolism may appear to future generations less close than it does to us is possible;

still the increased knowledge of the higher organisms, the relation of food-supply to bodily exertion, the recent work on digestion, blood-supply, and tissue change, do not lead to a less but a more close chemical analogy; in any case the inference, as far as the present time is concerned, is in favour of a very close connection between the laws of chemistry and physics on the one hand, and the forms of vital activity on the other.

Now, as far as this inference has weight, it must tell against climatic modification in favour of climatic and inter-organismal adaptation, inasmuch as chemical elements have definite affinities, and enter into definite combinations in fixed proportions; and as any alteration in a compound, however complex, must proceed along definite lines, it follows that each form or variety of protoplasm, in so far as it is chemical in nature, can only grow and keep active by being fed by *certain* foods which it can make use of, and by being under *certain* conditions more or less favourable to its organisation; and when a sufficient number of these favourable conditions are not present, the surplus energy of the organism must in time run down, and the organism will die because it cannot utilise other conditions.

At the commencement of this chapter I endeavoured to emphasise the importance of keeping in mind the fundamental distinctions between accommodations which are the direct result of environmental influence, just as wood becomes altered in its composition by a sufficient amount of heat, and those other forms of accommodation which are the

result of the organismal response to its environment ; and I pointed out that only in the former set of conditions was it strictly correct to speak of acquired modifications ; and, further, that this somatic responsiveness was not in the least discordant with the principle of selection—it would, in fact, aid selectional development, making the process of evolution more rapid. Now, just as the chemical analogy tells against climatic modification, and in favour of use-development or organismal response, with elimination of the less responsive, so I hope to show in this concluding portion of the chapter that every broad generalisation tells against climatic modification, and in favour of organismal response ; and I shall endeavour to show that the somatic response becomes increasingly separated off from the germinal, not through any special isolation of the germinal products, but for precisely similar reasons as those for which other organs have become separated—namely, by increasing specialisation and complexity of structure.¹ For this reason I wish the reader to keep the following distinctions constantly in view : (1) The direct climatic response, an external influence or influences producing internal modifications ; except in so far as these external forces are destructive, I believe this influence to be negligible. (2) The response of the organism, whether it be uni- or multi-cellular, to external conditions and alterations that will ensue through elimination of the less fitted

¹ Lloyd Morgan, in his *Animal Life and Intelligence*, has put forward a theory of reproductive specialisation to which I am greatly indebted.

and preservation of the more fitted ; internal response to external conditions, and external elimination of the less responsive organisms. (3) The relation, if any, that the somatic response bears to germinal variability.

In considering the chief differences between plants and animals, we find certain more or less constant conditions which lead to the conclusion that protoplasm is not directly modifiable ; thus a broad general difference is found between these two great divisions of the living world in the fact that vegetable organisms live on simpler foods than animal. The fact that the fungi and certain insectivorous plants form a partial exception to this rule only increases the strength of the selectionist position ; for, from the fact that the vast majority of the various forms of vegetable life do live on simpler foods than animal, we may infer that the difference in the structure of the protoplasm was not easily overcome, while the constancy of the character of the exceptions, now that a change has been produced, is almost positive proof that, if organisms can be directly modified by climatic action, it must be to a very slight degree. The same line of argument applies to the other differences observable between plants and animals. On the assumption that this difference of metabolism is due to a structural difference existing in the protoplasm itself, that the assimilative power of an organism depends not on its environment but upon its structure, and that these structural peculiarities are never modifiable, although they may be adapted through elimina-

tion of unfit and less fit, and subsequent reproduction among the surviving favoured organisms, and repetition of this process until a better and better adapted organism is produced, we have an explanation which satisfactorily accounts for both the constancy and the variability of the many forms of plant life.

Again, the constancy of all low forms of life under varying conditions is often remarkable. In view of the fact that these unicellular organisms are not easy to keep under constant observation, that their reproductive power is often enormous, and that it is at present very difficult, if not impossible, to place them under test conditions to prove whether or no they are capable of being directly modified by changes in temperature, food, &c., it is worthy of note that the few recorded experiments have taken years, and not months or weeks, to induce any change in the organism; and this suggests elimination rather than direct modification as the main, if not sole, agent.

The science of bacteriology is surely strong presumptive evidence that no very rapid modification of form and habits is effected by altered conditions in these low forms of life. The constancy of the characters of diseases known to be produced by these forms of micro-organisms, and the fact that the bacteriologist can frequently tell by the form and behaviour of the bacillus, micrococcus, &c., what disease it will induce, and this in spite of the immense capabilities for modification under changed conditions, &c., that its habits afford, are all arguments against direct climatic accommodation.

Another point which appears to me to throw very considerable light on the subject is the behaviour that all organisms, as far as I know, without exception, exhibit towards their environment. Local conditions of light, heat, food-supply, do not appear to modify organisms in a certain definite manner, as one would expect were direct climatic accommodation possible ; on the contrary, the action of every organism, from the lowest to the highest, appears to be selective to its environment, the response of certain internal activities to outside conditions. Recent observations made on the phagocytes of the blood show that the determination of their movements is partly chemical, that they move away from some and towards other products ; their action is selective. Plants living on the same soil do not make use of the same material, and it is perfectly extraordinary what minute quantities of a substance can be utilised if it be needed by the organism. Iodine, and its selection from sea-water by some forms of sea-weed, is a case in point. Precisely similar results occur in the animal kingdom. The same choice of food is manifested in different animals choosing different foods ; the same blood circulating in the body of one animal yet has different substances extracted from it by different tissues. Wherever we look we see life display this selective action towards its environment ; if the materials that supply its needs are not present, the organism dies. This constant and universal tendency in living tissue to select out of many substances its own particular foods is not favourable to any theory of direct

climatic modification ; it does, however, favour the principle of selective adaptation.

The phenomena grouped around reproduction, in so far as it consists in conjugation and sex differentiations, seem to me to be explainable only on the assumption that protoplasm is scarcely, if at all, climatically modifiable. The simplest form of reproduction is that of simple fission ; the single-celled organism in which it occurs splits into two or more divisions. Spencer has suggested that the reason for this division may be that, unless very exceptional conditions of growth arise, there will be a constant tendency for volume to increase relatively to surface, and consequently that a point would at last be reached when certain portions of the cell would be insufficiently nourished. To decrease bulk and increase surface division would be necessary. Such a theory of fission, formed on mechanical grounds, offers no difficulty to selection or other theories.

But if the relation that bulk bears to surface determines fission, it follows that fission will be favoured, as we have seen, by poor food-supply and by rapid metabolism ; while the opposite conditions will favour slow metabolism. Under the first set of conditions a small rapidly dividing cell would be favoured ; while conditions that favoured slow metabolism would produce a large cell. On any system of climatic inheritance, the structure and needs of the organism would be modified according to the environment : hence one can see no need for conjugation. On any hypothesis that relies mainly or

wholly on selection, it is, on the contrary, easy to understand that union of two nearly allied individuals would tend to preserve the stability, in so far as they were allied, and would promote variability on the unallied smaller portion. There would be as a result an increased number of possible variations to select from, and those organisms in which conjugation occurred would be more likely to survive under all conditions, as they would always tend to adapt more readily. A certain limited unlikeness in the two cells which entered into combination would be favoured by natural selection, in order to preserve this necessary variability. This unlikeness might be the beginning of sex differentiation. That conjugation occurs at all may be explained in part by the fact that all living tissue has a certain selective affinity (and in this it presents many analogies to non-living) for what it has need of. Conjugation might be merely the satisfaction of an organismic need. The fact that the male cell is in some cases attracted to the female by chemical products¹ is some confirmation of this view. Conjugation would thus be allied to the phenomena associated with assimilation.

So far, therefore, the evidence appears to be in favour of protoplasm not being at any period directly influenced by climatic conditions. Protoplasm everywhere exhibits a tendency to select its food from its environment; and when it is unable to obtain such food, or is subject to conditions of environment

¹ Hertwig's work on *The Cell* gives a brief *résumé* of some of these cases.

which are unsuitable, it appears not to be rapidly modified, but is apparently eliminated. Protoplasm manifests in its different forms considerable resemblance to the more complex non-living chemical products ; and this, so far as the inference is justifiable, points to the conclusion that certain conditions are essential for its development, that different forms of protoplasm require different conditions of environment, and that when any organism is not in sufficient harmony with its surroundings, it is unable to live, and is therefore eliminated. The constancy of the differences of the early forms of life would seem also to lead to the conclusion that protoplasm is never, or at most with extreme difficulty, *directly* modified by external influences. Lastly, the facts associated with conjugation and sex differentiation are apparently only explainable on a pure, or nearly pure, selectionist hypothesis.

Turning to another aspect of the facts relating to life, we find that while very considerable specialisation may be developed in unicellular organisms, yet when these organisms multiply they do so with very little alteration of the mother plasm, reproduction consisting in the separation of a portion of this mother substance, this portion, whether small or large, becoming a separate organism.

In multicellular organisms, on the other hand, we see, besides this method of reproduction, another kind, which very early in biological evolution takes precedence over the more primitive method. The younger organism is developed from a structure that is not represented in the adult form, and the younger

organism begins to closely resemble the older only after a period of development. In what respect is this latter kind of reproduction superior to the former? In the hydra we have an organism in which these two types co-exist. A new organism is sometimes developed as a simple outgrowth of the mother substance, develops a mouth and tentacles, and with this new mode of obtaining nutriment gradually loses its connection with the parent organism and becomes independent. In other cases we find interstitial cells collecting into groups at different parts of the organism, in some of these groups the inner cells becoming slightly altered in shape, and developing thin, ribbon-shaped pieces of protoplasm or tails, by the aid of which they become capable of considerable powers of movement, and thus provided escape from the hydra into its surrounding medium. Other groups of cells undergo a different change: one cell, again occupying an internal position in the group, enlarges at the expense of the surrounding cells, and when it has attained a certain size ruptures from the capsule which surrounded it, extrudes two nuclear portions of its substance (polar bodies), and if one of the smaller active cells comes into contact, and fuses with it, it will commence a series of cell divisions accompanied by increasing growth, and develop into an adult hydra similar to its parent. This sexual mode of reproduction very rapidly supplants all other forms; it is probable, therefore, that there is some immediate advantage resulting to the organisms which reproduce in this way rather than by budding. The most obvious

difference in these two methods is that there is a great reduction of tissue material, much less being required for this mode of development than the other; it is therefore less expensive to the parent organism. Apart from this there is the additional factor that it would be the most suitable for development, if direct climatic accommodation does not take place, owing to its being the best means of obtaining the requisite amount of variability. This reduction must presumably be largely quantitative and not qualitative, since we find that under very dissimilar conditions a complex hydra can be formed, provided portions of both ectoderm and entoderm are preserved.

Now, where this sexual mode of reproduction arises, we have to consider a new set of conditions; we find that each individual appears to go through a stage of development, maturity, and decay, and that during maturity the reproductive power of the whole organism is best developed.

Perhaps one of the most striking facts associated with the higher forms of life is that these three periods of growth, maturity, and decay in the whole organism do not correspond in time to similar periods in the several different parts of the organism in question. This fact appears to be universal in its application; how is it to be explained? Now, as I have already noted, the most marked difference between unicellular and multicellular reproduction consists in the fact that the latter develop chiefly by a quantitative evolution from a cell which is quantitatively undifferentiated, while the former reproduce by splitting

off a portion of their structure, so that in most particulars, except size, the parent and the offspring are identical. Now, one of the peculiarities of development and growth in one of the higher organisms is just this quantitative development, yet we must assume that the morphological element is present, for it is inconceivable that actual differentiation of structure could arise without some structural difference for its starting-point. We are bound therefore to assume two positions as essential to development: (1) Some basis for the differences that are found in individual development which must be of a structural and not a physiological nature, whether we call them gemmules, physiological or morphological units, biophors or stirp; (2) that development consists largely in a reduplication of parts which at the time of fertilisation are somehow or other qualitatively represented in the fertilised ovum.

In development every organism passes through a series of stages which are more or less proportional to its specialisation and complexity, and the definite stages are passed through in a definite order, the highest specialisations, except where definite atavistic or degenerative phenomena intervene, always coming at the later periods of development. When decay sets in in the organism we not uncommonly find that this order is reversed, the higher being the first to disappear, just as they were the last to come. In the action of many drugs we see the same tendency; if their action is general, the highest nerve-centres go first, the lowest fail last. Now this sequence in development, since it is so universal,

must serve some purpose. The very early stages of segmentation appear to be little else than quantitative in character, but later qualitative differentiation begins to be manifested. The study of life in recent years has shown conclusively what an enormously important part the various products of tissue metabolism exert over life; the toxic and anti-toxic theories in disease, phenomena associated with internal secretion, the influence of vegetable alkaloids on different animal tissues, &c., all go to show that tissue activity is very dependent on its surroundings for its activity. Some facts of embryology lead to the conclusion that some organs have an almost purely developmental significance, and are of little use to the developed organism. We know also that organs vary in their relative importance and size to the whole organism at different periods of its development. How are we to explain the cause of this atrophy of some organs while others are developing, except on the assumption of a chemical food sequence? If we assume that, with a growing specialisation, itself induced by the liberation of metabolic products in the preceding stages, there is a growing specialisation of ferments and other material necessary to a more developed organism, and as a consequence a growing specialisation of all food material, we shall have a theory in accordance with facts, and which can explain many otherwise incomprehensible phenomena. The more specialised the food products circulating in the organism, the less favourable the conditions for the more generalised tissues; hence the progressive development of some

tissues, and atrophy of others, would be explainable.

The sequence in development would then be itself understandable, as the higher could only be developed from the lower through this sequence; hence the necessity of recapitulation of the ancestral types in development. Rudiments would on this theory disappear in proportion to the generalised character of the rudiment as compared with organismal specialisation, and this would apply to germinal and somatic development. On this theory the whole organism would continue specialising so long as the morphological elements allowed of further differentiation; when this limit of specialisation was reached the organism would arrive at maturity, and, so long as each tissue remained proportionately active, health would result, but when this balance failed degeneration and disease would follow.

We come now to the concluding question, the relation that germinal development bears to somatic.

As an organism reaches maturity, the phenomena associated with reproduction become manifest; this fact is practically universal, it holds good for multicellular and unicellular organisms alike, and for both the animal and vegetable kingdoms. In unicellular organisms, as we have seen, it is probable that there is a mechanical limit to the size of the cell, beyond which growth as a single cell becomes impossible; this growth limit will not be the same under all conditions, but must ultimately be reached in all single-celled forms.

In the metaphyta, under suitable conditions,

there appears to be a nearly constant tendency to growth at any place where a breach of continuity is formed in a living tissue or tissues ; in the lower forms of metazoa removal of a portion of tissue is nearly always followed by growth of the remaining, so that more or less complete repair results ; in the higher animals, on the other hand, this local reparative process is much less complete, yet even here some attempt is always present.

The fact that removal of tissue tends to produce activity and growth at the seat of injury suggests that possibly some mechanical limit to growth is one of the causes of cessation of growth.

The inferences so far necessary to determine the relation that somatic development bears to germinal may now be summarised as follows. I have endeavoured to point out that facts do not favour direct climatic modification, and I accept the Neo-Darwinian conclusion, and believe that there is very little evidence for the transmission of somatic responses. From a study of facts which have universal applications I have endeavoured to show (1) that growth and reproduction are in some way closely related ; (2) that facts justify the inference that an increasingly complex food sequence prepares the way for morphological quantitative specialisation ; (3) that some morphological interpretation of heredity is necessary to explain the facts. Some such provisional theory as the following would, I believe, explain the facts of heredity, growth, decay, and certain facts which have reference to disease, better than previous theories :

1. That there is a mechanical nutritional limit of growth for each cell, that this bulk limit varies according to physical conditions and food supply, but is reached sooner or later by all growing cells (Spencer). When this limit is reached, cell division takes place, which may be equal, as in fission, or unequal, as in budding, &c.

2. Under conditions which demand variability of the organism, conjugation of similar organisms placed under similar conditions would be favourable for the attainment of this requisite variability. If protoplasm is never directly modified by climatic conditions, then the best chances of survival and adaptation, either to old or to new conditions, would be through conjugation. Selection would therefore favour conjugation (Weismann).

3. If for some reason, possibly nutritional in origin, fission in an organism had not been quite complete, and the cells instead of separating had remained together, then as each new division reached maturity it would divide and the process of division would continue till interfered with by some outside condition; many different forms of these masses of cells would thus be produced, examples of which may be found in the different forms of sponges. Now, if for any reason a curved single layer of cells were formed, it would go on growing in all directions until it met other cells of the same collective cell colony; a multicellular growth limit would thus be reached. Now, assuming this growth capacity to remain constant, one of three things can happen. With a somewhat irregular hollow sphere of cells, it

would be conceivable that : (1) a bending in at one of the weaker points, or (2) a bending out would occur, many cells being involved in this yielding ; or (3) each cell might bud off a certain portion independently. Of the first or outward yielding, and the formation of buds, we have many examples occurring in nature, as, for example, bud development in the hydra ; of the inward yielding, the passage from the blastoderm to the gastrula stage, through the process of invagination occurring in the development of many animals, affords an example of the second means of satisfying this growth tendency ; while in the third case division of the individual cell, and separation from its parent tissue, occurs in the formation of red blood corpuscles in mammals, &c.

4. It is obvious that the general structure of the organism would be least disturbed by each individual cell throwing off buds, and therefore the more specialised the organic structure the less likelihood of those organisms reproduced by any collective alteration of the organism surviving. With growing specialisation each tissue will become less and less able to reproduce other than its own specialisation, hence reproduction will occur only when the buds from the requisite differentiations meet ; now, in the case of the hydra it appears to be only necessary to have representatives of two classes of cells, the ecto- and entoderm, and these thrown-off portions of cell structure would, when the requisite number met, owing to perhaps some stronger growth tendency, tend to push up the cells above them, and as the

most likely place for the ectoderm and entoderm units to meet would be *between* these two layers, we should expect development to commence from this position. With increasing differentiation reproductive centres would tend more and more to be localised to one centre. Hence with increasing specialisation there would be progressively less power of local or somatic reproduction.

5. A special kind of organism survives for two reasons: (1) because it is suited to its environment; (2) because it can reproduce similar organisms in sufficient number to maintain or increase its relative position in its surroundings. The more perfect the organism the less its chance of elimination, consequently so long as its reproductive power is successfully maintained it is to its advantage if it can reduce to a minimum the loss incurred by the organism in successful reproduction; it will follow, therefore, that the cells which throw off least reproductive material from the adult structure will require less nutriment, and therefore the collective organism will, other conditions equal, survive under competitive conditions. For this reason protoplasmic growth will be reduced as far as possible when beyond the needs of the organism, and the reproductive buds or units from each cell will tend to be reduced both in size and number. For these reasons it would obviously be of advantage if merely the morphological elements were extruded from the different cells,¹ and

¹ In the extrusion of the polar bodies from the ovum, we may possibly have an instance of what on a smaller scale is universal among multicellular organisms.

these when collected in the reproductive centre would form the material for the new individual.

6. As differentiation of reproductive function continued running a parallel course with other specialisations of structure, natural selection continuing to favour the best-formed individual and offspring that environments could allow, two tendencies would become manifest: (1) a tendency to reproductive economy, by which every unnecessary development would be eliminated so as to make reproduction a less and less expensive process to the organism; (2) owing to increased complexity, specialisation, and evolution of structure, reproduction would become a more and more delicate process, and would constantly have to be conducted with increasing care, and the stages of development of the organism would therefore become increasingly prolonged. The development of the individual, and the capacity of that individual when developed for competition with other individuals, would form two partly competing and partly complementary elements of race progress, and the resultant of the two would correspond to the line of progressive adaptation and development. With the increasing length of the period of development differentiation of sex becomes first an advantage and then a necessity.

7. A progressively specialised method of food supply will be required to keep pace with the other specialisations.

In applying these conceptions to the interpretation of phenomena, certain points must be specially emphasised :

- (a) Every important specialisation of structure must be represented.
- (b) As, however, one of the causes of evolution of structure is quantitative complexity, it follows that every quantitative element need not be represented, but only the right proportions preserved between the various qualitative specialisations.
- (c) Reproduction on this theory commences when full, or nearly full, development of a structure is reached, when its growth capacity is in excess of its demands. From this it will follow that the reproductive units will be collected in the reproductive organs in the order of their evolution.
- (d) A progressively specialising food-supply would determine the development and the atrophy of the different reproductive units.
- (e) The later a specialisation was developed, either in the history of the species or the individual, the less chance of its obtaining a foothold in reproduction; and, conversely, these must be the first to be eliminated under stress conditions. It will follow from this that the effects of use and disuse, in so far as they are of a somatic nature, will be very little, if at all, transmitted to the germinal structures, since development, in so far as the major part of the organism is concerned, will be completed early.

The first advantage of a theory like the preceding is that it has no need for the supposition of any isolated germ structure, use-inheritance being largely negated by specialisation. The relation of germinal to somatic development is on this theory understandable. It would account for recapitulation in development, not on the ground of a tendency in the organism to repeat certain ancestral characters, but simply as the necessary preparatory specialisations out of which the later ones are built.¹ It would divide all anomalies into—(1) those cases of faulty representation due to the missing of some prior stage in development, as in the case of cretins, where the morphological element is present, but the means of developing it is not, or where there is deficiency of the element itself, as possibly happens in the case of mongoloid idiots ; (2) disproportionate representation (quantitative anomaly), leading to dichotomy, &c. ; (3) under rare conditions the reappearance of real ancestral characters.

If, therefore, the recapitulation theory has a different meaning from that of ancestral repetition, and if most cases of so-called atavism can be explained on the assumption of incomplete development ; if it is further borne in mind that, given the power of segmentation, then all that is chiefly required is a proportionate representation of germs, then the complexity of the germ plasm, although very great, need not be so inconceivably great as that which involves the representation of a large

¹ In a limited sense, however, these stages would represent the history of the individual ancestral line.

number of ancestral as well as all living characteristics. Normal sexual reproduction would, on this theory, be the right principle for selection to rely upon, since the male and female lines of heredity would be largely in harmony over the earlier stages of development, the tendency to vary being increased towards the later stages. Thus the requisite stability and variability would be largely obtained. Finally, this theory involves no very great assumption ; it is, when examined, very little more than a series of inferences drawn from peculiarities of life that appear to be nearly or completely universal in application, being dependent solely on the assumptions of mechanical and chemical limits to growth, the latter being no longer an assumption, but an established fact in some instances ; on the innate capacity for growth, qualitative and quantitative specialisation ; and upon the conclusion that protoplasm is never directly influenced by climatic conditions. The theory of coincident variability and the non-inheritance of acquired responses would equally accord with this theory as with Weismann's, while it would account for those cases of modifications which have been effected during the early stages of development.

In conclusion, I have endeavoured to show reason for believing that the principle of selection, when rightly viewed, is the only theory which is capable of explaining the various phenomena in their entirety ;¹ that the properties existing in the lowest forms of life do afford sufficient material for natural

¹ Mendel's principles, if true, do not weaken this position.

selection to act upon ; and therefore, until it can be shown that another theory is in more complete accordance with the facts, that natural selection must be regarded as the dominant factor of evolution.

The conclusions to be drawn from this chapter prove how little our present life conforms to biological principles which ought to be practically, and are scientifically, its *natural* foundation.

1. Natural Selection is the only theory that makes the *progressive* development of the living world comprehensible, and the more closely it is studied the more its *universal* power is recognisable. There would seem to be no aspect of existence where the living responding organism is not subject to its control. From the more limited climatic to the more extended inter-organismal, inter-industrial and international forms, its action is never ceasing.

From birth onward—perhaps even pre-natally—there is no period of a child's or of an adult's life which is not tested by the particular environment in which such an individual lives, in regard to individual surviving power. Further, be it remembered, this environment may be beneficial or evil in its character, may be actually or relatively aiding or stultifying any given person in desiring higher or lower living. There is something indescribably awful in this thought. Actually at this time, in the twentieth, as in the preceding centuries, there are probably amongst us human beings who are failing in business, and dying from disease, because, and only because, they are nobler, more self-

sacrificing, more intelligent and more refined than their fellow-man.

How long would public opinion be indifferent to the social atmosphere of the nation in which it arises, if it once realised that this atmosphere *determines* who shall survive among the millions born in each new generation?

If individual fathers and mothers *felt* that, as the smaller but intenser surroundings of the home and the larger of the community are noble or ignoble, so will those children that are noble live and succeed or be crushed out and perish, and the ignoble be eliminated by higher surroundings, or survive and multiply in lower, would they remain as now carelessly apathetic? If so, humanity is inevitably and justly doomed; but to believe this is to believe the inconceivable, for man *is* progressive.

Henceforward, therefore, environment, in all its multiplicity of forms and multiplicity of influences, will be the transcendently important and worthy study and occupation of life; and its influence, as it gradually takes its rightfully supreme position, will infuse all subsidiary subjects with the sense of its greater end. This is the first lesson that biology has to teach to its sister science, sociology.

2. No organism is capable of being modified by what environs it. However much any one feature predominates in the surroundings over others, it yet has no power over living forms brought into contact with it except to debase and destroy the unsuitable, leaving the fit to survive and compete among themselves for a still higher survival and reproduction of

a higher or perhaps only a more specialised type. Like produces like with absolute fidelity. From the fig seed, the young fig tree, varying only as fig trees vary and because they vary. From the navy father and a mother *naturally* suited to a navy life only navy sons and daughters, some more, others less like, as they inherit in varying degree better or worse features in their parents' constitutions formed by countless selections of the successful, after countless rejections of those that have failed. From the lovers of higher life only children who love it too, some more, some less; from fig trees, figs, though some may be ripe and full flavoured; and others poor and ill nourished, and from the thistle, thistles.

Do we understand this terrible truth that modern science has laid bare, but which has been half-realised for centuries?

Do we know where we are drifting when we allow the loafer to breed from lust, while true men and women struggle desperately for a bare pittance, and are compelled to marry late, perhaps mistakenly, through enfeebled ideals, because the wealth-seeker likes sweated bread, sweated clothes, aye, even sweated thoughts and feelings, and that thus the loafer is happy where the citizen starves?

Do we know that weeds will grow in flower gardens, and that the flowers will die because of them? That the great mind is choked and stifled when compelled to live in alley tenements, work with alley workers, and exist on an alley wage? From the citizen, citizens; and the loafer, other loafers.

3. In any progressing set of conditions specialisation to ensure fitness is necessary, but this means that generation by generation an increasingly definite direction must be given to each organism existing under them, and because of this definite character there will be less variability. Yet it is only through many variations arising and a few of these being selected that progress can be ensured. But the necessary definiteness of structure and the necessary variability are both requisite, although seemingly antagonistic to each other.

Like, however, only produces like, so that if reproduction were unisexual the child would never advance beyond the parent. On the other hand, if one living form could share parentage with another of widely different organisation, the variations of the offspring would be so divergent as to be unselectable. The parents, therefore, must be similar along the main, and even most of the minor developmental lines, in mental and bodily growth, and yet sufficiently unlike to produce children differing from themselves to an appreciable degree.

This end can be, and is, obtained by sexual divergence. The specialisation of sex in each species, *Man not excluded*, is, therefore, probably of incalculable importance, affording evidence of possibility for further development and improvement, owing to the greater opportunity that is given for variability in healthy and progressive directions.

Sexual differences are important not merely, nor even mainly, on account of the value of reproductive specialisation, but rather because female and male

predominance pervading *the whole organism* is of supreme value in racial evolution. Quite apart, therefore, from the enormous value of the manly and womanly types of mind in their power to influence the course of social development, there is the not less valuable result obtained of making it possible for every succeeding generation to be, if environment permits it, mentally and physically of greater *human* worth than its predecessor.

Lastly, evolution teaches that every change to be healthy must be sufficiently rapid to be vitalising, sufficiently slow to seem natural to the mind, so that it can be readily assimilated, and should lead easily and by gradual transitions from older defective ideas to newer and more valuable ones.

If we attempt to ask ourselves the meaning of these considerations on life at the present day, it becomes evident that much that we have been accustomed to is obsolete, where it is not actively hurtful and transitory in its nature; while familiarity from infancy with evil customs has made us blind to things that are in themselves transparently vicious.

If Natural Selection be the controlling principle of biological and social evolution, and if hereditary variability sufficient to secure adaptation to changing surroundings can only be obtained through *survival* of the favoured types—and permanently by no other means—then it is clear that all tendencies that promote evolutionary selection ought to be fostered and those which help devolutionary checked. Yet the now obsolete feudal and the irresponsibly

wealthy classes of to-day are allowed to exert their unjustly large influence without let or hindrance, in spite of the fact that this scum aggregate forms the strongest bar to advancement.¹

The hereditary claim is based—where it makes any pretence to an honest and logical assumption at all—on the permanent superiority of a class of individuals. This cannot be justified.

With changing environment, and evolution of all social surroundings, an altered selection and an altered type are required, and therefore the upper classes in healthy national existence should be constantly and everywhere interchanging less fitted individuals of their own with those more fitted from the lower sections. Under an hereditary system this is impossible. The even more puerile contention that wealth is in any way associated with intelligence, either approximately in general terms, or in degree according to amount possessed, is too absurd to require serious refutation.

Yet, in spite of the rational and ethical weakness of their position, feudal and monetary scum classes exist. That they are tolerated proves how little modern civilisation is even now beyond mediævalism in its ideals, and explains why humanitarian influences appeal to disputants with so little force in commercial and international transactions. It further affords a solid reason for the continuance of the Monarchical system on a reformed basis till

¹ A large number of scientists and sociologists have dwelt upon this evil in their works, and this is a distinct step forward, but public opinion is not yet sufficiently educated to demand reform.

greater intelligence in the people fits it for something higher; but this point I shall allude to more fully in a later volume.

At different periods, different capabilities are required, and different intellectual, moral, and physical standards are aimed at, and the standards which appeal to each age should be in the ascendant for that age if Society is to progress. This is true not only for civilisation and for each nation as a whole, but also for each profession and trade, and for each professional and trading man separately, and not least in importance for the home itself.

Ordered change (not *rigid* class customs) graded according to an ordered evolution, so that natural leaders are selected because of natural ability, is therefore the ideal which progressive life must slowly and steadily substitute for the monetary and the feudal.

Biology lends no support to privilege nor to the contemptible idleness and luxury of the parasitically wealthy and parasitically influential in our midst.

The environment must necessarily, however, favour inequality founded on natural divergence of powers—on account of the progressive specialisation of life—and it must therefore be largely anti-socialistic in aim. For the necessary inequality required cannot fail to be accompanied not only by differences in output of effort and power, which might be made to earn an equal social claim, *but also by inequality of life requirements, dependent upon inequality of disposition and desires, and these justly presuppose an inequality of remuneration in order to satisfy them.* So that by no means devisable

would it be possible to fix an *equal* general *citizen* value to this divergent individual life. Moreover, advance is in itself bound up with progressive subordination of lower to higher; it is therefore impossible to do away even in the home and private life with the idea of caste, while industrially, as State organisation develops, class rule must increase rather than diminish, but the supremacy of one growth over another must be on account of natural powers, and not by antiquated customs.

Further, genius has a social value, and the amount for each generation is fixed, to be wisely used or foolishly wasted according to the wisdom or folly of each state and nation throughout the world. Ruskin was, no doubt, largely right when he insisted on the impossibility of manufacturing talent, and asserted that 'a certain quantity of intelligence' is produced for us 'by providential laws,' and that we are quite unable to add to, though we might easily lessen, this stock of genius that each generation possesses. But science demonstrates that higher surroundings may, by selecting and favouring those who have greater aptitude and power than the majority of their fellow-citizens, create a still higher environment, which will require still greater talents from those living under it, and by this means the capacity of the average and exceptional persons of each succeeding generation will be largely increased.

To endeavour to secure the right atmosphere which shall favour the capable for each generation, and to know how to recognise, discover, and utilise talent and genius, while at the same time subordi-

nating the counterfeit, should be the dominant aim of those wishful to take part in the upward movement manifesting itself around us.

In the United States of America the death-rate of the coloured races is much in excess of that of the white because the environment is primarily a white man's. Less noticeably, but not less inevitably, the law of survival prevails in classes of any nation as among separate nations and races. The slum has its own death-rate¹ and its own selection, as the palace has, and the survivors will have survived, in each case, because they are naturally adapted to slum and palace vicious habits and modes of life, and to this extent both are a menace to the industrially surviving portion of the community, growing, if their environments are not *forcibly* changed, more slum-like, more loafing, with lower and lower tastes; more palace-like, more luxurious, more selfish, more debauch-desiring decade by decade. Individual reform of individuals is therefore useless unless scum and dreg environments are altered. So long as they are not, the wealthy self-seeker and the public-house lounge will live and breed in the surroundings which suit them, and our ideals of manhood will be proportionately debased by their desires. Capacity to socially utilise is the scientific as well as the moral test of social rights, and this capacity varies from year to year.

¹ The infantile mortality is at least twice that of the wealthier scum, and probably three times that of the cultured portions of the community.

Again, biology teaches that sex is one of the earliest as well as one of the most important specialisations. It is indeed doubtful if any cell exists which is completely devoid of sexual character.

In plants as in animals, in single-celled as in many-celled organisms, in lowly only less than in highly developed life-forms, sex is observable as a fundamental feature or series of features. When, in the advanced animal types, the reproductive organs become clearly localised and separated in their functioning from other organs of the body, sex, as an all-pervading influence, does not cease, nor even become mainly limited to one part, as one might expect, but becomes, on the contrary, more diffused and more intense, more dominating, as the animal occupies a higher position in the species and class to which it belongs. Sexual science, so *evolutionary* and *progressive* are its characteristics, might almost be defined as the study which is concerned with the *development* of life from the lowest organism, in its single-celled, primitive, and undifferentiated sex state, to the higher and more complicated forms in which sexual specialisation has attained its most marked and dominating influence. To treat this subject in any other manner than becomes one so progressively important is illogical. Its effects, therefore, on the whole organism of man in relation to mental and physical peculiarities, and the changes that it has been responsible for socially, must be sought out and examined—and not, as heretofore, disregarded—with the greatest care.

Everything that encourages *healthy* manly and

womanly ideals, that favours *natural* differences in dress, in occupation, in habits of life, as well as every influence that strengthens mutual respect for these distinct, but complementary, sex standards, and that brings boys and girls, and men and women more completely into each other's presence, so that they can realise and appreciate them more fully, should be fostered. For it is from the development of these ideals that higher home and industrial feelings grow, and also because these same differences have a special value in promoting the requisite amount of racial and national differentiation in the social body by increasing individual variability.

This power of social environment to select certain individuals, while it rejects, or partially rejects, others, coupled with the hereditary persistence of characters, so that an organism must die or cease to breed if its peculiarities are not to be perpetuated, makes the need for surroundings being kept sensitive to every higher influence vital. In educational science, in the general trend of industrialism, in the various ideals of the various arts, this principle of a continuous change in an *upward* direction must be constantly and always dominantly present. Any ancient dogma based on fixity of beliefs, fixity of scientific methods, fixity of art standards or of persistent-tone ideals in music, must be given up. As the environment should be evolving, so should the individual types existing be multiplying and becoming more perfect in it as it evolves; and, if the tastes of human beings are getting more human, they must necessarily be displacing old ideals by

newer and better ones. Hence upward paths rather than fixed goals will become the means of stimulating effort.

The physical standards of existence must everywhere be displaced and subordinated to the mental. Human beauty, womanhood, manhood, love, truth, honesty, and other similar conceptions must be mentally, not physically, visualised.

The laws of heredity establish beyond doubt a conclusion deducible directly from them which overshadows all others—the attainment of a healthily advancing environment which has one standard, and one only, that never changes; one which, on the contrary, must grow more firmly rooted as others grow less—namely, a belief, a faith, in time a religion, founded on the one great fact of life evolution, *progress*.

As in social science so in medical, the whole aspect of the subject is changed when it is looked at from the modern selectionist standpoint. For all individuals, according to this view, being possessed of a comparatively fixed organisation, which is in some manner favoured or unfavoured by surroundings, it follows that the study of differences in different constitutions or the mastering of the facts relating to the science of temperaments, on the one hand, and the relation that different environments bear to different temperaments, on the other, are the two fundamental groups of considerations upon which all subsequent medical superstructure must be built. Even now the risks in different occupations to differently constituted individuals is an important

subject dependent primarily on medical knowledge. With the multiplying of trades and professions and the minute specialising of industry, knowledge of the environment, and the form of men and women living in it, will be essential in order to determine what individuals will be best fitted for the widely divergent occupations.

We are thus led, for sociological and biological reasons, to a consideration of the varying characteristics of the individual, in the hope that this may form a basis for social and medical reform. To endeavour to discover what class, or classes, of citizens ought to survive because they are fitted naturally for higher social life, and then with the knowledge gained return to the question how to change the environment so that it shall select them, is the social aim ; while the medical inquirer desires to know what the individual is fitted to healthily labour upon, in order to advise each patient correctly as to the best manner of living.

The medical practitioner has the more general problem of understanding how the different temperaments can be occupied industrially to their own advantage, while the sociologist has to search for types that are liable to react favourably to a society growing more complex, more speedy in its working, and more mental in its methods, in which human ideals are acquiring more power, and the merely brutal less, and where manly and womanly sex differences are multiplying and intensifying. The study of temperament is therefore a necessary step to further knowledge in either direction.

CHAPTER II

TEMPERAMENTS

PASSING down any main street of a large city, any ordinarily observant man or woman can hardly help noticing the broad contrasts between the many individual human units that move in the great stream of coated and frocked persons drifting heedlessly, or occasionally curiously, by. To the thoughtful student of nature the problems presented are fascinating and intricate. Short and tall, fair and dark, here a firm athletic figure closely knit passes with swinging, easy stride, while after him, perhaps, a stout, greasy mass, who wobbles rather than walks, and all are alike bound for some destination. Nicely clothed or flashily plastered, dressed for comfort or in rags, pinched and haggard, or stout, well fed, and comfortable. This face thoughtful, truth-loving, and impressionable, that leaden and clownish. Some soddened with drink, some with the marks of vice manifested in every gesture, and others looking like hunted beasts, cringe past in their desolation. Animal, diseased, selfish, stupid; human, healthful, intelligent. In the right understanding of this monster multiform medley lies the secret of the only true

means of forwarding all that is worthy in modern life.

Here for sociologist and medical scientist is a problem whose solution must be sought in main street and side street, in the factory and on the farm, in the mansion and the bare existing room of the slum. What is the meaning of individual differences? Why do such variations exist? What end do they serve? How far are surroundings responsible for them?

There are many aspects to be considered in dealing with this problem. Is beauty of form found in all healthily *developed* types, and ugliness always associated with some amount of imperfection? If so, is there more than one ideal of the human figure? How far is the presence of ill health in any individual evidence of defective power in that individual's organisation? What amount of importance is the educationist to attach to these differences, in educating the young, and to what degree should these natural powers of each citizen be stimulated and utilised in industrial life? How far can divergence develop without interfering with the evolution of the common human manly and womanly basis which should itself be progressing in all persons irrespective of temperament, *as commonly understood*? To what extent can specialisation of industrial work be carried by methods of individual specialisation without endangering the worker's individuality? These are some of the questions that any study of the individual naturally suggests.

The subject may be considered historically, and

in this case the evolution of the varying ideas that have been formulated from age to age may be mainly valued, or the student keeping his attention fixed on facts and largely disregarding past theories can search for evidence of a non-speculative character. Each method, however, is incomplete if pursued alone ; and as the former plan of procedure is the less important and also naturally precedes the latter, it may be convenient here to briefly allude to the conclusions to be adduced from past workers in this field.

Primarily the study of the individual must to a large extent be dependent on medical knowledge. As the Art of Medicine has come down to us from prehistoric times, and is not even yet based on sufficiently solid principles to be thinkable and workable as a science should be, it is not therefore surprising that the theories of temperament are even more crude than those belonging to the parent study. Besides medical, however, artistical generalisations have had some share in arousing interest in this subject.

These two aspects of the history of temperament afford a curious confirmation of the danger of approaching any series of facts with any preformed notions to direct the course of investigation. Medical men have endeavoured to establish some rules for depicting the more or less perfectly or imperfectly formed groups of human beings, as if each group were a *distinct unrelated unity*, and that any person must necessarily belong to one group, or at least be mainly characterised by the group characteristics, and as a consequence little notice has been taken of

the many minute resemblances between one type and another, and the pictures have been made clear only at the expense of truth. The artist searching for an ideal of human beauty looked upon all human beings as if they diverged more or less from a fancied standard of perfection which he imagined he had deduced from nature. Both ideas were untrue.

Art very early in its growth appears to have formulated rules on human proportions. The ancient Egyptians had certain standards of symmetry to which they evidently thought men and women ought to conform, and Greek and Roman figures are generally modelled on some similar basis. Modern artists have followed with like plans, endeavouring to discover some unit which will prove that all parts of the body bear some definite relation to all other parts. Yet it is a striking fact that, in spite of the most diverse attempts of great students in this field from a Vitruvius down to a Topinard or a Marshall, there is no satisfactory law of proportion in existence by which the artistically fashioned form can be gauged, and yet all the while during the whole of this period of research great artists have succeeded practically where the others *have* failed in theory. Is there one ideal type?

Not less ancient beginnings are traceable in medical history. Hippokrates considered that four temperaments existed dependent upon the preponderance of one of four substances—blood, phlegm, yellow bile, or black bile in the body.

Innumerable modifications have been made by innumerable writers, yet none have proved satis-

factory or even added any new consideration to the problem till modern times. This is remarkable, for the subject has attracted the attention of some of the greatest thinkers and observers in the past.

It is not a little curious that as the evolutionary idea began to gain ground the first real advance in this subject commenced and continued till it was checked for the time by the knowledge of disease obtained through another channel—bacteriology—making the older study less profitable.

Sir Charles Bell made the first real advance in the study of man's form when he insisted that in order to understand what is essentially human it is necessary to know what is characteristically animal, so as to increase the former elements and decrease the latter, when depicting ideal forms of men and women.

Dr. Gregory, in pointing out the importance of the nervous system in determining the characters of one temperament, brought into prominence in another way the same truth. For the nervous part of man is that which most characterises him.

It is difficult to state precisely any time at which a change from the old humoral theory began to show itself; but as one advances from ancient to modern conceptions of this subject one finds the belief growing first that bodily organs, and later groups of these organs, and not theoretical fluid substances, account for differences of temperament, and this change, no doubt, corresponds with our advancing knowledge of the physiological conditions of the body.

Finally, Thomas Laycock's 'Lectures on the Physiognomy of Disease' (1862), and his 'Principles and Methods of Medical Observation and Research,' with Charles Darwin's 'Expression of the Emotions in Man and Animals,' and Francis Galton's 'Inquiries into Human Faculty' and 'Hereditary Genius,' mark the commencement of a new epoch—that of systematic observation.

Nevertheless, Jonathan Hutchinson's words may be repeated with truth at the present time: 'As yet I fear we must say that the labours of the physiognomist and those of the student of temperament have been alike disappointing.'¹

The medical like the artistical effort has, therefore, been abortive, and it is possible that the want of success may be due to some common difficulty. Now, the fundamental deduction to be drawn from the teaching of evolution is that of *a continuous progress*; is it possible that the ideal of beauty is progressive in human forms, in physical and physically expressed mental beauty as in human thought; is it possible that the temperaments vary age by age, and that in neither case are unchangeable proportions and characteristics to be sought? If so, new methods for the study of human differences must be adopted. If, as it would seem from the conclusions of the last chapter, it be necessary to accept the selectionist basis as the foundation of all biological superstructures, then it is clear that surroundings of the individual as well as individual peculiarities must receive attention.

¹ *The Pedigree of Disease.*

Now, as far as I am aware, no study of individuals based on a large number of observations, including sexual, racial, idiosyncratic characters as compared with the temperamental, has been made, nor have occupational and environmental influences on the individual during life been studied. The subject has almost exclusively been taken up either medically in relation to present types, and these mostly of one nationality, or artistically in reference to past works of Art.

As a matter of scientific interest the first question should obviously be, Do type characters exist? and secondly, if they do, Are they changing under changing conditions? Yet neither of these fundamental positions has been considered.

It is clear, therefore, that any analysis not taking these considerations into the general plan of the problem must infallibly fail, and the conflicting conclusions arrived at by older investigators is not surprising. The lesson taught by this brief historical survey is that any narrow method of research adopted for present inquiries must be doomed to failure as certainly as its predecessors.

The Rational Basis of Temperament

If an attempt is made to examine this subject on purely rational grounds, it is reasonable to suppose that relative predominance of certain tissues in the body will lead to relative predominance of certain individual characteristics.

This assumption is necessary whether we assume that mind and body are merely correlated, or that

mind is in some way either a phenomenon of, or connected with, matter. On *any* causal hypothesis the fact of the close correspondence of certain bodily and mental states with each other must be admitted, and this granted a relative preponderance of one group of tissues will be associated with certain individual characteristics, and these may be studied by the ordinary methods of modern science. It may therefore be assumed that the first question to consider is the manner in which the various structures are grouped, and next to observe what effect each of these groups is likely to have on the whole body considered physiologically and structurally.

The first obvious relationship of tissues functioning for one end is the sexual. Certain gland structures and certain subsidiary organs are definitely associated with the phenomena of reproduction. Further, throughout the higher forms of the animal kingdom certain characteristics bodily and mental *are* found associated with the preponderance of male or female reproductive organs. Rationally, therefore, the sexual system seems to form the first division of a rational classification of temperament. Besides this system there are in the body tissues connected with *motion*, tissues connected with absorbitive processes, absorptive or digestive,¹ tissues connected with distribution of food material or *circulatory* and respiratory, and lastly tissues connected with co-ordinating

¹ I exclude what might be called an excretory group, because, as I have explained in Chapter I., it is probable that all tissues are excretory, and also for the reason that the kidneys and skin must, in all healthy temperaments, vary their functioning according to the demands that each type puts upon them.

and responding to impulses or *nervous*. There are thus four other groups to consider: motor, digestive, circulatory and respiratory, and nervous. How far are these systems when relatively developed associated with temperamental characteristics? How far is this rational classification into six temperaments supported by facts?

Taking first sexual characteristics and the relation that these appear to bear to physiological and pathological physical and mental states, we have evidence:

Firstly, that the presence of active functionary testicles in some way or other does influence the growth of essentially masculine characteristics, and that, after removal of these organs in early life, the individual, though still of masculine build, appears to develop in a feminine rather than in a masculine direction.

This is also true of almost all higher animals, and similar evidence is supplied by diseased states and errors in development affecting this part.

Secondly, removal of ovaries even when this occurs late in life generally leads to changes in the individual of a masculine nature, such as growth of hair on the face and deepening of voice, &c. The same changes are often seen when the functional activities of the ovaries cease, and the climacteric period in woman is perhaps more generally than not associated with some change, often, however slight, of a masculine nature. In animals similar alterations in their organism show themselves under similar circumstances.

Thirdly, there would appear to be almost every stage of sexualism from pseudo-hermaphrodite individuals—in which in rare cases it is impossible to assert which sex predominates, and who are sometimes without sexual desire, and even without any marked manliness or womanliness of character—through feminine types of men and masculine types of women to the highest forms known on this earth, the real manly man and the womanly woman, both specialised physically and more important mentally for worthy human life. As moreover sexual divergence is an increasingly marked feature of progressing communities, it is additionally necessary to understand each of the two types.

There can therefore be no doubt of the existence of sexual temperaments, and their mental as well as physical significance will be considered later.

When, however, we pass from sexual to the other divisions which rational principles would lead us to expect to exist, the evidence is found to be *conflicting* and uncertain.

There is the general fact that among white races the conquering peoples of the past have been largely tall and muscular, and it might be assumed from this that motor activity and powerful muscles are associated with a combative type. The fighting qualities of man, as compared with less muscular woman, might be adduced as additional evidence; and some aspects of recent psychology which associate willing-power and doing-power together might seem to form further evidence in support of the contention. Again, the ancient Greeks and Romans,

when their power was greatest, believed intensely in athletics as a basis, almost the foundation, of natural development; while to-day the Anglo-Saxon, the most progressive race existing at the present time, is equally characterised by its love of bodily exercise. Unfortunately, facts when more closely examined do not bear out these generalisations. Muscular power and muscular skill are often associated with extreme cowardice, and small and nervously organised men are often distinguished by their intense fighting desires. It is difficult, therefore, to believe that any causal relation exists between motor bodily predominance and fighting capacity. And although the whole drift of civilisation is to protect the physically delicate and to lay less stress on bodily and more on mental powers, yet the civilised white man of to-day does not seem to have deteriorated in courage. It is true that the Anglo-Saxon does spend an unnecessarily large amount of time on the physical side of life; yet this excess is found mostly in the scum and dreg, the unproductive and inferior portions of the race, and therefore is not characteristic of it as a whole. The main body of the middle class are more seriously inclined. One cannot, therefore, assert that development of the motor system, with large bones and strong muscles, leads to any corresponding mind qualities which, *à priori*, one would expect it to. Neither can one assert that muscular people are peculiarly susceptible to any particular group of diseases or resistant to others. There is, however, a general and probably well-founded impression that fevers are more severe

in such people, the temperature being unusually high; but the tendency to excesses in eating and drinking may fully explain this. Even if true, it is by no means clear that this peculiarity is due to constitution rather than to habit.

Again, among white races it is probable that the darker, shorter peoples (Italians, French, Spanish, &c.), who approach the feminine type in relatively small chest capacity as compared with abdominal development, are more resistant to certain fevers, as malaria, and more prone to tubercular diseases, such as phthisis, than the masculine, fairer, taller, and larger-lunged Teuton and Scandinavian; and a similar parallel may possibly hold among darker races. So that there is slight, though quite insufficient, evidence in favour of abdominal and respiratory temperaments.

Therefore it would appear that the only satisfactory truths obtainable which lead to conclusions of a definite nature are those relating to the action of certain gland tissues on bodily growth, alluded to in Chapter I., and others which seem to point to co-ordination of bodily form and nervous organisation.¹ The first evidence of this has already been noticed, when facts in favour of sexual temperaments were considered.

There is reason to suppose that the Thyroid, Suprarenal, Thymus, Pituitary, and Renal structures each excrete some substance, which passes into the

¹ The nervous system has quite possibly its own internal secretion, and would thus be like gland structures in its organismal influence.

blood and exercises in some way wide influence over the whole body. I have suggested in the previous chapter that this is possibly due to some sequence of nutrition, and that all tissues in the body may not unlikely exert their own particular influence in a food-chain ; so that what is an excretory product to one tissue may be a nutritive product to another, and interference with this circle of activity may, by breaking the bodily metabolic series at one point, affect the whole system.

Whether this be so or not, there is now definite ground for associating Thymus, Thyroid, and Pituitary glands with development ; and the relation of the latter two glands to the curious conditions known as Cretinism and Acromegaly, and in a less definite manner Gigantism, affords some reason for believing that the science of temperaments may one day be definitely established on some gland-group basis.

The Cretin has a large abdomen, small limbs, short extremities, which are, however, stout and thick ; head relatively large and broad, and general physiognomy approaching to the Mongoloid type. Intelligence and sexual power are mostly undeveloped, and this state is associated with absence or disease of the Thyroid Gland.

Again, in Micromegaly and in the study of dwarfs the characters that seem to be manifested are relatively large heads with small jaws, and often with relatively short limbs and large bodies.

In giants, on the contrary, the height is mainly due to enlargement of the limbs ; and, as may be seen by reference to illustrations and specimens,

there is generally a very considerable development of the lower portions of the face. This is particularly well seen in the skeleton of O'Brien at the College of Surgeons.

Nearly the same facts are disclosed by a study of the disease Acromegaly. Not only are the limbs longer, but the hands and feet are large even in proportion to this extra height standard. In the face and head the main growth is seen in the superior and inferior maxillary bones, the lower jaw in particular growing to a strikingly noticeable degree. This growth in the face, as in the limbs, is not confined to bony tissues, because the nostrils, lips, and tongue enlarge and thicken, and even the ears may be affected.

Broadly, therefore, there are facts here which suggest that there are certain features of growth definitely associated with a motor or limb temperament, which, in the cases of giants and acromegalic patients, has run to great excess, whereas in dwarfs it has been slight, often almost absent. And tall and short individuals have unquestionably distinct traits of character.

There are, therefore, facts which definitely connect male, female, and motor temperaments with certain glands of the body. Further, it will be noticed that in more than one feature dwarf characters approach the female type, and giant and acromegalic the male.

In the size of the jaws, in the largeness of limbs with their large extremities the male and the acromegalic agree, whereas the short limbs and larger

bodies of the dwarf find some counterpart in the female form. The large head in the dwarf, however, is not, of course, a specially feminine characteristic.

Sex types appear to accentuate or weaken the characteristics of the long and short, giant and dwarf, forms of men.

Generally, also, the tall races conform to the male type, and the short to the female, as may be seen in a comparison of Latin and Teuton races.

But there would appear to be no known reason why the tall type should thus resemble the male, and the short the female.

The facts that have relation to the development of a nervous form may now be considered; but, unlike the above-mentioned evidence, it rests on an observational rather than a physiological basis.

It has long been noticed in England that the John Bull type of Englishman is disappearing. Whether we look at portrait galleries like Hampton Court and the National Portrait Gallery, or turn over illustrations in old books, whether caricatures or not, it is evident that some physiognomical change has been taking place. The stout, plethoric, muscular, ruddy-faced man of stolid expression is becoming exceptional, and his place is being taken by a thinner, more alert, active type. What is the explanation? It is the same in the United States. The modern face is more keen, leaner, and of less coarse mould than that of the older pioneers who laid the foundation of their country's greatness. Portraits of old French, German, and Italian people

reveal, though to a less marked degree, the same fact.

What is seen in the men is equally obvious in women and children.

The stout mask-like contented type is dying out everywhere, wherever civilisation exists, only more slowly in backward countries. At the present time the manual worker is most like his predecessor, and the average brain worker least. For this reason, and because of the widespread evidence from old portraits in all parts of the civilised world, the change must be accepted as being too general in character to be due to any fashion or custom, or manner of living or habits among painters of portraits.

Is this change real or fictitious?

There is nothing inherently unlikely in the assumption of such alterations in men and women. We have evidence that the type of to-day is very different from past forms of man *if we go far enough back*. Broadly, too, the savage now existing has everywhere signs in smaller cranial capacity and in general formation of face and head of a lower organisation than the civilised man. Within the last 150 years, short as the time undoubtedly is, vast economic changes have taken place. There is evidence, too, that contact of savage and civilised man leads to a great destruction of the former till some imperfect equilibrium is reached. There is nothing, therefore, improbable in the assumption that economic changes are resulting in a destruction of the less responsive types and a preservation of those

more adaptable, and later a still further selection among the children of the selected parents owing to a progressing environment.

What are the known facts upon which conclusions may be formed?

The first factor of importance to consider is that Natural Selection has ample scope to produce a modified type in the variety of material open to it to select from. The more carefully that one studies different organisations, the more divergences and differences are manifested. From the quick alert child to the one generally stupid, from the child with early developing bent to one with scarcely any preference at any age, from the vast differences in capacity everywhere manifest, it is clear that material is available if it only be utilised. (See Francis Galton, 'The Human Faculties,' &c.)

That some sort of selection does take place may be seen from the fact that in children under one year the death-rate is exceptionally heavy, and, although diminishing rapidly from this period with however minor variations to adult life, it is even for the most healthy periods always an appreciable one. If for the first thirty years of life the death-rate were practically negligible, it would be evident that environment would have very little chance of selecting its desired types. The facts, however, being quite otherwise, it may be worth while to consider briefly how selection would be likely to affect a population composed such as ours now is as compared with former states.

Taking town life as contrasted with country life,

there can be little doubt that on the whole it is less healthy for all classes of adults. The death rates in the main prove this, but the death rate is greater and the health is poorer in densely packed poor districts. We have therefore to take into consideration two features: (1) the increase of town life and the rise of machinery and its accompanying conditions; (2) the differing effects of such conditions on the comfortably situated and the poverty-stricken.

As a result of *essentially* modern conditions there is a greater nerve strain, and a greater selection of mentally fit in a multitude of different directions. It is inevitable that some change in the direction of weeding out the incompetent must be taking place, and prisons and asylums all over the advancing parts of the world prove it. This greater demand on the nervous system may possibly affect injuriously the stability of the organism, and the growth of chronic diseases of such a nature as cancer may be in part the result of such advancement, though even if this be so, means must be found for combating them.

The other inevitable general fact of advance is the increasing risks of spreading diseases of an infectious nature by the greater rapidity and ease of communication. This is already being counteracted by isolation and notification of disease, and the remedies will probably fully keep pace with the growing requirements, though this field of medical activity is likely to become an increasingly prominent one.

As a particular cause affecting particular groups of the nation, the occupational risks of the people in the working hours of the day varying, owing to improvements in old trades and the rise of new, from year to year, are a factor of vast importance. Factory and workshop legislation has already made creditable advances in this direction.

Whether enough attention has been given to private individual habits—such as street shouting and lumbering noisy vehicles, station noises, spitting in the highways, drunken men and women in public thoroughfares, &c., which are dangerous to the community—is more than doubtful; but even here improvement is commencing, and it is not unlikely that before long further extensions of the tendency may take place, and public musical performances in parks and streets may be controlled by municipal powers, and even ugly buildings may be in time prevented from being erected, so that æsthetic considerations may at last be valued practically.

But growth of machinery, multiplying employments, and general surroundings are conditions affecting all more or less equally, though even these influences can be more readily avoided by the wealthy than by the poor. And, moreover, to consider these conditions adequately requires much more extensive treatment than can be given in this volume.¹ To do so completely it would be necessary to understand the special risks of each of the hundreds of different occupations, and also how these risks

¹ In subsequent portions of the work I shall again refer more fully to these considerations.

are likely to be modified and developed in future times. After the conclusions on this subject have been mastered, it will be necessary to advance one step farther and trace out how these complex tendencies affect individuals (men, women, and children), and how marriage between those of similar or dissimilar occupations will check or foster qualities good or bad in each class, and in the nation as a whole. While, therefore, the subject is too intricate to deal minutely with here, it may be well to note certain broad conclusions deducible. Increased rapidity in all aspects of life is beyond doubt inevitable. Greater speed in travelling, in conducting business, in writing and quite possibly in reading, must make *a quick responding type an absolutely inevitable feature in the future*. On the other hand, the need for pioneers of new movements, and the greater delicacy of ideas essential in higher employments, will make a delicately susceptible refined form of mind and body requisite. Finally the growing complexity of social interactions will favour those of large reasoning powers as well as others who can by artistical, musical, and practical talents develop a new poetry of life out of the newer surroundings.

Thus a quick responding mechanical lower section of modern society will probably some day be developed to displace the sodden clownish labourer of to-day, and a refined delicately organised group must supplant the now moderately efficient middle and useless scum portions of the community.

So far, therefore, from the alteration in type as shown by our picture galleries appearing improbable,

when examined by the light which modern economic change throws on this problem, it is seen that these two groups of facts, drawn from different sources, strengthen each other.

The John Bull type is, therefore, probably dying out as inevitably as a result of modern human life conditions, as the old Mammoth and larger reptilian forms of animals have been displaced by others smaller and more adapted to newer environments.

Thus much may be inferred from a study of the general tendencies of the times as they affect all classes of any social aggregate of individuals.

The surroundings of the wealthier members of society, when compared with those of the poorer citizens, offer a set of influences that are much more easily traced and grasped by any observer who is prepared to free himself from prejudice.

And as this problem is one that I believe is not only fundamentally bound up with the capacity to progress in a nation, but also explains to a large degree one aspect of the temperament theory, I propose briefly to consider it.

The main difference of a physical nature between rich and poor, particularly in town life, though to a considerable degree everywhere, is that conditions among the poor *favour brute living* with a tendency to destroy those whom it brutalises and those who are too delicately organised to stand *lower* life.

Briefly, the poor are from birth underfed, overcrowded, and to a not inconsiderable degree forced, owing to lack of washing and toilet opportunities, to lead lives which are in varying degree dirt-surrounded.

The air of their houses is stuffy or draughty, even the most washable articles smell close and foul. As the children grow up they tend more and more to find their way to the streets, because the mothers are glad to get rid of them, and even when this is not so, their playmates attract them, and later they are not expected to inhabit the home, and still less if unmarried to live in lodgings, but merely to sleep at night in them. There is no place to go to in the day time and evening *except* the public-house. In the libraries, if any happen to be near, talking and chatting are not allowed. There may be a mission hall with a person who preaches religion to them, but does not seriously attempt to remedy their grievances. The public-house is to them their refuge, and it is a refuge that soddens and undermines the little constitution they may by this time possess.

A wealthy person can, if he will, live a life which is not dependent upon capacity to exist under unhealthy conditions—the poorer fellow-citizen cannot.

Now, the disease which is peculiarly powerful and operates with extraordinary power under these conditions is tuberculosis in one form or another. Now that typhoid and typhus fevers have been almost exterminated, this one disorder is of all others the predominant eliminator.

How will this disease tend to act in its ability to destroy? What type or types of individuals will it be likely to select?

G. Archibald Reid has done good service in

pointing out how important a factor narcotics and diseases are in evolution.¹

That narcotics and nerve stimulants, especially when taken in excess, do predispose to disease is undoubted. That alcohol is a potent factor in creating a favourable soil for consumption is proved again and again in medical practice.

It is generally recognised that there are two types subject to tubercular disorders, the finely organised intelligent type and the coarse type. The former generally at some period in life has tried to keep respectable under adverse conditions, and sometimes failing this has gone wholly to the bad; the latter is almost always a public-house loungee or excessive drinker and lives in filthy surroundings. Broadly, however, the finely organised dislike their surroundings, and the coarse are not much troubled by them. *Among the poorer classes, therefore, selection attacks two groups quite unlike in disposition.* Why should *both* these groups be classed as degenerate?

Now, in mental disorders the same groups tend to repeat themselves. There is the coarse thick-set muscular type who becomes morbid when life advances too fast, who has perhaps been placed in a position which requires intelligence and decision above the individual's capacity. Such a person, being frequently the subject of syphilitic disease, contracted as a result of immoral life, often alcoholic, indulging perhaps in betting, and attaching more importance to 'Sport' and music-hall amuse-

¹ *The Present Evolution of Man, &c.*

ments than either home or business pleasures, has become, through his own excesses and also because life conditions have been too high for him, enfeebled.

On a slightly higher plane is the big, stout, buxom individual, who from overfeeding is troubled greatly with indigestion, has gouty aches and pains, and who, though really in fairly good health, is a general nuisance to the medical practitioner on account of constant cowardly fussiness and fear for his health.

General Paralysis of the Insane, Hypochondriasis, Alcoholic Dementias are common diseases in this John Bull class when run down by following too closely the cravings of animal appetites.

In contrast with this group there are others who are strongly averse to physical excesses. They are nervously organised, slim, with delicately fashioned limbs, acute and sensitive faculties all alert to every passing sight or sound, eyes that often look startled and half-frightened, though their possessors have plenty of moral and, when occasion demands it, of physical courage also ; often hard workers and keen students, and nearly always sober and peace-loving, their tendency is to use themselves up with overwork and too much worrying over business troubles ; with women, especially, household affairs will get on 'their nerves,' and they will fancy that their homes are not quite as tidy as they used to be. The slightest noise will cause them to start, glaring colours and bright lights hurt their eyes, and if this mood is not checked by rest and relaxation life becomes very burdensome, and is faced, though often

very pluckily, also very wearily. A month or two's rest at a quiet seaside village will often restore them to a surprising degree.

To these fine and coarse types may be added a third, the feeble-minded, half-witted, generally ill-formed group.

Tubercular diseases attack these three groups of individuals, though in each case for different reasons. Must we condemn them all as degenerate? Are we justified in asserting that this wholesale elimination is necessarily beneficial in all cases?

Now, the test of degeneracy is not, and never has been, dependent on the mere fact of destruction. If it can be shown that the highest class of external conditions, which were fitted for each type, did actually prevail, then destruction can be rightly assumed to be eliminating the unfit—i.e. those too primitive and those too degenerate for their surroundings. This cannot be demonstrated; hence the mere destruction argument is fallacious.

Let the reader think for a little while of the import of this conclusion. Think how many millions of future men and women may arise happy and progressive, or brute-passioning and debauched, as a result of humanity at the present day, grasping, or not grasping, in some degree, the meaning of this problem.

If the evidence in favour of a higher type is strong; if the social need for that same type is almost self-evident; if there is reason for believing that the old forms of man are even now being displaced, though very, very slowly, by higher forms,

and these only slightly higher than those that they displace ; if there is reason to believe that, as well as destruction of the most animal men and women, there is going on side by side with it a destruction *of others who are too human, too advanced for the brutal nature of their environment*, ought not every one of us who has manliness or womanliness in our nature to exert oneself to the utmost to make 'civilised' conditions a little less disagreeable than they are to-day, so that the children of the coming generations may not die because of our passion for, or indifference to, brute-modes of living ?

Reviewing, therefore, briefly, the conclusions arrived at in this chapter, we have, firstly, the undisputed fact that sex is a temperamental, and not a merely local, condition ; secondly, that there is every probability that through progressing environment the John Bull types are being displaced by others of a nervous temperament ; thirdly, short and tall types somewhat resembling male and female in their characteristics exist. We have further to note that survival, though in some respects due to general causes, the result of general national and social conditions, is in others dependent on variable local class surroundings, and what may be highly organised social forms, as well as what undoubtedly are low and anti-social, are being destroyed by conditions which ought not to exist in a civilised land.

In the next chapter the consideration of the problem of healthy organisation and development as a test for estimating the healthiness or unhealthiness of the individual has to be considered. For, if

the organisation is naturally responsive and progressive, and yet has become through living diseased, the fault must be sought in the manner in which it has been compelled to live, and in this only. The surroundings where this is so, and not the citizen, are degenerate.

CHAPTER III

TEMPERAMENTS (*continued*)

IN the last chapter some reasons were given for believing that an examination of the possible causes that may lead to the development of the different forms of temperament might not be unprofitable, as by this means only can evidence be collected capable of explaining the reason for the presence of higher and lower types of humanity in society. It was also pointed out that the absence of evidence on this subject was not sufficient justification for thinking that future work conducted on more rational lines would be as barren of result as past labours have been. Further, some evidence was brought forward to show that certain gland structures do tend—when relatively active as compared with other bodily tissue changes—to be associated with distinctive mental and physical characteristics.

At the outset of our inquiry certain difficulties require consideration, in order that the legitimate scope of the investigation can be adequately appreciated.

The study of temperament is concerned *solely* with peculiarities which have a physiological significance, and which are found in certain large groups of individuals who appear to be healthily organised,

as far as known data permit of our estimating accurately what is or is not healthy. But while it is true that the science of temperaments should be concerned only with those characters of human, and in some cases other animal, organisms that are free from the effects of disease, yet, in order to limit the study to these features, it is necessary to understand other subjects that lie close to its natural boundaries.

The more carefully the influence of disease on any individual organism is studied, the more certain must be the conclusion of the investigator as to the permanently modified state of that individual organism as the result of that disease. Most acute fevers protect more or less completely the individual throughout life from further attacks, therefore some changes in the individual's tissues must have resulted otherwise no protection would have been secured. Syphilis is a disease which has, perhaps, been more closely followed up in the life history of each patient than any other, and we know that in the majority of cases each person suffering from the complaint continues to suffer in some degree throughout the whole period of life. Did we know as much of other diseases it cannot be doubted that the study (diathesis) of the influence of past disorders on patients would be valued much more highly than it is at the present day. But *diathetic* states are closely related to temperamental, hence a knowledge of the former conditions is necessary to the right appreciation of the latter, and *vice versa*.

But many diseases, particularly those that run a

chronic course, produce a series of changes in the body which result from the activity of *existing* disease. The individual during the whole period of the continuance of the disorder is not in a healthily reacting state, and consequently does not respond to the surrounding environment in a manner similar to other individuals who are not so suffering. In so far as this response is unhealthy and differs from what is physiological, it is *dyscrasic* and not temperamental, but dyscrasic states pass by insensible degrees into diathetic, and thus knowledge of this branch of medicine is also required to appreciate adequately the facts upon which the study now under consideration is based.

Further idiosyncrasies of different individuals must not be confused with widespread temperamental features. Nor must racial phenomena be included.

A consideration of what is healthily as contrasted with what is unhealthily organised, of the chief diathetic and dyscrasic states, as well as determining wherein race and individual features are separable from the temperamental, is, therefore, a necessary preliminary to the main study. A few points on each head may now be appropriately noted.

If there are different kinds of temperaments there must clearly be different kinds of healthy states corresponding to these distinctive organisations. Health as a subject for study is not therefore co-extensive with the science of temperaments, though it is closely related to it. What is common to all true temperaments, because this common basis is essential to healthy functioning of human life every-

where and in all its forms, is the field which the science of health occupies. But since it is necessary to distinguish between healthy and unhealthy types, it is necessary to understand the principles of healthy organisation in order to discriminate between dyscrasic, diathetic, and temperamental states. What is health?

Most authorities would agree with Marshall Ward¹ when he states that 'disease is a condition in which the functions of the organism are improperly discharged,' or with Allchin² that 'the standard of bodily health is at present incapable of accurate definition.' Such statements, however, are of little value and do not lead to any wiser outlook from which the problem may be considered. Bland Sutton has pointed out that disease may in some cases be the result of features persisting in a later stage which naturally belong to an earlier. This conclusion is of service in drawing attention to the fact that one of the elements to be estimated is this imperfection in the later stages of development, and it opens up, by suggesting an opposite group of conditions, a further means by which disease is fostered, namely, where developmental processes lead to the production of a more advanced structure than is required.

It is not impossible that just as a citizen may fail in a state because he is too honest to hold his own with surrounding competitors of a lower order than himself, so some part of any individual's constitution being more highly organised than the other

¹ *Diseases of Plants.*

² *Manual of Medicine.*

parts, may become diseased because this higher level in an otherwise lower body cannot be maintained. *Disease may quite as possibly result from irregular progressive tendencies as from retrogressive.*

It is also clear that any steady environment that surrounds any individual may be favourable or unfavourable to that person. If unfavourable, such an individual is not necessarily unhealthily organised should he or she become diseased. If the environment does not conform to general health laws, all individuals will be more or less prejudicially affected by it. If the surroundings are unfavourable to a particular kind of organism, then some group of men and women belonging mainly to one temperament will be principally injured. Health is, therefore, as much the result of environmental plan as individual organisation and disease may be the result of failure to grow in progressive directions in either or both. *The capacity to live healthily in any person cannot therefore be estimated solely by present and past evidence of disease.*

Again, among the millions of cells of which the Mammalian animal is made up there are always thousands belonging to each class of tissue which are functioning defectively, some because of uncompleted growth, others on account of excessive age, and yet still others that are diseased as a result of some slight local disturbance. So long as this weakness is limited to a *relatively* small number of cells and can be adequately held in check by the others, the whole state of the individual may be one of comparative health ; nay, more, the presence of these

few diseased cells may be necessary to keep in a condition of active resistance the many healthy. *Health is not therefore a fixed condition, but a relatively harmonious adjustment of parts.*

Health and Temperament.—While it is true that to define what is healthy in one individual is often at the same time to describe that which may be disease in another; that what is a satisfactory environment in one instance may be quite otherwise for some other; that the term bodily health signifies, only as it were, an *aggregate* well-being, and never presupposes an equal condition of health in all parts of the organism at the same time—every cell in the body being in some evolutionary or devolutionary condition whose course is related to, but distinct from, other cells—yet it is possible to formulate certain general principles which are capable of being applied in such a manner that some estimate of a healthily formed organisation may be arrived at irrespective of its temperamental peculiarities *and of the healthy or unhealthy response which a beneficial or prejudicial environment may elicit from it.*

Thus while temperament as a science does afford some valuable criteria for forming a judgment on the natural powers of certain individual groups, the study of health also supplies material by which the perfectness of each individual belonging to each group can be estimated. Hence to understand what is generally healthful is to have means at one's disposal to reject, even among the most divergent types, those forms which are actually unfitted to exist not on account of unfitness for their surroundings but

because they would be defective anywhere owing to *imperfection* of organisation. The science of health should enable us to discover actual *flaws* in the build of the individual, while that of temperament explains the *aptitude*.

Health principles therefore afford the only available means of estimating the degree of perfectness of the type irrespective of fortunate or unfortunate environment in which such type may be compelled to exist. This science thus forms the basis of all sound temperamental work, and is also pre-eminently the study for the artist on account of its disclosing true beauty of form, and for the medical man in pointing out the healthily fashioned organisation. With the principles of this study to guide one the artist will know how to avoid utilising, except under appropriate conditions, characteristics that are really defective, and the medical practitioner will understand more fully when a form is too imperfectly modelled to be of value to the nation, and also the need for preserving it from strain. What deductions is one justified in making on this subject?

In the first chapter I pointed out the need as higher and higher forms come into being for increasingly delicate adjustment of each part to all others in each individual, so that harmony of all tissues and structures delicately adapted to the whole plan of each complete organisation becomes of increasingly vast importance to the welfare of each being; progress and specialisation in one tissue becoming, at last, actively harmful unless accompanied by an ordered adjustment of the others.

This applies with most force to man, the most complex and highly evolved life-form.

A definite adaptive individual end is therefore an absolute essential of healthy capacity. *A marked uniform personality pervading the whole organism is the first requisite of fitness.*

In this respect, as one would expect, savage falls far below civilised Man. Firstly, there are fewer higher sexual characters as distinct from merely reproductive. Manly and womanly life is little marked off from the brutal, and manliness and womanliness, in so far as they exist at all, are less distinctive features of sex, woman is more masculine and man more feminine relatively to each other than is the case in the cultured citizen of either sex.

Secondly, the less complex bodily appetites much more largely predominate in primitive Man in supplying incentives to action than the higher, more numerous, and later evolved mental desires. There is, therefore, more diversity and, on account of great specialisation, more individuality in the cultured man and woman; and in society organised on modern lines the criminal, the labourer, the artisan and tradesman, and lastly, the professional man, have in the order named progressively less resemblance in this respect to the savage and semi-civilised races.

Unity of plan throughout the whole body focussed towards a given goal by powers that thus give rise to a strong individuality is the first important feature of a healthfully evolved person.

While, however, this conclusion is supported by

all known biological and sociological data, it is yet neither practically nor theoretically recognised. The educationist in the main disregards individuality *as an educational factor*; the medical man does not consider it among the assets of health, neither does he specially consider that the presence of a mixture of temperamental conditions in one body is necessarily primitive. Yet relatively large hands and feet in a woman, or small in a man, may reveal an organic defect or lack of vitality difficult to establish by other means; or again a prominent face, a broad flat nose, &c., in an individual otherwise delicately developed may give warning of an unbalanced character that can be detected by no other sign. The artist, too, frequently combines in one ideal the coarse thick powerful labourer's hand, beautiful in its own way, with a face strongly suggestive of mind power that is beautiful in another and higher manner, when, as a matter of fact, *the whole* form should conform to one standard and one only. *Unity of design is one essential of healthy organisation.*

As almost a part of this conception, but nevertheless to be looked for separately, is the evidence of co-ordination of functions. Stammering, awkwardness of movement, &c. of a more or less *incurable* character show that the ordered control of bodily activities is defective; though these conditions must not be confused with the natural slowness of a person of physical rather than nervous organisation. The inability to direct one's own actions seen in an old man's fumbling would in a young

adult imply serious defect. Much less obvious points would probably be noticeable if the study of functional unity were more adequately valued.

Apart from this idea of harmonious ordering of the whole body, it is generally recognised that lack of symmetry and irregularities in growth—such as inequality in the two halves of the face, uneven growth of teeth, deflection of nose to right or left side, eyebrows unequal level, &c.—are phenomena which quite apart from reversionary peculiarities (as the Mongoloid (Chinese) or Ethiopian (Negro) forms and characters, in those of European origin) are of great importance when estimating the more or less defective nature of any person's constitution. As, however, these small irregularities exist in some degree in all persons, it is necessary not to attach too much importance to them, if small and few in number, especially if the organisation of the individual is uniform. Some variability when not extreme is evidence of a progressing type.

Finally, there are a large group of characters which, though not coming under either of these three heads, are yet always evidence of faulty development and are usually spoken of as atavistic or reversionary phenomena; such instances as hair in non-human positions, rudimentary tail, accessory auricles, additional breasts or nipples, &c., are examples of this class. The still graver errors in development do not come within the scope of this present inquiry.

I have purposely omitted such considerations as muscular tone (evidenced by firm muscles, strong

abdominal wall, regular action of bowels), clearness of complexion, sound teeth, &c., for these depend, though not exclusively, more largely on an environment suitable to the natural powers of the individual, and hence do not have any definite relation to the more fixed temperamental features.

The same principles that apply to the body are not less true of the mind. Other things being equal, that personality which is dominated by purpose is always healthier, and on account of the increasing necessity of direction in the later evolved, more complex and specialised minds, generally higher. Ill health will make even the strongest will vacillating, and the imbecile and feeble-minded are generally quite unable to *direct* their energies towards any end. In like manner the savage's and the child's attention wanders and cannot be concentrated without great incentives, and then the effort is spasmodic.

Again, as man advances from primitive to cultured forms of environment, individuals tend to survive who are progressively more capable of subordinating lower to higher feelings. Such mental qualities as cruelty and wanton destructiveness, which are natural to primitive peoples, are always indicative of faulty development in persons belonging to advanced races.

As in the body certain temporary signs of enfeeblement were only alluded to in passing because they afforded proof of lack of harmony between it and its environment, and were not therefore of value in the study of temperaments, so certain states of the mind are not available as evidence of

defective powers, and for a like reason, but merely show that the individual is overwrought, and is living under such pressure of uncongenial circumstances that there is some danger of a breakdown. Irritability of temper (not mere hastiness), a constant harassed feeling, dread of sudden and grating noises, &c., are not symptoms of permanent mental weakness existing from birth, and are not, therefore, utilisable for the subject now under consideration.

Summarising, therefore, the conclusions arrived at, it is evident that a healthy organisation must be, firstly, manly or womanly throughout its *entire* development ; secondly, characterised by the features of one temperament, its hands ought to suggest the form of the face, and the face that of the body, and the whole have a definite distinct individuality of its own ; thirdly, it must be co-ordinated one part with another, be symmetrically proportioned, and not be marked by reversionary (primitive) characters ; fourthly, the various vital functions performed must respond readily—and not act more or less imperfectly and independently—to the needs of the *whole* person ; fifthly, the mind must have definite predominant tastes, harmonising with bodily powers, which direct the whole individuality towards one clearly defined goal ; sixthly, and lastly, in a more or less civilised man or woman mental desires should control physical, and the desire should be to act with rather than against one's fellows.

Now, bearing these points in mind, it is evident that some types do exist which, although not strictly diseased nor arising from the after results of disease,

are nevertheless not temperamental, because they are not developed on any physiological system or gland basis. Moreover, these forms appear to exist mostly in surroundings which favour those social forces which make for general degeneracy.

Caricaturists (Gilbert strikingly ; see illustrations to 'Bab Ballads') have often depicted the simple, empty-minded type so frequently met with in army and merely wealthy Society circles. Its receding chin and forehead, and its small conically shaped head, smaller part upward and the lower portion at the back fusing in one straight line with the neck, while, to increase the ugliness of the picture, ears of an uncompromisingly large size project from a physiognomy that is expressionless or vaguely curious. The gold-mounted cane depicted as resting between rather thick lips and against teeth which are frequently large, though set in feeble jaws, and a clumsy figure clothed flashily, completes a picture of inanity that has its tragic as well as comic aspect. (See plate.)

Any large portrait gallery will afford evidence of the characteristics alluded to.

Although most typical of the idle, wealthy sections of the community, and probably due in them to interbreeding among individuals who are distinguished by feebleness of mind, it also occurs to a considerable extent among the poorest and most destitute members of civilised nations. Talbot states that about 50 per cent. of criminals at Elmira, New York (p. 256, 'Degeneracy'), have arrested growth of the lower jaw, and the sugar-loaf head is



SCUM TYPE.



a fairly common criminal feature. A comparison of fashionable scum and slum-dreg crowds will afford evidence to anyone caring to utilise his powers of observation of the existence of this class of person in our social life.

It does not appear to exist to any appreciable degree in savage-life conditions. In about five hundred reliable illustrations¹ it was present only once, and that doubtfully. This is evidently because uncivilised races have usually large faces as compared with heads; and, although the chin is mostly slight, the jaw does not recede, and thus the typical prominence of the middle part of the face, especially the nose,² is not obtained.

The form of degeneracy found among the poorer classes is characterised by poor physique, small size, flat and narrow chest, with a generally thin, shrivelled, hunted appearance. The face is not always symmetrical, but is notably so more often than not; the forehead actually recedes as in the preceding type, and does not merely appear to do so, and is low and narrow. The eyebrows often extend slightly down beyond the root of the nose on to the bridge, and the nose itself, though not sunken, as in syphilitic cases, is slight and only very little raised above the cheek-bones. These latter are also very little developed, and give the face a sunken appearance below the eyes, while the jaws

¹ Taken from modern anthropological works of reference where collotypes have been used, or from photographs and museum specimens.

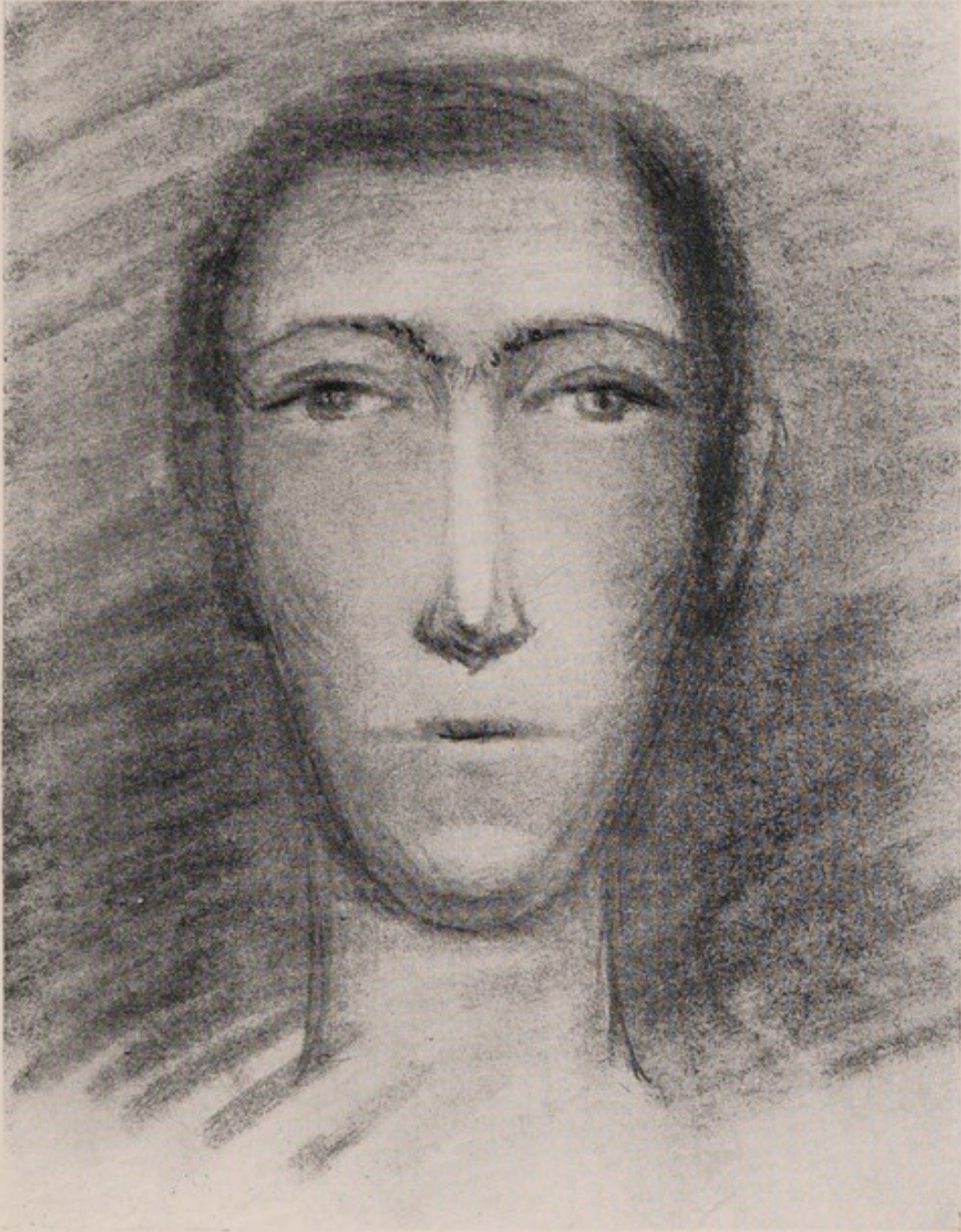
² This is generally less prominent in savage types. Old Roman and Jewish faces are occasionally like this scum, degenerate type.

are extremely feeble, and the angle is scarcely, if at all, visible when seen front full-face view. (See illustration.) These individuals are often phthisical, and always mentally deficient; and in women pelvic disorders frequently make life a great burden to them.

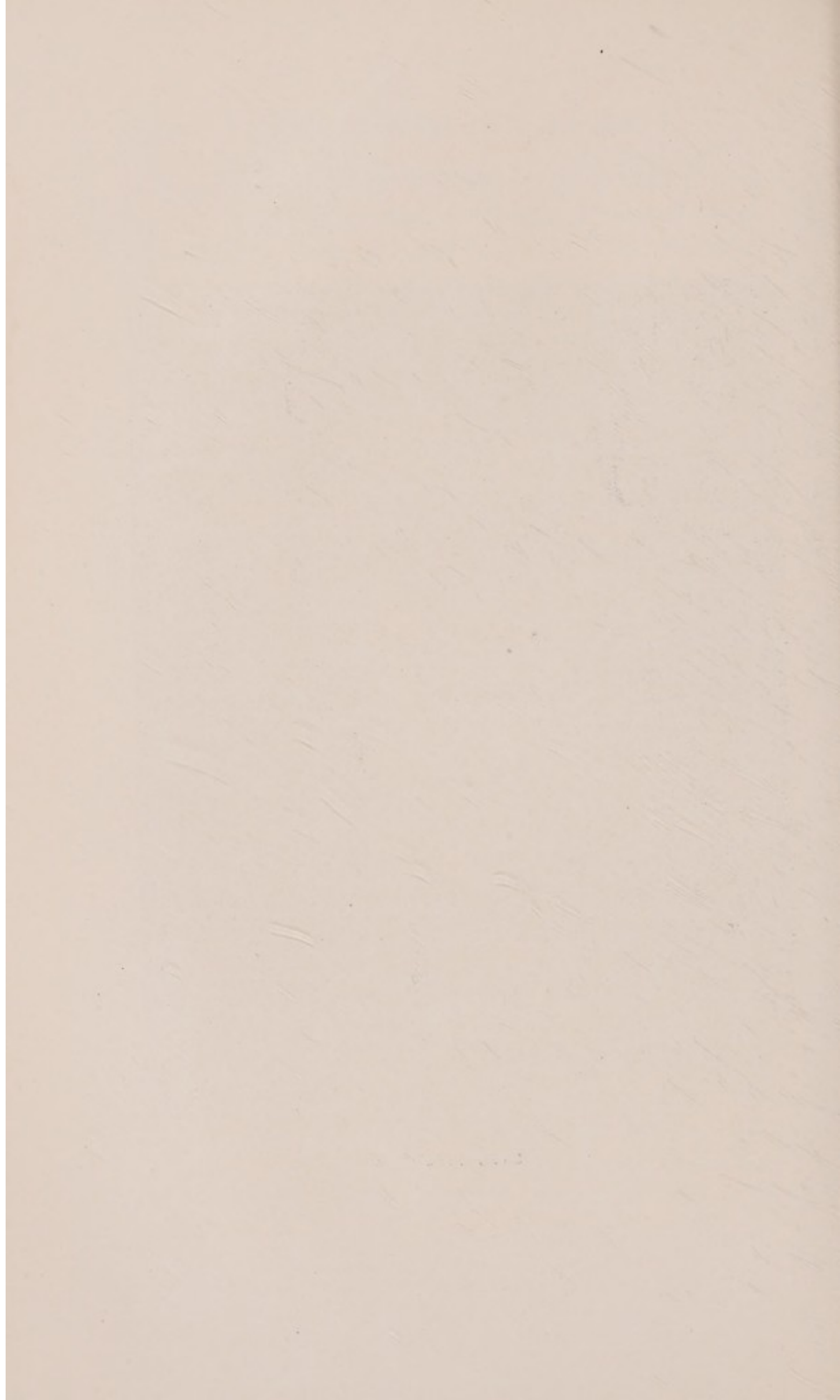
There is much evidence to point to the conclusion that the present commercial conditions of sweating, child labour, overcrowding, and poor food have produced this deteriorated form by deficiency of healthy conditions.

So far we have seen that certain general features ought to apply to all temperaments, and also that there are degenerate types which are not temperamental, in the sense of being dependent on any predominant system of organs and tissues. The next difficulty—that of excluding diathetical characteristics—is not easily dealt with, for unquestionably certain persons having certain *natural* characteristics do tend to develop certain diatheses, and it is therefore peculiarly easy to confuse true temperamental characters with diathetic.

In the diathesis that remains after rickets has subsided, and continues often into adult life, certain features, such as high, square forehead, with lateral parts specially developed, with enlarged ends of bones, and other features, all of which are usually regarded as diagnostic, are found. No doubt the thickening of the ends of the bones, and the curves due to the once-softened bony tissue having again become hard and fixed, are unmistakable evidences. But a high, square forehead does exist frequently



DREG TYPE.



without either a history or other evidence of rickets, and a forehead with proportions relatively developed in comparison with the face is frequently evidence of mind-power in the individual, just as it is when viewed as a racial characteristic ; and it may be that nervously organised children are naturally predisposed to rickets.

The same difficulty of estimating what is a diseased head, as compared with one that is highly developed, presents itself in Hydrocephalus, the so-called 'water on the brain.' Except in the extreme forms, it is difficult to tell a hydrocephalic child from one that is genuinely large-brained ; and, again, it is not improbable that the naturally large development of brain may, owing to its being the seat of rapid growth, be also one that, on account of its instability, is especially liable to be attacked by tuberculosis and hydrocephalus ; these diseases may therefore be most often found in children with large frontal regions, because they attack those that tend to natural predominance in this direction.

Again, writing of congenital syphilis, Jonathan Hutchinson remarks : 'There is usually exaggeration of the frontal eminences, and between them and the eyebrow is a shallow furrow or depression. Posteriorly, on the parietal bones similar eminences, but more widely spread and lower, exist, constituting the natiform skull of Parrot. As a whole, the skull is somewhat larger than normal. All the peculiarities are chiefly due to chronic infantile periostitis, with softening, but a tendency to hydrocephalus takes some share. All of them tend to diminish in

conspicuousness as their subject advances in life. With these peculiarities of skull may also be noticed the very common flattening of the bridge of the nose, consequent upon internal and external periostitis of the nasal bones.' (P. 85, 'Syphilis.')

Thus not only may one kind of diathesis be confused with another, as the rickety and the syphilitic, unless great care is taken, and the two forms may co-exist, but also racial and temperamental features have to be taken into account.

Again, in the alcoholic type—the bloated blotchy individual with his thick coarse features, his solid heavy frame, and watery eyes—it may be that the naturally coarse man has a natural tendency to excess in eating and drinking, and that part of the typical alcoholic's appearance is temperamental in character.

It is necessary, therefore, to distinguish carefully between diathesis and temperament, and it is not always easy to give a definite opinion on isolated characters. With dyscrasias, also, the same difficulties are present, only here other evidences of actual disease make it much more easy to decide as to the nature of each peculiarity.

Finally, idiosyncrasies may be excluded on the ground of the isolated character of the features presenting difficulties, and racial points because differences largely occur as variations not specially linked together by physiological function, though occasionally some alteration may have a temperamental significance as well, and then would be included in the general description.

Certain general characteristics, all of related functional nature, existing in individuals who are distinguished by symmetrical form, co-ordinated bodily functioning, *mental and physical uniformity of plan* and distinctive personality yet marked by a common resemblance, too adaptive to general bodily ends to be of purely racial meaning, too general to be individual, and too full of present activity to be atavistic or reversionary, are the basis upon which any rational theory of temperaments must rest.

Before seeing what characteristics remain after exclusion of irrelevant material, it may not be unprofitable to consider some of the special difficulties involved in the study of this problem that have not been alluded to in the past pages.

Firstly, there is the fact that family histories have been studied in relation to actual disease incidence and not upon any predisposition basis. But given a sufficiently unhealthy environment, and the most robust will give way before the unusual severity and strain, and where conditions are satisfactory the most delicate may lead healthy lives. Environment, disease organisms, and general ætiology are, therefore, the known factors which, studied carefully, ought to throw light on individual susceptibility. On account of current medical practice, and investigators not studying environment from both occupational and home aspects, and satisfactorily examining each series of diseased persons upon this knowledge of their *individual* habits, there is now no evidence available to prove how certain human

organisations react to certain diseases under certain conditions as compared with others.

The same unfortunate deficiency is observable on the sociological side. No school or industrial records exist which show the innate tastes of each child or worker in relation to after life, with the commercial and domestic skill that has or has not been developed, and how far the success or failure afterwards attained was associated with predisposition. Hence, the first difficulty in the way of the study of temperaments is the complete lack of reliable statistical evidence.

Secondly, privileged national and class types, and individuals drawn from them, obtain an artificially high place in society and civilisation, not merited by their actual powers. Hence, if allowance for this unmerited success is not made, talent existing under unfavourable circumstances will be under-estimated, while the untalented, fortunately placed, will be included among groups for which their natural capacity does not fit them. Again, in those exceptional cases where real natural mind power is possessed by individuals born in scum-surroundings, it must be remembered that great force of will is required to live a studious life amidst the excesses and brutalities around them. If these possibilities of error are not *constantly remembered*, the studies of physiognomy and temperament will seem little more than a foolish jumble of unproved assertions. *The intensity of desires and the nature of these desires, and the effort put forth to overcome environmental difficulties, are of infinitely greater*

value as indexes of character than the mere popular estimate of notoriety. Even achievements are largely a matter of opportunity. Temperaments must, therefore, be studied in some degree from a purely individual aspect, and the facts known of each person's environment must be utilised to balance any over- or under-estimate of successful or unsuccessful effort.

Thirdly, social qualities are likely to figure more largely than home in any character-estimate formed of any human being known to one merely by reputation, on account of the greater opportunity for observation of the former qualities. The distinctly home-loving persons are therefore likely to suffer from an inadequate treatment of their powers if this unavoidable failure of evidence is not allowed for.

Fourthly, geniuses, when once their reputation is gained, are likely to appear unnaturally separated from the talented because their lives are constantly before the general public through their works; so that the less known, but still clever, men and women of more than average ability are passed over as if only possessed of ordinary capacity.

Fifthly, some occupations require more continuous skilled effort than others, and a few may require little more than a brief spell of inspiration now and again. For instance, a poet requires less persistency than an artist, because he has no manual dexterity to acquire by training, like that of drawing and painting. The drudgery entailed in good prose literary work probably exceeds the drudgery of the

artist, and the musician and scientific writer have yet greater difficulties to contend with. The more drudgery the greater the love required to master it; hence the more completely will the profession of the individual who has attained eminence in such a subject be evident in his physiognomy. The average artist and poet will probably, therefore, have less *distinctive* and determined faces than the musician and scientist.

Again, in the lower walks of life so little is demanded of the worker that each person's characteristics may be in different individuals widely divergent from others, because, so long as the small minimum capacity is reached, any excess of power, mental or physical, may be drafted into channels that are not made use of by the trade or kind of labour performed.

Sixthly, photographs, collotypes, even impressions jotted down by watching living men and women themselves, are open to a multitude of objections, when dealt with statistically, in estimating features and forms of persons, and I need not enter more fully into them in this volume, as I hope, when dealing with trade and professional aptitudes in a later book, to treat of these in some detail.

All of these six groups of difficulties are practically dependent upon the weakness of material for study that is available. The rest of the obstacles are to a certain extent inherent in the subject itself:

(a) Civilising tendencies are difficult to estimate in different races and in different periods of time,

and comparative studies based on these estimates are, though necessary, peculiarly difficult.

(b) As the many types of man have almost certainly sprung from one primitive ancestral form, it is difficult to separate what are merely these primitive—only modified—characters from those that are truly temperamental.

(c) A type bred and selected for generations under one set of conditions frequently migrates to another set, and this leads to confusion of two different climatic and temperamental selections.

(d) The same *apparent* characteristics have often different meanings in different stages of evolution.

(e) Instability of the individual may be evolutionary as well as devolutional, and diseases may attack advanced types because they are too far ahead of their surroundings, as well as those that are too low. Disease is not therefore an accurate index of faulty organisation.

(f) A further difficulty in reading correctly temperamental features is due to the fact that marriage of individuals unsuited to each other's mental development tends to debase characters that would otherwise not be debased. Hence a strong face with the form that should be associated with higher living is frequently found in objectionable home surroundings which seem to contradict the temperamental peculiarities.

In spite, however, of these difficulties, certain conclusions seem to be formulable :

(1) That in Europe a tall, fair-complexioned, blue-eyed type, most frequently long-headed, with

big limbs, large hands and feet, and large lower jaw, with many resemblances to giant and acromegalic individuals, has been associated mostly with cold, mountainous, and northern parts of the Continent.

(2) That a darker-complexioned, shorter form has been found mainly in warmer and more southern regions.

(3) That both of these types appear to be undergoing modification by the advancing conditions of civilisation.

(4) That the characteristics of the evolution of sexual temperaments has to be considered in relation to the three other groups of features.

William Ripley, in his 'Races of Europe,' gives very strong reasons for assuming that the European races have originated from Ethiopian and Mongoloid sources, of which the former was probably the more primitive. The fact that in idiots these two types have been specially noticed is strong evidence in support of his view. He further puts forward the hypothesis that the original European type was short and dark-complexioned, and that the Teutonic race of Northern Europe may be merely a variety of this primitive long-headed type of the Stone Age, 'both its distinctive blondness and its remarkable stature having been acquired, in the relative isolation of Scandinavia, through the modifying influences of environment and of artificial selection.'

However originating, it is clear that anthropological data definitely afford support to the two contentions with which I commenced this chapter, and I considered the physiological evidence for this

at some length in the last, pointing out that wrong methods of study have been previously resorted to, and that the right path is to be found only through greater breadth in research, which will probably be based on the effect of glandular secretions in their influence on the tissue exchanges of the whole body.

In the next chapter these considerations will be taken as the foundation principles upon which any sound temperament theory must be founded.

CHAPTER IV

TEMPERAMENTS (*continued*)

IN the last chapter I pointed out as one of the great difficulties which the consideration of this subject involves, that the faulty position of nearly all individuals in the State, dependent upon the official disregard of real merit, leads to widespread confusion in the popular estimate of what qualities and powers are the real test of ability.

As a result of these misapprehensions not only are persons of poor or average capacity found in responsible positions, but, what is more unfortunate, their commonplace utterances are looked upon as statements of real value, so that there is not only an untrue, dishonest official standard to be disregarded, but also an honest popular one.

Let any individual consider carefully the significance of this fact. An absolutely incapable individual cannot, of course, hold any position, certainly not in England or Scotland, unless behind his incapacity is the capacity of some nominal inferior. In the main the incapable are tending to be excluded from public posts, and they may, therefore, be left out of the problem. Provided, therefore, that the small minimum of mind power is present, any posi-

tion attainable in Great Britain is rendered incomparably more easy of attainment if scum influence is procurable. On the other hand, almost the whole of the higher positions in life are closed to any who are not born in homes where at least a moderate competence is assured.

Now, it cannot be too strongly emphasised that opportunity, even to the average man or woman, is almost essential to advancement in life; to the genius, unless possessed of unlimited fighting power, it is everything. Give a truly great mind a clerk's position, force him to sit obediently to a wealthy, natural inferior, and you stultify and degrade him. Give a medical man *practising exactly as other medical men* the opportunity of, and the necessity for, study which a staff appointment on a large teaching hospital requires, and in a few years he will know more of medicine and have had more experience and *have become more capable*. Force the natural medical scientist into the hurry and fashion-enslaving circle of general practice, and he soon becomes as enslaved as his fellows, or perhaps even more so, only he will feel his practical inferiority and know his natural superiority to the day of his death. Hence the naturally capable grow with faulty life surroundings unnaturally incapable, while the naturally unfit grow, supported by unjust usages, unnaturally efficient, only the efficiency is always conservative and imitative in character and scarcely ever initiating.

Now mark what this involves. In the recent 'Reports of the Mosely Industrial Commission,'

Mr. Mosely, in writing his prefatory remarks, makes the following observation: 'As a rule the British employer hardly knows his men, seldom leaves his office for the workshop, delegates the bulk of his authority to a foreman whose powers are arbitrary, and *who, if any of the men under him show particular initiative, immediately becomes jealous and fears he may be supplanted.*'

The italics are mine, and I have quoted the above opinion not because it is original, because it is not, nor because it is true, though it undoubtedly is, but because it is the belief of a thoroughly sincere practical man, and it states in plain language particularly what is of universal application. *The fear of being supplanted is always the particular fear of the man who is relatively incapable.* In the present unjust state of existence there are a large mass of discontented, and justly discontented, workers who *know* that the right man does not obtain the right place, and there are a few unjustly fortunate who knowing, but not openly confessing, their inferiority, subordinate the capable men by unreasonable and nationally detrimental tyrannies. The result cannot fail to be universal hypocrisy.

Now, with these considerations in the mind, it is possible to return once more to the study of temperament and physiognomy. It is clear that, as the favoured scum type grows from the result of his position more capable and more hypocritical, and the unjustly treated geniuses and talented grow less capable and more embittered as they grow older, in a large number of cases *physiognomical expression,*

which is the result of life habits rather than innate power, *will conflict with temperamental features*, which are more permanent evidences of capacity. Hence the more permanent characteristics of the individual must be mainly considered in dealing with the existence of groups of individuals believed to be naturally fitted for certain ends.

Now, in order to consider advanced forms, it is necessary to appreciate what are the more or less permanent primitive needs of individuals living under the conditions which the climates of Europe demand from them. What common features, if any, can be found which will harmonise with the modern anthropological and medical data which we have already considered?

From Anthropology we learn that the tall, fair type inhabits mainly Northern Europe, and that a shorter, darker, and stouter form is found mostly in the more southern parts.

Further, from racial physiognomy the deductions to be drawn are: (1) that primitive races have usually large faces in proportion to size of heads; (2) that less advanced peoples have mostly large squat features that are coarsely moulded; (3) among the most sodden, drink-loving, and brutal men and women of our own races these characteristics are still to be seen. The old types must, therefore, have been heavy-featured and large-faced.

Further evidence on these points will be considered later.

There would, therefore, appear to be existing among white races a tall, fair, long-limbed form,

and another short, dark, short-limbed, and it has already been seen that these two groups have many resemblances to the extreme giant and dwarf abnormalities seen occasionally.

On *à priori* grounds one would, as has been seen, expect that in the northern colder climates those individuals possessed of large lung power, to permit of rapid tissue exchange, and active excretory powers, to remove waste products, as well as great motor powers, for alertness in procuring food, would be predominant. In actual fact the Teuton *has* large muscular limbs and big lung power, *is* a big eater, and *seems* capable of standing extreme cold. Of course, beyond a health-responding limit one can understand that the largest supply of foods of a heat-liberating character would be barely sufficient to combat the rigorous climatic surroundings, height would under these conditions be a disadvantage, as adequate nourishment could not be obtained, and the short, dumpy Arctic inhabitants are, therefore, probably best fitted for their environment. But in Northern Europe the cold is, though severe, mainly such that it stimulates to activity.

Exactly opposite conditions prevailing in the southern countries, one would expect a more slowly reacting type adapted, owing to the surrounding warmth and less need of heat-supplying foods, to less active life. A frugivorous and vegetable diet would probably supply sufficient food material to support life adequately, and as this class of food is more bulky and less nutritious, those individuals whose abdominal system was relatively well de-

veloped might be expected to survive; and as the production of large quantities of bodily heat would be a disadvantage, smaller lungs supplying smaller quantities of oxygen would probably be better fitted for climatic requirements.

As civilisation develops, climatic needs become less imperative in their demands on the individual because they can be more readily overcome by appliances, hence primitive characters tend to become obliterated under higher life conditions.

Now, broadly it is known that these climatic inferences are not merely hypothetical assumptions, but are conclusions that are supported by a study of racial characteristics. The Italian, Spanish, French, and Greek bear badly northern climates, and the Norwegian, British, and German are not so well adapted to warmer regions; and I have already noted the fact that the southern peoples are darker, shorter, fatter (and this implies less active lung power) than the northern. Is there, therefore, a common primitive northern type existing and comparable with a southern? It must be here noticed that I am not contending for the existence of a race, or races, having these characters which actually does, or did, inhabit these respective regions, but for individuals who if they tend to possess these temperamental peculiarities will live most readily in the regions corresponding to their powers.

Northern Long-Limbed Type.—Broadly speaking, it is tall, long-limbed, long-headed, and is found usually in colder climates. These features are all met with in an extreme form in the condition known

as Gigantism, together with a long face in which the lower part, particularly the jaws, is well developed relatively to middle and brow portions. In acromegaly similar features to those of gigantism are present, and although *disease* of one ductless gland is mostly present, there is reason for thinking that the distinctive features are rather due to physiological excess of activity in this gland than to the disease, and that this pituitary body, as it has been named, has some definite causal relation to growth. In many of the oldest skulls and limb bones found in Northern Europe this same type of head and body repeats itself. If, therefore, we can class these features under one group, it is probable that large hands and feet (and these features are generally present in tall individuals of the present day), as well as long limbs, long face, and relatively large jaws with long head, are the normal associations of a tall type. And if we judge from racial features it is also probably large-chested. This, with fairness of complexion, light-coloured hair and eyes, makes a nearly typical Saxon description. Maturity in this primitive form should be reached late. (Retardation, effects of cold.)

Southern Form.—Shorter, with relatively short limbs. 'In the majority of cases, particularly in Europe, a relatively broad head is accompanied by a round face, in which the breadth back of the cheek bones is considerable as comparable with the height from forehead to chin' (Ripley, p. 39, 'Races of Europe'); and again (p. 123), 'From Northern Europe as we go south the nose portrays a marked

tendency to become flattened and open at the wings.' The darker colouring and the stouter bodily forms thus complete the idea of a southern as contrasted with a northern European individual.

Endeavouring to exclude characters which seem to be due to the effect of the influences of civilisation, and bearing in mind that sexual divergences of form are a late rather than an early feature, two primitive types may be portrayed that have a distinctive individuality.

LONG-LIMBED NORTHERN (PRE-CIVILISED)

(1) COLOUR CHARACTERISTICS. — *Complexion*, ruddy, fair. *Skin*, coarse (primitive feature). *Eyes*, blue. *Hair*, wavy or straight—more often the former—golden or reddish.

(2) FORM.—*Face*, the whole physiognomy uniformly coarsely fashioned (primitive feature), and head and face both long rather than broad; cranium relatively small to face. *Forehead*, less than one-third of face, receding (primitive feature). *Middle portion* of face, about one-third, cheek-bones high and prominent, but not wide (northern feature). *Nose*, bridge well defined and large (northern feature). *Jaws*, more than one-third of face; very powerful (northern feature). *Chin*, absent or slight (primitive feature).¹ *Lips*, bright red, little curved (primitive feature), and not very thick (southern and tropical races generally thick fleshy features).

¹ Not well developed in lower races, and in the most primitive almost absent. (See Holden, &c.)

Teeth, large, yellow, and strongly set (northern and primitive feature). *Ears*, few curves, large, badly shaped, set high in the head because of large-jaw development (northern feature), and appear higher because of badly developed brain (cranial) portion (primitive feature). *Neck*, thin and muscular (northern feature).

Body.—*Shoulders*, square and muscular (northern feature). *Limbs*, long, with large feet and hands (northern feature; masculine and advanced features if in man, northern and primitive if in woman), heavily fashioned (primitive feature). *Chest*, big capacity relative to abdominal development. *Height*, tall.

(3) MENTAL CHARACTERISTICS.—*Passions*, strong, fond of all exercises, large eaters, lust desire excessive.

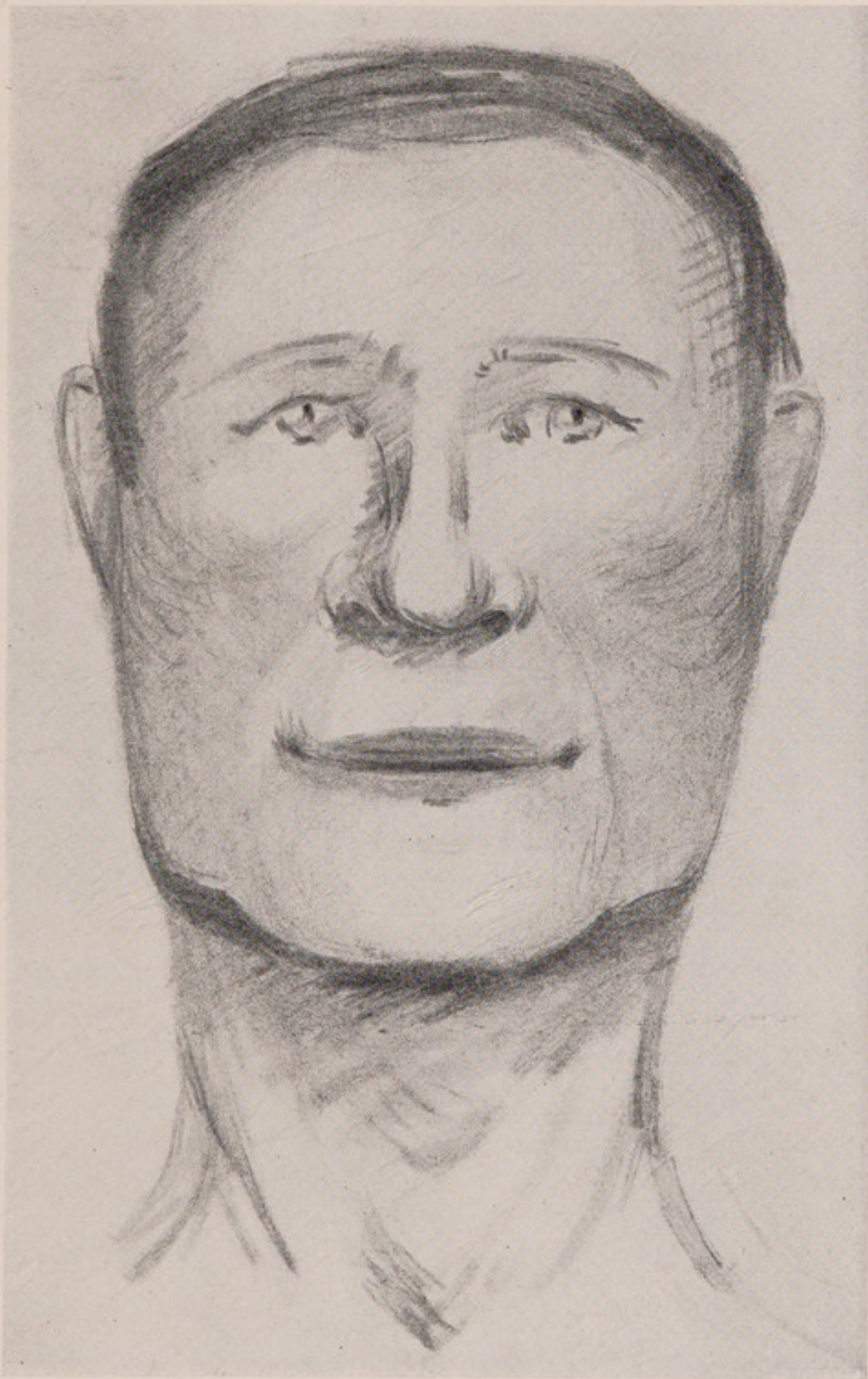
Emotional Powers.—Impulsive, very combative, some real imaginative powers,¹ some sympathy for other men, and beginning of sexual love,² but animal cravings predominant over emotional.

Intellectual Life.—Powers feeble, but the little that exists is utilised; sense perceptions alert.

(4) SOCIAL CHARACTERISTICS.—War and fighting main life-business, fond of all sports, dislike of sedentary and mental employments; fitted for labourers in civilised States, and are natural soldiers and adventurers; easily become criminal on account of the predominance of physical desires and weakness of all higher social feelings.

¹ See *Norwegian Mythology, &c.*

² Teuton monogamic traditions.



NORTHERN PRIMITIVE LONG-LIMBED TYPE.



(5) **MEDICAL CHARACTERISTICS.**—When present in higher surroundings are subject to diseases the result of passion excesses, such as alcoholic disorders, heart disease from over-exercise and unhealthy life ; apoplexy from disease of blood-vessels, fostered by venereal disease and over-eating ; pneumonia ; consumption from excesses, not from a natural predisposition, and therefore treatment is satisfactory if their life-habits can be controlled and the disease is not too far advanced ; insanity from mental deficiency¹ in higher environment ; in tropical climates suffer severely from tropical diseases.

(6) **EDUCATIONAL CHARACTERISTICS.**—As the interest of such individuals is mainly physical, the mind can only be aroused through physical channels ; hence manual training and employments requiring manual skill should be taught to them in such manner that the small mind-power existing may be developed. Higher education pernicious, as distaste for study is aroused or superficial outlook engendered.

(7) **ARTISTICAL CHARACTERISTICS.**—From this form of temperament the true physically beautiful form can be developed. The embodiment of physical strength, of physical prowess. Such perfect physical power cannot be combined with perfect mental strength, as the mould of the whole organisation cannot be adapted for two ideal but opposite ends.

¹ General paralysis of the insane frequent in this type

SHORT-LIMBED SOUTHERN TYPE
(PRE-CIVILISED)

(1) COLOUR CHARACTERISTICS. — *Complexion*, bronzed and dark (temperamental feature); *Skin*, coarse and thick (primitive feature), oil glands in skin much developed (temperamental feature); *Eyes*, dark; *Hair*, black and mostly straight, sometimes dark brown (temperamental feature).

(2) FORM.—*Face*, nearly round, greatest width opposite cheek bones (temperamental feature). Features, uniformly coarse, and head short round type, cranial capacity relatively small to size of whole head. *Forehead*, small receding and less than one-third of face (primitive feature). *Middle* and lower portions slightly over one-third (temperamental feature). *Eye*, sockets rounder than northern form and eyes more prominent (temperamental feature). *Cheek-bones*, wide rather than prominent (temperamental feature). *Jaws*, small as compared with cheek portion (temperamental feature). *Chin*, almost absent (primitive feature). *Teeth*, large and yellow (primitive feature), but differences in size less marked than in sanguine type. *Lips*, thick, loose, and unshapely (primitive and temperamental features). *Nose*, broad low bridge (temperamental feature), and fleshy fat nostrils (temperamental and primitive features). *Ears*, lobe thick and large (primitive and temperamental feature), whole form of ear flat, little curved, large and appearing near to the top of head because of small cranial capacity



PRIMITIVE SHORT-LIMBED TYPE.



(primitive features). *Neck*, short, thick, and fat (temperamental and primitive features).

Body, shoulders, sloping, limbs short with small but thickly fashioned hands and feet. Relatively large abdominal development (temperamental feature), small heavily fashioned hands and feet, with rounded short limbs (feminine as well as primitive feature). Short and stout of person. Circulation sluggish.

(3) MENTAL CHARACTERISTICS.—*Passions*, rather large eaters and drinkers, but inclined to be fastidious in choice of food and drink. Extremely sensual. Not fond of exercise.

Emotional Powers, slight, almost absent, slow of perception and apprehension, vindictive, imaginative power small. Governed by animal cravings.

Intellectual Life, slight, speculative tendency exists.

(4) SOCIAL CHARACTERISTICS.—Very little value socially, lazy and given to physical excesses of every description.

(5) MEDICAL CHARACTERISTICS.—Liable to all diseases that result from idle life and excesses of an animal nature. Strong tendency to tuberculosis in all forms in cold regions. (? Coarse tubercular type.)

(6) EDUCATIONAL CHARACTERISTICS.—Almost hopeless from the educationist's point of view, born an animal and will remain so. With a slight increase in mind power becomes attracted to finance and gambling generally, and then passes into stock-broking criminal class of society.

(7) ARTISTICAL CHARACTERISTICS.—The type of vegetative animalism. A natural Bacchus.

Up to this stage the investigation of facts and their interpretation is not extremely difficult. The whole of the facts studied point clearly to the development of two definite forms of bodily growth existing under conditions which are unaffected by civilisation, or among those classes in an advanced state that are least influenced by cultured life. The tall and short human forms are uniform types which have been more than half intuitively realised by artists and which are found to still exist at the present day, and are associated with other related types, more or less diseased, and whose characteristics are known to be causally related to and dependent upon certain gland structures of the body. In proportion as an individual approaches to either of these types he or she will possess these tendencies according to the degree of resemblance.

To obtain information even of an elementary nature, in relation to the changes fostered by civilisation, is difficult and beset with obstacles. The John Bull type, or more correctly the primitive man, is, as we have seen, disappearing, but beyond this elementary fact observation of further changes is not recorded.

The picture galleries, as I have already mentioned, afford tangible evidence of alteration in the physiognomy of present as compared with past men and women. One has only to glance at the

paintings of Holbein, Rubens, Hals, and other painters of the same period, and to note how in the English, Dutch, and other nationalities the same primitive features appear, to realise that the heavy physical man was strongly in the ascendant. The same cast of face persists in the scum and still more largely in the dreg stratas of Society of to-day. And the life which these scum and dreg individuals desire to live at the present time is virtually the same as that which our ancestors had to tolerate or enjoy and live in. The physical type appears in all *early* civilisations, and it must, therefore, be connected in some way with the environment. Like physiognomy, like desires, and like environment must favour individuals with like desires. After the fall of the Roman Empire and up to 1500 or 1600, there would appear to have been an almost exclusively physical form thriving and multiplying corresponding to the physical surroundings.

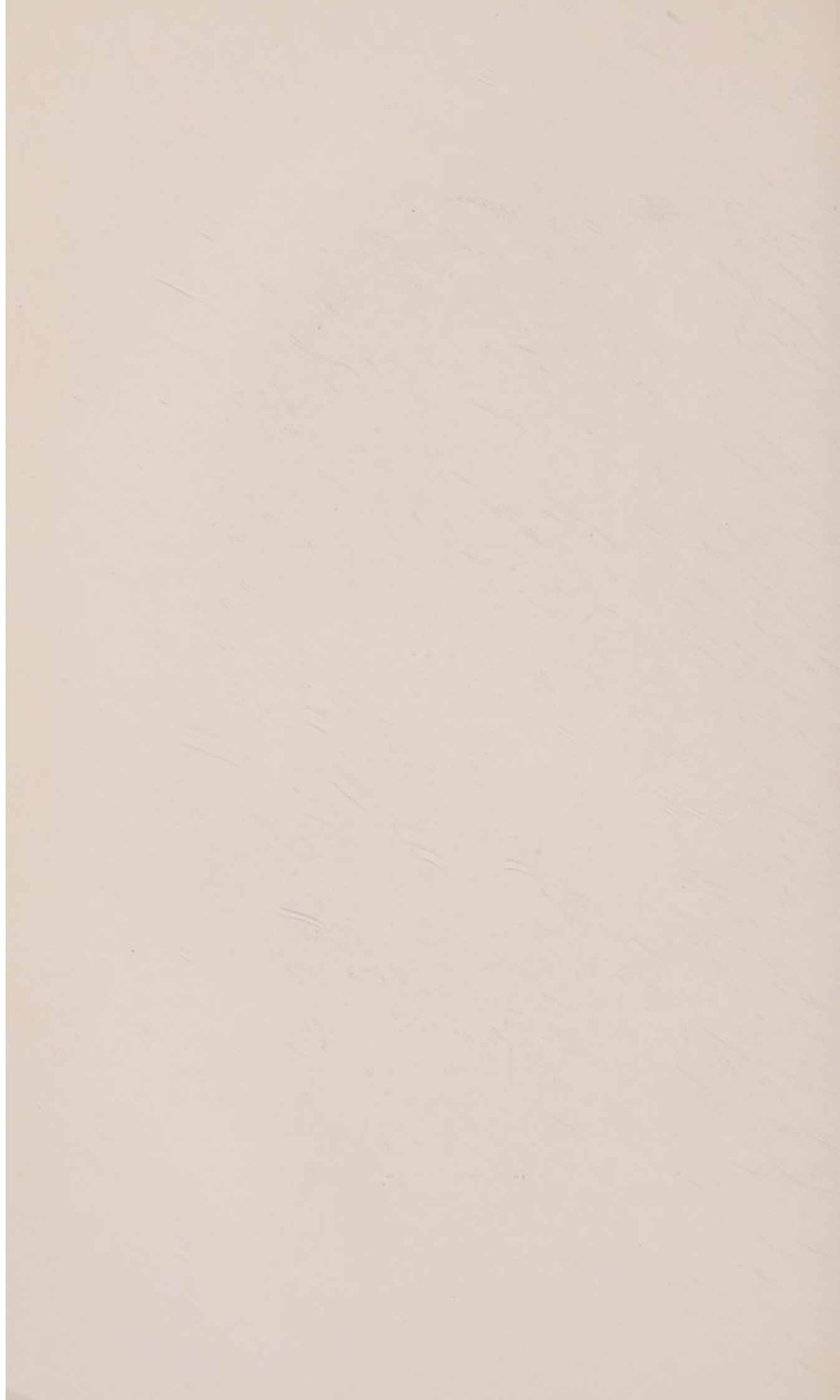
About this period, and to a very slight extent even earlier, certain modifications of these primitive heavy-faced forms begin to manifest themselves.¹ Raphael Santi, Botticelli, Hans Helming, Van Eyck, &c., mostly in ideal representations—and it must be remembered that, to some degree, even portraiture in art is ideal, and will follow ideal lines somewhat in *advance* of the time—depict an oval face that is obtained by diminishing the size of jaw

¹ There is a good deal of evidence to prove that earlier inhabitants of the Egyptian, Roman, and Greek kingdoms had cruder physiognomies than those who belonged to the same empires in their later stages. It would, in fact, appear that human, like animal, forms evolve or degenerate with their environments.

and cheek and enlarging somewhat the forehead. A certain smoothness also appears in the paintings, the result of smoothing down all abrupt lines; and the general impression obtained is a rather colourless form, not unbeautiful, suggestive of refinement and some capacity for mental life. That this form did exist, and that it was not a mere painter's ideal, is proved by the fact that the portraits that exhibit these peculiarities are nearly always those of cultured people; while those that were intellectually and emotionally nonentities, such as the majority of the old monarchs and Court followers, were represented as belonging in physiognomical characteristics to the heavy-faced brute type, exactly as one would expect from their low habits of life. Shakespeare's face, in many respects, belongs to modern types, but in many other points it represents the unspecialised capacity for culture distinctive of this period; and most great men of the time exhibit some of the characters of this transitional form. An oval type of face may, therefore, be recognised as fitted for, and existing mainly under, semi-modern life conditions. If anyone will take the trouble to examine paintings some two or three centuries old, in which the nude female figure is represented, as are to be found in the Hampton Court and National Gallery collections, he will discover plenty of evidence of change of form corresponding to facial differences, already considered in previous chapters. The masculine build, the stout limbs, the primitive masculine hips—which, instead of being evenly balanced, are tilted anteriorly downwards and backwards, so that



MEDIÆVAL TYPE.



the buttock region projects (a primitive feature), causing the lower part of the abdomen to curve downward between the thighs—are all points in favour of the existence of a lower prevalent type in the middle period of our civilisation. The same barbaric and semi-barbaric characteristics are to be observed also in the male figures for this time. (See illustration.)

Of the many forms now existing, it is quite evident that individuals belonging to the primitive types, especially among unemotional and unintellectual peoples and classes, still exist in large numbers. They are found scattered among the whole body of labourers throughout the world, and are occasionally seen even in the lower artisan class. Country life is less destructive to these types than town, and they are frequently seen in prisons and lunatic asylums. The loungers of the public-houses are often striking examples, though here the debasing effect of alcohol accentuates the lower primitive characters. Nevertheless, such places are naturally attractive to them because of their primitive desires, in the same manner as stimulants attract the primitive savage mind wherever drink is introduced to it. As I have pointed out, the environment of the poorer classes is favourable to the preservation of the brute types; and for this reason these cruder forms still exist, not because of their value socially, but on account of scum criminal control of the national affairs. Modifications of the long northern type will of course be utilisable for some time, as the physical strength and *toughness of organisation*

which accompany it will be required till machinery is much more highly adapted to mind-life and control. In all ages a primitive type of some kind must, on account of progressing evolution, exist ; but with each age its standard must rise.

Examples of the survival of lower temperaments may be seen in the adaptation of the physically slothful, short, crude type and the oval-faced middle-age form to modern anti-social conditions. Any individual who takes the trouble to observe carefully moderately large numbers of the modern stock-jobbing class will find that, with some exceptions, they may be studied under two heads. Under one the individuals are dark, heavy of face, and possessing the characteristics of the round-headed Eastern peoples, stout of body, and their brain capacity, which is average, as far as intellectual powers are considered, but unemotional, is used for obtaining the means of satisfying their crude savage passions and desires ; under the other may be seen persons, often of much slighter and mostly taller build, who, unlike the former group, have small heads and faces, and whose limbs and general bodily conformation are not cumbrous, like the other, but alert and active, and the whole aspect is one of sharpness, superficiality, and hardness. The heavy, cumbrous type has recently been illustrated in the general physiognomy of the two or three recent ' company-promoting ' criminals who have been prosecuted for unusually glaring offences, and not a few of the present Trust manipulators exhibit the same physiognomical features. A few slight additional alterations

of an intellectual nature to the primitive southern temperament will give one form of modern speculator. But both classes are essentially parasitic, being without higher emotional feelings, and thus living for passion, satisfaction, and display, and utilising their slight mental power to the furtherance of these lower ends. It is to these scum commercial beings, supported by equally useless scum feudal associates, that the nations of the present day owe the preservation of those habits and customs that make dreg conditions possible. Without any love of higher life, they exist in ill-gotten or ill-maintaining affluence, interesting themselves in supporting, in commercial circles, in Parliament, in the Church, and in public bodies generally, beer, tobacco, gambling, sensual, and other physical interests, to the exclusion of higher art, higher music, higher science, and, greatest of all, higher morality, which alone characterise Man as Man. It is time that our prison doors were widened to admit, where necessary, the nobleman's carriage and the speculator's car.

Above these two parasitic groups is another that is naturally social in its capacity, but is apt to become hostile to collective welfare owing to its being guided by scum rather than true society leaders. Of slender build, with sharp features and natural rapidity of thought and action, they are fitted admirably for the growing rapidity of modern industrial life, and for the better class of mechanical and subordinate mental occupations; but lacking creative power such individuals when given important posts become responsible for the spread of wrong ideas in all phases of life.

Now, although the anti-social slim stock-jobber type as well as the social slim alert citizen are both manifestly derived from the middle-age form of individual, in that both have faces and heads of relatively equal proportion, it is curious that the parent type should not persist more in Society than it does. This is, I believe, due to the fact that while middle-class life favours the advanced temperaments, which I shall presently describe ; and slum conditions dreg and old primitive brute powers ; and the scum atmosphere parasitic and debased individuals, there is yet no section of society now existing that is favourable to the slow, more or less refined, pondering, but superficial mind that values bodily and mental employments equally, and which was fitted for the pre-mechanical times of the seventeenth and eighteenth centuries.

The rapid changes that have occurred in the past hundred years, which have necessitated more rapid response to surroundings and more intelligent methods of social organisation, are unquestionably making themselves felt in favouring different characteristics to those which were formerly required. There are many difficulties, however, in the way of accurate investigation on this subject. It is extremely difficult, if not impossible, under present circumstances, to get people of more or less similar physiognomy to come together, and it would be equally troublesome to induce them to allow an investigator to examine and note their individual differences, inquire into the family history of each, and endeavour to form some estimate of the relation

of each person's surroundings to his or her individual predisposition. One cannot reasonably blame anyone for this, or for the sense of the privacy of home life, nor for their objections to even a scientific study of home conditions even when only the conclusions would be utilised for publication. The emotional ideas, of each human being who possesses them, are in their nature too sacred to permit of rational handling, and their importance individually and socially is too great to be sacrificed for any, even the noblest, truth-seeking end. Nevertheless the closing of this method of study to the student throws him back upon the less reliable facts of general observation.

The same drawback applies in medical practice, though possibly with less justice, thus making it necessary to be content with the most rapid notes jotted down after each patient has left the consulting room.

The most important point that I was desirous of obtaining information upon was the general one of health relationship to types. The points to be looked for I have already discussed—the unity of idea pervading the whole organisation, the sexually specialised individual if belonging to a higher type, the absence of inco-ordinated movements, and the sanity and individuality of the mind. I tried to exclude persons of the same family, so as not to include a large number of the same stock and thus vitiate my estimate, and I ceased taking notes when the same families some months later reappeared for fresh treatment. In this way I made 189 rough estimates

of cases all of which were new to me, and, as far as I could control it, without family relationships to each other. The figures given are in no sense intended to be accurate, firstly because I could not, as I should have liked, study each health feature separately for each temperament, nor even for all temperaments, as I was obliged to judge rapidly the general impression on all these points, noting the regularity of teeth, shape of face, hands, &c., while I was considering others connected with the disorder from which the patient was suffering. Again, it is possible that my number of healthily fashioned individuals may be smaller than that of the average population, as it was drawn from people who, though not sufficiently ill to require a doctor to visit them at home, yet sought his advice on the ground of some pain, or cough, or feeling of languidness that worried them. Nevertheless, taking these reservations into account, the general conclusion will, I believe, be found to be approximately correct. Most of the patients were females, so that the variability would be rather less than that of the general population.

Paying attention, therefore, to those features which would appear to be the result of healthy development, I found that of the 189 cases thirty could be described as being regularly and harmoniously organised. In considering this aspect of the question, I noticed more particularly the regularity or irregularity of the teeth in relation to each other and the jaw, and the whole harmony of face and limbs in relation to them; i.e. delicately formed

teeth are not commonly found in muscular, coarsely fashioned, large-limbed individuals, and *vice versa*. Irregularities in size of upper and lower jaws, irregularities in the palate, &c., disproportionately large or small nose or cheek bones, or crude or advanced shape in an otherwise advanced or crude face. Of people with harmoniously formed regular symmetrical organisations and healthily reacting mental powers existing in the general population, there would thus appear to be about one to six or seven if this estimate is fairly accurate. That is to say, that about six out of every seven people are in a racially and temperamentally transitional stage, mostly from a lower to a higher form, but occasionally degenerating from a higher to a lower. This incompleteness or imperfectness of structure is not necessarily associated with great lack of health, but does denote that ideally suitable environments for these irregularly evolving types are more difficult to obtain, and also that on account of this lack of unity they are less stable characters, and when irregular are compared with regular forms of the same temperament, more subject to disease.

Amongst the 189 cases one large deformity, a complete cleft palate and hare-lip, was found, and this is very probably somewhere near the proportion of extreme abnormalities to the healthy and less accentuated unhealthy variations.

Fifteen individuals were strikingly delicately fashioned, but out of this number three had disproportionately large teeth, which, however, were quite

regularly placed and were set in jaws that were themselves small and slightly made.

Generally, in my experience large teeth have been more often associated than small with irregularity of growth and position. In each of these fifteen persons the palate was small but uniformly and regularly narrow and relatively deep. There were two others who combined with regular features and small-face type a relatively large, wide, deep palate almost as roomy above as below. I know of no means of deciding whether the narrow, or broad, regularly formed palate is natural to the small-face type, but my impression is that the broad type goes with a square chin and a less emotional cast of face and mind. Three others, with small-type faces and forms, had palates which, though regular and symmetrical, were characterised by great depth in the central portion, and generally with this characteristic I have noticed the so-called 'bird-like' face, and I am inclined to believe this to be a degenerate peculiarity. There were thus twenty individuals—perhaps more strictly, if I exclude the five who may have been somewhat defective, only fifteen—out of the 189, who were uniformly and really beautifully proportioned, who were graceful and had no obvious deformity or irregularity, and were delicately adapted for a mental responsiveness to their surroundings. In my experience this class is almost uniformly sober, respectable, and fond of culture. Again, I only found ten out of the whole number of cases that could be strictly described as belonging to a *uniformly* primitive type, and not one of these ten belonged to the

southern primitive form, the whole group being northern, tall,¹ and long-limbed.

Now, from this analysis it is clear that *normally* a delicately organised group exists which may be contrasted with another that is also normal, but is coarsely formed, and as both are not infrequently found living fairly healthily in their surroundings, it is necessary to consider the evolutionary significance of these two differing classes; and, while the sociologist and the medical man may be not less interested in the greater number of individuals who are not fashioned after one exclusive plan, whose scheme of organisation is not regularly developed, it is clear that the artist will find in the altogether primitive and the extremely delicately moulded modern types material for studies of the different kinds of beauty associated with the human form.

Stewart, in his work on 'Our Temperaments,' quotes with approval from an anonymous work the following passage:

'The nervous or mental temperament may be known by the sharp, quick, intelligent eye, well-formed brain and V-shaped pale face, with small bones and neatly formed body. This is the most active, finely strung, and delicate of all the temperaments' (page 70).

This description certainly corresponds with the small-faced type already considered.

Now, from an examination of pictures, especially portraits, that take the human face and form for

¹ As far as I could judge, the women were about 5 ft. 6 in., and the men were about 5 ft. 9 in. or 5 ft. 10 in.

their main subject in earlier periods and in our own time, and in all civilised countries; from the fact that the heavier type corresponds more nearly to the savage, to the criminal, and the insane; that among manual labouring unskilled sections of the community the best examples of the coarse temperaments are still to be seen; it would seem not improbable that the large physical man and woman of to-day with clumsy slow movements, love of sport, outdoor exercises, and passion excesses, is the older form of citizen,¹ and that with a changing environment newer and less brutal human beings are coming into existence.

Among these small-faced delicately developed mental types what forms are to be considered? To take examples of the different leaders in the many different walks of life might be of value could it be carried out harmoniously, so that for each trade and profession the ideal line of physiognomical fitness could be portrayed. Unfortunately the unfit predominate so largely as to vitiate all such statistical methods.

I shall accordingly limit myself in this volume to the consideration of the three extremes of higher specialisation, sexual, emotional, and intellectual, without which no higher type can exist.

The methods which I have attempted to use are based upon, what seem to me to be, the lessons to be

¹ In reviewing the same question from an anthropological aspect Professor Symington notes that 'There is strong evidence in favour of the view that the evolution of man from microcephaly to macrocephaly has been associated with the passage from a macrodontic to a microdontic condition.'—*Lancet*, 1903.

learned from the errors of past students in this science, and also from corrected mistakes of my own since I first commenced (in 1895) to investigate a few of the many problems which this intricate subject presents to one. It is clear that a knowledge of the broad principles of evolution is absolutely necessary to anyone desirous of considering the question either biologically or sociologically; that no organism can be considered apart from its surroundings, and also that the widest known group of facts must be utilised.

Accordingly my attempts were first limited to tabulating faces and forms according to the primitiveness or advanced nature of their surroundings. This plan, simple as it seems, at first sight is no light task, for individuals can only be rationally compared with one another, if age (child, adult, and senile) changes and racial factors are equal and common to all in which such comparison is made.

But at the very outset of one's labour one is confronted with the obvious fact that one must use one's own judgment far more freely than is desirable for scientific accuracy. To discover the exact age of the person when each photograph of each individual was taken, to know sufficient of his or her family history, and to tabulate, guided by anthropological data, according to race, and subsequently again re-label according to social position and occupation, requires such detailed information of the life of each case as only unlimited time and wealth could make realisable.

The difficulty of estimating the face-form from a

photograph which necessarily registers only one impression and only one portion, and is almost always 'touched up' by the photographer, is extreme. To watch and hurriedly note characteristic features in individuals and then discover their habits is even more difficult; while collecting many photographs of the same individual, although valuable, is open to the objection that not many can be obtained that have been taken at the same time and by the same photographer. Colour characteristics have to depend largely on individual observations, as no camera in common use registers them. To obtain the common characteristics of advanced individuals it is necessary not to include those who appear great, by and as a result of scum advantages; nor exclude others, if it were possible to do so, who, naturally of great capacity, have been dragged down by dreg disadvantages. In practice, unfortunately, it is only possible to obtain and make use of the few who have proved their capacity by tangible results, and from these few a further thinning must be taken so as to remove those men and women belonging to different periods of time as well as those whose minds are cosmopolitan enough to be emotionally and intellectually great. There are, therefore, only a small number of individuals who conform to the requirements, that is, who are intensely emotional *or* intellectual, and who are or have been, at least for some period, contemporaries of each other.

Again, it is not possible to select, unless great care is used, leaders in any field, however much the requisite qualities are needed, if other powers as

well are required. To study the emotional qualities and their physiognomical accompaniments, one must select only that employment which requires emotional power. For this reason a poet if characterised by capacity for emotional representation and easy-flowing picturesque style is a better subject than a musician to work out the type from, as the intellectual qualities required in the composer give higher intellectual as well as emotional points. Thus, Shelley, Keats, Tennyson, &c., are better to work upon as special studies than Wagner, Beethoven, or Bach.

For the following types I noted the most common features in individuals characterised by emotional, scientific, and metaphysical power; and the sexual temperaments have been worked out from recognised sexual differences.

I would again repeat that the only reason why statistics have not been given is because it is not yet possible to do so. I have now some thousands of photographs in my collection, and each one necessitates individual handling and grouping, hence I have been reluctantly compelled to abandon any attempt at percentage enumeration; but I hope to return to this method when I am able at some future date to analyse a much larger number of sub-varieties of forms in relation to the less general, and therefore more detailed, consideration of occupation fitness.

Primary Requirements of the Scientific Mind.—

(1) Great powers of observation; (2) trained imagination to utilise observations; (3) a love for truth as great or greater than that of the artist's for

beauty—without this an investigator is merely a speculator; (4) analytic and comparative powers to enable irrelevant observation to be excluded, and to limit imaginative theorising rigidly by direct inferences from discovered facts; (5) a mental organisation which, while being predominantly intellectual, is yet sufficiently interested in Art, Music, Literature, and practical life to be open to all outside influences that may bear on the subject under consideration.

Now, it is clear that these qualities are closely related to those of great minds in other fields. In powers of observation the scientific man is easily supreme, but visually this quality is required in a less degree by the artist; aurally, the musician should obviously be open to every fresh sound or group of sounds that are of musical import. Still, in observational capacity applied generally to all senses this is the trait that more than all others gives the distinctive feature to the physiognomy. It must, however, be recollected that this naturally varies with the subject each individual has a capacity for. The deeply set keen eyes which distinguish natural investigators such as Darwin, Huxley, and Wallace show aptness for the line of research which they pursued. But in the laboratory the sense of touch may be of vast importance, and the sense of hearing be of equal value with that of sight.

In those persons whose observational tendencies are definitely predominant there will be a tendency to take a more literal view of life than is perhaps justified. It is this error in their work which has

been responsible for the just and unjust criticism of the scientist as being a mere materialist.

Again, a trained imagination is a common requirement of all mental employments. The artist for visual allegory and harmony of ideas. The musician for aural allegory and intellectual and emotional development of beautiful harmonies out of a beautiful but simple melody. This faculty, though differently directed, is of equal importance to all.

The love of truth, which is essential to all scientific advancement, is not unlike the love of accurate presentation of a subject, as a subject which an artist should be imbued with and the sense of tone correctness which a musician requires.

A comparative power, too, is also universally necessary, and finally a certain breadth of mental capacity is necessary, to all really great work. Hence, the highest ideal of scientific efficiency approaches somewhat to that of other ideals in other fields of labour.

When, instead of predominant love of truth and capacity for observation, the imaginative elements of the mind and higher feelings are the marked characteristics, then a prophet like Carlyle, or if combined with a love of form and colour, a Ruskin, may arise. And the intellectual element in the music of Beethoven and Wagner and others explains the resemblances, in many cases striking, between the higher scientific and musical physiognomies. Lastly, when the critical and synthetical powers are specially strong, the tendency to theorise widely as in Spencer

allies such students of nature with the mere philosopher and the metaphysician.

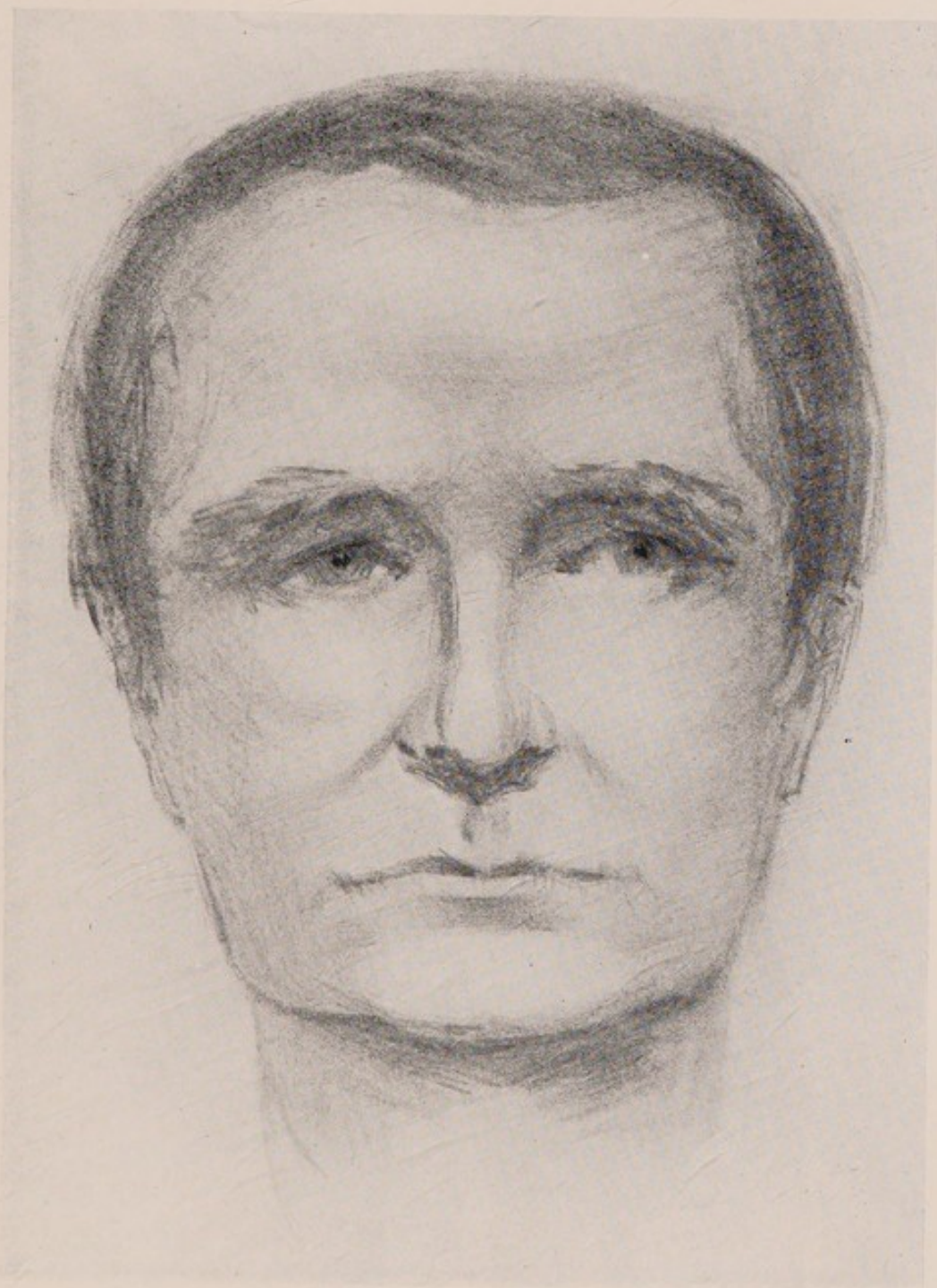
There is, of course, a much more common, and at the same time lower, worker in science, the mere accumulator of material, and above this the mere recorder of observations, and both of these forms are useful, but they are not the controlling minds upon which progress depends, and it is the ideal scientific mind that I am at present alone concerned with.

In each of the types I have tried to take the broadest *common* ground for my material. For the scientific all those whose power actual achievement has rendered evident, whether it be like Armstrong in engineering and mechanical science, like Huxley and Darwin in biology, or like Sir William Huggins and Simon Newcomb in astronomy.

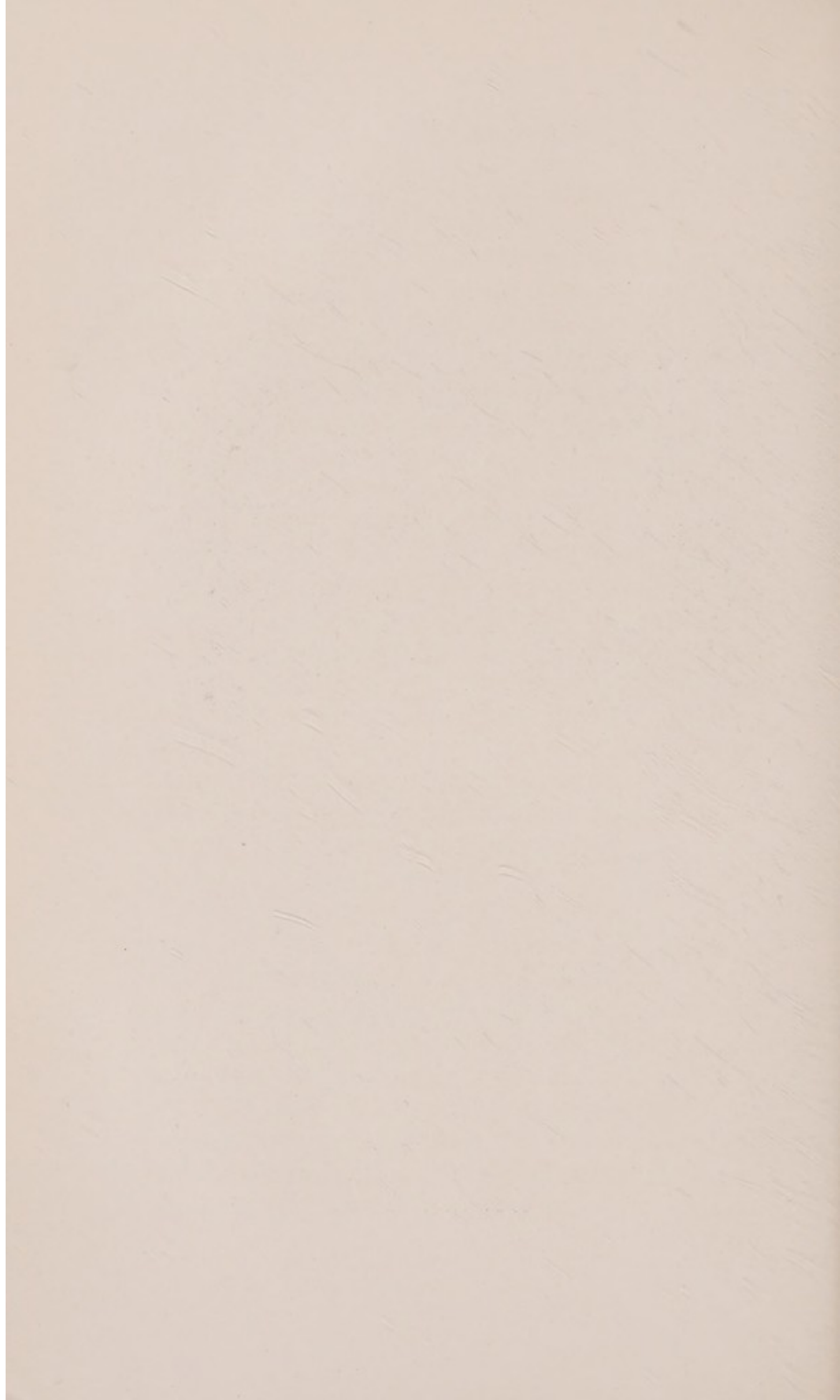
THE SCIENTIFIC TYPE

(1) COLOUR CHARACTERISTICS. — *Complexion*, pale, and of a uniform pallor; little affected by excitement. *Eyes*, some shade of grey, brown, or, more rarely, dark blue, though very variable. *Hair*, most frequently straight, and rather dark.

(2) FORM.—*Face*, broad V-shape. *Forehead*, more than one-third of face; not necessarily high, but generally broad and full in upper and lower portions, but often slightly depressed in middle region. *Brows*, clearly defined, strong and straight, following closely the upper margin of the eye socket. *Eyes*, deeply set. *Nose*, straight, but not Greek



SCIENTIFIC TYPE.



form, as root passes below forehead and forms notch; inclined to thicken slightly downward from root, but the nostrils are delicately formed, rather narrow, and inclined to be rigid. *Jaws*, less than one-third of face, and falling away gradually downwards below ears and cheekbones, but moderately full in chin region. *Chin*, square and prominent. *Lips*, rather thin and inverted, but shapely. *Teeth*, small, regular, white. *Ears*, finely shaped, with lobe slight, and apparently placed low down, on account of large head above them. *Head*, front part full and well developed, and back rather large. Whole cranial portion, in relation to face, large. *Features*, uniformly refined. *Neck*, long and rather thin. *Body*, shoulders more or less square; chest, broad, but not very deep. *Limbs*, generally long. *Whole form*, taller than its primitive type, whether northern or southern; and this is, I think, due to delayed maturity. (Facts relating to growth and height in middle-class schools, as compared with poorer, seem to support this assumption.) Circulation active.

(3) MENTAL CHARACTERISTICS.—*Passions*, subordinated, and relatively slighter than primitive types; small eaters and drinkers; not sensual; sedentary habits.

Emotional Powers, considerable; rather quick of perception; love of knowledge and theorising; and form in presentation of theories and practical tests of ideas.

Intellectual Life, large; analytical and synthetical capacity.

(4) SOCIAL CHARACTERISTICS.—Fitted for organisers ; leaders in almost all fields where thought and action the result of thought are required ; need the co-operation of others in order to develop their own life and higher needs ; are therefore sociable, lovers of home.

(5) MEDICAL CHARACTERISTICS.—Liable to brain inflammation in childhood (meningitis), but, if properly educated and rightly environed, grow to acquire considerable strength in adult life, but cannot stand slum or savage surroundings.

(6) EDUCATIONAL CHARACTERISTICS. — Tends naturally to look at life from the modern standpoint, and must therefore be trained with this fact in view ; love for exact studies ; hence artistical and musical and other emotional studies can only be taught by showing interdependence of scientific and emotional pursuits on each other ; learns readily, if schoolmaster or schoolmistress has aptitude for teaching.

(7) ARTISTICAL CHARACTERISTICS.—A natural mind king.

The metaphysical cast of mind is one in which rational powers hold almost absolute sway. It is a highly advanced form, but, on account of the dominance of intellectual processes, is cold and unfeeling. In any field of work, whether in art, science, literature, or commerce, it is valueless and superficial, because it never has sufficient love for any subject to honestly grapple with the difficulties and wearisome details which all require of the investigator.

With a slight bias in favour of emotional life, it becomes a preacher of stale platitudes from some pulpit, and not infrequently on account of intellectual power holds a high place in the religious body to which any individual of this type may happen to belong; and, since the mild colouring of emotional feeling has little real influence on the character, such persons are easily persuaded, occasionally honestly so, that class injustices do not exist, that jesuitical means are justifiable, and, when necessary, have consciences sufficiently elastic to be able to avoid any unnecessary social unpleasantness that might result from holding fearlessly and honestly to honest belief.

When passion supplies the slight incentive required to keep their mental power active, they become the foul, fiendish creatures not uncommonly seen in the more wealthy walks of life—the clever evader of the law, the rogue too slippery for legislative restrictions, the class politician, or, worse, the epicurean beast who *scientifically* lives to eat, drink, and lust pleasantly, keeping always within healthful lines, and careless of the wreckage and misery that he spreads around him. This Machiavellian type, whether it be exemplified in the Jew Stock Exchange jobber, in the English scum ‘aristocrat,’ or as leader in a retrograde religion, or, least harmful form, as a mere speculating philosopher, or perhaps research experimentalist, is always a danger to social life. The power of the reasoning mind combined with the exceedingly weak higher feelings make it always easy for it to become criminal, and when criminal

its capacity makes it dangerous to an incalculable degree. It differs from the scientific mind in the complete, or nearly complete, absence of *love* of truth and desire for knowledge for its own sake, and the value of this advance in thought to humanity. It has thus no forces in its nature that bind it to society, and *physiognomically it may be known by the absence of emotional characteristics from a face otherwise suggestive of mind-power.*

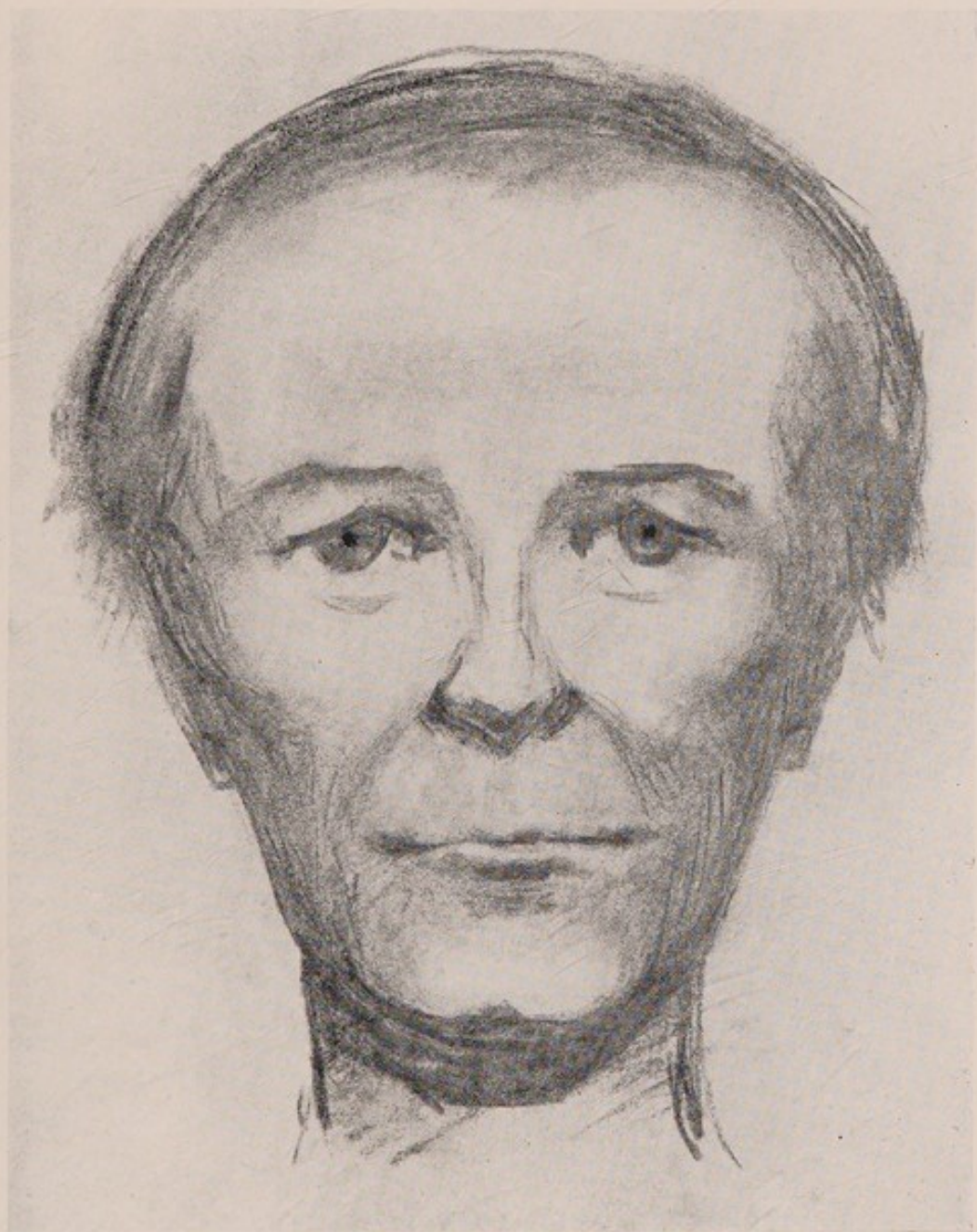
THE METAPHYSICAL OR RATIONAL TYPE

(1) COLOUR CHARACTERISTICS. — *Complexion*, pale, almost earthy. Not at all affected by existing conditions of life because of incapacity to feel excitement. *Eyes*, either black or watery, grey or blue. *Hair*, straight and black.

(2) FORM. — *Face*, somewhat similar to scientific, except that forehead is higher and brows less developed, with eyes less deeply set. *Nose*, may be Greek in form. *Mouth*, upper lip long. Features often strikingly regular, and face sometimes handsome, inclined to cruelty and placidity. Head deficient in back (occipital) region.

Body. — Tall and moderately well built, graceful, cat-like in motion. *Limbs*, long and thin.

(3) MENTAL CHARACTERISTICS. — *Passions*, not extremely strong, but usually supply incentives to life as emotions are lacking. The individual, therefore, is savage and primitive in desires, but owing to a great *intellectual capacity* is diabolically advanced in methods of satisfying them.



RATIONAL TYPE.

Absence of all emotional characteristics.)



(4) SOCIAL CHARACTERISTICS. — Of no value unless subordinated to higher type in some scientific or mercantile pursuit.

(5) MEDICAL CHARACTERISTICS. — On account of care in habits of life and easy manner of living, in a great measure screened from disease.

(6) EDUCATIONAL CHARACTERISTICS. — Love of intellectual life should be fostered as the only possible means of checking criminal tendencies, as no other higher feelings are strong enough to train and check lower life.

(7) ARTISTICAL CHARACTERISTICS. — A mind satyr.

In passing from the extreme intellectual to the extreme emotional form, it is necessary to keep in mind the fact that very few geniuses are available to draw general conclusions from. Neither the musical composer nor the performer is available because of the intellectual power required in the former and the manual capacity and dexterity needed by the latter, though both are emotional. In artists, sculptors, and architects emotional power is also supplemented by other qualities. Poets, alone, seem to be satisfactory studies for this temperament, and from them must be excluded those with marked physical qualities, such as Byron, and others whose mystical and intellectual tendencies predominate over emotional, such as Browning, or who have the poetical force without the poetical power of expression, such as the American poets. It is, therefore, only upon those who combine clear emotional feelings with

clear emotional imagery and expression that the type can be based. Such men, in fact, as Shelley, Tennyson, Keats must, therefore, be predominant examples, and qualities present in them that are found to be also present in minor degree in the less characteristically emotional forms may be regarded with some qualifications as emotional.

EMOTIONAL TYPE

(1) COLOUR CHARACTERISTICS.—*Complexion*, pale, clear, with suggestion of faint warm flush over cheek bones, vessels often observable through the delicate skin, which reddens quickly. *Eyes*, bright, pupils reacting to light and emotional changes very quickly; colour, dark blue most frequently, gray, blue, and sometimes a lighter shade of brown. Suggest alertness, activity, and vivacity, and often have a slightly alarmed look. *Hair*, tendency to curl, brown or golden, or darker shade of red.

(2) FORM.—*Face*, narrow V-shape. Forehead more than one-third of face, high, and owing to the smaller and less prominent upper and middle portions of head appears to gently recede upwards, nevertheless whole frontal region is large, but breadth seems to increase downward. *Brows*, clearly defined, but curved and follow an orbital margin, that is more open than in the scientific type. *Eyes*, not deeply set yet not projecting, eyelashes long and curved outward from the eye. *Nose*, nearly straight, with forehead at its root, clearly defined, delicately fashioned, bridge high but thin, *Jaws*, less than



EMOTIONAL TYPE.



one-third of face, and from lowest and broadest part of forehead the cheek bones and jaws narrow downwards, so that the face tapers more than in the scientific. *Head*, full and well shaped, back well developed, and therefore long-headed in form. *Chin*, more rounded and has less breadth than in the intellectually predominant individuals, but is markedly prominent. *Lips*, rather thick, red but delicately shaped. *Teeth*, small, regular, white. *Ears*, finely shaped, delicately outlined, lobe distinct and rounded, and the whole appears to be placed low down as in the scientific and other highly evolved forms. *Neck*, rather long but graceful.

Body.—*Chest*, broad but inclined to flatness. *Limbs*, long and delicate, hands and feet small, fingers long and tapering.

(3) MENTAL CHARACTERISTICS.—*Passions*, strong, but in the main subordinated to emotional and higher impulse-life, but control less complete and continuous than in the scientific form.

Emotional Powers, very active, sensitive, generous, responsive to what is beautiful or noble in life.

Intellectual Life, small, everything realised as a series of sense impressions.

(4) SOCIAL CHARACTERISTICS.—Fitted for higher life and best social conditions. Unfitted to struggle against adverse tendencies. Are natural beautifiers of civilised surroundings.

(5) MEDICAL CHARACTERISTICS.—Delicately organised, succumb to consumptive diseases if existing in unhealthy neighbourhoods. Tend to exhaust themselves nervously with spasmodic efforts. All

appetite excesses peculiarly dangerous. Life that is free from worries is most suited to the healthy development of their powers.

(6) EDUCATIONAL CHARACTERISTICS.—Easily overtaxed, can be appealed to, ought not to be driven, quick to learn, but not capable of prolonged effort. Every opportunity should be given to encourage healthy exercises that are not brutalising in their nature. For the moral stability of this character it is absolutely necessary that ideals founded on reality and capable of affording support for after life should be encouraged and not discredited, but these must be natural growths of each individual and not grafts from the teacher's mind.

(7) ARTISTICAL CHARACTERISTICS.—The idealist and higher visionary enthusiast belong to this form of temperament, and material for conceptions of man corresponding to this cast of mind are, as a matter of fact, drawn intuitively by artists at the present time, and it is to this modern type rather than to the ancient Greek standards that emotional ideals of the human form should correspond.

SEXUAL DEVELOPMENT

Of all forms of disposition those of sex are most readily estimated, and the most definite part of temperamental study belongs, as I have already pointed out, to work done in relation to differences of a sexual nature. Laycock¹ was one of the first to establish clearly some of the most marked peculiarities of men

¹ *Nervous Diseases of Women.*

and women. Charles Darwin,¹ in detailing some of the chief secondary sexual characters, placed the study of sex upon a scientific basis, and Professors Geddes and Thompson² have recently reviewed the subject in a most suggestive manner, while the modern standpoint has been admirably summarised by Havelock Ellis in 'Man and Woman.'

Broadly, sexual differences are innate and pervade the whole organism, and are much less the result of nurture than heredity. Most of them are unquestionably associated with the primary sex organs, and others are so frequently associated with male and female specialisation as to be justly classed with other characteristics of this nature.

Sexual peculiarities, both mental and physical, are very much less developed in primitive as compared with more civilised races, and those classes of a nation that have greater capacity for culture also show more marked manly and womanly divergence than the vulgar scum and dreg sections of the community; but at the same time certain distinctions apart from primary differences are so constant and are present in all higher animals, that it is probable that they are founded on some universal cause common to all. Why some of these psychic as well as physical characters are peculiar to one sex is not known, but that they are so makes it probable that there is a not understood biological basis for all phenomena of this nature.

Just as in the different races divergence is evidence of higher as contrasted with lower evolution,

¹ *Descent of Man.*

² *The Evolution of Sex.*

so likewise in the animal kingdom sexual specialisations run a parallel course with other specialisations from lower to higher, and in the unfolding of the child life into that of the adult, sex differentiation grows more marked in later as compared with earlier stages; it seems certain, therefore, that such development is evidence of an evolutionary as opposed to a stagnant undeveloped type of organism. In the following scheme I have co-ordinated the manly and womanly peculiarities into two types. As in other temperaments, it has to be constantly borne in mind that no individual belongs exclusively, but only predominantly, to one group; hence it is doubtful if masculine or feminine development ever occurs to the degree here depicted, though it approaches or falls away from it according to the degree of specialisation, and because each type is more extreme than that which we are used to, they are less attractive to the eye.

In dealing with this question of differences in form of body and mind between men and women, it is absolutely essential to keep constantly in view two independent, though often co-existing, groups of facts—viz. divergence dependent on the lower male and female brute attractiveness on the one hand, and differentiation the result of higher womanly and manly characters on the other.

Among the most primitive peoples the forms of men and women, except for differences in relation to reproductive organs, are often strikingly similar. The women are muscular and generally masculine in appearance, and the faces of both sexes

are often, except for distribution of hair, extremely alike.

Now, the first upward movement manifested is an increase in primary reproductive divergence. Psychically the woman becomes less combative, and the man, relative to his partner, more so. More of the woman's energies centre in bearing and rearing children, and more of man's in providing protection, food, and shelter for himself and those that share his home. *Physically* reproductive constitutional grounds form the basis of survival in the woman, and *physical* efficiency in environmental control that of the man. Accordingly the value of woman in this stage is directly fixed by her child-bearing capacity, and to be barren is held to be disgraced.

Probably at no time was this low conception the exclusive one; but its power was, and is, proportionate to the semi-savage state of the environment, and the strength of its influence may be seen in the lower life of to-day, where physical strength and physical courage in man, and breast and hip development in woman, weigh more than the really manly and womanly feelings. Low-necked dresses and tight-lacing are, of course, a conscious or unconscious pandering to this lower ideal, and many music-hall ballets are of the same nature. I am not, be it observed, alluding to the beauty of form which a really nicely proportioned man or woman may possess, but to the accentuation of points which really destroy symmetry and grace for another and inferior end.

Wherever and whenever this spirit is dominant woman's position is that of relative degradation, and polygamy or nominal monogamy is the frequent outcome of these feelings, coupled with dominant military aspirations for men.

In the higher stage of sexual evolution woman and man acquire definitely womanly and manly influences, and it is these latter forces which have had the greater power in changing and modifying so completely the forms and the mental characteristics of each sex.

Broadly, therefore, females differ from all males in being less passionate, generally weaker, more dependent, and more sluggish and passive than males. But higher woman differs from higher man in being more social, depending more on others, and therefore willing to sacrifice herself to a greater extent for social ends. Woman is thus becoming progressively altruistic, and in this she has been, is, and probably always will be, superior to her companion. She is, however, less individualistic, and, on account of greater emotional susceptibility and what Laycock has termed greater 'affectability,' is more influenced by surroundings. She is, therefore, less capable of taking those isolated paths that lead, on the one hand, to the heights reached by genius, and on the other to those savage descents to brutedom of the criminal. Again, because she is less governed by passions and mere appetites, she is on an altogether higher plane than man, but having less power and driving force, mentally as well as physically, her sphere of action, though more perfect, is less wide.

The value of sexual characters in modern life cannot be estimated in terms of superior and inferior, because they are divergent and serve different ends, and it is the different human factors of each that are of predominant social importance. These facts must be remembered when considering the special predispositions that make the modern woman a woman and the modern man a man.

WOMANLY TYPE ¹

(1) COLOUR CHARACTERISTICS.—Woman's complexion is, on the whole, clearer, less subject to boils (Williams) and acne than man's, and it is probably of a somewhat darker shade (Beddoe, Havelock Ellis).

Eyes, somewhat darker than similar type of man; pupils more responsive and more dilatable (greater affectability).

Hair, darker, longer on the head than in man.

(2) FORM.—*Face*, as a whole more tapering; in higher types and features relatively slighter on a relatively smaller face.

Forehead, more than one-third of face, moderately high and broad, but is so delicately rounded off at the sides that its breadth appears smaller than it actually is, and owing (1) to less marked upper portions of the eye-sockets and less developed air-sinuses in the lower part of the forehead, which is

¹ All proportions refer to the whole woman's form in relation to the whole man's, and are relatively small or large *in relation to the smaller frame of the woman*.

thus less prominent below, and (2) to greater fullness than man's in the central portion, is more rounded and smooth in shape. *Brows*, clearly defined, but more gently curved and more widely separated than in similar type of man, and the upper orbital margin is more open and curved, so that the eye is less covered above by bone and brow, and the light falls more gently and distinctly upon the upper eyelid. This is a point of great beauty. *Eyes*, not deeply set, but not prominent, though this will vary with the scientific or emotional tendency of the mind, in the latter having more tendency to project, especially if short type (southern, primitive) is the basis of emotional and womanly development. *Nose*, more delicately fashioned, with lower part narrower and less dilatable than in the male, bridge high and running smoothly into its junction with the forehead, though this again, as in all other points of sexual differences, will vary with temperament. But there is always less abruptness in woman as compared with the like form in the other sex. *Cheekbones*, wider than lateral parts of jaws, but not prominent except in lower types of women. *Jaws*, less than one-third of face, and taper downwards from cheek; bones delicately fashioned and smooth, not showing muscular movements. *Chin*, rounded, but prominent. *Lips*, rather thinner than in male, but slightly everted and shapely. *Teeth*, smaller, more regular, and whiter. *Ears*, finely shaped, small, finely outlined; lobe rounded, and not so full as in male, and placed low down in head. *Neck*, rather longer, though this appearance of length is enhanced by



FEMININE TYPE.



greater slope of shoulders ; more rounded, especially in lower part, which is relatively fuller to the upper portion and to the same portion in the male.

Body, Chest, more rounded, smaller, and movement more marked in upper part, on account of smaller shoulder muscles and bones allowing greater freedom to chest expansion (the true natural costal breathing of higher types of women). This feature is often much accentuated by artificial means and becomes much more noticeable.¹ Limbs shorter and body relatively longer than in male. Hands and feet small, forearms and legs small, arms and thighs large, and all more rounded than corresponding parts in men. This gradual tapering of the limbs from above downward is one of the most constant marks of higher womanly specialisation, and is also a feature of great beauty. Shoulders sloping, so that, in persons not disfigured by dress contrivances, there is a natural and gradual widening from neck to shoulders, and below this a gradual narrowing owing to gradual disappearance of shoulder muscles, which are less developed in women, downwards to smallest part (natural waist) below ribs, and hips which cause, owing to their greater breadth, a second widening laterally, falling again owing to tapering lower limbs. Muscles over the whole body, less marked and more perfectly and

¹ Tight corsets. That costal breathing is natural daily observation proves, for the higher types of women, being more cultured, either do not wear corsets, or wear them so loosely that their influence can be excluded. The fact that costal (chest breathing) form is not found in savages is exactly what one would expect, for sexualised types are absent.

gracefully covered, so that everywhere less abrupt curves are formed which make the higher form of woman much less rugged and more naturally beautiful, artistically, than the man's. The more evolved female hip (pelvic) girdle is tilted less markedly backward than in the savage form, and hence the slight waddling movement of the lower woman is replaced, owing to more easy balancing of the body on the thighs, by a light, on account of shorter stride, graceful step. Stature less, form less ungainly, less heavily constructed.

(3) MENTAL CHARACTERISTICS.—*Passions* in all respects less than man's. Smaller desire for food and drink, and less intense sensual craving. (See Campbell, &c.)

Emotional Powers characterised by intensity, but still more by constancy, as character-governing forces, unselfish feelings largely developed, responsiveness, pleasurable or unpleasurable, to surroundings also greater. Less combative.

Intellectual Life, capacity for studying detail greater, but the area of observation is narrower, while the mind acts more rapidly. Less originality.

(4) SOCIAL CHARACTERISTICS.—Fitted for higher life and for best social surroundings. Adapted to an environment where the need for physical force is steadily decreasing, and where delicacy of perceptive powers and movements, together with unselfish higher feelings of human and maternal love, are capable of finding a diffused outlet socially in the hatred of all mere coercive acts. She is unfitted for the same reason for barbaric life. Has an extremely

strong dislike to coarseness and low ideals, and has a love of privacy and sanctity in the home.

(5) MEDICAL CHARACTERISTICS.—Being more specialised, and therefore more delicately adapted to higher life, will be more subject to diseases, the result of slum and hard physical conditions. Consumptive disease is probably more dangerous to this type than to the more primitive temperaments. Further, because of higher development, period of growth is likely to require more care, and our present educational system is not improbably responsible for many breakdowns and diseases in after life.

(6) EDUCATIONAL CHARACTERISTICS.—Womanly development must be recognised in education.

(7) ARTISTICAL CHARACTERISTICS.—The true type of womanhood must be drawn from the higher and not the lower forms.

MANLY TYPE

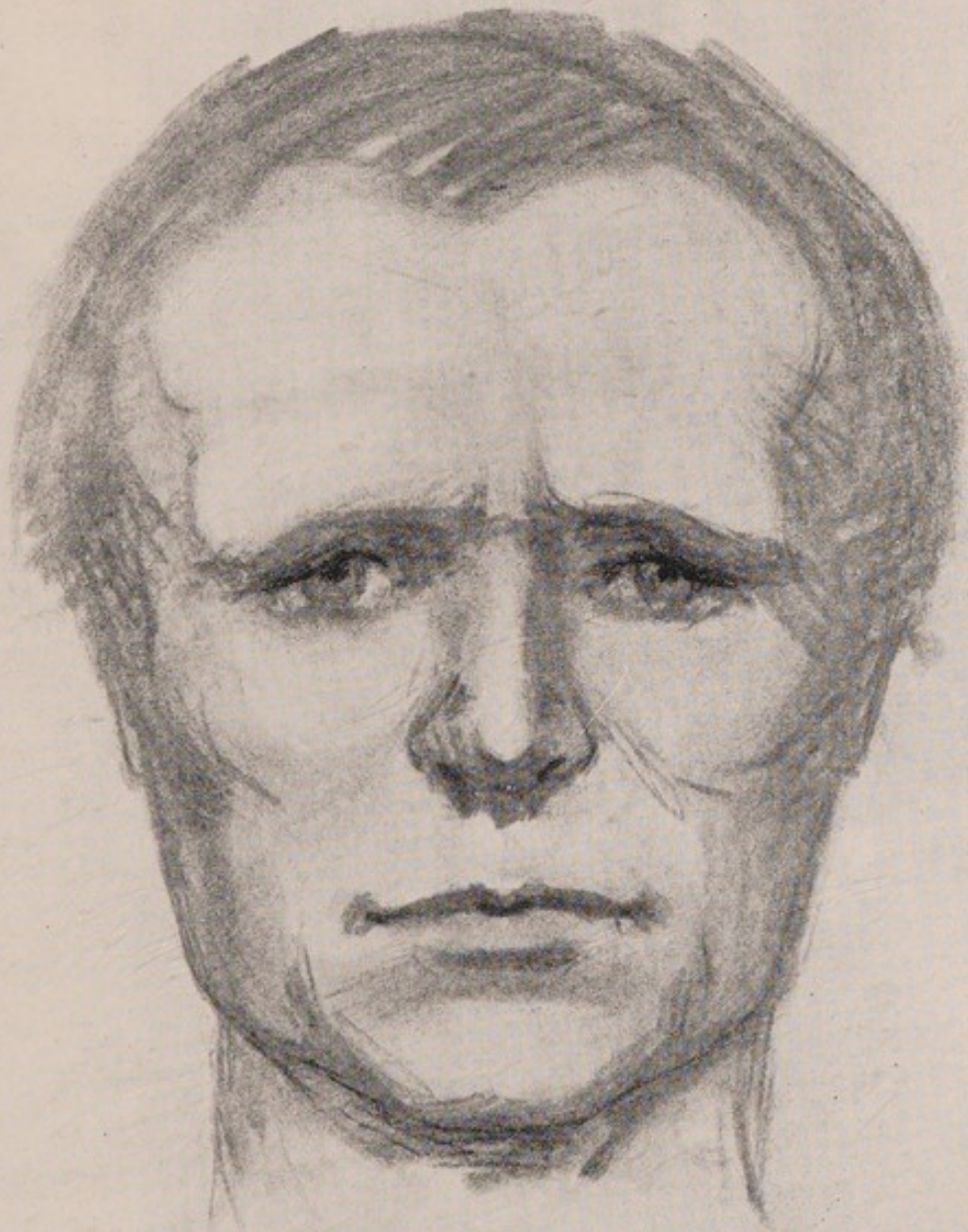
(1) COLOUR CHARACTERISTICS. — *Complexion*, somewhat fairer and less clear. *Eyes*, of lighter shade and pupils less responsive. *Hair*, lighter, shorter on the head, growing freely on the face in jaw region, and more frequently present on the chest and abdomen and whole body than in woman.

(2) FORM.—*Face*, forehead, more than one-third of face, broad, orbital margin, especially in upper and outer portions strongly marked, and frontal sinuses (air spaces in forehead) large, making lower part of forehead on each side of central portion project, giving to eyes a deeply set frowning appearance, and

causing a slight depression in forehead above nose. Middle region of forehead depressed on account of projecting brows and prominence of upper part of forehead. Hence wrinkles in the middle of the forehead are for this reason, as also on account of greater muscular power, deeper. Outer margin of forehead strongly marked owing to attachment of stronger temporal muscles which are associated with more definite and thicker ridges of bone. *Eyes*, deeply set, close together, and hidden partly by brows. *Nose*, strongly and clearly defined and straight, lower part longer and fuller than in woman of corresponding race and type. *Cheek-bones*, appear less prominent than in woman owing to greater development of lower jaw. *Jaws*, a full third or more of face, muscular. *Chin*, prominent, inclination to squareness. *Lips*, thicker than woman's but inverted. *Teeth*, larger than feminine type. *Ears*, finely shaped, not very small, lobe relatively larger. *Neck*, shorter, less rounded, thinner, and muscular.

Body.—*Chest*, broad, capacious, square shoulders with heavy shoulder girdle and big shoulder muscles. *Limbs*, longer, hands and feet larger, hips smaller, bones everywhere stronger, with large muscular attachments. Stature greater, curves everywhere, more abrupt. At the same time the whole organisation is *not thickly built*, but is adapted for mental rather than physical activity, and the strength though considerable is not, as in the primitive forms, combined with toughness of constitution.

(3) MENTAL CHARACTERISTICS.—*Passions*, very powerful, but in well-balanced individual controlled



MASCULINE TYPE.



by emotional feelings and intellectual desires for higher life.

Emotional Powers.—Characterised by intensity, desire for companionship of opposite sex very great, more individualistic than womanly woman.

Intellectual Life.—Forceful, fitted to control and govern lower forms.

(4) SOCIAL CHARACTERISTICS.—Fitted for higher life, but capable of controlling lower, and because of this combative power not quite so susceptible to the highest feelings which civilisation can offer, as the woman. Natural dislike for coarseness, and liking for privacy, dislike of brute living.

(5) MEDICAL CHARACTERISTICS.—The capacity for intense feeling makes it necessary for higher emotional life to be specially developed in order to control lower appetites, which are peculiarly dangerous if not subordinated; hence all occupations involving lower standards of living should be avoided.

(6) EDUCATIONAL CHARACTERISTICS. — To co-ordinate all physical to *governing* mental ideas.

(7) ARTISTICAL CHARACTERISTICS. — Ideal of manliness.

So far I have endeavoured to point out that anthropologically, physiologically, and pathologically there is evidence in favour of a long type associated with a glandular structure (possibly the pituitary body), of a short type also associated with some unknown glandular arrangement, of sexual forms related to the primary reproductive glands, and finally of nervous forms in some way perhaps dependent upon nerve-tissue activity. Whether one

looks to Northern or Southern Europe, to past or present life, confirmation of these facts when studied in the most general manner is found. The same is true if one examines the evidence that daily practice of medicine affords.

The predispositions of each sex to disease are undeniable, and the facts on this head have become so generally admitted as to occupy a considerable portion of all modern medical text-books. There are also a number of diseases which can be more or less definitely associated on the one hand with higher, and on the other with lower, modes of living.

Of the diseases due directly to appetites which have exerted a prejudicial action on the system, there are disorders that directly follow excess in over-eating. There can be little doubt that overloading the system with food, besides directly injuring the digestive organs, causes an excessive quantity of imperfectly digested products to be absorbed and circulated in the blood, and these probably exercise some definitely poisonous, or at least deleterious, action on all the bodily tissues. It is not unlikely that premature senility is one of the results of gormandising. Syphilis and other venereal diseases are again the basis of other secondary disturbances, as General Paralysis of the Insane, Locomotor Ataxia, Arterial Disease, Gonorrhœal-Rheumatism, &c., all of which end in a more or less permanently weakened state of the individual. Alcoholic disorders (Gout, Cirrhosis, &c.) also result mainly from excesses springing from otherwise healthy desires for drink. Fletcher Beach, in

a clinical lecture on General Paralysis, stated that 'The disease does not occur in weakly persons as a rule, but those that are strong and more likely to give way to excess,'¹ and this seems to be the general opinion among medical writers on this subject. The heavy physical man, with big face and relatively small head, coarse features, and large physical body seen among criminals, is also the predominant form in these lower type diseases.

Among individuals who are nervously alert and delicately organised one frequently finds such diseases as Asthma, Chorea (St. Vitus's Dance); and night terrors &c. are often present in children, definitely marking predisposition to brain trouble extremely early in life, while neurasthenia is commonly associated with those whose brain capacity has been exercised continuously with little rest, and who have consequently become feeble and exhausted as the result of using up the small reserves of strength in a delicate not necessarily diseased constitution.

F. May Dickenson Berry, in a letter to the 'Lancet,' June 7, 1902, in reference to feeble-minded children, notes that, in the London School Board special classes, two types are often observed, 'the first, neurotic excitable children below par mentally, but *without marked mental abnormality*;² the second, stolid and apathetic children with sluggish brains

¹ *Clinical Journal*, vol. xi.

² Italics mine. It is surely likely that these two extremes of overstrung, excitable, fragile, and apathetic, heavy, coarse types of children, should have some evolutionary, as well as pathological, significance.

but usually well nourished physically.' Eustace Smith, in 'Lancet,' January 24, 1903, alluding to tendency to convulsions in children, writes: 'The children thus affected are usually members of families which show distinct neurotic tendencies, although perhaps they *may be free from the graver signs of nervous instability*. The children themselves are highly strung, excitable, and easily moved to tears, but by no means necessarily spiritless or timid.'¹ Again, Treves' 'System of Surgery,' vol. i., in the chapter on Tuberculosis, thus describes the two classical consumptive types :

(1) '*The Fine or Sanguine Type*.—The children have fine and regular features, well-shaped limbs, and delicate hands. The skin is clear, white, and thin, and marbled with venules. The complexion is usually fair. The face is oval, the lower jaw small, and the lips thin. The eyes are bright and covered with long lashes, and the hair is often remarkably fine and silken. In the younger children there is not infrequently a faint growth of downy hair over the forehead and on the backs of the fore-arms.

'The teeth are, as a rule, white and well formed, but brittle. Not infrequently they are noticeable by the large size and square outline of the upper central incisors.

'These children are sprightly and emotional, full

¹ Robert Hutchinson, also, in lecturing on Diseases of Children, refers to some that 'are easily frightened and start and tremble at any sudden noise or unaccustomed sight.'—*Clinical Journal*, June 3, 1903.

of life, and from the modern standpoint would be called neurotic.'

(2) '*The Coarse or Phlegmatic Type.*—In this class are comprised individuals who are, as a rule, short and bulky, with coarse limbs, large hands and feet. The face is broad, the lower jaw heavy, the malar bones often predominant, and the features generally coarse and irregular. The nose is usually thick, the lips tumid, the lobes of the ears large, and the neck unshapely. The teeth are often ill formed and soon become carious. The skin is coarse, harsh, and thick. The amount of subcutaneous tissue is considerable and often sufficient to conceal the muscular outlines of the body. The skin in the previous type is fine, and it is possible to pinch up with the fingers a little portion of it; but in these individuals none but a large fold of skin can be picked up, as it is so coarse. The children of this class appear dull, flabby, and heavy-looking. They are apathetic and without vivacity, have little muscular power, and are soon tired.

'Their circulation is remarkable. The blood appears to stagnate in exposed parts, the cheeks often assume a bluish or mottled aspect, the extremities appear swollen, and the skin itself feels often chilled and clammy. These children are often very liable to chilblains.

'To this type belongs "parochial struma" and the tuberculous affections common in the slums of great cities.'

Thus in tubercular, in mental, and other diseases these fine and coarse types manifest themselves.

How is the contrast of these two widely different forms, yet both subject to the same diseases, to be explained? If real diathetic types, surely similar characteristics should mark similar susceptibilities to the same diseases; but if these features are temperamental, and it is through unsuitable environment that they have both become associated with disease, then the divergence of fine and coarse groups is understandable.

Now, the Southern Europeans *are* subject to tubercular disorders when living in colder northern climates, and this short, southern, primitive type corresponds in many physiognomical features to the generally recognised coarse, strumous form; while the emotional poetical temperament, and in a less degree the other highly evolved forms, approach in characteristics and in physical conformation to the fine-tubercular individual. And, as has already been pointed out, there are many reasons for believing that too high a civilisation and adverse climatic conditions affect prejudicially the former; while the unsanitary and semi-barbaric surroundings, habits, and customs of the dreg stratas of society favour disease in the latter, the diversity of type may be thus explained.

From every point of view the likelihood of individuals being progressively evolved generation by generation with a great capacity for culture is rendered probable; but lower local environments will not favour, but destroy, those more refined individuals that are surrounded by them.

Again, if protoplasm is not strictly modifiable,

although it is responsive, and above all selectable and rejectable, by the conditions surrounding it; if disease processes are universally associated with disintegrative and negating forces—and this conclusion few will seriously doubt; if the drift of true social degenerating tendencies is finally towards sterility in those that have become degenerate—and this evidence has already largely proved; then it is *inconceivable* that diathetic, actually neurotic individuals should be born in increasing numbers in any advancing state. Therefore many individuals who are called neurotic are probably only healthily and progressively nervously susceptible, and are either made neurotic by their surroundings or are confounded with other truly degenerate groups. Taking, therefore, the facts dealt with in past chapters into consideration, it may be assumed that a true healthy nervous temperament, as distinct from an unhealthy neurotic diathesis, exists.

If this view of temperaments be in its main outlines correct, if it be true that while individual examples of higher types have been occasionally found in the past, yet in the main each race in evolving has evolved and still evolves from more primitive to less primitive forms, and that each succeeding civilisation has been marked by advances in organisation of its average individuals, and this assumption, in view of racial, criminological, and medical facts, can hardly be doubted, then it is clear that the classical assumption of fixity of type is a mistaken one, and that higher and more specialised forms of organisation are growing up century by century.

Under these circumstances it behoves all advancing nationalities to utilise their powers to the full. Too much value is placed on mere social position. As a whole the poorer classes are in the main not only less cultured but also less capable of culture; largely, I believe, because in these surroundings, those capable, by their higher organisation, of mental life are, on account of a necessarily more delicate, *but not unhealthy*, physical type, killed off by tubercular diseases, the result of overcrowding and underfeeding, educational cram, and occupational hardships. But while it is true that this labouring section is on the average inferior to the middle-class thinking portion, there are yet a sufficient number of exceptions to justify much easier access to higher walks of life than now exist. It must also be remembered that just as the lower sections of the community are, on account of the retarding action of adversity, more intelligent and capable of realising higher feelings than they seem, so the scum portion is always less cultured than it would have the main body of the nation believe because of its great advantages. The appearance of great learning is often obtained by a smattering in many branches of knowledge.

The primitive type must be displaced in all our public positions, and this can only be done by studying the means of *discovering* the naturally strong citizen, and giving him or her the fullest opportunity of self and state realisation of powers which will expand by use, or atrophy by idleness.

To do this will necessitate changes of the widest

and most far-reaching character in the educational and occupational aspects of our national life.

If, too, there has been a steady advance in the average capacity for higher life with each succeeding generation, then it is clear that a progressing mental standard of ideals of beauty of soul and mind must displace, and, as I hope to show later, is actually displacing, the *physical* artistical conceptions of the past. And the same principle would apply to literature and to the greatest of all arts, music.

In medicine the environment must be studied more closely, and its healthily progressive or unhealthily retrogressive state must be decided upon before asserting that an individual liable to contract particular diseases is or is not degenerate.

Finally, more attention must be paid to the increasing sexual specialisation of higher social development. Such questions as co-education and industrial sex opportunities must not be left to be decided in the arbitrary manner that they have been heretofore. Alpheus Hyatt¹ has pointed out the necessity for considering how far femininising and masculinising tendencies ought to be allowed to grow or be checked.

There can be no doubt that the development of high womanly ideals is absolutely essential to a growing state. Does co-education foster them? If not, it stands condemned. Is our present competitive industrial system favourable to womanly development? If not, it must be made to be so by the nations that expect to lead in future times.

¹ *Natural Science*, vol. xi.

How grave a danger any destruction of womanly standards would be, may be realised when one reflects that masculine supremacy is associated with force, while woman's influence is mainly founded on the respect she engenders in others and on her industrial value. Her whole influence is increased or lessened by her power or weakness, whether in the home or the community, to substitute altruistic considerations for the merely egoistic. She is thus when given freedom always a socialising power, while man is often anarchistic on account of his individualising tendency. Without womanly ideals to bind those that are truly manly into a co-ordinated advancing whole, there can therefore be no guarantee for social progress. A study of sexual temperaments, like other predispositions, therefore, is at the basis of all sound modern sociological effort.

These are only a few of the important issues that the science of temperaments raises.

Looking back over the facts passed in review in this volume, one conclusion stands out prominently and irrefutably. The idea of temperaments put forward may be right or it may be wrong; but it is based on evidence the significance of which seems, for some reason or other, to have been almost entirely overlooked, namely, *that there is now going on a change in the natural dispositions and forms of all persons in advancing civilisations which is producing an inevitable change in desiring, and therefore in attempting to realise, that which is desired.*

Savage man had no opportunity to develop in

any direction any mental ideal of which he might have been faintly conscious. As a consequence, he gradually idealised the natural physical surroundings about him—his house, his food, and nature. Later, Egyptians and other Eastern peoples enlarged the conceptions growing up around men's dwelling-places into a definite art, that of architecture, and about this time the human form began to be symbolised and artistically portrayed. In Greek and Roman times the worship, and, be it remembered, the *natural* worship of the physical, reached a stage of perfection never before equalled and never since surpassed. In Bacchus, in Hercules, in the *physically* idealised form of woman (Venus), physical standards reigned. It is true that in middle and late Greek periods some intellectual flavouring of the physical existed, and coloured in some slight degree deeper religious beliefs; but the enjoyments of life and its beauty remained essentially bound up with bodily appetites.

Christianity and the growing influence of Teuton feelings mingled with Latin tendencies and fused into a religion in which the sharing of worldly benefits was to be the great dominant note. To feed the hungry, to clothe the naked, to feel for others that were hungry or naked, were the great injunctions of the new faith.

Later, a sense almost unconscious of the ignobleness of mere appetite began to grow up, and the ideas of celibacy, fasting, and mortification of the flesh manifested themselves as preparatory groups of customs which in later times were to lead to an active, mental, and truly spiritual dominance of life.

And the best art of this period has a purity of imagery, a religious inspirationalism deeper and intenser than that which characterised previous ages. In Raphael and in Botticelli evidence of newer mind-standards displacing old physical ones of *spiritual loveliness of form* are as evident as the qualities of moral restraint are of the later religious reformation.

The old passions have not been destroyed. Indeed, it is probable that as the sensitiveness of the whole organisation has increased, the capacity for sensual enjoyment has increased with it, and perhaps even because of this increase of appetite-enjoyment the realisation of the dangers of animal tendencies has been driven home to the human mind. But realisation of the power of passion would be useless as a restraint unless its lowness as contrasted with other feelings be such that some check could be set up against the vicious exercising of forces that in themselves, when rightly used, serve only to strengthen *human* consciousness.

Now, mind-desires have two enormous advantages over body-desires. Firstly, they minister to no special bodily functions, as hunger, thirst &c. do. These desires are not, therefore, appeased by easily found means; but all aims have to be searched for, and, owing to the fact that satiety cannot in the ordinary life be induced, grow with the searching. Secondly, the novelty of mind-pleasures is always present, for each step opens up fresh vistas. Hence there is capacity for infinite intensity of feeling, and infinite inducement for arousing it. It is not, therefore, surprising that body-passions are being sub-

ordinated to mind-emotions ; for the spasmodic and little-varying pleasures of the former cannot be expected to offer an equal inducement *in racial evolution* to the constant opportunity, and interest, aroused by the latter.

In this silent evolution of social life, where individuals are being born with mind-desires becoming increasingly paramount generation by generation owing to a favouring environmental selection, the whole social fabric is being adapted to nobler ends. There is not an art nor a science that will not feel with increasing force the increasing strength of this vast impulse ; not an institution or a private home that will not in future ages respond in great degree to its power.

Think of the first race that awakens to the perception of mind-knowledge and of truth which science alone can instil, of mind-beauty as higher art can portray, of mind-feelings in their full majesty, gentleness, and grace which higher music can set vibrating. Think of the constancy required for successful achievement in these scientific, artistical, and musical fields, and of the mightiness of the love that such constancy is dependent upon, and compare it with even the loveliest physical embodiment of bodily passion of the ancients. We men and women of the newer age are, with our new ideals, like what the older men and women of the older age were at the commencement of theirs. They scratched and scrawled on stones rude images of the nature around them, and we with imperfect thoughts, imperfect ideas, imperfect instruments,

rudely represent something of the social possibilities of human development; when, with our growing skill, the result of growing souls, we learn to build our *modern* Parthenons and our modern homes as the ancients learnt to build theirs, then we too shall pass from the sordid primitive mental stage of life even as they did from the sordid physical.

Against a nation made up of citizens whose natural love for music springs from the capacity it possesses to arouse spiritual feelings, whose ingrained love for art is based on its power to appeal to mind-ideals of beauty, whose love of science grows out of a thirst for knowledge and truth that is deep and lasting, and, finally, whose bodily desires are ordered by the higher laws of mind—against such a nation, working for human ends, what living nationality, with its class antagonisms, its drunkenness, and its prostitution, could survive?

The old people lived a life that they loved; they fashioned and wrought beautiful things because they loved beauty, and they speculated deeply on the problems of existence because they loved speculation. Never again will the same beauty of old architecture, of old furniture, of man's form, of old rural life be realised, because what is past is past. The old gods and goddesses have had their day, and, like all else in this evolving universe, they, too, are ceasing to be. Bacchus, Venus, Hercules, Mars, represent ideals which we have now outgrown. Man is slowly ceasing to care for wine, for physical strength, for war, as if such caring were of the greatness of existence. Woman is already

outgrowing the aims of animal beauty, and as a companion and comrade of husband and brother, or as mother and educator of her children, stands for higher and worthier ends than can be expressed by the old symbols. Hope, born of science, believing in the infinite goal of all things in all time; truth, soul, love, are greater ideals and must be interpreted by higher allegories than past ages have used. These ideals are our modern gods and represent our modern aims. Some time in the home, but a higher home, in the market place and in state halls, in temples dedicated to music and its religious harmony, in academies and in schools, beauty of life will once more reign, but not the old beauty. And on the old throne which humanity supports always with difficulty, oftentimes painfully, will sit a goddess more lovely, more refined, than she who has now laid aside her crown; robed in the garb of truth, fashioned by Time's own hands, graceful with the spirit of soul loftiness, environed by human harmonies, and her handmaid her once royal sister. This is the message which science brings with it for a newer era.

CHAPTER V

THE SOCIAL ASPECT OF THE PROBLEM

IN the first chapter I advanced reasons and facts for believing that—

(1) From the simplest forms of life to the most complex, from unicellular organisms to man, the one dominant factor to consider is the response which each living unit *can* or *cannot* make to its environment.

(2) No surroundings have the power, or conceivably ever will have, to modify living structure so that particular characteristics are *produced*.

(3) Such surroundings only *foster* a response which the structure from its commencement has always been *in a degree* capable of.

(4) The study of disease, and experiments inflicted on living animals, seem to lead to the conclusion that *defects* may be passed on to the offspring that have been acquired during the life of the parent. This is, however, not an instance of inheritance, but of its absence. To survive and reproduce, or to degenerate and die out—according to fitness or unfitness for survival—are therefore the only two alternatives open to the different competing forms of life. Heredity is in its power almost absolute ;

variability is induced by the selecting of certain qualities at the expense of others, and *all* these qualities are found generalised in the most primitive life forms, and specialised in the various groups of cells and tissues of higher mammals. Natural selection acting on *responsive* but unmodifiable protoplasm is the supreme principle of life evolution, and its influence is probably not less powerful in social development. It must, therefore, be the central guiding tendency in the mind of the student who would wish to comprehend the meaning of differences now existing in the human form.

Keeping one's mental vision steadied by this directing idea, it is possible to consider the varieties of temperament from a newer outlook, and in the second, third, and fourth chapters I have, I hope, proved—

(1) That there is ample opportunity in the widely different surroundings of different classes of individuals for selection to favour temperaments.

(2) That the death-rates, varying according to classes in all civilised nations, are evidence of some selective action being actually now in existence.

(3) That certain temperaments have probably a physiological basis, and are dependent not upon any system of digestive or respiratory predominance, but arise out of the activity of certain glandular organs of the body.

(4) That primitive and advanced types of man exist, and the advanced were probably developed from both primitive forms (short and tall).

(5) That these advanced forms of man must tend

to become more nervously adaptive to mental surrounding and more delicately sexualised.

If these conclusions be even approximately correct, then it is evident that life must be intelligently and consciously adapted by all well-wishers of higher national and social existence to the healthy needs of the healthy, but more delicate physically, and more human nervously developed forms of specialised manhood and womanhood.

Those citizens who are degenerate, but also are too sane for asylum treatment, must be prevented by the social atmosphere from harming their own, and, more important still, other existences that are mentally sound. And those that are naturally primitive-minded must be given every opportunity of development that is consonant with their naturally inferior powers; brute living, however, must be sternly and unerringly checked. Drunkenness, especially in public places, must be put down with a firm hand, and if necessary the drunkard ought to be deprived of freedom and forced to live in human fashion under human control, while the law courts should deal severely with all who encourage the demoralisation of their fellows. Anything indelicate or immoral, especially that which tends to lower the general standard, such as quack advertisements, lewd literature, low-class houses, music-halls, &c., ought to be interfered with. Lastly, betting—that mental debauchery which weakens and degrades by its insidious influences our whole social fabric—on the Stock Exchange, in West-End ‘card’ clubs, on ‘race’ courses, by prize competitions and lotteries

&c., in all forms should be punishable. *In a brute environment there must inevitably exist those who survive by brute powers.* The first effort, therefore, of those who are wishful for reform must be towards the consistent improvement of the tone of national life, and the equally consistent desire to see that all individuals have at least the opportunity for higher living open to them.

If, however, every person may be grouped more or less naturally according to natural powers and desires, and if such powers and desires are inbred and are not capable of being greatly modified by education and employment, then it follows that it is of primary importance to afford for each person outlets that are social in their nature. The primitive-minded will tend naturally towards physical means of employment, while those that are advanced will desire opportunity for exercising their greater mental powers, but in a healthy state the former should be subordinated to the latter. If, as the result of some influence, the physical types are given positions of responsibility of which relatively they are mentally incapable, then the outlets which their nature requires will make mental work a labour to them, and hence their duties will be performed not only inefficiently—for they are not mentally capable of good work—but also in a grudging, careless spirit, because they are incapable of love of the higher occupations, which will make all effort degrade them as well as produce inferior work. Serious as this evil is, it is only a small part of the harm resulting from the lower types occupying higher positions, for their

particular pleasures, which again are naturally physical, tend from their unjust position to become fashionable, and for the same reason an artificial veneer and glamour of higher life are spread over low habits, so that they are rendered enticing to minds that would otherwise shun them. Anyone who cares to realise the contrast can note the difference in outward appearance, for the moving inner spirit is similar between a scum group as compared with a dreg, such as may, for instance, be seen occasionally standing in a railway station waiting for the trains to take them to the racecourse, the one not wholly repulsive, the other like brutalised animals, and yet in essential feelings closely allied.

The effect, therefore, of degenerate and primitive-minded individuals being welded together into a scum parasitic caste on the nation at large is that the moral tone is everywhere lowered. Such persons not having occupations which use up their physical energy, squander it in unhealthy forms of dissipation, such as hunting, gambling, and sensual pleasures; and as they have money to satisfy every craving, they demand, and unfortunately too often obtain, from the artist, novelist, architect, musician, and actor something that is low in idea, but tastefully presented to please their lower tastes. Not only so, but not understanding the meaning of the word justice, and having little sympathy with other members of the community, they use their money to support parasitic trades, favour low wages, high rents, and sweating, and thus directly encourage the slum environment which selects the slum hooligan

type. To make the scum class cease to be parasitic it is necessary to *employ* it on *physical social work*, so that their physical powers can have a social end to serve, and this end must moreover be subordinate to that of all cultured mind-loving people.

Again, if those whose capacity leads them to seek higher mental pursuits are compelled to toil through a monotonous existence without mind exercise, for which they naturally crave, then they also will tend to be demoralised, and, their higher life-guiding ideals being destroyed, are apt to sink morally, mentally, and physically.

Further, if the higher aims and desires of manhood and womanhood are persistently thwarted, so that marriage—with its home life and home love, and mental manly and womanly growth—is rendered either unattainable, or attainable only late in middle age, to a large body of men and women in the state through *criminally* small wages for honest work, while physical satisfaction is only too readily obtainable, then sensuality will grow and the whole nation decay because of the widespread human loss.

If, therefore, higher human beings are forced by scum anti-social tendencies to forego their higher social life, and are compelled to enter into an unhealthy competition with individuals, their natural inferiors, and become as a consequence neurotic and consumptive, it is only what any rationally minded observer might predict. Man is not less man because he cannot enter successfully into a struggle with a larger wild beast if he is unarmed, nor can higher man survive over lower if the external con-

ditions favour the lower. Until our social atmosphere is made less brutal, until higher and lower forms are naturally placed in respectively mental and physical social positions, it will be impossible to realise accurately the difference between healthy and unhealthy nervous organisations. To exterminate slum environments, and to employ healthfully, according to natural capacity, *every* citizen, are the first two direct deductions from the science of temperaments.

To accomplish these ends, however, it is not advisable to level all social grades; for specialisation is the distinctive feature of advanced life, and individuals naturally group themselves according to common interests. What is required is to give this aggregating tendency an industrial and social, instead of an obsolete and predatory, meaning.

At the present time society is little influenced by real merit, and scum power—which is largely made up of hurtful feudal and criminal commercial elements—is dominant, and largely controls the whole of collective life. In order, therefore, to make monetary and social distinctions of real value, it is necessary to crush out the gambling monetary spirit and to completely subordinate feudal influences. Honestly gotten wealth would then signify natural power, and responsible positions would be held by the capable and worthy, while talent everywhere manifest in high places would stand prominently out as a real stimulus to the effort of others.

It has, however, to be remembered that national, like biological, growth is strictly and quite literally developmental, proceeding stage by stage, every

antecedent grade influencing in some measure what follows. Ordered growth is absolutely necessary, and therefore a definite amount of progressive national stability is undoubtedly a great social asset. Every class, every institution should have its own traditions, and these traditions should be subordinated to the greater ones of empire and country. Now, class ideals can only be preserved if there is a preponderating class feeling among members of the class. If new customs entirely or even mainly displaced old feelings, there would be too much change for regular progressive growth to be built up, and little or no continuity of development in any part of the nation, either in relation to that part or to the nation as a whole. The Present would control too largely present means to serve even its own interests; law, which is only stereotyped tradition, would become too unstable to be authoritative, and selfish considerations would everywhere rule. The tendency even in the most ideally perfect state should be slightly in favour of preservation of established as against newer forms, precedents, and institutions. This means that some amount of favouring of those already in favoured positions is inevitable. The labourer's home, the labourer's friends, and the labourer's wage (and in all states and times there must be what is comparatively a labouring type) will in some measure limit the exceptional child whose ideas are suited for higher positions. Some injustice to the capable children of less capable parents is unavoidable. Castes are necessary and growing features of pro-

gressing nationalities, and must always be in some measure a little unfair. The question to consider, therefore, is not how to make them individually impartial, but in what way they may become a true general stimulus for all.

Now, the active social parts of the nation are its middle cultured and respectable lower sections, as the scum and dreg are each mainly, though not exclusively, parasitic. The upper section absorbs, far beyond its social value, vast quantities of social wealth and natural resources, and shares, in common with the lowest poverty-debased strata, desires that make higher feelings outcasts. Yet the cardinal fact in sociological science of to-day is the presence of these scum and dreg elements. In no age has the divergence of parasitic and useful portions of the community been so striking, and the reason for this cleavage is not far to seek. The social changes, railways, steam navigation, and industrial machinery, which have aroused widespreading educational tendencies into life, have evolved with great rapidity a newer social atmosphere, so that whereas, as Wells has pointed out, until recent times the classics of ancient Greece and Rome were works fascinating and attractive to the cultured, they have now comparatively rapidly lost their value. 'The Literature of Rome was living reading in a sense that has suddenly passed away; it filled all occasions, it conflicted with no essential facts of life.' . . . 'Correlated with the sudden development of mechanical forces that first began to be socially perceptible in the middle of the eighteenth century, has been the

appearance of great masses of population, having quite novel functions and relations in the social body, and together with this appearance such a suppression, curtailment, and modification of the older classes, as to point to an entire disintegration of that system.'¹ As a result of these new surroundings, which have and are reacting mentally and physically on all active partakers in the work of modern times, new types of individuals, nervously organised, equipped for a more active age, less able to stand mere brute hardships, are growing up, and the ideals of this mind-desiring mass of men and women are not like those of past ages ; these modern forms want new ideals of leadership, new ideals of greatness, and the old feudal appeal and the later appeal of early commercialism have both lost their value, and, as castes formed on these standards have still persisted, they have become generation by generation more onerous and harmful, and so scum leaders are now mainly attractive to their dreg supporters.

If we are to live as a nation, it must be by gradually throwing off this scum influence. While the old habits of over-eating and over-drinking are supported by the wealthiest and most privileged members of the community, it will be impossible to reform the dreg masses, and the advantages of a physical primitive type will cause it to survive in bestial surroundings to the detriment of the mental. Slum life must be lessened by legislative interference with scum privilege ; and castes, the result of culture, mental power, and moral habits, must replace or

¹ *Anticipations*, p. 20.

transform those that depend upon ostentatious display of wealth and feudal traditions.

The two new features, therefore, of modern life are : (1) the presence of a class that is growing more and more permeated by mental conceptions and feelings ; and (2) the growing assertion in this large cultured group of womanly and manly ideals.

The consideration of the womanly mind as contrasted with the manly, in order to understand how these two complementary forms may be developed educationally and utilised subsequently industrially, *is therefore essential.*

‘It seems strange at first sight that women themselves, and their warmest advocates of modern days, should rather choose to urge the contest for extended freedom and a larger scope in the management of the world’s affairs from the basis of the false idea of woman’s equality with and similarity to man, instead of the inexpugnable position of her real nature, and the claims that it gives her to the duties that it demands from her.’

So wrote a contributor to the ‘National Review’ for 1858, and after the lapse of nearly half a century it is still necessary to repeat the warning that it is her complementary divergence which is mainly of social import.

In a masterly analysis of some of the chief differences the writer points out that woman’s intellect is characterised by greater delicacy of perceptive power and rapidity of movement. Romanes and most other writers have confirmed these differences. He continues : women ‘have never signalised themselves by

a methodic and skilfully executed inroad on the surrounding realms of ignorance such as those of Newton or Liebig. The female mind 'is valuable not so much in conducting deductive operations *as in furnishing and suggesting the materials for deductive thought*.¹ It is an inexhaustible fountain of those general ideas (whether derived from induction or not) on which deductive reasoning is based ; but it rarely employs itself in an exhaustive inquiry as to the operation or consequences of that general idea. Its habit is to use it for the elucidation of some particular simple case within it, and then to cast it aside. A woman's mind is probably not less occupied in induction than in deduction. It is constantly ascending with rapidity from few facts to a general idea, and coming down on a particular. A man's mind ascends slowly through many particulars ; but having gained the broader platform, he endeavours to master all that can be seen from it. The question of the extent of women's inductive exercise of mind depends upon the vexed question, how far the ideas they strike out with so much fecundity are the results of unconscious induction or simple insight ; but either they have a marvellous lightning-like faculty of induction, or a perhaps still more inexplicable one of direct mental insight. Whatever range, however, we may ascribe to this latter faculty, it still remains certain that women are incessant and rapid generalisers, and often hasty and rash ones. The nature of their imagination tends in the same direction. It is not perhaps so comprehensive

¹ Italics mine.

as that of man ; it has not the same power of at once presenting a subject vividly, and holding it steadily and continuously before the mind ; it is not perhaps so searching, but it is much quicker in its movements, and in much more constant operation ; it is far more of an everyday working faculty, and far more universally used by women than by men as a ministrant in the operation of thought.' . . .

'If we were called upon to indicate the most marked and deep-seated distinction between the minds of men and women, we should say that the minds of men rested in generals, and were stored with particulars, and that the minds of women rested in particulars, and were prolific in general ideas.' . . .

'And the mind of woman is more fluid, as it were, than that of a man ; it moves more easily, and its operations have a less cohesive and permanent character.

'The characteristics of the moral and spiritual nature of women are clearly allied with those of intellect. Their superiority in all depends on instruction ; their higher apprehension of, and fuller life in, personal relations, as distinguished both from material things and abstract ideas ; their deeper powers of influencing, and greater dependence on, individuals, as contrasted with a wider power exercised over numbers, are too obvious not to have been often made the subject of remark.

'A man feels more deeply a sin against his deliberate convictions ; he throws the sins of impulse aside more lightly, especially if the temptation

has been strong and sudden. But they weigh heavier on a woman, and they degrade her the more because her character does depend more on the unbroken strength of her higher impulses. Again, compassion to the individual is the woman's virtue; justice to all, the man's.'

To these considerations certain others of importance may be added. Man, it is generally conceded, is more passionate, desires good food and drink, values his appetites more than woman. On account of greater physical strength, man is generally less subject to fear of harm, but he is at least as much afraid of actual pain, and long-continued suffering is borne by him with less fortitude. Woman is more emotional, and mental influences effect more bodily change than in man; she blushes more readily, and emotional disturbances very readily induce physical states corresponding to them. Similarly, bodily influences react on the mind more completely than in man, and the tendency to hysteria in women may be taken as the extreme development of a great underlying affectability. Women are more inclined than men to preserve old customs.

To summarise, a woman's mind is generally attuned for both a higher and more distant goal than that of man. It is higher because she is less governed by animal cravings, and its ideals are more distant because the mind as a whole is moved by mental rather than physical feelings, and its aims are correspondingly raised, and because feelings direct woman by indefinite, but forceful, emotional promptings; whereas in man intellectual principles,

less high, but more definite, largely govern. Now, although her aims are superior, her imagination, being more impressionable, and also because of its impressionability less permanently directed, causes her to notice more definitely immediate surroundings, and her rapidity of perception makes her form detailed pictures of great accuracy. She is thus more affected by her immediate locality than man. Finally, a woman is organised on a more delicate and complete plan, physically and mentally, reaches maturity earlier and more suddenly, and is therefore less inclined to vary individually both in higher and lower directions. She is thus more conservative in idea and more conforming in practical everyday life. She is a social binding force, while he has in the main more or less individualistic and pioneer tendencies. Mentally as well as physically their powers are complementary.

Socially, therefore, the male mind has been, and there is every reason to believe will be, the initiating force of human existence; woman's, on account of her higher ideals, the humanising. Intellectually, 'Women have exercised a most beneficial influence in softening the hard and untruthful outline which knowledge is apt to assume in the hands of direct scientific observers and experimenters; they have prevented the casting aside of a mass of most valuable truth which is too fine to be caught in the material sieve, and eludes the closest questioning of the microscope and the test-glass, which is allied to our passions, our feelings, and especially holds the fine boundary-line where mind and matter, sense

and spirit, wave their floating indistinguishable boundaries and exercise their complex action and reaction. Women, acting faithfully on their intuition in such things, and justified by the event, teach men also to rely upon them in their lives, to give them place in their philosophy; and incalculably widening, ennobling, and refining is the influence they have thus had upon what the world calls knowledge. But their influence, like their knowledge, has been direct, immediate, applied to particular cases.'¹

' . . . Feminine "taste" is proverbially good in regard to the smaller matters of everyday life, although it becomes, as a rule, untrustworthy in proportion to the necessity for intellectual judgment. In the arrangement of flowers, the furnishing of rooms, the choice of combinations in apparel, and so forth, we generally find that we may be most safely guided by the taste of women, while in matters of artistic or literary criticism we turn instinctively to the judgment of men.'²

Broadly stated, woman's influences are exerted generally through the particular, and man's particularly through the general; therefore men and women have need of each other, so that their complementary powers are not wasted by the deficiencies of each. Intellectually as well as emotionally the man gains by comradeship with the woman, and the woman with the man. 'From a female mind

¹ Article, 'Woman,' *The National Review*, 1858.

² 'Mental Differences between Men and Women' (G. J. Romanes, *Nineteenth Century*, 1887).

on a level with his own a man gathers much more that is new and interesting to him than from conversation with a fellow-man; he sees a new side of old ideas, and is presented with a thousand delicate suggestions beyond the reach of his own faculties—nay, often when his mind is saturated with knowledge which yet forms a turbid incoherent mass, the touch of a woman's mind, some hint, vague perhaps but far-reaching, will make it shoot into sudden crystalline harmony. . . .'¹ Further, without a woman's influence a man's existence is apt to become dulled to those nicer delicacies of feeling which keep everyday life from becoming brutal and commonplace.

A woman, too, needs the help of man because her mind, having reached a more finished maturity, is apt to stagnate, and her natural love of detail grows into a tiresome, intense desire for unnecessary neatness and primness. To each mind the stimulus of the other is needed to freshen and vitalise.

If this be so, if socially and individually manly minds and womanly minds have each their place, and if Society grows more and more to need these complementary ideals as it evolves, is it too much to ask from men and women that they should each consider their limitations? Limitations which, moreover, will force themselves to the notice of each person at last if, instead of appreciating, they disregard them. Is it too much to expect that the manly man should desire to be manly, and the womanly woman desire to be womanly? From

¹ Article, *National Review*.

manly and womanly contrasts spring love, the home, culture, civilisation. Is it so little worth while to put high-minded feeling and thought into this great question?

But a woman cannot develop her higher powers if she keeps out of touch with industrial life; she cannot understand her brother, her father, her husband, nor they her, if she lives a hermit, even though it be a cultured, life, and they an industrial, though it be an honest, collective working existence. Their lives will be so far separated as to have no common meeting grounds for higher sympathies. Somehow woman must be brought into touch with the general collective realities around her. *How to do this and yet preserve her womanliness is the great question which modern civilisation must set itself to solve.*

Woman is more impressionable, she is more affected by external surroundings, she is more fragile, she is higher in her ideals than man. In the good home the better side of existence is seen; in the rough and mostly sordid scramble of man and man the brute side of the human being is uppermost. The disillusionment in a woman because of her higher life must be greater, and it must be easier on account of her greater delicacy, her less combative disposition, and her smaller hold of collective forces. The drunken woman is more irretrievably drunken than the man, the harlot more debased than the libertine, women in business drive harder bargains. May there not be many industrial fields where, because of the *competitive* struggle, because

of the greater roughness, because of physical hardship, it is better, wiser, and fitter to keep them in the hands of men? Womanly qualities are too precious to be risked rashly; they are allied too closely with higher advances in social development to be thrown carelessly away by thoughtless or dishonest disregard for them.

Educational Aspect

Bearing, therefore, in mind the fact that a sexualised type is born and not made, and that the local surroundings of the home largely determine whether a higher or lower form shall survive, there are two great groups of collective forces that are largely responsible for the right or wrong development of the individual. The first is educationism, and the second industrialism.

I have already noticed the need existing for closer unity of life-aim between the sexes by the fostering of common points of sympathy and common knowledge about the great realities of life. If manliness is to receive its full development and womanliness at least be as carefully encouraged, it is clear that their complementary powers must be somehow unified by similar final moral appeals to the object of life itself. Their education, while differing widely as far as girlish and boyish outlook is concerned, must be turned in the same human direction.

In what respect is co-education likely to favour or hinder complementary development?

It is clear that any strict system of co-educating is self-condemned. A girl's mind is always a little

or a great deal different from a boy's mind in the process of growing, and from babyhood upwards to maturity becomes more and more markedly divergent. It is ridiculous if these natural distinctions are of value to attempt to train the unlike by like methods. A girl's body is never the same as a boy's; differences in shape of limbs and in build, though growing more obvious, are always present from the earliest period of infancy. The curves of growth are not identical for any single structure, and even the little that is known on the subject already points clearly to an immense number of fresh distinctions being established when the subject receives the attention that it deserves. Co-education of the sexes, therefore, is in the nature of its assumption as anti-evolutionary as collective education; the former method would crush out sex individuality, and the latter destroys the individuality of each individual.

That even the most close association of the sexes with each other is of little value, *unless accompanied by higher sexual ideals*, is proved by the complete freedom and the scarcely less pronounced coarseness manifested in boys and girls, and in men and women, of the labouring classes in relation to each other's habits.

Dressing and undressing, often till quite near the end of childhood, in one room, sometimes sleeping in the same bed, playing nearly the same games, working together in the evening over school difficulties, these children are in a very real sense co-associated and co-educated, and yet as a result of

this co-association neither boys nor girls of this class, nor men nor women, know the meaning of what is required even by a decent animal life : little more modesty prevails than in barbaric countries. The young men, even during their pre-married and early married state, are mostly inclined to be brutal and rough with the young women, and very early cease to spend their evenings at home, and tend more and more to drift towards the public-house. The labourer, be it noted, whatever his feeble theoretical conceptions may be, is practically no believer in womanliness as something distinct from manliness. He remarkably easily becomes accustomed to his wife working not only at home but for the support of the home, and is quite content to loaf away six months at a time in idleness provided he can induce his wife—and he mostly can—to support him. Co-association, therefore, is not, as many not very shrewd observers would have us believe, a sure means of refining human existence.

On the contrary, girls and boys of undoubtedly higher type grow up mostly in those homes where *physical* differences have been tacitly recognised as forming adequate reasons for differences in living and privacy for all personal toilet arrangements. In the rich as well as the poor, dominance of animal freedom is almost invariably productive of vice in one form or another. Mental comradeship is possible only under the conditions where every natural higher feeling in each sex is hereditarily powerful and is fostered by surroundings, so that emotional dominance becomes at last strong enough

to form a complex barrier progressively limiting lower excesses.

Physically, the evidence in favour of co-education is insufficient ; nor is there at present much evidence against the practice, and it is difficult to obtain satisfactory data on which to found a correct conclusion.

The co-educationists maintain, on insufficient evidence, that where the system has been tried largely, as in the United States, it has been on the whole very successful, and it has not, so it is claimed, been found to work prejudicially in other countries, except where the management of the school is bad, and under these circumstances it would be generally admitted to be more prejudicial than an unmixed school. It is also asserted by upholders of these views, both English and American, that statistical evidence shows (1) that during the educational period, and subsequently, women are not injured by such education ; (2) that in regard to number of children, and also in reference to their healthiness, the more educated mothers compare very favourably with those less educated ; and figures in support of these contentions have been compiled.

Now, this evidence is unsatisfactory :¹ firstly, because no distinction is made between the different types of women. The highly civilised and delicately organised womanly woman, gifted with her characteristically sexualised mental powers and her more susceptible physical organisation, is, in all prob-

¹ A good summary of it may be found in the *Report of the Commission of Education, 1891-2*, Washington, vol. ii. ; and also in Hughes's *Making of Citizens*.

ability, much more likely to suffer from the effects of co-education, *or general education not co-educational but conducted on masculine lines*, than her more masculine sister. And in this connection it is not a little suggestive to find how frequently prize-takers are masculine in physiognomy in those colleges and schools where woman's development is disregarded.

Womanly aptitudes are at present scarcely known outside of the home, the higher forms of mind in literature and art being judged largely by masculine standards. And the fact that women who have distinguished themselves have been so frequently masculine in appearance and character implies that the womanly woman has not had fair opportunities of development.

The question, therefore, to be considered is, not whether co-educational masculine training-schools compare favourably with others that are not co-educational, *but are also masculine in their methods of teaching*, but whether *womanly women* are more liable throughout their life to suffer from mental warping, to become eccentric and dissatisfied, and have less physical strength and resisting power to disease as a result of being educated under a masculine rather than a feminine system. No answer to this question at present exists. From physiological and psychological grounds, one would expect that to educate against the line of development would tend to produce mental and physical disorganisation, and until co-educationists can prove the contrary, the medical man is surely justified in believing any educational cramming system to be

faulty which disregards mental and physical laws, and considering that our present-day schools are in some degree responsible for the ill health found among the cultured women of the higher type at the present day.¹

Secondly, no large series of figures exist which would afford evidence (*a*) of the healthily environed uneducated boys and girls to compare with (*b*) those who have been individually trained, due regard being paid to their essentially girlish or boyish development, special attention being given to the *degree* of femininity or masculinity *present* and developing in the organism; then, when the health standard from these two results had been obtained, to contrast it with (*c*) those who have been undergoing the ordinary collective system of school and college cramming, with its competitive examinations and competitive class aims. Were such statistics carefully compiled, I feel convinced that little more would be heard of co-education claims. To my thinking, it is in the highest degree improbable that the varied powers of different individuals of both sexes can be dealt with on any but an individual system. However, could accurate statistics be shown to prove the contrary, it would be necessary to modify the grounds on which one has hitherto based one's beliefs.

Thirdly, the evils, if any, that are or are not

¹ That for both sexes, especially in young children, the present forcing system is prejudicial, and that in this sense there is grave overpressure, will, I believe, be generally admitted by medical men who have had much experience of poorer children's ailments. Is the girl more affected than the boy?

produced must be examined by a study of the students for at least ten years after the termination of ordinary educational work and for the whole of their pre-school existence.

Fourthly, each school must be shown to be in some degree co-educational, and in proportion as it falls away from the co-educational idea and passes into the co-associational, its results must be excluded.

Clearly, therefore, there are no grounds for believing that co-education is a satisfactory method of training.

On the other side the evidence is not less defective. Broadly, the evidence brought forward by Dr. Clarke, Dr. Philbrick, and others is that the educated woman is more fragile than the uneducated, that certain peasant women and others have been found to possess what is assumed to be the natural healthful female form. How this natural idea of health is obtained is not stated. Yet if, as I have pointed out, the evidence at the present time strongly points to a more sexualised form of woman growing up in advancing countries, it is clear that the physical conformation and the general estimate of health must be formed for primitive and advanced forms independently and then the results obtained compared. The backward tilt of the pelvis varies with race, and with class in any nation, and this among other points modifies the carriage¹ very considerably, and the cultured woman can no more be directly compared with the peasant woman for form and like health standard than the

¹ Other details have already been referred to in discussing sexual temperaments.

health of a navy can be compared with that of a Huxley or a Darwin. With the mental organisation that Huxley had and with the work he had to do and did do, we can compare the physical organisation of the typical physical man and the physical work that he accomplished. Taking the circumstances of their different organisation and different capacity into consideration, was one less healthily capable for his work than the other for that other's labour? The mental woman is not fitted for peasant duties and must not be judged by a peasant standard.

Dr. Clarke was surprised at the red blood that fills and colours the faces of ladies and peasant girls in Europe as compared with the United States, and was reminded of the canvases of Rubens and Murillo.

Now, this paleness of the American girl may be, and doubtless often is, as he assumes, due to bloodlessness, but it may also be due to a natural pallor connected with a mental organisation.

It has, therefore, first to be established that either the nervous types are unhealthy, and this, as I have pointed out, is altogether improbable, or, if not unhealthy naturally, that their environment, and particularly educational environment, has made them more subject to disease in higher surroundings than the coarse types are in lower.

Much, therefore, as one would desire it to be otherwise, the case must still be adjudged to be non-proven, though it is likely that a false system of education does harm the higher types of womanhood from the prevalence of neurasthenic conditions among this class.

Looking broadly at the life of a growing boy as compared with that of a growing girl, it is clear that up to the commencement of puberty there is little in either of their developments to warrant any separate system of training, though some judgment is demanded in the teacher to appreciate the different methods of appeal required even at this stage in the female as compared with the male mind. The influence of woman on this period must be beneficial for both. It is the time when the mother's influence is first lacking during a considerable portion of the child's life, and no man can approach so nearly to the realisation of the feelings of maternity as is possible for a cultured sensitive woman to do for this period, therefore a schoolmistress rather than a schoolmaster is required. Woman, too, is more observant by nature on all points concerned with the life of others that she is brought into contact with, on account of greater altruistic feelings, and is less wrapped up in her own speculations; she is therefore peculiarly fitted to almost intuitively divine the early powers and tendencies of each of her pupils when they themselves, owing to their early age, are unable to understand the childish feelings that stir them. Perhaps, greatest of all, the habits and standards of the better type of women are almost always more refined, more beautiful, and more moral than those of men, and these can be inculcated *by unconscious example* so as to be remembered for the rest of life.

But when the child grows into the *conscious* boy or the *conscious* girl, when the former becomes

aware that there are many things which he can do which she cannot, that in all physical ideals, of strength, tenacity, and activity, he is daily becoming her superior, he is extremely apt to regard the girl 'as only a girl' and as his natural inferior if he associates with her in all games, and the girl herself is likely to concur in this, for she has become conscious of her weakness.

At this adolescent age physical appeals are strong, and neither has at this time grown old enough to perceive the dignity and height of real manhood and womanhood, nor to realise that the claim of each to equal development rests on mental power, so that co-education is likely to engender a feeling of superiority in the boy, which he as likely as not may carry with him through life.

But a far more important aspect of the question tells heavily against co-education during the adolescent period. If the advantage of sexual specialisation is dependent upon the collectivising and altruistic tendencies of women, and the individualising, and, in the higher sense, selfish and self-realising powers of man, if these two distinctive tendencies are necessary for progress in the social aggregate, just as conservative and liberal movements are, if the higher emotional life can be fostered mainly by woman and the higher intellectual by man, and if both are needed to modify each other, then from the national standpoint some degree of separate training of the developing boy and developing girl during the period of active transition is absolutely essential to intensify to the full the ideals of true manhood and woman-

hood, while later in college and industrial life they can meet freely and fearlessly with the strength of healthy maturity to maintain unimpaired the highest womanliness and manliness, and each value the other for qualities which, though distinctive, are bound together for common ends.

No one who knows life can seriously doubt that the tendency of business is to destroy courtesy, and to lower terribly the standard of gentlemanliness and gentlewomanliness. In trams, omnibuses, trains, in every thoroughfare, in the vulgar hordes that meet in vulgar fashionable drawing-rooms, consideration for woman is less than formerly. How is this evil to be checked except by reviving the old ideals of chivalry *on a higher and nobler basis*? Women among the uncultured are giving up their ideals not because of progress, but because their life is approximating to the male standard, and so the natural emotional refining power of woman is losing its hold on Society because women have been encouraged to forget what ought to be remembered, felt deeply, and gloried in.

As the sexual temperaments are the natural outcome of a natural progressive evolution of life, as the ideals which such divergence fosters are of social value, it follows that to preserve these at whatever cost is essential to all state growth.

Yet it cannot be denied that each sex throughout the whole period of human existence is capable of deepening to the other the meaning of living. The more closely brothers and sisters associate in mental companionship, the greater will be the strength of

the family tie. In a common school it cannot be doubted that, consistent with the development of each, common growth would foster great appreciation of each other.

One of the great evils—perhaps, in the harm it works, nearly the greatest evil—in the world, is that girls and boys grow up into women and men leading lives so widely separated as to be almost unintelligible to each other. Large acquaintanceship by this separate living is impossible, and this is accentuated by formidable anti-social barriers placed between them in adult life. Hasty inexperienced marriages, resulting in more or less widespread unhappiness, take place where real affection from two mutually responding natures might have been the common experience if greater choice had been possible.

Co-association during school life would seem to be the right evolutionary basis if supported by complementary divergence of ideals. How may this association and divergence be obtained?

C. E. Rice, in an excellent chapter¹ on the practical solutions of Co-Education Problems, writes: 'Each sex is most itself in the presence of the other;' and granting this, the further question of importance is how to take care that education, while being perfectly co-associational, is yet sufficiently distinctive to be fitted for sexual differentiation.

Most teachers who have had experience of mixed schools seem to concur in the need for equal proportions of girls and boys in the same school and in

¹ *Co-Education*. Edited by Alice Woods.

the same classes, and also of similar age periods. Nearly all seem to agree in the necessity for keeping the physical differences of functioning widely separate; for this reason lavatories &c. should be in altogether different parts of the school buildings. The majority seem agreed that games require some differentiation, and that for rougher games, and often also for reasons of differences in physical strength, it is necessary to play separately. Most, again, seem to admit that some subjects, such as needlework, carpentry, &c., are essentially feminine or masculine subjects.

All, therefore, that is necessary to satisfy the evolutionist is that these natural differences should be encouraged.

It seems to me that this can be achieved in a very simple manner, firstly, by the reduction of pupils under the care of one teacher so that greater individuality of teaching may be rendered possible, and, secondly, by the complete avoidance of competitive examinations, so that each child may be measured entirely by his or her own progress and effort and not by relative slowness or rapidity as compared with others. Under these conditions co-association schools are the ideal to which evolutionary tendencies are naturally and inevitably leading. But it must be remembered that their chief justification is on account of the natural womanly and manly characters that they tend to develop; if they fail in this they have little social value, they may even be a positive means of corrupting life, as physical differences will become familiarised without any

higher mental differences being recognised to control them

As the child develops, these higher differences will become fixed and settled, and men and women going out into life with such past memories behind them will be firm in respecting each other.

Industrial Aspect

Industrially, I know of nothing in history more appallingly evil, more self-condemning of man as man, than the attempt to selfishly keep down wages to that which is barely sufficient for mere existence. It is childishly shortsighted ; for to pay men well is to be able to select good workmen who are reliable and sober in their habits, and good wages make it possible for them to take a real genuine interest in their trade. Nowhere is the hideousness of the commercial spirit more awful than in its relation to women. Woman is naturally non-combative and non-competitive, and the higher the woman the more these two *socialising* aspects of her nature are developed. As a result women combine less than men to resist what is evil, and put up with evil institutions, obeying law and custom even when harmful rather than be revolutionary. Woman, too, in the majority of instances looks upon industrial work as only a subsidiary factor in her life, while to man economically it is the dominant one.

Looking back over our modern history, over the beginnings of the development of modern factory work, one feels it shameful to have been born of the

same race and to belong to the same nation as the disreputable blackguards who made money out of human misery. Young women as well as boys chained like slaves to their debasing toil, treated as no animal would be treated by a self-respecting man, make the records of this part of our history burn with a self-stamped disgrace that no after-actions of our own can purify. And yet to-day, though we cannot chain women to our work, we can sweat them, we can pay them so badly, work them for so long, crush their spirit with deadly monotony, so that at last prostitution or death seems preferable. Fashionable drapers, fashionable and unfashionable food shops, pay women a wage so low that they cannot even buy the mere physical necessities of life. The shop managers know how these girls amplify their incomes; the religious bodies of England, if they do even the smallest fraction of their long-forgotten duties, know also; yet there are no general widespread denunciations from the pulpit because the ministers themselves are saturated with the self-same monetary and feudal spirit that degrades and deadens us. There is much talk over the rights of women, but little action, and it would be better to consider in grim determined earnestness the crimes of men in high financial places.

When more care is taken in investigating the effects of disease-causing tendencies, this low wage of women, and, be it remembered, mostly of young women, will be considered one of the greatest social crimes of our age. It is a gigantic and foolish

blunder of ignorance, where it is not immoral, to assume that women can find out *practically*, any more than men can, employments that are suitable to the healthy development of their powers when the maxim of this world is, 'Work, not as your powers direct, but work as Mammon's slave and in such manner as wealth commands that you shall work. Work under these orders, be criminal or starve.' Even dimly to realise one's power requires physiological and psychological knowledge that most people do not remotely possess; and the few who do, feel it to be at present a quite insufficient guide. The more highly evolved a woman is, the more the coarse savage conditions of over-crowding, over-working, and under-feeding will be *peculiarly* prejudicial to her, because she is more specialised and more subject to disease on account of greater delicacy of constitution. Slum conditions must be civilised by constant steady effort against those who wish to maintain these anti-social areas for their own anti-social advantages, in order that the womanly woman may have a fair chance of living free from the curse of sweated labour and its accompanying evils.

To fix by some means, legislative or otherwise, the man's wage standard as that of the woman's, to make the same time that a woman works payable at the same rate, would tend to naturally specialise manly and womanly powers, for the women would then obtain positions because they were fitted for the work, and not because they work for less than a man. Industrially this specialising tendency must

become increasingly recognised, prominent, and respected in all advancing states.¹

While it is difficult at the present time to define even approximately manly and womanly fields of activity, yet there are certain points of outlook which can be clearly enunciated, as they rest on physical differences which are incontrovertible.

It has been pointed out by more than one writer on the subject that women by their relatively small feet, by their relatively wide hips, and shorter legs, have the weight of the body less perfectly transmitted to the ground. The inclination inward of the thighs from the widely separated points above downward to the knees, the result of the wide pelvis; and the smallness of the knee, with its weaker muscles and sinews surrounding the joint; and the small size of the foot that receives finally the weight of the body, not only cause unsteady walking, producing in extreme cases the waddling gait, but also unfit women for standing. Further, when it is remembered that this standing still for any long period of time, either in home or industrial occupations, is one of the most important causes of varicose veins, and that these distended vessels frequently lead to ulceration of the legs, and that all such conditions are made much worse by pregnancy, it is truly lamentable that much more rigid restrictions are not imposed on all employers who encourage or allow women working for them to stand for hours. Not

¹ In subsequent volumes I shall endeavour to point out how this scientific ideal is being practically realised, not only industrially, but also in the home and in art and mind life generally.

the least shameful in this respect are our hospital authorities. If heavy fines were imposed on all responsible for such harmful habits, one great evil of industrial life would be abolished.

Again, women tend, owing to the growth of the child during the later months of pregnancy, to have the muscles of the abdomen relaxed as a result of stretching ; if this becomes extreme, as it frequently does, the processes of digestion are affected and dyspepsia results. Any sedentary occupation which relaxes these muscles, or necessitates stooping over work, is therefore at all periods of life specially harmful.

Finally, woman is more readily tired out by *constant* attention to any work, This has been clearly pointed out by Ames.¹ Women naturally require frequent intervals of rest, and this explains why housework, which supplies varied employment and opportunity for little pauses, is so readily accomplished by women who are quite incapacitated by apparently easier but steady outside occupations. This greater need for occasional interruptions from work is still further necessitated by the slight or considerable monthly indisposition.

The increasing influence of sexual development must be recognised practically in the nation (educationally and industrially) if the higher womanly types are to grow up into healthy, beautiful women.

¹ *Sex in Industry.*

Higher Human Beings

But as the differences of sex are of supreme value to the State, so likewise are the differences of individuals. I have endeavoured to show that broadly the study of temperaments established a primitive series of characters as compared with a highly evolved. Now these differences must to a degree *always* hold; what is advanced to-day may be, ought to be, backward for to-morrow, but progress depends largely on leaders, hence progressive and relatively unprogressive *types* must exist.

It cannot be too strongly emphasised that while it is of great value for the State to possess individuals organised for higher life, it is not less important that distribution of all citizens in the various strata of society should be largely proportional to capacity. It is therefore for a nation a supremely urgent question, which it must always be considering, as to whether the *most* fitted man or woman is occupying the *most* fitted place. This is entirely different from the idea of moderate efficiency; it is not a question of whether A can or cannot perform certain State duties, but whether B C D could *better* carry them forward. This question of adaptation, therefore, has one and one meaning only, the destruction of scum monopoly.

Scientists are already beginning to realise this, and some day the nation itself must wake out of its torpor, and when it does an aristocracy of merit, instead of one of barbaric display and vicious living, will be established.

Now, just as it is necessary for womanly and manly ideals to be established in order to check any tendency towards any desexualised and spiritless national life, so it is equally inevitable that industrial class ideals will one day be firmly established, displacing the present monetary and feudal. All citizens will soon be more or less educated, and old social distinctions will at last become so ridiculous that they will sink under general public condemnation and contempt. All will meet under the common right of citizenship, only each trade and profession will have its own ideal towards which honour and respect will be concentrated, and the national standards of rank among these occupations will unite them under a common aim.

Another feature, the growing importance of speed, has not attracted the attention that it should have done. The tendency of modern life is to economise time everywhere, but for the individual and the nation the strength of the position lies in the meaning to be attached to the word economy. It is no economy to gulp food down in large half-masticated lumps, for there is no reason for believing that our digestive organs will grow more healthy by this process. It is equally certainly not economy if a temporary advantage to the nation is secured by a permanent disadvantage. Yet though in this question of speed biology has at least as much a right to define its claim as that of practical economics has, it is not so generally recognised.

There is, as I have already pointed out, much reason for believing that the heavy John Bull or

Hodge yokel type of mind is giving place to one more active and alert, and this result of modern life is likely to continue generation by generation, so that the keen mind of this century will be the slow lethargic one of the century following it; steam power has displaced horse power, and electrical energy is already carrying the possibilities of motion far beyond that which even thirty or forty years ago would have been considered within the limits of the conceivable. Yet it must be kept constantly in mind that the capacity of *healthy* response in the individual to his environment is the determining factor of the problem.

Women are capable of more rapid movement than men, and some classes of men are in comparison to others quick, and if the quick forms are constantly selected, I can see no check to the process, man becoming generation by generation capable of greater and greater *rapidity* of perception.

I can see no check in this direction if speed is the principal quality required for modern life; but before it is assumed that increasing quickness means increasing advantage socially, it is essential to consider if this speed rate is adapted to other more important social elements.

Imagine for a moment the life of an individual in whom this speed consideration had become the most prominent feature. I have known men who, with the present incomplete contrivances, could take a cold morning bath, shave and dress in less than twenty minutes from the time of getting up. A commodiously arranged bath near the bed, an

efficient razor guarded to prevent cutting the skin, and clothes made to slip on by easy buttonless contrivances, and the whole toilet might be completed in not very much longer than the fireman now takes to respond to a night call, or possibly five or six minutes in all.

If breakfast were to consist of food that required little mastication and was partly digested by some malting or peptonising process, another five minutes for its swallowing, and a rest of five minutes during which a summary of the morning's news might be read, and the business man might be getting into his motor carriage fifteen minutes after waking.

A steady, well-balanced vehicle, taking five or six or more similar minded individuals to their respective business houses, might be fitted with writing accommodation, so that a good deal of work could be accomplished before setting foot in their offices.

With systems of telephonic and other means of communicating with each other, with typewriting and shorthand facilities, and with the midday meal, again specially prepared for easy digestion, brought into the room of the worker, it is possible that by about six in the evening an enormous mass of work might have been got through with perhaps less than thirty minutes' interruption. But the atmosphere of rush which would pervade the country composed of individuals with such time-saving ideas would be that of a tornado.

All work would probably be done in relays, so that night and day, perhaps on the countryside as

well as in the town, would be alike unrestful. To walk safely in the streets on account of the rapidity of the moving traffic would require the utmost concentration of mind to avoid being injured. One element, from the time of rising from bed to its return, would be absolutely essential—that is, concentration of mind on the *immediate* work or pleasure in hand. Would such an atmosphere be favourable to intellectual, artistical, or musical life? Could the great organisers exist in such a breathlessly non-theorising, non-feeling, practical environment?

To think of beauty, and to feel its influence, one must *dwell* on beautiful things, have them always with one, become saturated with the impressions that come in daily and even hourly. To grasp an intellectual problem one must hold and wrestle with it all day, and sometimes all night, before one can master it. The *atmospheres* of thought, of beauty, of melody are as necessary to thinker, artist, and musician as the atmosphere of speed is to the quick man. Without the controlling soul forces mere quickness becomes shallow hurrying, an empty hustling that is meaningless alike nationally and individually.¹ Biologically the more definite surroundings are, the more definitely will they select those fit to survive and compete under them.

If the gormand and drunkard are unpopular and find it hard to obtain the food and drink luxuries which they require, and are too low in capacity for efficiency, they will sink to the lowest sections of the

¹ Is there not already some evidence of this weak spirit in all modern countries, especially in the United States?

community and in time will be eliminated. If the shallow but quick man is always subordinated to the far and clear-seeing and far and deep-feeling minds, then quickness will not check the growth of genius; but if the great minds do not control the great forces of our life, mere celerity will make cheap, showy, quickly finished, and therefore inartistic work predominant everywhere.

To guard religiously womanly and manly standards; to subordinate feudal tendencies and eliminate from practical state existence all mere mammon worshippers; to make ability determine both opportunity and rank; to open all positions to those that labour lovingly; to keep the nation pure by throwing responsibility on all *according to the greatness of the national position assigned to each*; to foster natural differences; to firmly realise that ends such as the pursuits of beauty, truth, and morality, for human progress may not and shall not be subordinated to methods of a speed-saving and money-saving nature; and, lastly, to economise for progress, not to progress for economy, are shortly the ideas which must underlie our efforts. These briefly are the doctrines which the biological and sociological study of temperaments formulates for higher political and individual state aims.

CHAPTER VI

THE MEDICAL ASPECT OF THE PROBLEM

THAT which a medical man worthy of his calling sets himself to accomplish is the increase, to the best of his power, of the health reserves of the community. This is his primary aim, beside which all other aims are subordinate.

But health, as has already been noted, is not a mere hypothetical relationship, existing between an unreal average type and a non-existing average of environmental conditions. It is, on the contrary, a very delicate adjustment between the powers of each individual, as an individual—with a distinctive physical and mental individuality—and the particular group of conditions, varying with each patient, in which the said individual lives.

To the scientific physician, therefore, three aspects of the question present themselves as primary, secondary, and final problems. Firstly, to determine what the drift or drifts of *each* patient's limited social circle is or are. Secondly, to study the peculiar character of the patient and form some opinion as to the general suitability or unsuitability of his or her powers in relation to the public and private occupations pursued. Lastly, to satisfactorily decide

upon the nature of the disorder that such a one is suffering from, and to seek by therapeutic and other means immediate temporary alleviation or cure of it, and to give advice, after the temporary benefit has resulted, which shall lead, if it is followed, to greater harmony between the natural powers of the citizen and the citizen's communal and individual position.

Now, in order to give this detailed information to each person, it is necessary to have knowledge of the general principles of environmental evolution, of the laws of temperament and idiosyncrasy, and of the effect of drug action, diet, and general hygienic treatment on the human form. And the capacity required to master even the broader details of this great field of knowledge is of no mean order.

Socially, also, from industrial, educational, and criminological aspects the medical practitioner's importance is progressive. He must, therefore, broaden his field of vision to meet the growing social needs.

While it is evident that progress in the treatment of disease has been a distinctive and undoubted feature of advancing civilisation, it is no less manifest that, for some reason, the growth of therapeutic knowledge and skill has been less characteristic of the modern medical movement than surgical and hygienic developments have. The stethoscope, thermometer, laryngoscope, ophthalmoscope, and many other similar contrivances have greatly facilitated accuracy of diagnosis. But whereas the discoveries of ether and chloroform, and a knowledge of bacteriology and antiseptics, with improved surgical

appliances, have led to great changes in the treatment of surgical diseases, so that the prognosis in most surgical and gynecological disorders has greatly improved, in medicine—beyond the better hygienic arrangements made, and beyond the dying out of some extravagant and dangerous methods of practice—the essential backwardness of our practical handling of disease is still manifest.

‘Scientific therapeutics is what we are hoping for, but at the present time very little exists. . . .’¹

To what cause or causes may this failure be attributed?

The answer to this question is not a difficult one. The average medical man is one whose spare time is both small and liable to frequent interruption. As a consequence it is peculiarly difficult for him to settle to any regular systematic study of a problem that lies in his path. He has either to retire from general practice, and this necessitates great monetary loss, or postpone—and in most cases the postponement is final—the consideration of any question arising till the opportunity given by leisure allows of it being studied. Frequently by the time the favourable occasion offers itself, the power to grapple with the difficulty has, with advancing age and inability to keep pace with the growth of knowledge, disappeared. Further, the deductions required in surgical or obstetrical arts; or the percentage estimation of the conditions which affect prejudicially large masses of people, which hygienic science takes note of; are far simpler than those which predispose to, or

¹ Samuel Wilks, *The Practitioner*, June 1897.

produce, disease in individuals, and which therefore require individual knowledge in handling. It is, for instance, comparatively easy to foresee that a certain type of knife, forceps, or other instrument would accomplish its work better if this point or that were modified, and to make this alteration and then practically prove whether the expected result has or has not been brought about; nor extremely difficult to discover whether after a certain change in drainage or modification in the style or method of building in a certain town or country area, improved health of the inhabitants living under these altered conditions has resulted. The estimate of the result is, of course, considerably influenced by the many industrial and home habits of the citizens, and the local features and surroundings. Nevertheless, by an examination of the results statistically, it is possible to arrive at fairly accurate conclusions.

When, however, it is a question of special individual treatment, the peculiar idiosyncrasy of the patient, the temperament, habits, and kind of environment he or she has been subjected to, the course of the disease—the earlier stages of which are frequently undiagnosable—form so many uncertain points to deal with, that much closer study is required to achieve even the most limited real success.

Now, it is doubtless owing largely to this greater necessity of following up many groups of facts, requiring both more time and mental concentration than the average medical practitioner can afford to give, that the backwardness of this branch of medicine is due. But, in spite of all obstacles, the neces-

sity for grappling with the difficulties of therapeutics, of studying the art of healing by methods that are rigidly scientific, is paramount.

To attempt to follow, but in merest outline, the principles upon which rational sound treatment should rest, and observe how these can be practically applied in the many different details of the general practitioner's life, is the object of the present chapter.

It is obvious, as has been stated with almost wearisome frequency, that a knowledge of health is necessary for the adequate study of disease. Yet, perhaps, no statement in the whole field of science is so frequently disregarded. It is true that the average medical student, the world over, is taught a certain amount about the functions of the different organs of the human body. He learns that lungs, liver, kidneys, have each special activities, and that these exhibit in different individuals slightly different variabilities. He acquires, if he is industriously inclined, a series of facts which prove that certain sex differences exist in the nervous, respiratory, motor, and digestive systems, as well as in the primary reproductive organs. Perhaps also he studies anthropology, and is aware of many racial peculiarities, and he may know that certain wide departures from the usual type of organisation seriously interfere or are altogether incompatible with living. Yet, while conscious of these variations, he is almost wholly ignorant of facts which would teach him by what insensible degrees the abnormal is related to the normal. Consequently the laws which might explain the origin and cause

of human deviations are not sought for, and the practical value of even the little knowledge acquired is therefore lost sight of, with the result that, after the 'examination' period is passed, it is soon forgotten. But in order to understand the meaning of the small divergences, and how and why these arise and are perpetuated, it is necessary to closely follow the relationship between different individuals and their different surroundings. Environment, therefore, ought not to be overlooked. Biologists, unlike medical men in this, have, since Darwin's works were published, studied this matter carefully (as the works of Galton, Cope, Osborn, Weismann, Weldon, and others prove). Why has the medical profession neglected it?

Again, it is almost certain that no *complex* organism—composed as any higher mammal is of millions of *complex* cells, each single cell being somewhat differently situated even to other cells of its own class and functioning more or less differently—could be so ideally constructed and adapted to its environment as to be equally and perfectly healthy in its various specialised parts. What is meant by health, when the term is used scientifically, is a state of individual activity in which a preponderating harmony exists in the organism by which it is able to respond readily to its surroundings. When from any cause failure of adjustment becomes the dominant feature, the result of this failure is referred to as disease.

While, therefore, it is possible to define major faults in development, and to show that these are

incompatible with existing healthfully in any environment, it is yet quite hopeless to attempt to enumerate the characteristics which mark the many minor distinguishing elements of the many forms of men and women and interpret these characteristics in the terms of health and disease. The unhealthiness, or the healthiness, of minor points of divergence in any single man or woman depends on the suitability or non-suitability of the particular social atmosphere that encircles such an individual. To study the conditions under which particular rather than collective life exists, is as necessary for the medical practitioner as the ordinary studies of physiology and pathology are, and as the less ordinary but equally important science of temperaments.

Different races of men, and different individuals of these races, have—like the many species and varieties of vegetable and animal life—certain conditions which favour their growth and development and others which retard. *The problem, therefore, before anyone who attempts to study the true principles of disease, is the estimation of the relationship existing between particular environments and particular types of organisation.* This is the immediate question for the physician in his daily rounds of visiting.

The second, but not less important, inquiry is, *which of these particular types are progressive and evolutionary, and how must the whole national environment be modified to be adapted to the ends of these higher forms.*

As certain small living organisms exist parasitically either on man or at man's expense, it is necessary to establish a progressing environment that is not only directly favourable to higher, mentally organised, men and women, but is also *actively unfavourable* to other forms of life (disease germs) which affect them prejudicially.

Physiologically, therefore, as well as ethically, the true study of disease brings the medical man into touch with three aspects of the same question.

Firstly, Environmental.—(a) Human ; (b) Parasitic within the human types.

Secondly, Temperamental.—Evolution of higher types.

Thirdly, Therapeutic, or the whole field of treatment of diseased individuals and the prevention of disease in the healthy by the removal of predisposing and exciting causes.

With a general knowledge on these points, it would then be possible to treat the particular and distinctive individual in general practice, and without this information no science of medicine is possible.

Each of these sections can now be considered more fully.

FIRST SECTION.—*Environmental*

(a) *Human*

The consideration of human environment naturally falls into two groupings : (1) Those influences that are produced by the more or less permanent

climatic conditions; (2) those that result from man's own evolution and the effect produced by this evolution on other forms of life, which in turn tend to react again on man.

(1) *Climatic Action*

Since Erasmus Darwin and Lamarck studied the relation that climate appears to bear to life existing under its influence, this subject has received increasing attention by biologists. Charles Darwin, and after him a very large number of American, a few English, and many Continental writers, have studied, both in animal and plant life, the alterations that have resulted from changing the physical conditions under which plants and animals commonly live. The results obtained have been compared with other groups of facts derived from a knowledge of the natural distribution of life forms in tropical, temperate, cold, hilly, flat, dry, and moist regions, and much useful information has thus been obtained. The subject is a peculiarly interesting one, but is, unfortunately, surrounded by difficulties which make it hard to establish definite conclusions.

Many facts have long been obvious even to the untrained mind. The change which results when the seed of some garden annual falls on a gravel path instead of some well-manured bed is, in itself, sufficiently striking to attract notice. The insignificant character of the seedling, as compared with its parent, is remarkable. Thus a variety of poppy, itself perhaps eighteen inches high, may have within two feet of it a daughter plant of not more than

three inches. The conditions of growth may be similar, except for the one difference of rich loam soil or stony ground. Again, the fact known to many breeders of animals that type characters often change when animals are transported to different climates from the one in which they have been developed, would appear to be of an analogous nature. In one case the soil, in the other the altered atmosphere, appears to be responsible for the changed response of the organism, as the hereditary conditions can often be excluded. Again, the English race, distributed over many widely different climatic areas, seems to afford some confirmation of the influence of the inorganic surroundings on the organism. The American-born, while preserving many of the English characteristics, appears to tend to approximate to an American type. Has climate directly affected the change in question? or is there a destruction by disease of those less adapted to the newer environment? and is it this selection, plus the response of the selected organism, that accounts for the change? How far are the changes temporary ones due to lack of healthy development owing to defective vital stimuli and lack of food material? How far of a permanent character?

Now, as I have already pointed out in Chapter I., it seems probable that physical surroundings are not able to do more than develop or retard some quality already existent in the organism, and are never able to create. This being so, however, it is still extremely important to realise how far this developed or retarded response in the parent is passed on

to the offspring. Is it transmitted at all, and if so in what degree?

Protoplasm appears to be in all cases a highly complex substance which integrates or disintegrates, when living, always along certain definite lines, varying only according to the kind of variety to which it belongs, and it would appear that climate can only affect by stimulation these integrative and disintegrative tendencies.

Experiments have already established the fact that protoplasm, even of an extremely simple nature, responds in some way to light, heat, and atmospheric pressure changes and to electrical stimuli. Similar experiments on vertebrate animals prove that the various tissues of which their bodies are composed react also to these varying physical conditions; but to obtain results of this nature on the higher living animals it is necessary to interfere with the unity of the whole organisation, and the results obtained are, therefore, though useful as physiological studies, not of great practical value in helping the medical man to understand how each whole living individuality responds to the changing conditions of its environment. To stimulate the cortex of the brain directly, or to cause a muscle contraction in an isolated piece of muscle tissue, does not afford much help to the medical climatologist in his desire to explain the much more general temperamental responses which vary with the different temperaments and idiosyncrasies. Nevertheless, the facts demonstrated prove that the tissues of the human body and other higher vertebrates are susceptible to these influences, and

that prejudicial or beneficial results may be obtained by these means.

An exposed muscle or nerve being unprotected is immediately affected by change in the experimental surroundings, but the Mammalian type of organisation is so well protected by means of its outer covering (skin) and its power to largely preserve a fixed internal body temperature and a comparatively fixed internal environment, that it is less dependent on external surroundings. For this reason, doubtless, the changes in the human organism are much less easily definable than the reactions which any separate tissue would make were it free from the adjustments which the organism, as a whole, is able to make to outside variations, of temperature, moisture, &c., which are not sufficiently intense to be destructive of life.

We know that climate and season do exert an immense influence on plant and lower animal life, and, allowing for the greater means of resisting outside changes which the higher living forms possess, it may fairly be assumed that these influences, though less important, are nevertheless real and deserving of study. The beneficial effect of warm dry climates on phthisical patients is perhaps the most certain known evidence of this nature. There can be little doubt, however, that in the future knowledge on this subject will be greatly extended.¹ The relation which meteorological conditions bear

¹ Edwin Grant Dexter's Study offers already promising prospects in this respect. See his work, *Conduct and the Weather* (Macmillan & Co.). Also Dr. East's article in the *Lancet*, July 25, 1903.

to astronomical—as, for instance, the nearness of the moon to the earth at various times of the year and during various seasons; how far sun spots affect light and heat supplied to us from the sun; to mention only two points at the present time being considered—prove how wide and far-reaching is the knowledge required to appreciate adequately the influences at work on the human organism. The prevalence of particular diseases at particular seasons of the year, and the curious fact that during epidemics the epidemic disease is often simulated by minor disorders—which do not always appear to be milder forms of the prevalent malady—are both suggestive of some relation between the rise of the epidemic and the particular climatic conditions prevalent at the time. The few facts bearing on this subject, therefore, seem to favour the probability of promising results if greater attention were to be given to it.

(2) *Social Evolutionary Tendencies*

The second class of environmental influences are obviously of a much more complex character than those just considered. Climate tends to act on all organisms in the same area equally, but the peculiar features of the environment resulting from Man's own evolution is that the social environment which surrounds him does not affect each man, woman, or child similarly, but varies individually for all individuals—one surrounded by luxury, another by poverty, one by opportunity for culture, another almost compelled to adopt a career of vice, and each

one of the varying environmental influences is likely to act diversely in accentuating or checking susceptibility or resistance to certain diseases. In climatic influences their effect may be taken as being relatively constant ; sociological features, on the other hand, are as variable as the variability of the individual, and thus unequal conditions produce effects upon unequally predisposed persons.

The social forces that tend to affect Man's evolution are—(1) those which he partly determines himself in his private or home capacity ; (2) those which affect him in his industrial or public capacity ; and (3) those general influences of the age, locality, and country in which he is born and lives.

1. *The home* has in all times varied within very wide limits. While it has always largely been bounded by the fashions and the customs of the time, yet the differences manifest between one class of society and another have been, and still are, one of the most remarkable features of social life. The opportunity existing among the wealthier classes for expensive foods and drinks, the particular amusements which they tend to monopolise, the difference in living due to house accommodation, clothing, &c., would make an interesting study when compared with the simpler means of gratifying hunger and thirst open to the poor, and their means of enjoyment, and the evils resulting from overcrowding which they have to submit to.

The increasing use among all classes of condiments taken with real foods, and the enormous growth of nerve stimulants of all kinds, tea, coffee,

cocoa, alcohol, and a host of others, would probably reveal, if studied in relation to changing conditions, some radical defect in our method of living which ought to be modified.

Observations made on varying foods in their relations to varying individuals, due weight being attached to hereditary predispositions, would, no doubt, throw much valuable light on the causes of largely constitutional diseases, such as Phthisis, Diabetes, Cancer, &c.

Again, the distinctive feature of civilisation is the growth of the mental element in life, and the relation that this changed mental outlook bears, in producing changed habits of citizens in an advancing community, to insanity and crime, cannot fail to be important and directly practicable. Yet this whole home group has been very little studied by medical men throughout the world.¹

2. *The relative healthiness of different employments* is a question that has attracted many careful investigators, but even here it is largely the object of introducing collective precautions into industries for *all* workers alike that has been chiefly considered. The natural fitness or unfitness of differing individual men and women to differing labours has been unaccountably overlooked. The progress made in protecting persons in different trades from avoidable trade risks has been specially praiseworthy both in the northern part of the United States and in the British Empire, but the larger subject of uncongenial

¹ Absolutely unhygienic conditions have, of course, received great attention, as the decrease of typhus and typhoid fevers testifies.

and *individually* dangerous work has been very generally disregarded.

We know that the generalised employments of the past have rapidly been displaced by others more numerous and more specialised. This tendency is universal, involving the highest arts and sciences as well as the lowest occupations. Its effects must have been far-reaching, yet even pioneer efforts have not so far been forthcoming.

3. Lastly, the study of the changes that the general environment produces on the whole mass of environed individuals has to be noted. The rise of mechanical power, the influence of steam and electricity in changing the general character of town and also country life, the telephone, telegraph, and other similar contrivances, are rendering a more alert type of mind an absolute necessity. What is happening? It is stated by some authorities that general paralysis of the insane is a disease that results from the onward march of civilisation, that the worry and excitement of existence in addition to the syphilitic poison, or possibly even in very rare instances without it, result in a retrogressive disorganisation of the higher centres of the nervous system. If this theory is well grounded, does the specific poison, acting through the relatively large blood supply, attack the most used part, or is the nervous system itself weakened by overstraining independently of other contributing causes? Is there unhealthy stress on all citizens, or do the present tendencies in modern surroundings mainly affect the unfit? The relation of crime and insanity to the

changing habits of human existence present similar collective problems to be worked out and solved. That all customs and states of life that evolve sweating in any form are productive of disease-favouring conditions is of course now generally admitted, but the further question to consider is what necessary and essential morbid changes accompany, perhaps directly result from, healthy social development, and how these changes may be held in check.

Again, the spread of infectious diseases in spite of improved hygienic methods and knowledge is a not unlikely result of modern development. The growth of large block buildings, housing upon the flat system enormous numbers of families in close proximity to each other; ¹ the growing tendency of adult individuals to be brought into close contact in trains, trams, and other vehicles, and while attending public meetings or visiting theatres, public art and science galleries, and finally the steadily increasing educational institutions, each offer such vast opportunities for the dissemination of germs that it is extremely unlikely that this class of diseases will become less evident as social development continues. Hygienic science has, so far, not been successful in controlling scarlet fever, influenza, whooping-cough, measles, &c., and there would seem to be no adequate reason for supposing that fresh diseases, adapted to newer surroundings, will not develop. With the exception of smallpox, which has been controlled by unusual and not generally applicable means, there

¹ It is likely, as Wells has pointed out, that this feature will not be an increasingly marked characteristic of life.

seems little prospect of dealing with this group of disorders.

The less virulent contagious diseases, which are more readily checked by germicidal precautions, are decreasing. The field of disease in future times is thus likely to be mapped out into two large divisions, firstly, the extremely numerous collection of constitutional ailments, and secondly, the scarcely less important aggregate of intensely infectious illnesses.

What effect will the evolution of this aspect of the environment exert on human evolution ?

To consider this question more fully it has to be borne in mind that the two factors to be appreciated are firstly the power of disease germs to grow and develop in the environment, and secondly the predisposition of the individual to these parasites.

The environment may be favourable to the growth of parasitic micro-organisms, and also to the resistance of the individual, in which case disease will probably make little headway among the native population, but would affect powerfully any alien immigrants. Or the social surroundings may be such that disease-producing causes and individual citizens are both prejudicially affected. Thirdly, the environment may be destructive to disease agencies and favourable to human development ; in any case the two separate studies of disease evolution and human development in relation to the same environment will have to be considered.

Looking over the main features of the past, tracing out the characteristics of the varying environment, it is noticeable that the strain must have

been thrown least prominently on man's nervous system. The savage in order to combat the rigorous conditions of his life had to possess *physical toughness*, and was forced to value eating and drinking. The physical nature demanded and selected by local and general environment produced by selection a physically organised being, who took his pleasures physically. Among the Greeks the fundamental pleasures of man were physical, and down to the present era the prevailing elements of character, though weakened by growing mental ideas, have been and still are the same. Among the cultured new aims are subordinating the older and more animal forms, and these must ere long in progressing communities become dominant. What effect will this mental displacement of the physical have on man—how will the change of habits affect his health?

The full-blooded powerful man of the old school, and the strong woman half man in physical hardihood, giving birth to and mothering seven, eight, and nine children without the sense even of fatigue, and preserving the feeling of robust well-being till late in life, are both different types from the nervously organised, often tall thin man, and his graceful, fragile, wistful companion, both keenly alert to mind life, but with less resistance to physical strains.

At the present day the contrast is obvious, and it is possible to fill in the picture of the past and future from the extreme backward and forward sections that confront us to-day. One group eating and drinking largely, often immoderately, rearing

large families, dirty, careless of refinement, the victims of inordinate stoutness, gouty and apoplectic in middle life, often troubled with dyspepsia, the result of excessive feeding, would now often be benefited by the old 'heroic' remedies of bleeding, blistering, and purging, which the old doctors, not, it has been suggested, without cause, had such faith in. The other group, erring often in paying too little attention to the demands and natural cravings of their bodies, are clean, respectable in their habits, but often extremely nervous, and when broken down, by too close application to life pursuits, become the neurotics and the neurasthenics, and the bright consumptives of private and hospital practice.

It is a misreading of history that makes fashion merely whimsical; that it often is without *social* import, and sometimes may be anti-social, is undeniable, but there is nearly always somewhere a substratum of truth in each custom that is, in some degree, permanent.

The old methods failed partly because they lacked completeness and were fitted only to one group of individuals, and partly also because they were applied with a non-discriminating extremeness which was irrational; but I doubt if they would ever have fallen into disfavour but for the fact that the humanitarian sentiments in doctors and patients are deepening, and physical excesses are now less extreme, even when not less common, owing to the growing numbers of citizens fashioned naturally for mental, rather than physical, development and utility.

The significance of this change has been much masked, and in consequence little recognised, owing to the absence of statistical class information in the State. The scum classes have always been, and in the nature of their existence will always be, so long as they exist at all, passion lusting,¹ and the labouring portion of modern life has now greater *opportunity* to live to excess than it formerly had. To the untrained observer, therefore, it might seem that little change either in form or in habits of the whole nation has been brought about; but the active, social, middle portion of national life, the real directing mass in social development, is more abstemious and more mind-loving, and the coarse heavy forms of men and women are growing rarer and rarer amongst them. This is the big important feature that requires emphasising.

Among all non-anti-social portions of the community there is an increasing tendency to utilise, and therefore throw more stress upon, the nervous system, and it is with the light of this idea constantly illuminating the mind that nervous diseases and the rise of nerve stimulants and narcotics as beverages must be studied.

It is quite possible, therefore, that with the improvement of medical science, diseases of primitive barbaric conditions may almost completely disappear, while the advancing environment, by throwing the strain in other directions, will tend to favour the spread of other disorders. With evolution of sur-

¹ Recent divorce trials have proved that this class of Society is now as wanton as that of earlier times.

roundings a *corresponding* evolution of individual and collective man and of diseases to which he is liable is probably manifesting itself, and against these new diseases medical men will have to labour and organise their efforts.

It is not unlikely, therefore, were adequate means of investigation at our disposal to realise it, that there has been an evolution of predominant diseases, as characteristic of the stage of civilisation, race, and country to which they belong, as the customs and habits existing and practised by man are for the various periods of his development, from savagery upward.

Viewed from this aspect the true historical picture of disease has yet to be drawn. Valuable as many works on this subject are as compilations and as commencements for more detailed study, they are yet of little practical value, because they do not keep in view the peculiar surroundings in which *each* disease has tended to attain its *maximum intensity and diffusion*, and the kind of organism that it has tended to select for its development and propagation.

The most suggestive works in modern times are those which have made detailed studies of particular diseases with the object of forming some estimate of the prevalence of these diseases in past as compared with present times. If it be true that heredity is largely the dominant factor, and that environment favours, weakens, or destroys, but cannot create, then it would seem that particular diseases will tend to die out after the particular human or

domesticated lower animal has been destroyed, so that the soil for its growth is no longer favourable. The future historian will probably therefore consider temperamental and environmental material as fully as he now considers morbid anatomical evidence.

(b) *Parasitic Development, through Human Forms*

It is too often forgotten that the danger of unclean habits and of unhygienic conditions generally is proportionate to and directly dependent upon the character of the progressing types of individuals in a progressing community. Had we digestive organs as resistant to putrefactive organisms as a dog's or a vulture's, it would be scarcely necessary to prevent stale and bad meats from being sold. The tubercle bacillus when in the atmosphere is obviously little, if at all, hurtful to those who appear to be able to be constantly in the surroundings of the consumptive and yet remain free from consumption. The same, or nearly the same, exposure to weather inclemencies does not develop the same disease in all that are so exposed. Some may be attacked with acute rheumatism, others with kidney disease, others again with chronic joint disorders, and many escape altogether. These are only a few examples of what is of universal application. Hygienic considerations should have, therefore, a temperamental basis, and bacteriological precautions should be regulated by sociological as well as laboratory investigations. To discover temperamental susceptibilities, and then to so organise collective life that checks, as various as

the various parasites that are hurtful to the different groups of men and women, may be placed in the paths of parasitic development, should be the aim of the modern hygienist. To construct a preventive science from the natural qualities required, and the natural risks involved in each profession and trade—from the highest to the lowest—and so to adapt surroundings that the general atmosphere in each shall be healthful for the naturally adapted individual and not unhealthy for the nation as a whole, while ready escape from an unsuitable to a suitable occupation is provided for all individuals, should be the ideal of the medical sociologist. Only by such standards can the spread of disease in a susceptible community be checked.

SECOND SECTION.—*Temperamental*

If it is necessary to study bacteriology in its social dissemination aspects as well as on its purely biological side, so it is not less necessary to observe how far parasitic relationships with man are modified by differences in organisation of differing types.

Looking broadly at phenomena, there is the incontestable fact that all individuals vary in some degree from all others in their individual susceptibility to disease. Whether it be infectious diseases such as smallpox or scarlet fever, in contagious disorders such as phthisis and other tubercular troubles, or in constitutional derangements such as acute and chronic kidney inflammation, bronchitis, &c., the varying proclivity to disease is one of the

great universal truths which are absolutely unquestionable. This varying intensity in the varying forms of resistance is illustrated most clearly by the finding of pathogenic organisms in apparently healthy individuals; lower animals show analogous instances confirmatory of the same truth. Guinea-pigs are very susceptible to tuberculosis, the horse is resistant to diphtheria, and domestic fowls to tetanus.

The insurance offices have pointed out that there is much reason for believing that each family has, in some degree, a natural tenure of life to which the majority of the members tend to conform. Individuals belonging to one group tend to die close to this breaking-up time; for one family it may be 50-55 years, for another 70-75, but for each aggregate the limit of life is fairly constantly observed.

Races of men vary as individuals do. In the United States the negro population has less chance of long and healthy living than the white.

In animals and in plants of all classes the same truth is evident; from the insect that dies in its single season to the slow-growing trees that last hundreds and possibly thousands of years, the law of an inherited fixity of life applies.

Again, epidemics are generally more severe in those communities that have been previously free from the disease; such instances as the rapid spread of measles in the Fiji Islands and of phthisis among American-Indian tribes prove this.

The predisposed individuals are apparently largely killed off in the first few outbreaks, and a process of selection continues until the weaker organisms are

eliminated, the disease gradually acquiring a milder character as it encounters fewer and fewer predisposed. Possibly, also, the disease-producing organism is itself weakened by long contact with increasingly resistant individuals, or the converse may happen in some instances.

What very slight differences of structure may be the determining causes of survival under certain circumstances has been proved by many instances recorded by Charles Darwin and others.

'Canales and Morpurgo have shown that by means of starvation we can render pigeons, which are naturally resistant against anthrax, extremely susceptible to this infection.

'Permice and Alessi proved that dogs, hens, pigeons, and frogs can be rendered susceptible to anthrax by depriving them of water.'¹

There are many other facts recorded with regard to the influence of food, fatigue, exposure to unusual degrees of heat, cold, moisture, &c., which make it clear that extremely slight constitutional differences may, under certain circumstances, be the means of determining the life or death of large numbers of individuals.

That the study of the individual, and his susceptibility to disease, is a very complex one, may be at once admitted. Nevertheless, the fact that all persons are predisposed to some ailments and resistant to others proves that, however difficult the science of temperaments may be to establish and apply, it is yet one that is capable of existing, and

¹ Allbutt's *System of Medicine*.

needs only prolonged patience and wide knowledge to establish.

In the past and at the present time, the medical man has been, and is, largely a medical 'Jack of all trades.' The hospital physician is perhaps at one time a 'specialist' in diseases of children, at another he is a 'great chest man,' and later a 'nerve expert,' or perhaps an 'oculist.' It has been said that it is bad to change horses while crossing the stream, and the proverb that 'a rolling stone gathers no moss' has likewise its lesson to teach. To excel in any subject at the present time, *if anything more than a mere monetary reputation is sought*, it is necessary to read deeply, and follow closely the many investigators working on similar lines; but, above all, individual thought and practical experience are required. To give up one's work is to lose ground that has been gained, that has been cultivated with germinating ideas, and to turn to wild tracts where the stubble of ignorance and inexperience has to be again uprooted before some return for the labour expended becomes evident. To lose such valuable time in a man's lifetime is not wise or worthy; we have each our purpose in existence, and should early discover it. For our light that guides us is dim, and the night comes fast, while the open wild country of the mind stretches out to infinity. Yet we dally and play at working till the shadows deepen.

We ought to have a general knowledge of medical science in all its aspects, and above and beyond this to be masters in one; we *cannot* do more than this.

May we honestly do so much. We must organise the medical profession so that each person is an expert somewhere, and all are co-ordinated to the general medical end. If the general practitioner ceases to interfere in obstetrical and surgical matters, and recognises that eye and ear are special pursuits not coming within his scope, he will be able to study the relation of the individual to the individual environment and face manfully the problems that this pursuit will involve. In this field he himself will then become a true specialist.

At the present time, any person who has gone through some form of medical training will give, if consulted, advice on the suitability of employment to individual capacity. A delicate, flat-chested man comes to the consulting-room; he has no evident disease, but it is considered best to warn him off those occupations that expose him much to bad weather. A clerk in a stuffy bank or office is perhaps advised to seek some open-air employment. The cases might be multiplied indefinitely, but we do not stop even at this stage, for in mental conditions that approach the border line of insanity we also try to induce the patients to adopt what are to us more satisfactory methods of living. There is no wrong committed in giving this advice, if we are competent do so; the *preservation* of mental and physical health is the physician's highest function, and the treatment of actual disease is, and ought always practically to be considered so, secondary to this. Why is not this advice dependent less on practical deductions and more on scientific studies?

Every medical man who has had experience of poor districts has three settled conclusions in his mind. First, that most so-called charities are not charities. The business man subscribes to these institutions because it pays him by the advertisement. The clergyman distributes money and clothes, or coals, because it is his business to do so, and not because his heart is in his work. And personal pride is the big moving motive of the wealthy. Here and there a real large-hearted man or woman gives help as a small addition to a greater gift of true worthy fellow-feeling, and, in giving, gives wisely. Broadly, however, money is given to those worthless individuals who, because they have no homes, but merely bare, filthy rooms to live in, look poor and wretched. Such people, animal by nature, drunken and lying by custom, find it easy and profitable to be smooth-tongued to the district visitor or the parson, and as a result the public-house is filled from church doles. True men and women are proud, you must meet them on the human level, they will not be mere suppliants. Reserved, with some real idealism in their lives, they will not tell their troubles to any stylishly dressed creature that asks for information about their misfortunes as one might order a vagabond from one's doorstep. A little money saved in past years, a home bought article by article, and every small purchase associated with some little happy incident of past life, each piece of furniture clings to them in associations, and the whole means life. The price of selling even the least of these trifles

is not what they gave when buying it, nor the allowance of the pawnshop, but their soul. The house without some signs of comfort is also the house where poverty is in a great measure deserved, and yet it is on these doors that 'benevolence' knocks. Firstly, therefore, Charity, like justice, seldom is seen in real life, and when she comes she is bound by ignorance and gagged by fashion.

Secondly, one learns slowly, and after much teaching, that the average working-man is little, very little, above the animal. The deserving are few and hard to reach.

Thirdly, great minds are found struggling painfully with adverse circumstances, more often than not swamped by the dreg-slime that surrounds them, and with all escape closed by the great barriers of scum-favouring which the wealthy parasitic classes build up. These are the conclusions that a knowledge of poverty forces on one.

As I look back on my own actual experience, two or three characters tower out of their prison atmosphere. As medical men working in poor districts, we cannot help seeing that the clergyman is in most respects a sham, a more or less worthless and pretentious exponent of something in itself noble and sublime. To think of the Pope of Rome, with his childish, and sometimes evil, ceremonies, and of his millions of crude followers, is to have aroused in one's mind feelings in which a profound pity is the dominant pervading influence of consciousness, but tinged and colouring this is an even profounder, though less intense, contempt. That the twentieth

century should still permit customs to prevail which are little more than irrational curiosities, and for which there is not one single shred of evidence to stand out prominently as an important feature of its development, is not to its credit intellectually. That it is still willing to allow 'disciples' of a great Teacher to parade before the world as *His* disciples, while they live a life of luxury which fosters their natural, physical, emotional, mental, and moral sloth, is not creditable to its higher impulses. What does the Church of Rome *actively* care for individual evils? Does it hold the man or woman disgraced who dishonours his manhood or womanhood, however rich or however poor he or she may happen to be? Does it refuse such person a full pardon until honest attempts at reparation of wrongdoing have been made, or does it bow slavishly and ignominiously to the titled wealthy, preferring scum notoriety to honest men's and women's loves? Every one knows how Rome has read the parable of the publican, and of the rich man going away sorrowfully, and the pulpits resound with praises of the duty of rendering 'unto Cæsar the things which are Cæsar's,' but 'the things which are God's' require no sermons. To think of our Protestant Church, with its archbishops and bishops and their seats in the House of Dives, with its wealth, vain display, and mockery, which are in no sense natural outgrowths of the simple, pure faith of Christ, is to feel despair. Yet, medically, these 'expounders' of religion have failed because their environments distort their vision.

Yet I have seen a Christian man whose natural

and acquired grace, whose bravery of heart and moral sublimity of soul, *humbled* one. But he died poor and occupied no pulpit.

I have known men with undoubted musical ability whose *love* for their subject would make them willing to sacrifice much, yet circumstances proved too strong, and they lost heart.

I have spent three years in working in a poor populous district, and I have found no woman whose wage, taking deductions for immediate working expenses into consideration, exceeded eighteen shillings. For sweets factories a common wage is nine, ten, or eleven shillings—and there are plenty of callings where even this money would be almost princely—pinafores made for 11*d.* a dozen, and the wretched women to find their own cotton; blouses 2*s.* 6*d.* and 3*s.* the dozen, and again cotton to be found. Hood's 'Song of the Shirt' is still a living cry—is still, I say; one wonders whether it has made the least difference beyond the passing sensation that it once caused. *The worst sin of our age is the conscious, deliberate, devitalising, and dewomanising of women by modern commercialism.* The cant heard among the wealthy about the need for maintaining the health of womanhood is stifling, when we consider exactly what it stands for. Fashionable restaurants, large catering companies, fashionable milliners, drapers, tailors—and one could go through the whole long list of occupations—are sweaters of labour, and are supported by scum monopoly and custom. Natural adaptation of work to natural powers is not thought of.

Why do the people stand it? one asks when first the great ugly facts of existence are brought home to the mind. And the answer comes slowly as the facts penetrate into and saturate one's being, because, and only because, the best are crushed out of existence, die from consumption, or, goaded to desperation, become wanton and evil, and sink; because the middle class, which has the power and has the mind to say, 'We will no longer have such things with us,' will not say it. 'The things which are Cæsar's' are Cæsar's, but those which are God's are Cæsar's also.

Have medical men no duties in this respect? We look after the criminal and try to find him work on leaving gaol; we have sanatoria and hospitals for consumptives; there are homes for inebriates; there are asylums; and in all of these the medical man's influence is a growing one. We have efforts put forward to check unsanitary housing in the home and the workshop, yet we disregard—nay, more, ruthlessly override—things which are mentally unsanitary. There is no science of preventive mental disease as there is of physical; neither is there an individual preventive science as there is a collective one. *Yet there might be.*

A central bureau in each large district might be so organised that sound advice might be given and some practical help to place the man or woman of mind tendencies in a mind atmosphere, to put the individual with individual powers into a position where those powers could be used; and if such a bureau would disseminate in its own areas the need

to the nation of individual aptitude, its influence for good might be incalculable. The preservation of mind-health and body-health is as much a medical question as the prevention and cure of mind and body diseases. The recognition of the individual as an individual *and as a human being* is the second great medical lesson which the doctrine of temperaments teaches, and it is in this complementary to the first, which demands a careful detailed study of environment.

Thirdly and lastly, it is necessary to consider how far the theory of definite temperaments modifies practical treatment.

THIRD SECTION.—*Treatment*

If my position so far is, even to a very limited extent, accurate, then certain considerations directly bearing on medical science must receive increasing attention.

There seems to be a large mass of evidence now available to point clearly and unmistakably to the conclusion that environment can foster, or possibly destroy, qualities in any organism, but can never create, and that in any race by selection of the favourably adapted it can actually develop, through the laws of heredity, tiny and insignificant features till they become large and all-important.

A stock, therefore, that does not afford material for suitable selection in its environment can never survive, because neither climate nor inter-special influences can create something that does not exist. Each human race, therefore, starts each fresh stage

in evolution with certain more or less ill-defined but nevertheless *irrevocable* lines of development by which it may evolve or retrogress. No race has indefinite time available to effect needed changes, as inter-racial competition is now becoming so keen as to render any temporary retreat dangerous if not self-annihilative.

It is necessary, therefore, to *preserve at all costs* and to increase—through preserving and favouring every small element of individual strength and *progressive* capacity—the national health assets and the *collective* responsiveness to higher life conditions. Now, this cannot be done unless medical men are prepared to study the individual from a social and evolutionary point of view. To help each citizen, male and female, adult and child, to find that place in society for which he or she is *most* fitted as compared with others less fitted: this is the initial step in individual hygiene, just as good drainage, cleanliness, dry air, and sufficient house accommodation are necessary preliminaries for State hygiene. The individual man or woman functions mentally and bodily most satisfactorily under those higher conditions which stimulate, not unduly but constantly, his or her peculiar powers. To actively help to put our patients into their right *industrial* and *home* surroundings; to do our best to see that square pegs do not occupy round holes; to prevent natural scientists, poets, painters, and others with mental power being forced into physical posts, and to urge, and where necessary force, the scum natural navy to labour as his power fits him; to promote a strong

national opinion in favour of natural fitness as the only justification for State and industrial positions, is our first great law of medical guidance. We are not medical scientists, neither are we in any sense patriots, if we disregard this.

Another outlook is, however, scarcely less important. Two main aspects of adaptation to higher social life are manifesting themselves.

(1) The need for an ever-increasing alertness of the senses, and as part of this an ever-increasingly rapid response in the individual to those senses. The old country Hodge type, with his slow response to the simplest question, to the simplest incident, and his cumbrous laboured movements, will not, cannot succeed against quicker competition in an age of wireless telegraphy, telephones, and rapid transit. Quick time-saving contrivances are everywhere, and the time-saving mind and body are in even greater demand.

Physiologically considered, I can see no reason why the quick type should be less resistant or less tough of fibre than the slow type. All the way up the animal scale there are comparatively alert and comparatively slothful animals, and strength of fibre does not seem to be *necessarily* associated with either. At the present time the quick responsive man or woman, who is merely quick responding, is often conspicuously healthy. In the very fullest sense such a person *enjoys*, almost luxuriates in, the whirl of modern life, and chooses voluntarily the most active corner—happy where noises, shrill or deep, and movements break in momentarily upon

the ever-ready senses. This need of the future, therefore, does not appear to be incompatible with robustness of constitution in Man.

(2) But, though speed is one necessary element of social development, quality with its differentiating tendencies is another that is deeper and more fundamental. Among savages, especially those that have no settled homes, all men are employed more or less equally. As higher forms of collective existence come into being, men and women begin to be employed more and more unequally. Each industry becomes marked off from others, and in time becomes itself split into several where once one was sufficient. The generalised individual ceases to be of much value, and the one with a speciality understood and mastered displaces him. Now, in part this specialisation is a mere specialisation and nothing more, the result of the increased skill that results from long-continued work in one direction; but as by this means existence becomes more complex owing to the development of trade centres and the increased need for exchange of different commodities, and as the devotion of one person to one end makes it increasingly easy to devise improvements in the processes of manufacture and treatment of material, it follows that an actual qualitative difference is required in the worker to keep pace with growing life complexity and the growth of larger knowledge. *Intellectual growth and divergence are, therefore, like the development of alertness, factors of vast social importance.*

Again, the sensationalism of the savage, which

affords sufficient stimulus for activity amidst the constant exciting physical incidents of wild life, is valueless or nearly so where the need for steady perseverance and industry over long periods is required ; hence mental ideals, symbolised in art and pulsating in modern music and poetry, have arisen.

Mind feelings like intellectual power are required for present and future times.

How does this intellectual and emotionally specialised being stand in relation to his or her more primitive ancestor ?

Now, from studies of the comparative nervous systems of animals, and from similar studies of the development of nerve-cells in the brains of children as compared with adults, and of feeble-minded and animal as compared with higher mental types, it is now generally agreed that one aspect of advance is a growth in complexity, and it is also probable that greater fineness of nerve texture accompanies these quantitative changes.

The hands of the natural mental man as a rule follow the same law, they are both more lightly fashioned, more sensitive, and more adapted to fine movements, and this is but the counterpart of the fact already noticed that the large-featured, large-faced, and small-headed type is the primitive form.

An increased delicacy of organisation, an increasingly delicate power of perception, and an increasingly complex bodily system can by no conceivable means be prevented from becoming increasingly fragile. All instruments fashioned for estimating slight differences have to be more *finely constructed* than those

that measure large. More protected surroundings are therefore probably necessary for the higher forms, and as a matter of *actual fact* this effort to shelter man is one of the most marked characteristics of advancing civilisation. Clothes, houses, locomotion become increasingly definitely designed to this end of protecting the human being against climatic changes and extremes. It is therefore necessary to consider how these more finely organised but *fundamentally* necessary citizens of the State can be so environed as to live healthily.

Now, it is from this outlook that the question of higher wages for a *higher form of being* has to be considered. Some form of mental expansion is essential to well-being in these mind-loving men and women, a brick-and-mortar building is not home unless thus much is achieved. The physical navvy organisation has no need because he has no higher tastes for more than a physical sufficiency for himself and his family, *but thus much he ought to have, and opportunity for his children to leave their lower life if their capacity fits them.* But to the human being with marked or even average mental endowments there is the mind sufficiency as well to allow for, and this is beyond and above the physical.

To have, therefore, an efficiently developing healthy state it is necessary to have a rising wage, a wage moreover that rises everywhere, but is proportionate to higher mental desires in the different classes of society. But it must be borne in mind that this increase of money power should be accompanied by an increased moral stringency in public

opinion against abuses, and also by increased legal restrictions against brute excesses.

Again, in street noises, dirty habits, and the use of foul language in public thoroughfares and on public conveyances there are elements that are absolutely inimical to advanced life. The scum fox- or deer-hunting 'sportsman,' and the dreg bean-feaster coming back drunk late in the evening and disturbing by their rowdiness those men and women who are in bed, are offensive sights and harmful to progressing communities. These elements have their mental as well as moral outlook, for to fashion society for the brute is to unfashion it for the man. The lower must be environmentally subordinated to the higher, not the higher to the lower.

The superior types cannot live healthily in the scum, parasite-breeding palace, or in the slum, animal-propagating dens. The cultured man or woman must obtain cultured surroundings, and the medical man must support what are nationally and individually just but also scientific claims.

To obtain an adequate environment for more advanced forms is therefore an essential of rational treatment; but to remember that delicacy of constitution is not incompatible with health and is the necessary concomitant of progress, and to recognise the need for treating the mental types on a different basis to the physical, is not less requisite; it is to this latter aspect of the question that one naturally turns.

I have already pointed out the curious fact that in consumptive diseases, in brain disorders and related criminal studies among children at school, and

in many other instances, fine and coarse types of individuals have been noted.

There are certain diseases, like hay fever and spasmodic asthma, which, though not exclusively belonging to, yet occur most frequently in, cultured people.

There are other diseases which result from food and drink excesses and from sensuality that are most frequently found among primitive animal coarsely formed beings.

Now, it is curious that while the fine type appear to be free from the coarse type of diseases, it is to abstention from excesses and not to resistance that this freedom is due.

On the other hand, the coarser forms are not *liable* to the nervous diseases which plague the finer, and when consumptive it is principally due to hard living.

Once again, the conclusion, therefore, is reached that the more civilised mind-loving citizens are more delicate and require greater State protective precautions against disease than the lower anti-social individuals.

It follows that in individual treatment the treatment itself should vary as the individual. The open-air treatment of consumption, an undoubtedly sound method, is likely to fall into disrepute if all individuals, however unlike, are subjected to extremely rigorous conditions.

The Northern, tall, physical, deep-chested patient can stand and is benefited by regular habits of living to which an element of hardihood such as

exposure to inclemencies of the weather is added, and the warmer and more equable the climate the more this savage manner of living may be without danger resorted to. The barbaric life has its advantages for the barbaric type.

But the Southern short type of man or woman is not well adapted to cold, and to expose such to all sorts of weathers in northern countries is to court disaster.

The advanced mentally organised persons can be fed well without giving them coarse food that is hard to digest, can have pure fresh air and yet be kept warm with clothing and be sheltered from the extremes of the weather. In a hundred different ways this distinction between the coarser, robuster and lower, as contrasted with the higher, more delicate, but not less healthy group of people, is manifest in every society, and successful treatment must in all diseases be adapted to this distinction.

The degenerate forms of men and women, however, can unfortunately only be rendered less inefficient. Born into the world with definitely defective organisations, they can only be helped to become available for the simplest forms of labour; but in this group individuality and aptitude are observable, and here once more the medical scientist must utilise what exists.

Finally, it is necessary to look upon medical problems as a complex series of reactions between environment, individual, and treatment, of which the main factors are: (1) The sex of the patient; and

this is not the mere knowledge of whether any person is commonly characterised as man or woman, but in what degree a man is masculine or a woman feminine; the more feminine the man, the more masculine the woman, the smaller the influence of sexual predispositions. (2) The stage of development which each one has reached at the time of seeking advice; and this again cannot be gauged by the months or years lived, but by the evidence which growth, maturity, or senile changes yield. (3) The long or short type of conformation and the primitive or advanced characteristics present in each must be noted. (4) The individual and family peculiarities of the patient are of importance. (5) The incompatibility or compatibility of such patient's environment in his or her industrial and private capacity must be discovered. (6) The nature of the disease has next to be considered. (7) The tissues primarily affected and the sequence of symptoms, as other secondary parts of the body become disordered, distinguishing as far as possible what effects resulted from the disease itself, and what from deranged function of bodily organs as a result of the malady. (8) Finally, a reconsideration of the whole environment of the individual in relation to suggested improvements for healthier living and the choice of drug and dietetic treatment best adapted to the special case.

Or, briefly, every medical practitioner should be able to form some estimate of the part played by four great groups of factors that react on one another. Firstly, the evolution of the individual;

secondly, the evolution of his or her local surroundings ; thirdly, the evolution of the disease in these surroundings and in the individual ; fourthly, and lastly, how changes in the patient's manner of living and in his or her environment will react on the health, immediately and temporarily, and remotely and permanently.

Summarising, therefore, the present chapter, we may note that wherever the medical man attempts to review any aspect of medical science he assuredly finds that his problem is a much larger one than it is commonly supposed to be. Physiology is something more than a study of particular functions of particular bodily organs ; it must be, if it is to become of real practical value, the study of the whole individual in relation to his or her various tissues and structures, and of each tissue in relation to the *whole* body. Physiology is thus inseparably bound up with temperament.

Again, hygiene is not the simple enumeration and estimation of a few general rules on general health for the whole population, but it is rather a study of the effect of various civilisations, of various occupations, and of various habits of home life, on various kinds of individuals.

Finally, scientific treatment itself is infinitely complex, and it can only be satisfactorily carried out by the most careful estimation of the multitude of different facts placed before the intelligent investigator.

There can be no doubt that the power of the medical man in the State will increase, and if so the

need for both increased intelligence and probity must increase also with his added responsibility.

The *growing* importance of health as a national asset because of growing fragility of type, and therefore the wider control of foods to check adulteration and unhealthy methods of preparing them, the prevention of overcrowding, &c.; the *growing* need of regulating every industry, so that dangerous trades—and all are in some degree within this category—may be rendered less so; the growing tendency to seek advice on physical and mental fitness in individuals about to enter different employments, and of parents in regard to their children's school life, are all tending to force the doctor into alliance with the social reformer, and to make him more and more a scientific sociologist.

We must live up to the standard which the future requires of us, become truly and wisely and also *humanely* men of science, and learn to approach our daily work with a deep sense of its responsibility and difficulty, and a desire rather to establish right customs than slavishly follow wrong ones, prepared to work honestly, carefully, and rationally for greater ends.

CHAPTER VII

CONCLUSION

' . . . I could shed tears over that spectacle of rare vitality condemned to sordid life. The pity of it! And—if our conscience mean anything at all—the bitter wrong.'

GEORGE GISSING, *Private Papers of Henry Rycroft*.

' I do not hesitate to express the opinion that, if there is no hope of a large improvement of the condition of the greater part of the human family; if it is true that the increase of knowledge, the winning of a greater dominion over nature which is its consequence, and the wealth which follows that dominion, are to make no difference in the extent and the intensity of want, with its concomitant physical and moral degradation, among the masses of the people, I should hail the advent of some kindly comet, which would sweep the whole affair away, as a desirable consummation.'

T. H. HUXLEY, *Methods and Results*.

I HAVE reached the end of the first stage of an inquiry into some of the human problems of evolution. I began by pointing out that the impression which one obtains from the study of nature, if one pursues that study humanely and with a deep love of truth, is that, in spite of the blackness and ugliness of human effort, in spite of the apparent ruthlessness of nature's way in furthering progress, there is evidence of a strong underlying beneficent purpose, moulding it all to some not ignoble end.

To-day we have reached a stage in the evolution of feeling which is new and worthy of man. The

Greeks and the Romans, as well as the Asiatic peoples, arrived long ago at the power to intellectually criticise their own actions, and it is this aspect of the philosophy of Socrates, of Seneca, of Marcus Aurelius, and of Plutarch perhaps most of all, that is grand and noble. But at the present time a more far-reaching influence, beginning far back in the Teutonic and Celtic traditions but only now acquiring real power, is manifesting itself. In every field of work at the present day are to be found men and women who feel wrong done to other individuals almost as if it were done to them. The rise of true culture in its capacity to refine and develop mind feelings has evolved a class of high-souled men and women, the master spirits of their time, who are almost unanimously on the side of the oppressed. In art it may be a Ruskin, a Watts, or a Morris, in science it may be a Wallace or a Huxley, in literature a Gissing, in sociology a Spencer or a Crozier, in popular thought a Wells, in poetry a Watson, in all, however different their points of view, the one prevailing element is reform of the evils around us. And behind these there is growing up a public opinion that must one day sway the land.

It is in this rise of a mass of thinking and *feeling* citizens who are mostly above the immediate fear of poverty, and yet are workers in the highest and best sense, from the respectable mechanic to the trained expert and seer in art, music, and science, that the hope, it is scarcely too much to say the certainty, of the higher future lies. When this natural social body becomes conscious of itself, when the feeling of

sympathy and trust which is growing in this brotherhood and sisterhood of mind-fellowship becomes intensified and organised, the power of scum monopoly will be crushed methodically, peacefully if possible, but certainly unerringly and absolutely. When enthusiasm of soul, strength of will, and mind power confront brute desire, lust of ease, and animalism, the issue, whatever the temporary advantages of the lower may be, is inevitable. Only clear vision to see facts as they are is wanted to band together the higher so that they may subdue permanently the lower.

One fact stands out clearly in reviewing the conclusions now reached. The great dangers in our life to-day are scum and dreg immorality and widespread incompetency. To displace scum control the *combined* effort of the honest capable citizens of the empire is required.

In mental and physical cleanliness of life, in real culture, in practical knowledge, the middle section of the community is the strong section, and because of this it must determine the fashions and customs of the national organism.

In this struggle, which is destined to be waged, the medical practitioner must, on account of his growing social importance, take a leading part, but he must be less of a shirker of the real moral duties that lie before him. To feel deeply, to think clearly, to act resolutely and calmly, to face vices of the mind that stifle healthy growth, to oppose morbidity in thought and in feeling, and to stamp the brand of primitiveness on every tendency that is low, and to

dare to control these in the wealthy, even more than in the poverty-stricken, is the ideal towards which medical aims must tend. To be lovers of humanity first, lovers of science second, and lastly the masters of debasing money influences, so that these do not corrupt us, should be the dominant feelings of the modern medical man, and such a man is fitted to lead in modern reformations and take the position he is entitled to.

One thing is certain, mind-lovers can no longer permit the idly wealthy with their corrupt habits and false pretensions to interfere with the higher development of the present age. One of two things will happen, and one of two only: either there will be a bloodless social evolution or a very bloody revolution rigidly controlled by scientific methods and ennobled by higher feelings. All lovers of ordered life—and in this term is included every man and woman who has desires for higher living—will endeavour strenuously to make the bloodless legislative means the sole factor in reform. Force itself when it is destructive always puts back in some degree evolution, but the fact remains that men and women who are naturally fitted for higher living will not be kept down to a physical level long, will not be controlled by their inferiors whom the daily papers prove to be dissolute and vicious in their habits.

Neither will the workers be told that there are other countries for them to go to. Their reply will be, 'This country is our country, it was here where we were born, it is here where we will live, it is here where we will die.' Let the pleasure-seekers beware

if they ever force the workers to make good their claims.

If I have reasoned rightly, the great teaching of temperaments is the *irrevocableness* of character. As we are born, so by the force of heredity shall we grow up; dwarf us so that higher freedom of growth is closed to us, and the lower and more dangerous elements in our characters are fostered.

The physical man in power over mentally organised individuals becomes by the very nature of his inferiority a despot, while the higher subordinated persons become saturated with the explosive force of an inner rankling sense of injustice. Give the physical passion-led man wealth without work, and he becomes a gormand, a drunkard, and a libertine. Give the mind-led soul no outlet, and it becomes anarchistic or occasionally sullenly acquiescent in a sullen obedience to that which it knows to be naturally inferior.

You cannot override permanently the healthy desires of the healthy individual. If marriage is unattainable through the absence of its ennobling influences, vice will be unchained. If natural leaders of life starve, the collective monsters of revolution and hypocrisy are fed. There is no escape from the doctrine of capacity as the basis of social life. The most honest and the most capable man, with the greatest aptitude for the work required, is the one who, regardless of privilege, should obtain the post that is open.

The rise of the mind-type, look at it how we will, is inevitable. It is a national necessity, a biological

fact, an individual realisation. New ideals must arise—are arising at the present time. You cannot chain a world-force by an Act of Parliament. Mind enters the world as a natural king whose muscles are strong enough to tear the strongest chains asunder; bind him, and his power is still there; no weapons can destroy him; but if he cannot see he will grope through the world and pull down churches and schools as well as palaces.

To rid ourselves of hypocrisy, to see that justice shall be forwarded, to give opportunity of higher development to all, will evolve a land where human laws will reign and where womanly and manly life can enjoy the freedom for appreciation of the beautiful, the truthful, and the emotional. Where such an atmosphere exists, low living, cruelty, falsehood, and ignorance will find little room for existence.

But there must be no compromise. No relaxing of effort among the cultured ought to be evident. The surroundings in the state, whether in wide general influences or in those that arise from industrial employments or the home environment, must everywhere, among *rich* and poor alike, be never allowed to be brutal. In each generation, among the best human types, the conception of what is brutal is raised to a higher grade, and each generation should be socially characterised by this debrutalisation of social existence. If public opinion can once be taught to realise that wealth and privilege are of no value in estimating merit; that honesty, talent, culture, and health are the only requirements needed; then the scum influences will

weaken year by year, as better men and women displace worse. But this end can only be realised if every effort is made to raise public opinion to a higher level. If this effort is not made, scum power will increase, scum presumptions will grow every day, month, and year more insupportable, and the vulgar and dishonest speculator with other people's money, and the parasitic descendants of old feudal leaders, will endeavour more and more to sway life. The cultured will find themselves progressively shut off from all means of working for higher ends, and conflict and revolution will become inevitable.

Every step forward in the history of a nation is marked by displacement of one set of customs by others, frequently on account of the increasing complexity of existence by many sets. Any custom once temporarily established ceases for a time to be criticised, and persists till displaced by a new habit or habits. The history of civilisation is the story of these customs; and in proportion as their numbers increase, the possibility of error multiplies. In a higher state every single trade at last becomes, with the growth of its mass of traditions, almost as complicated as the whole life of a primitive people. To a certain extent it is true that the power of appreciating social usages grows with their growth; but shut off, as most of us are by daily routine, from leisure, the opportunity to enter into the whole spirit of national life is often wanting, and a tendency gradually grows up to limit our mental horizon to the thoughts that spring directly

from our work. The inevitable result is a failure to distinguish what is socially great from what is socially small, perhaps insignificant, and the still greater evil of losing sight of the principles of social morality. We particularise our speculations till the universal becomes of less and less significance to us, and finally we lose the sense of proportion and meaning and of social unity, without which all attempt to reason clearly is predoomed to failure.

The attempt made in this work has been to put aside, as far as possible, class and occupational bias, and to describe without animosity, but also without partiality, those tendencies which appear to me to be influencing, either favourably or unfavourably, the course of social evolution.

I have tried to describe accurately, yet popularly, some of the impressions of the *larger* movements of social evolution which I, one unit in the British Empire, have received. I shall later consider again, from the same outlook, how by custom and by the spread of new ideas and feelings the socialising tendencies of to-day have arisen, and are likely to develop in future times.

It must be understood also that the ideals that the evolutionary conception of life leads one to form and believe in, are in the strictest sense idyllic. The teaching of evolution is that reform is slow; consequently every aim, however accurate and truthful it may happen to be, tells only the direction in which it should move, but gives no hope of *immediate* realisation. No support is afforded to Utopian schemes, for these belong to the past age that be-

lieved in changes that were brought about by vast upheavals and catastrophes.

Not only is there a practical material atmosphere which surrounds each individual, and an atmosphere of social usages, both of which are characterised by too much or too little changeability, but there is also a more or less shifting, evolving, or retrogressing environment of thought and feeling, and this cannot be disregarded by the sociologist.

Art, poetry, drama, literature, music must embody the ideals of their time, because they are all founded primarily on an emotional basis, and the emotional life of the times must be entered into and *felt* in order to be portrayed. *Art* is in a degree rigid, and takes its standard from the more fixed elements of existence—the buildings, the furniture of houses, the aspect of towns and the countryside. It is, therefore, closely allied, in its progressive tendencies, with the progress of nationality and race, and its very existence depends upon the national spirit. Beauty is an aim distinct from soul, distinct from patriotism, and distinct from humanity ; but to love the beautiful requires something more than intellect, something which feels intensely and sees impressions and aspects rather than thoughts. Without the feelings that lie at the base of the love of humanity art would be incomprehensible to other human beings, and perhaps even to the artist himself ; and without the feeling of harmony which love of country yields there would be no art, for all aspects of nature would be antagonistic. Love of beauty, of humanity, of one land that appeals personally to the individual, is an essential

element in the true artist's nature. To value the past more than the present, to be able to find no little corner of the world which satisfies the eye, is to stand as a sterile force in a living age. No art has lived that has been dependent upon mere cleverness in handling brushes and paints. Nor has success ever been obtained by mere imitation. The great painter, sculptor, or architect *feels* the impulse that comes from the age in which he was born and reared; and once past, no imitation, however sincere, will arouse the same purpose and soul in another time with other customs, other flashes of beauty, and other aims. To produce good landscape work the painter must know, love, and have lived among every nook and cranny that he paints. To produce a good portrait the individual must be understood, watched in many changing moods—in fact, individualised. The artist cannot escape his environment; he may change from a less sympathetic to a more sympathetic country, but somewhere he must settle, *somewhere he must have a home*. Divorce art from the moving spirit of its own age, and it becomes weak, feeble, and unattractive. In poetry it is the same. There are poets who draw their similes from the world of sight, true artist-poets; there are others that find most inspiration in sound, and these are musical. But the poet, almost as much as the artist, must feel the age in which he lives, and in drama and literature the same truth holds.

Music only is like science in a large sense international; it has a common knowledge for all countries, and it appeals to all by the same paths.

But even in science nationality has some influence, every country has a distinctive scientific aspect that it has shown some *aptitude* for, and it has a musical one, or could have, if it would. A different type of mind requires a different kind of appeal to please it, and in this sense every little fragmentary and transitory effort is in some sense national. Man cannot escape from environment any more than he can from the influence of heredity. In some one or many senses every department of human labour should be tinged with the time in which it exists or has existed. Narrow individual and collective spirits are therefore the antitheses of greatness.

Neither can mere intellect accomplish anything beyond bare memory and rational feats. Every life pursuit has an ideal attached to it which necessitates some altruistic feeling. The *love* of truth in science, of sight beauty in art and sound beauty in music, of thought beauty in literature, carries the scientist, artist, musician, and literary student above the petty atmosphere of popular success and the still more petty money-making ambition. This love of a subject for a higher ideal which is embodied in it tells how far capacity will take the individual man or woman. With great love and little capacity the distance travelled may be large, with little love and giant capacity a stationary, motionless existence is inevitable. To grasp the greatness of nature love is necessary, not one single step towards progressive ends can be made without it, you cannot see the beauty of the earth if it does not enthral you, you cannot realise truth if you do not feel its greatness.

The savage, vaguely conscious of the white man's superiority, knowing in a strange hesitating way that the white woman stands for something which he but vaguely understands, yet feels at home and is satisfied with his dark coarsely made mate. The navy or navy type instinctively selects a navy ideal of woman, while to a Watts or a Rossetti the more delicate and beautiful forms of a 'Hope' or a 'Beata Beatrix' are visualised.

To a coarse mind coarse lusts are natural, to a refined soul intense love of many spiritual ideals is the only worthy evidence of greatness.

In this world, seemingly so commonplace to vulgar eyes, stands a vast lofty temple. There are no regions of the earth which have not signposts directing the traveller who wills towards its sacred precincts. The blind money-seeker, the self-complacent, the idly contented, and the sensualist cross and recross the little verdant pathways that lead up to its doors, but they see them not. Here and there, sometimes from the poorest districts where wretchedness and debauch have their natural homes, some one unknown, to whom the dirt and foulness are oppressive, sees what the others miss, and ever after his ways are strange to man. Here and there from the slippery gold slime a man frees himself, and he too follows a new course, aims at new goals, and passes out of the existence of his comrades. Here and there some woman catches a glimpse of her soul, and then she too must needs journey far. Along these little winding ways up steep country side and rocky passes few travel, and long solitary

lanes with high hedges that shut off the outside turmoil have to be traversed. But the end is worth the striving. Sometimes two companions bound close by kindred aims journey together, and then the road ceases to be lonesome.

The great souls of all ages have found sooner or later one of these paths, and all that have striven and hoped have reached the temple at last.

It is a strange shadowy building, high beyond reach of sight and of a beauty beyond words; forgotten simple melodies seem to be growing into mighty strains that float and echo softly along the massive chambers. And alone and afar off from the dim shadowy vaulting a greater harmony, to which all the lesser melodies softly resolve, floats like a cloud of solemn sound.

At the threshold men and women, accounted proud, who have bowed to no ceremony or worthless custom, walk softly and with bated breath; here the honest of all ages, *those that love deeply*, leave what is earthly and for a few short moments wander with bowed heads at the altar of their life aims. The scholar kneels at the shrine of truth, the artist at the throne of beauty, and the musician at the confessional of the soul. Here the patriots and reformers of the past attend humbly before the inmost sanctity of human destiny. The disciples of this new faith know each other, and so upspringing in the newer times is a new sisterhood and a new brotherhood, those that worship in the unknown country with its lofty heights. To these worshippers the future belongs.



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APPENDIX

Physiognomy of the Hand

It may be thought, and with some justice, that, in view of the important part which the hand has exercised in human evolution, too small a space has been allotted for its consideration. In my own defence I can only plead that there is very little satisfactory material available.

Sir Charles Bell was the author of a work on 'The Hand,' scarcely less famous than his 'Anatomy and Philosophy of Expression,' but beyond this study, which is now necessarily, as a result of the evolutionary movement, defective, there is very little scientific literature on the subject. The obviously unverified statements of 'Palmists' are numerous, conflicting, and of little value.

The few inferences may be summarised briefly from reliable sources as follows :

Primitive and Advanced Forms

(1) The higher apes (primates) are the only animals whose forefeet can be said to bear any definite resemblance to man's hands. In these, the 'hand' is characterised by less delicacy of movement, the fingers are more or less webbed, the thumb is short, and its movement is limited.

A large movable thumb, and flexible, long, unwebbed fingers, are therefore human characteristics.

(2) In different races of men, however, it is much less easy to generalise. 'Europeans, speaking generally, have smaller hands than the black races, while the yellow races

have the longest hands.'¹ Unfortunately there is no evidence existing to lead to any definite conclusion in relation to either of these points. It is not even known whether large or small hands are, or are not, of evolutionary significance, nor do we know what characteristics, of a mental nature, accompany long hands.

(3) *Industrially* it is stated that thinking and also practical types have square-shaped, broad hands, while emotional (artistical and poetical) individuals have the longer and more pointed forms. There certainly would appear to be some physiognomical evidence for this belief, but it is at present of too undecided a nature to dogmatise upon. Among persons whose capacity for higher mental life is marked, it will be seen that the delicately fashioned hand predominates. This is as true of the more refined members of the mechanical and physical labouring classes as of the cultured and professional, and the natural navy formation of hand, with its *thick* muscular fingers and thick stout palm, is often seen among those who belong to the scum sporting element of society. In my experience, I have generally noticed that the heavy-built physical type of man or woman has generally a less lined palm, with fingers that are often knotted in appearance owing to large joints and bony prominences for strong muscular attachments. Various occupations often modify the shape and appearance of the hand. Manual labourers have hard thick skins, and those whose work is mainly mental have a soft, pliable covering. Corns in various positions, staining, &c., afford evidence of the kind of work the individual is used to, but give no clue in relation to *natural* endowment.

(4) In reference to sexual differences the hand is relatively, as well as absolutely, shorter and smaller, and the index finger longer, and the thumb not so long in woman as compared with man. The palm is also more equal in

¹ Havelock Ellis, *Man and Woman*.

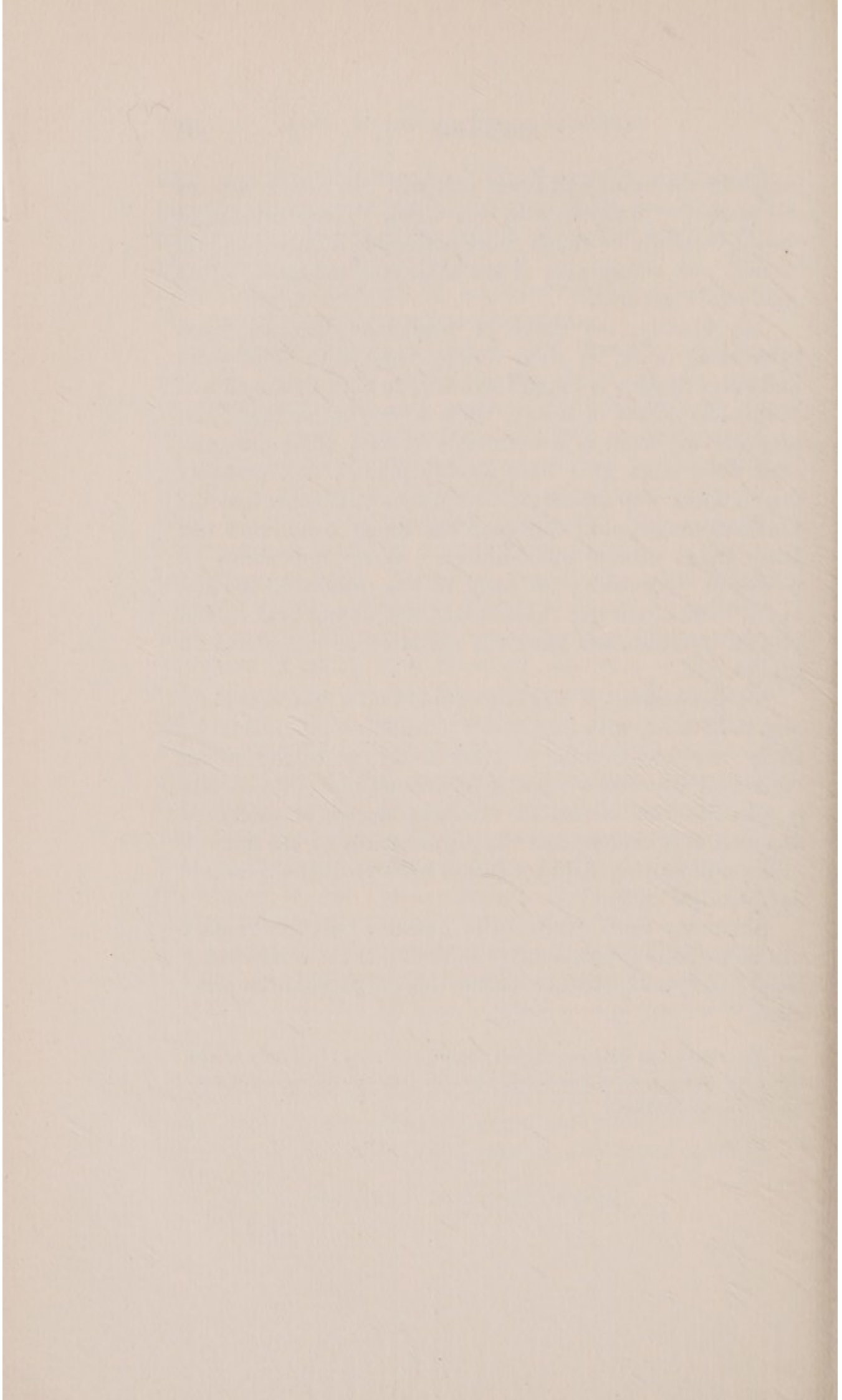
width in the upper and lower portions. In man it is often broad at its junction with the wrist. These differences would certainly be much more noticeable if only *womanly* women and *manly* men of the *same* race and class in that race were compared.

(5) Finally, the study of medicine¹ discloses some interesting facts. A short dumpy hand, with short palm and short fingers, is found frequently in both Cretinoid and Mongoloid forms of idiocy, while a very large, thick, and large-jointed hand is a noticeable feature of Acromegaly. And these facts, as I have already pointed out, probably are in some way associated with others that show that the northern long-limbed European has larger hands and feet than the southern short-limbed. Such indications of disease as Laycock's 'fat hand of the drunkard,' the distorted hand of chronic rheumatism, &c., do not bear on the present question, and need not therefore be considered in this place.

To summarise, it seems probable that a slim delicately organised hand, with long, freely movable fingers, and large, freely movable thumb, is more likely to belong to an individual who has a capacity for mental life. But as this is all that can at present with any degree of safety be assumed, it is evident that the physiognomy of the hand is rather a promising field for future research than a present-day practical study.

Some day there can be little question that this subject will be usefully supplementary to the other more important facial and craniometrical considerations of general temperament.

¹ Dr. Blake has written a small monograph, *On the Study of the Hand for Indications of Local and General Disease* which is interesting in this connection.



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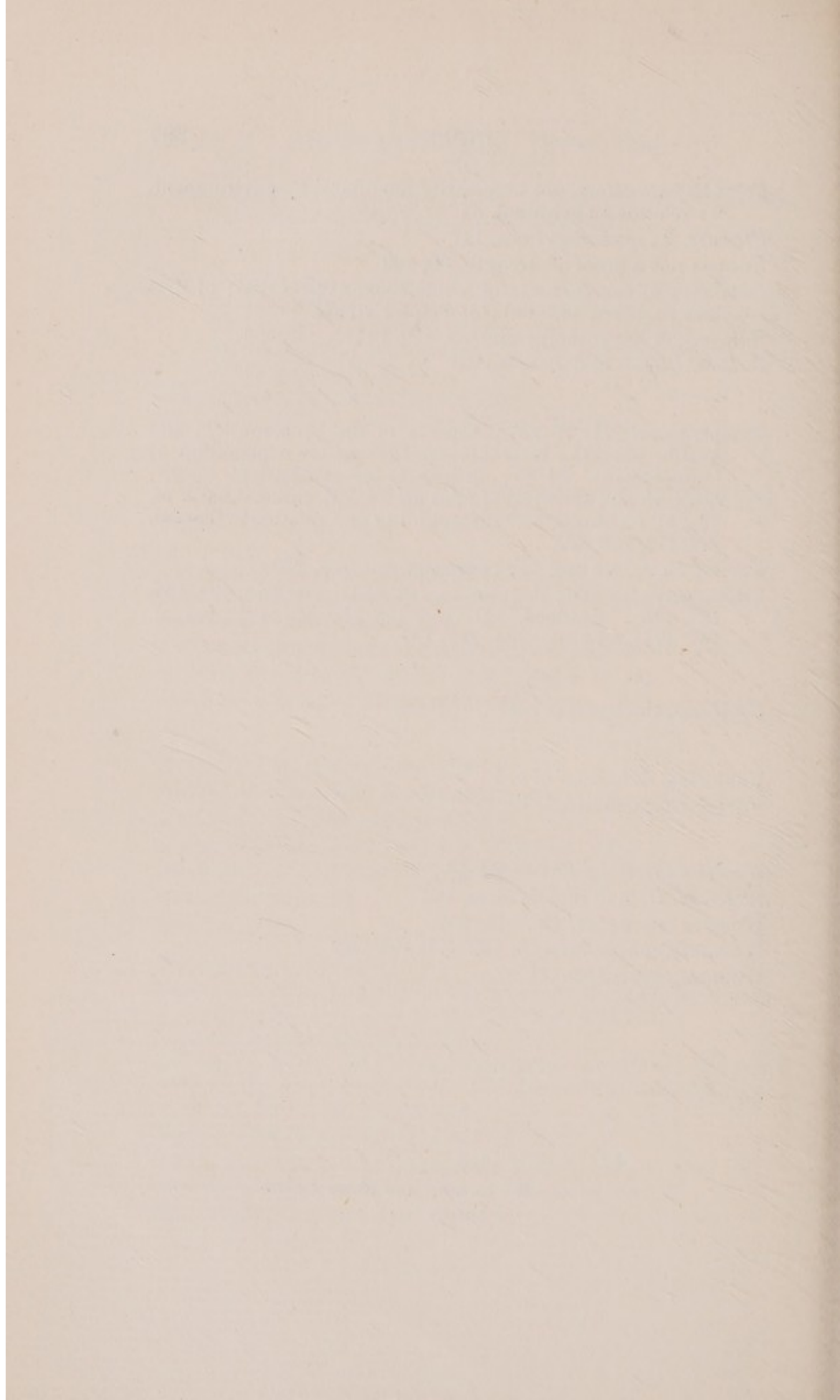
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