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Contributors

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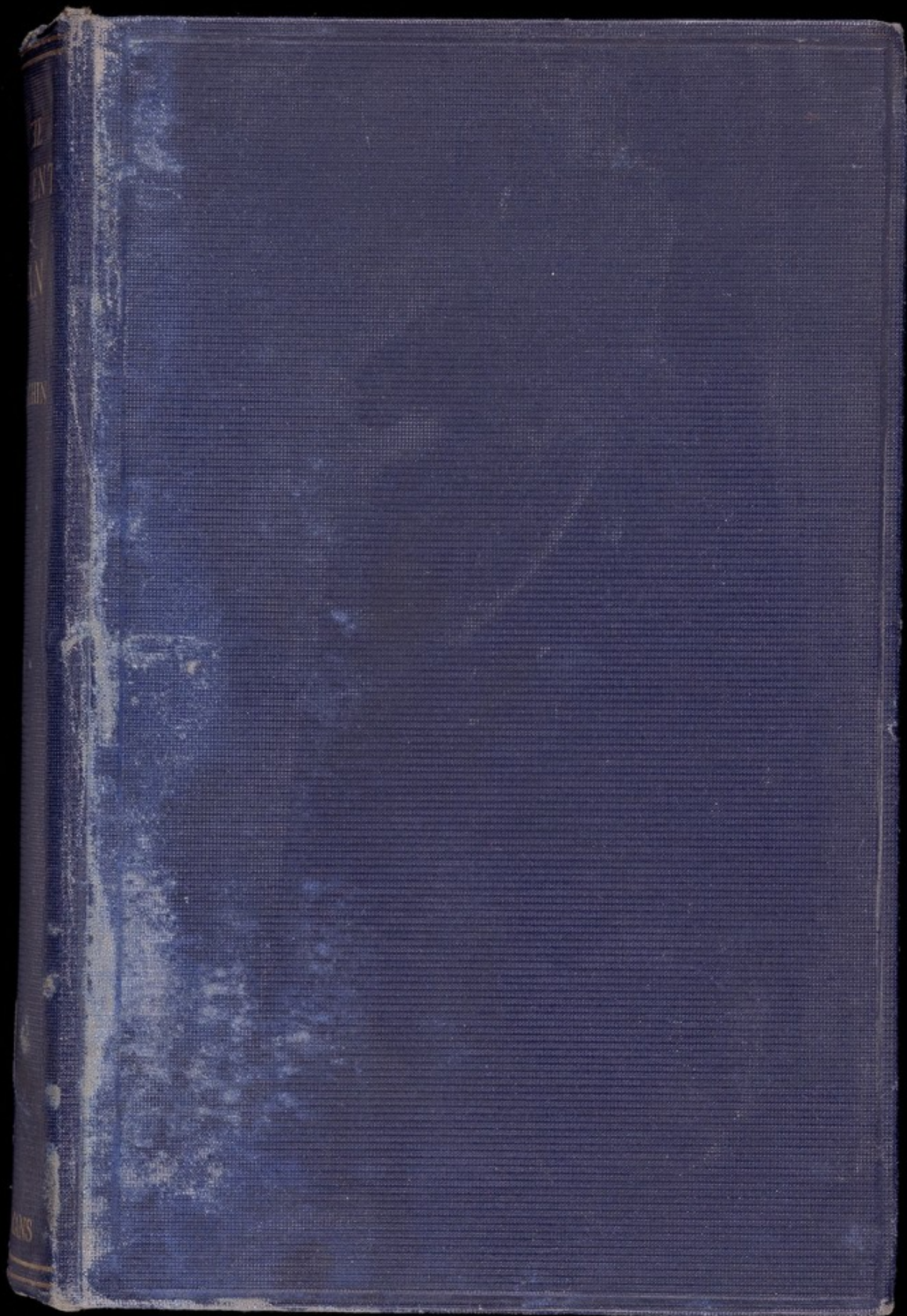
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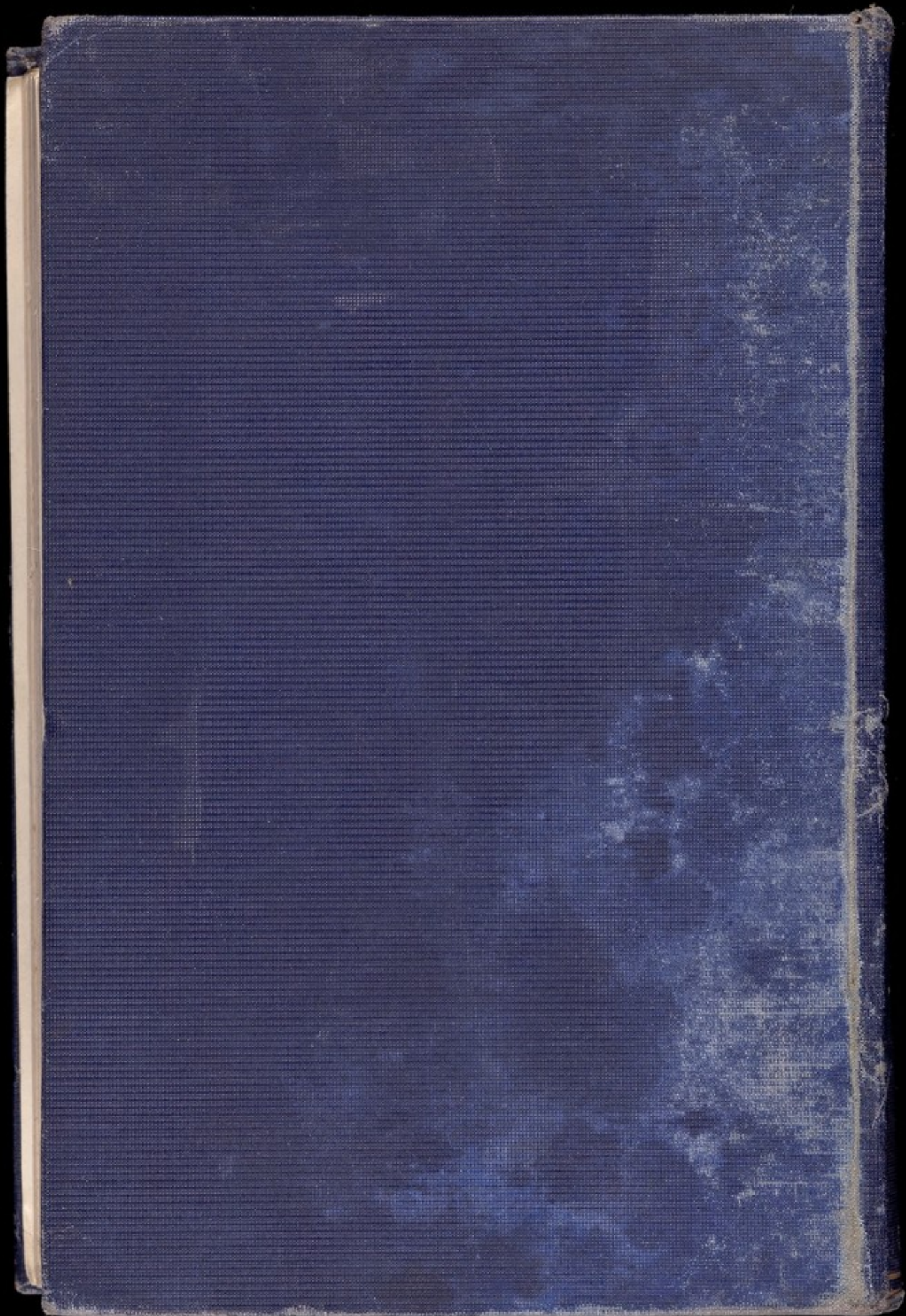
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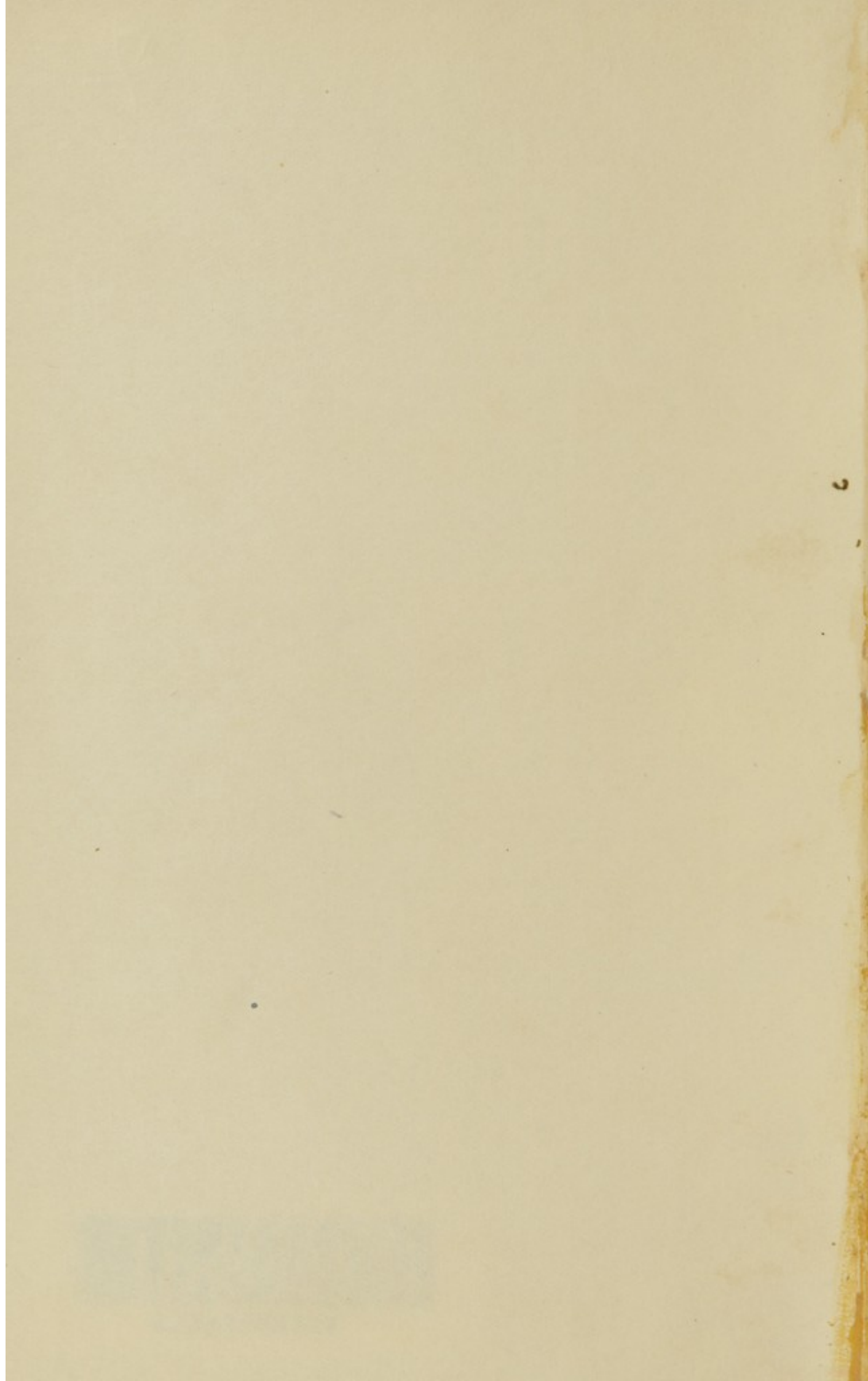


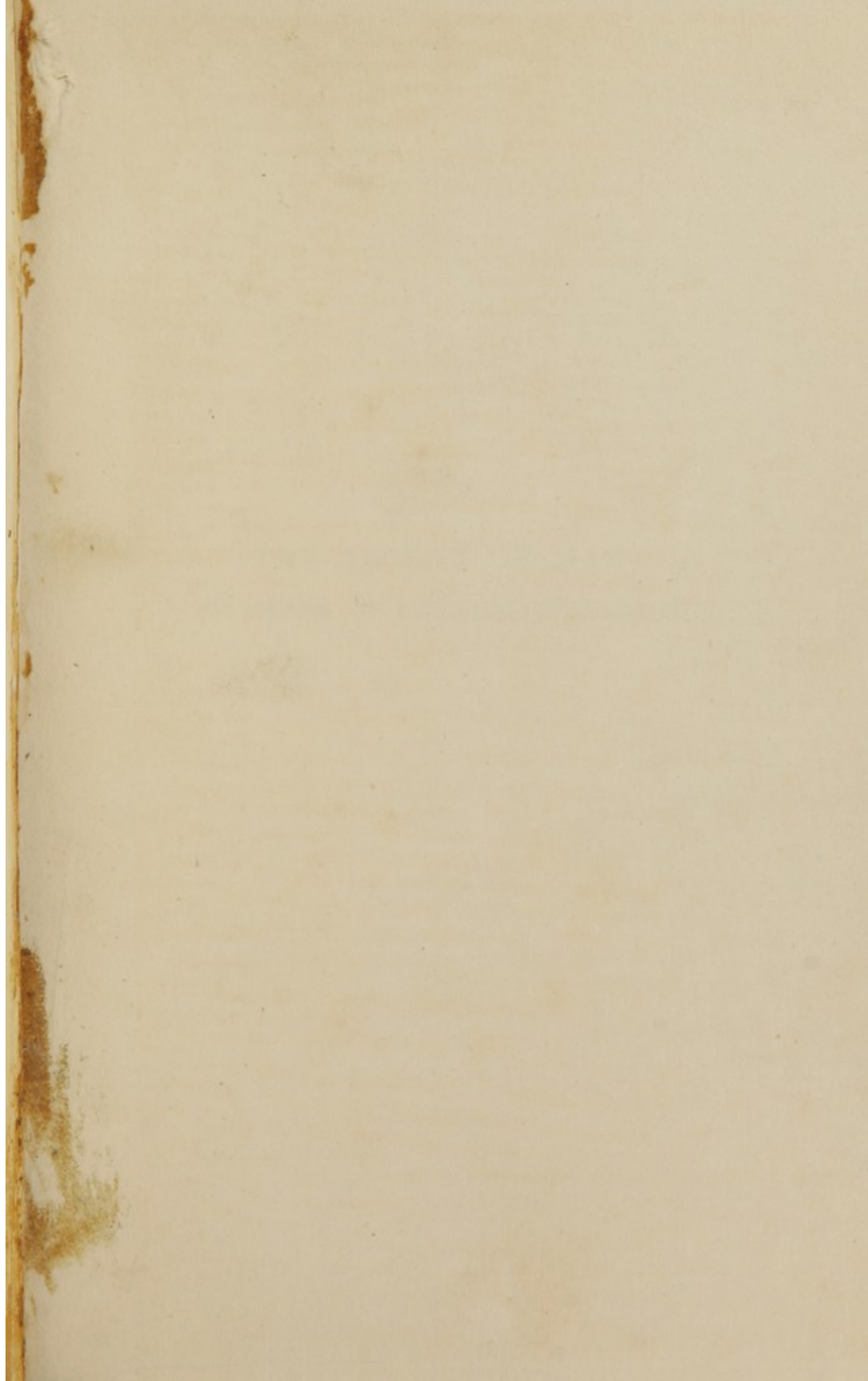


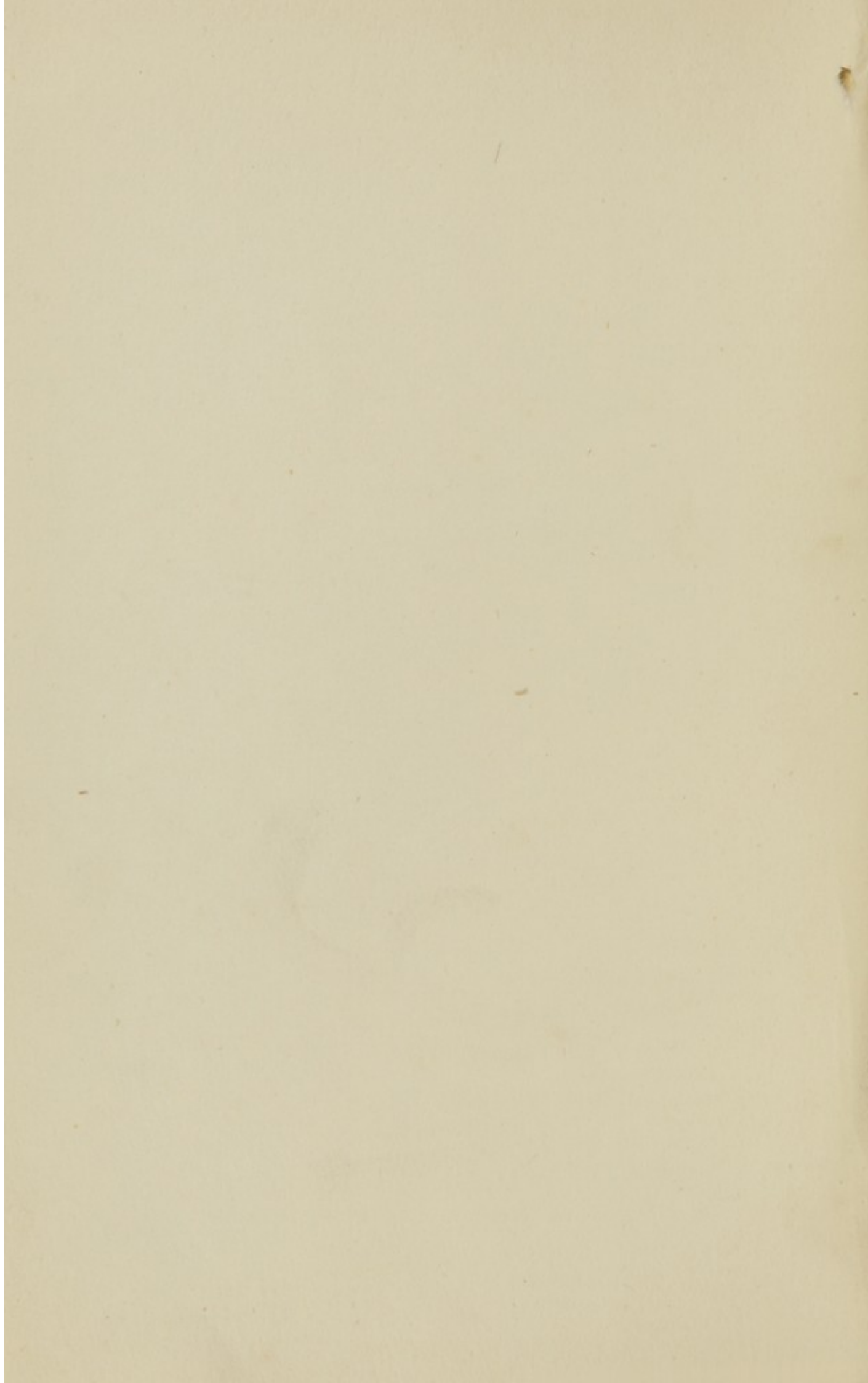
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THE ASCENT OF MAN
BY MEANS OF NATURAL SELECTION

THE ACCOUNT OF THE
REIGN OF CHARLES THE FIRST

Wassae

THE ASCENT OF MAN

BY MEANS OF
NATURAL SELECTION

BY
ALFRED MACHIN

Wassae
28/5/31

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INTRODUCTION

'The *Origin of Species*—the biggest book of this century, and a new Gospel for the next to think out.'¹

THIS book had its origin in the belief that if evolution was a fact it must have some definite meaning for the human race. And more certainly must this be the case if the process of evolution be a 'natural' one—free, that is, from any direct interference by *super-natural* agencies.

If man is indeed a child of nature, the outcome and consummation of a vast process, then there exist the strongest grounds for believing that only by an understanding of this process will man get some clear understanding of himself and his situation.

Thus human nature is commonly regarded as a vast mystery; as for the constitution of society, even the most brilliant of writers take pleasure in demonstrating how childish, how foolish, or how wicked it is. If there were any true understanding of human nature and human society, this attitude of mind would be impossible. It seems equally clear that this much-needed knowledge can be achieved only by a study of the past, only by penetrating the secrets of that process which has produced civilized man and civilized society as it is to-day.

Beginning with convictions of this nature, the writer set out to examine the problem of evolution, a task that proved vastly more difficult than he anticipated, but ultimately he reached conclusions that fortified

¹ Quiller-Couch in *Shining Ferry*.

and justified his original convictions. Of the importance of the subject little need be said. If history is, indeed, the only true philosophy, then it is plain that evolution, which is but the world's history, can alone serve to provide the major elements of an adequate philosophy of life. It is thus of supreme practical value.

This essay is based, in the main, on the works of the two giants of evolution theory—Darwin and Spencer. To the writer it seemed that Spencer had seized the vital facts and appreciated their true significance, while Darwin had grasped the fundamental cause, operative on those facts.

Unfortunately, neither of these great thinkers seem to have had any proper understanding of the work of the other, and so the two great inspirations which mutually explained and interpreted one another were never brought into close connection.

It may be desirable to expand this proposition, and then to indicate briefly the confusing elements that have interfered with the solution of this problem.

In the first place, it may be asked what is Spencer's leading idea. The answer is briefly this: that civilized man can be explained in one way and one way only, and that is as a descendant of savage man. It is now well known that civilization is a phenomenon of only the last ten or twenty thousand years, while for hundreds of thousands of years before that man lived the life of the hunter, dependent on wild animals and wild fruits for his sustenance. It was the genius of Spencer that enabled him to divine the significance of these facts even before they had been properly established. And the significance is very clear—it is simply that civilized man has inherited the instincts and constitution of his ancestors. Thus, physically and emotionally, these progenitors of modern man were designed

and adapted for the wild life of the hunter and warrior. Civilized man is thus burdened with a heritage from these capable roving savages who were his forbears ; their instincts are in his blood, they are organic to his constitution. It is this heritage which explains what the theologians have ascribed to original sin, and explained as a result of the disobedience of man's common ancestor to his Creator ; and it is this fundamental fact which illuminates vividly the basic instincts of human nature, such as the aversion to sedentary toil, and the great love of, and need for, what is comprehensively described as ' Sport.'

In his first important work, *Social Statics*, Spencer descants on this theme with the inspiring eloquence of a man who was intoxicated with a great idea. That it remained the basis of his convictions throughout his life is equally clear ; for in the Preface to the *Principles of Ethics*, the concluding work of his *Synthetic Philosophy*, he affirms that this final doctrine is fundamentally a corrected and elaborated version of the doctrine set forth in *Social Statics*. In both works man is ' regarded as undergoing transformation from a nature appropriate to his aboriginal wild life, to a nature appropriate to a settled civilized life. . . . In both, too, this moulding is said to be effected by the repression of certain primitive traits no longer needed and the development of needful traits.'

This, then, is Spencer's contribution to the problem : that human nature, man as he is, can be explained only by the theory of his descent from a long line of savage progenitors.

But the other aspect of the question is equally, perhaps even more, important. The question is, In what way, by what means, have savage men and savage societies evolved or developed into civilized men and civilized societies ? In other words, What is the cause

of progress with the human race. And here where Spencer signally fails, Darwin is triumphantly successful. Darwin's theory of natural selection serves, as nothing else serves, to explain the fitful, spasmodic, yet extraordinary progress of the human race.

Perhaps the best idea of this instrumentality is furnished by the phrase, 'Selection of the fittest.' Assuming, what can hardly be denied, that a natural selection of the fittest has been continually operative on man and human society, through the agency of incessant competition, then a true cause is indicated adequate to account for the progress of the human race.

This, then, is the contention of this work, that if the great idea of Darwin be applied to the fundamental facts asserted by Spencer, it will explain not only the prehistoric and historic records of the human race, it will also explain man as he is to-day, his nature, and his situation as a member of a civilized society. It will tell him not only *what* he is, but *why* he is what he is. It will explain, for instance, the institutions of property and marriage, the importance of industry and thrift, the significance of righteousness and love.

If a satisfactory account of human evolution is so readily obtainable by a consideration of these elemental facts, surprise will no doubt be expressed that this interpretation is not more generally recognized. But a host of factors have combined to confuse and cloud the issues. The task of disentangling essentials is by no means an easy one. One great difficulty is that previously noted, that Spencer and Darwin, working on independent lines, never seemed to have a clear understanding of each other's work.

Thus a writer on evolution asserts very justly: 'It must ever remain an incalculable loss to English science and English philosophy, that the author of the *Synthetic Philosophy* did not undertake his great task later

in the nineteenth century. As time goes on it will become clearer what the nature of that loss has been. It will be perceived that the conception of his work was practically complete before his intellect had any opportunity of realizing the full transforming effect in the higher region of thought, and more particularly in the department of sociology, of that development of biological science which began with Darwin.'¹

And not only did Spencer fail to appreciate the immense importance of Darwin's contribution to evolution theory, he also made it extraordinarily difficult for Darwin or any one else to recognize the very high value of his own views. Thus his *Synthetic Philosophy*, in ten tremendous volumes, took him some thirty-six years to write, and might very well take the ordinary man the same time to read and understand. Even worse is the fact that he sidetracks attention from his primary conviction, by insisting that the change from the simple to the complex is the dominant factor in all organic evolution. While the Darwinian can accept this idea as a subordinate factor, governed always by natural selection, he cannot accept it as the fundamental law of evolution.

And if Spencer did not understand Darwin, the reverse seems equally true. It is not difficult to sympathize with Darwin when he remarked that to read Spencer always made him feel like a worm, but that he retained the worm's privilege of wriggling. While on another occasion, referring to Spencer's writings, he remarks with gentle irony, 'Wonderfully clever, and I daresay mostly true.'²

But to the writer there appears to have been yet a further obstacle to the interpretation of human evolu-

¹ Benjamin Kidd, *Social Evolution*, end of ch. iv.

² Quoted by Professor E. B. Poulton in Obituary Notice of A. R. Wallace, Pt. I.

tion by means of natural selection. At an early stage in his inquiries he became convinced that there was an error at the base of Darwin's theory. Darwin's theory is founded on that of Malthus, and the views of Malthus are based on the incontestable fact that the powers of reproduction in the human race are altogether redundant ; that is, they are excessive to the needs of maintaining the population, or of increasing it, at the slow rate of increase permitted by slowly expanding food supplies. Malthus drew the conclusion, that the urge to reproduce caused a constant pressure of population on the available food supplies, and was the primary cause of poverty. Darwin applied this theory to the plant and animal kingdoms, and asserted that pressure of population was the primary cause of an unceasing struggle for existence in nature. In examining Darwin's theory, the writer was forced to the conclusion that, despite a host of appearances to the contrary, there was no real warrant for applying the Malthusian theory to the natural world. Being therefore unable to accept the root cause of the struggle for existence as propounded by Darwin, he had to examine whether there was in fact a struggle for existence ; ultimately he had no difficulty in arriving at an affirmative conclusion, and thus was able to decide that the validity of natural selection was in no way impaired ; but not only so, it became clear that its application must be considerably enlarged, and as a result its value as an instrument of interpretation became greatly increased.

No doubt it must seem a gross presumption for a layman to call in question one of the cardinal ideas of so pre-eminent a naturalist as Darwin. But the writer has taken extreme pains to examine the point ; he has had the opportunity of discussing it in detail with those who can claim to have some authority on such

subjects, and the difficulty remains an insuperable one.

Discussions of the Malthusian theory are in general so dreary, such a variety of conflicting views are held, that probably few will have the patience to weigh the criticisms and considerations set out on this matter in the second section, and the general reader may well be recommended to miss them. The writer, however, must insist that he regards them as neither untrue nor unimportant, but as they do not materially affect the thesis of the third and main section, the general reader might be well advised to commence at that point.

This third section is an attempt to interpret the outstanding facts of man's descent by means of the theory of natural selection, that is, it is an essay to explain human progress by means of natural selection, or, more roughly, it is *Social Statics* interpreted by the *Origin of Species*.

Fortunately, it is not necessary to discuss the 'Missing Link.' If there is one fact more than another that has inspired the average man with an aversion to evolution theory, it is the view, continually emphasized, that evolution means that man has descended from a monkey. No doubt man and the anthropoid apes have a common ancestor. But for all practical purposes this is of no importance at all. Consider, that the common ancestor of all the apes, dogs, cats, cows, and all true mammals is believed to belong to the *Insectivora*, whose present-day representatives are the mole and the hedgehog. That, still further back, the *Insectivora* sprang from some primitive reptile, and this latter ultimately from a fish. The fact that human descent derives through the ape is of no more importance than the equal fact that man descends also from a reptile, and a fish. These things are too remote to have practical meaning or significance.

But what does matter, and matters most profoundly, is the fact that civilized man is descended from savage man; that for hundreds of thousands of years his ancestors lived the life of the wild. These things matter, because these hunters and warriors are the immediate forbears of civilized man, and their instincts are in his blood. It is then with this phase of evolution only that this book is concerned.

It need, perhaps, hardly be said that any exact working out of human records by means of natural selection would be a most tremendous enterprise, and one for which even the most learned would be very inadequately equipped. All that the writer could attempt to do was to seek out the elemental facts in the records of the human race, and to see if they could be explained in the light of natural selection; and his main submission is that the evolution of man can be explained by natural means, by a continual selection of the fittest, and this contention is independent of any success or failure in the actual interpretation.

The belief that evolution is a natural process is one held by the majority of naturalists, as it was held by Darwin and Spencer, but it is plain the battle is not yet won when it is remembered that men of the calibre of Wallace and Sir Oliver Lodge insist that no natural explanation is possible, and that the phenomena plainly show an interference and regulation by spiritual agencies. Natural selection itself seems to be under a considerable cloud. Sir Oliver Lodge derides it as a 'trivial and simple idea,'¹ while Professor Sollas crystallizes a common sentiment in alluding to it as 'that idol of the Victorian era.'²

However, these iconoclasts have left an empty pedestal, a futile vacuum; perhaps it is fortunate

¹ Letter to *Spectator*, 31st May 1924.

² In *Ancient Hunters*.

that great men disagree, since it leaves the layman free, and not only compels him, but also justifies him in using his own judgment and forming his own opinion.

And so the writer need not perhaps apologize for enlisting under the ancient banner of Huxley, who asserted: 'It is either Mr. Darwin's hypothesis or nothing; that either we must take his view, or look upon the whole of organic nature as an enigma, the meaning of which is wholly hidden from us.'

While as regards the human race the judgment that seems soundest is the seemingly casual remark of Sir A. Quiller-Couch: 'The *Origin of Species*—the biggest book of this century, and a new Gospel for the next to think out.'

In conclusion, the writer has to acknowledge very gratefully his debt to Professor E. B. Poulton, F.R.S., and Mr. Binnie Dunlop, M.B., Ch.B., for reading and criticizing this essay, a service which proved very helpful; while they both considered the third section a very interesting and acceptable exposition of Darwinism, they have, of course, no responsibility for the views advanced, which are the writer's own.

'When I consider the blindness and misery of man, and those amazing contrarities which discover themselves in his nature ; when I observe the whole creation to be silent, and man to be without comfort, abandoned to himself, and as it were strayed into this corner of the universe, neither apprehending by whose means he came hither, nor what is the end of his coming, nor what will befall him at his departure hence, I am struck with the same horror as a person who has been carried in his sleep into a desolate and frightful island and who awakes without knowing where he is or by what way he may get out and escape.'

PASCAL.

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TABLE OF GEOLOGICAL PERIODS SHOWING THE SUCCESSION OF LIFE

RELATIVE LENGTHS OF EPOCHS
AS REPRESENTED BY THICKNESS OF ROCKS.

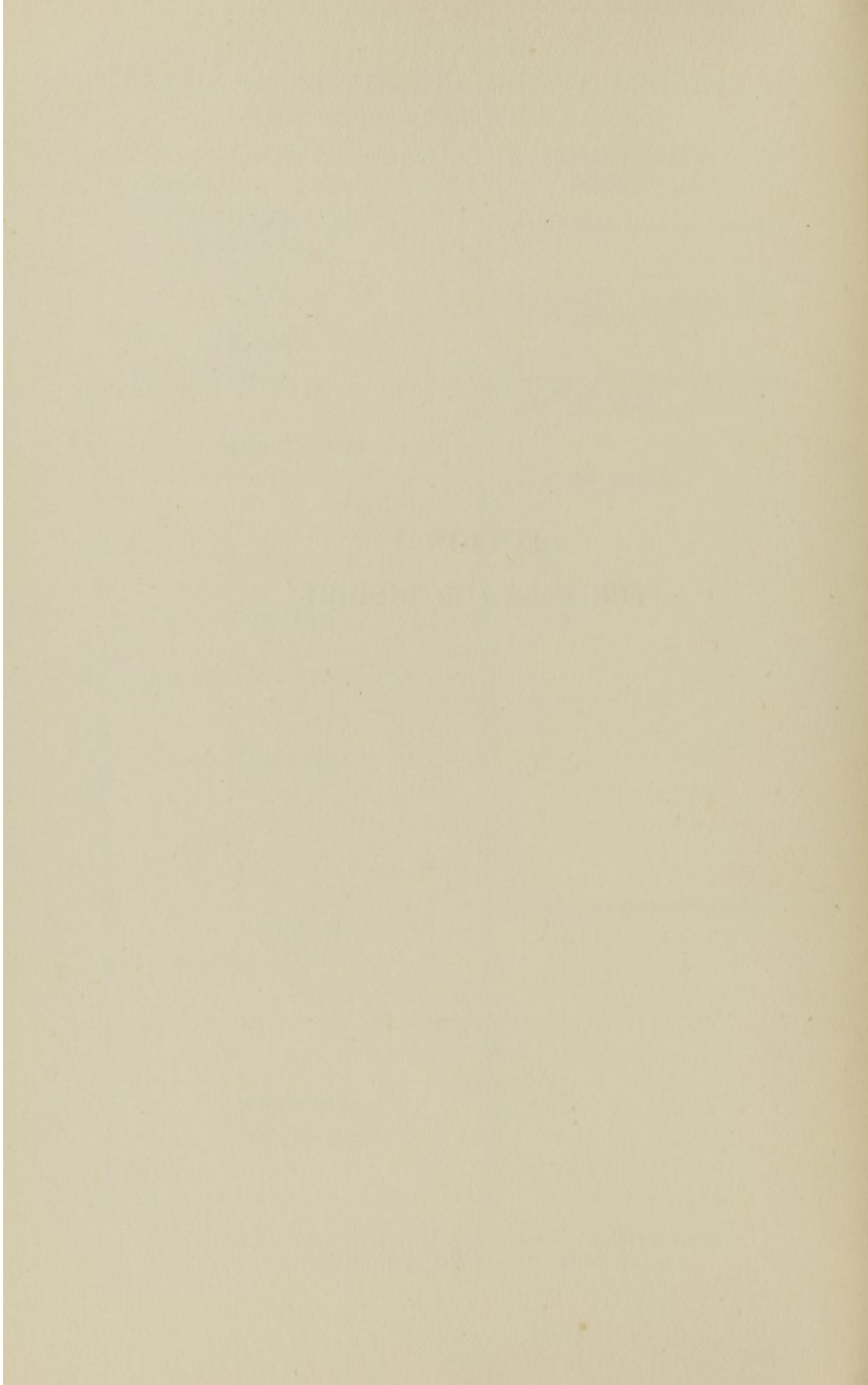
CHARACTERISTIC HIGHEST
ANIMAL LIFE.

TERTIARY. 1,600 ft.	} MAN. Mammals with developing brain.
CRETACEOUS. 2,500 ft.	
JURASSIC. 5,000 ft.	} Reptiles with insignificant brain, adapted for every sphere of life.
TRIASSIC. 3,000 ft.	
PERMIAN. 1,500 ft.	} Reptiles with insignificant brain, gradually changing to overcome necessity for life in marshes.
CARBONIFEROUS. 12,000 ft.	
DEVONIAN. 4,000 ft.	} Fishes.
SILURIAN. 7,000 ft.	
ORDOVICIAN. 15,000 ft.	} Water-animals without backbone.
CAMBRIAN. 12,000 ft.	
PRECAMBRIAN. Extent unknown.	

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SECTION I
THE CASE FOR INQUIRY



CHAPTER I

DARWIN—THE ONLY HOPE: ALTERNATIVE THEORIES EXAMINED AND REJECTED

AT the outset it may be desirable to indicate the strong grounds for believing that evolution is a fact, and the strongest evidence is that furnished by geology.

The whole movement of evolutionary thought in the nineteenth century may be said to have been started by Lyell, who broke down finally the view that the sequence of life on the earth had been periodically broken by tremendous catastrophes. He showed that all the observed phenomena could be accounted for by natural forces still at work on the earth ; and thus the facts of geology, the organisms embedded in the rocks, were left to tell their own tale and so point clearly to the fact of natural evolution.

The story of the rocks shows one uniform and uninterrupted sequence in the development of vertebrate life. First fish, then amphibians, then reptiles branching into the two great divisions of birds and mammals, and finally man as the highest of mammals. The evidence for the development of civilized man from savage man is exactly analogous : first in the sequence are found the relics of Palæolithic man, spread over a vast period of some hundreds of thousands of years ; then, in more rapid sequence, the records of Neolithic man, of men of the bronze age, the iron age, and so on to the records of history and the development of civilized man.

The concrete evidence shows conclusively that evolution is not a theory but a fact. ' If a single fossil had been found in the wrong geological formation, at the wrong period in geological history, evolution would have

received a shrewd if not a destructive blow.'¹ What a wonderful claim is this! The sedimentary strata, piled in chronological order, considerably exceed one hundred thousand feet in depth. It has been explored in countless ways all over the globe, yet not a single fact 'conflicting with organic evolution has been revealed.' Uniform sequence, on Hume's theory, constituted our sole knowledge of cause and effect; whether that be so or not, the uniform sequence revealed by the rocks admits of only one construction, that the higher types of vertebrate life have in some way developed from the lower types. The testimony of geology rests not on theory but on facts, and the final conclusion is that 'geologists are now able to show that whatsoever may have been the agencies at work, evolution of plants and animals has actually occurred.'²

And while the testimony of geology is the most solid, since it is literally graven in the rocks, the inevitable deduction is, of course, amply confirmed by the teachings of botany, zoology, and in particular of embryology.

Once the fact of evolution is recognized, the question that inevitably arises is, How has it come about, what is the cause of this wonderful development? Before asserting that the problem is insoluble, and taking refuge in the belief that evolution must be due to supernatural agency, it seems only reasonable to exhaust every inquiry with a view to discovering whether there are any natural agencies adequate for the task.

To make the problem clear, a short review of the growth of opinion in regard to progress and evolution seems desirable. Progress and evolution are, of course, parts of the same process, the former term being normally used when the development of mankind is considered, and the latter when regard is had to the origin and development of plant and animal species;

¹ 'A Century of Geology,' by Scientific Correspondent in the *Times* of 10th Nov. 1924.

² *Ibid.*

and, obviously, opinions regarding human progress and the evolution of species have acted and reacted on one another. Consider the idea of progress first. Essentially it is quite a modern belief: 'The majority of the human race to-day have no idea of progress; the majority of the human race to-day look (as until a few generations ago our own ancestors looked) upon the past as the time of human perfection.'¹ This seems the literal truth. Christian theology teaches the 'Fall of Man,' while the ancient Greeks and Romans pictured to themselves a legendary golden age which was placed in the remote past.

The germs of the modern idea of progress seem to have had their origin naturally enough in the sixteenth century, when the Renaissance of learning, the invention of the art of printing, the invention of gunpowder, the discovery of America, and last, but not least, the Reformation, combined to conjure up hopes and visions of betterment; with the growth of population, the division of labour, and the developed production of iron, came later the industrial revolution and an unprecedented increase in the wealth and population of European countries—this afforded a solid material basis for 'the conception of progress as a beneficent process immanent in the nature of things.'

But this general optimism and persuasion lacked a scientific basis until the doctrine of evolution was promulgated. This, of course, derives from Natural History. The fixity of animal species having scriptural warrant and being contradicted by none of the known facts of natural history was, until the beginning of the nineteenth century, the central dogma of natural science.

It appears that Aristotle, Bacon, Buffon, and Goethe, among others, had speculated more or less seriously with the idea of evolution. Not, however, until 1801, when Lamarck first published his views, did the doctrine of evolution find explicit and whole-hearted advocacy; except for theological repression he might

¹ Henry George, *Progress and Poverty*, bk. x. ch. i.

have had predecessors, but the fact remains that he is the great pioneer of the modern doctrine. Once plants and animals were classified, the remarkable identity of structure and organization of different classes became apparent. But the growing science of geology and the story of the rocks was bound to suggest a development theory. And when Lyell had demonstrated that these divisions were not separated by great geological catastrophes, but were part of a uniform and orderly process, the doctrine of evolution gained solid warrant and assured foundations.

It was, then, almost inevitable that classification and organization along with the facts of palæontology should suggest the idea that animal species had not been created but had developed ; and the course of development was obviously from the most primitive to the more highly organized. Study and meditation gave Lamarck, as later it gave others, the assured conviction that evolution and not creation was the law of life.

Convinced of the fact, the great problem that next suggested itself was, What was the cause of evolution—whence came the upthrust—how had this development come about ?

And that—for all who reject Darwin's theory as inadequate (and they are still many)—that is still the problem to-day. It is no more answered to-day than it was when first it thrust itself on the attention of Lamarck.

For what can be said of Lamarck and his successors ? Unable to discover a cause they invented one. All Lamarck could say was, ' There is a tendency to progressive development.' It is true he discovered an auxiliary agency, and one which, although it is now largely discredited, it is hardly possible to ignore, in the law of exercise—the effect of use and disuse ; but this alone was obviously and confessedly inadequate to account for the development of species. So he was compelled to assert that progress was in the nature of things ; as Spencer phrased it later : ' Progress is not an accident but a necessity,' and results ' from a law

underlying the whole organic creation.’¹ Mr. St. George Mivart, a distinguished zoologist, another of the same frame of mind, states that species change through ‘an internal force or tendency’ about which it is not pretended that anything is known.² Similarly, Nägeli believed ‘in an innate tendency towards progressive and more perfect development.’³

And this conception is still a favourite belief of evolutionists. It is essentially that of Professors J. A. Thomson and P. A. Geddes, who express it in poetic terms: ‘the manifold garments of life’ are ‘spun and woven from within.’ Evolution is a story of definite ‘branchings,’ a ‘simple rhythm of metabolisms.’⁴ It is possible to suspect that the idea of progress as a law of the universe is favoured by many, not because it is in conformity with the facts, but because it lends countenance to certain mystical or theological persuasions; for instance, Mivart, who condemns Darwin’s theory as a puerile hypothesis, believes that ‘the material universe is always and everywhere sustained and directed by an infinite cause, for which to us the word mind is the least inadequate and misleading symbol.’⁵ Samuel Butler, who follows Lamarck and condemns Darwin, quotes this with approval.

Butler says later, and not without good reason, that in evolution as first propounded there was an inherent purposiveness or teleology; and the battle is now between the evolution of the founders of the theory and the evolution of Darwin.

The great representative and principal expositor of the Lamarck school of thought is undoubtedly Herbert Spencer. He and Darwin are beyond all question the principal protagonists of the doctrine of evolution. To a past generation they probably appeared as comrades in a common cause; to-day, however, they stand out as representatives of two distinct and essentially

¹ ‘The Evanescence of Evil,’ *Social Statics*.

² See *Origin of Species*, ch. vii.

³ *Ibid.*

⁴ Thomson and Geddes, *Evolution*, p. 245.

⁵ Samuel Butler, *Evolution Old and New*, p. 371.

antagonistic conceptions of evolution philosophy. It is necessary to give a brief sketch of their contrasting views in order to indicate the irresistible reasons which made the writer follow Darwin in preference to Spencer. It seems better to treat this matter systematically, and therefore it is proposed to show the respective views of both writers on the question of what is progress.

Spencer's views will then be followed to their logical conclusion. The reasons for rejecting his view will be stated. Darwin's views will then be explored, until an impassable barrier appears; the inspiring character of Darwin's opinions will be indicated and the strong grounds which prompt to the re-examination of his doctrine, in the hope that the apparently insuperable difficulty may be overcome and progress continued.

In the first place, the following is extracted from the preface to Spencer's *First Principles* to show clearly his own recognition of, and insistence on, the fact that his doctrine is distinct from and independent of Darwin's: 'There has been very generally uttered and accepted the belief that this work and the works following it, originated after, and resulted from, the special doctrine contained in Mr. Darwin's *Origin of Species*.'¹

Spencer then points out that 'the theory set forth in this work and its successors had an origin independent of and prior to the *Origin of Species* published Oct. 1859.' He goes on to say: 'The distinctness of origin might indeed have been inferred from the work itself, which deals with Evolution at large—Inorganic, Organic, and Super-Organic—in terms of Matter and Motion; and touches but briefly on those particular processes so luminously exhibited by Mr. Darwin. In § 159 only . . . have I had occasion to refer to the doctrine set forth in the *Origin of Species*.'

The first question is as to what is progress; and on

¹ Herbert Spencer, Preface to fourth edition of *First Principles*.

this point Spencer and Darwin are agreed. Both accept the definition of progress arrived at by Von Baer, namely, the amount of differentiation of all parts of the same organic being. Darwin asks: 'What is meant by an advance in organization?'¹ and then gives the following answer: 'Von Baer's standard seems the most widely applicable and the best, namely, the amount of differentiation of the parts of the same organic being (in the adult state, as I should be inclined to add, and their specialization for different functions) or, as Milne Edwards would express it, the completeness of the division of physiological labour.' Darwin then explains why differentiation is the criterion of advancement: 'For,' he says, 'physiologists admit that the specialization of organs, insomuch as in this state they perform their functions better, is an advantage to each being.' He then goes on to claim, as the *cause* of advancement, Natural Selection or Survival of the Fittest, which would accumulate 'variations tending towards specialization.' Whether it be accepted or not, Darwin's statement of the case is at least intelligible and plausible. It will now, however, be necessary to leave Darwin and to note how Spencer developed this particular idea.

Spencer states he had independently arrived at the germ of Von Baer's principle, and in *Social Statics*, published 1850, had described 'the development of an individual organism and the development of a social organism as alike consisting in advance from simplicity to complexity, and from independent like parts to mutually dependent unlike parts.'²

To make this clearer it seems desirable to abstract the following clear exposition from the work (*Social Statics*) referred to:—

'A function to each organ and each organ to its own function is the law of all organization. To do its work well an apparatus must possess special fitness for that work.'³

¹ *Origin of Species*, ch. iv.

² *First Principles*, Par. 119, note.

³ 'The Limit of State Duty,' *Social Statics*, Ab. and Revd., 1892.

‘ Between creatures of the lowest type and creatures of the highest, we find the essential difference to be, that in the one the vital actions are carried on by a few simple agents, while in the other the vital actions are severally decomposed into their component parts, and each of these parts has an agent to itself.’

He then goes on to show that division of labour in industry furnishes a further illustration, and language a third, and concludes: ‘ May we not then suspect that the assigning of one function to one organ is the condition of efficiency in all instrumentalities? If as far as we can see, such is the law, not only of natural organizations, but of what in a superficial sense we call artificial ones, does it not seem probable that it is the universal law?’

Then he says that in 1852 he became acquainted with Von Baer’s principle ‘ that during its development each organism passes from a state of homogeneity to a state of heterogeneity.’¹

‘ The great aid rendered by Von Baer’s formula,’ he states, ‘ arose from its higher abstractness; since, only when organic transformations had been expressed in the most abstract terms, was the way opened for seeing what they had in common with inorganic transformations. The conviction that this process of change gone through by each unfolding organism is a process gone through by all things, found its first coherent statement in an essay on *Progress, its Law and Cause* (published 1857).’

It will be seen that, starting from the idea that specialization is the criterion of progress in animal organization—an idea clearly understandable because specialization makes for efficiency—Spencer had grasped the idea that the development of human societies as illustrated by languages, division of labour, and so on, was a further illustration of the working of the same principle. So far so good, it may be said; the application to human society was, and remains, an excellent and most helpful analogy. But on becoming ac-

¹ Spencer, *First Principles*, § 119, note.

quainted with Von Baer's principle, the term 'heterogeneity' in place of complexity, differentiation, or specialization, Spencer made a most bewildering leap from the living to the non-living world, from the organic to the inorganic, from the processes of living things on the earth to all the processes of suns, stars and nebulae in the whole universe. The writer is not competent to discuss the validity of this conception in its application to the universe. But what needs pointing out is that, in the process, the conception of progress has been transformed out of all knowledge. Instead of differentiation meaning efficiency of function, it becomes merely a mechanical process that goes on automatically, alike in the diffused matter of the universe and in living organisms on the earth. Progress certainly becomes a necessity, but ceases to have any intelligible meaning or purpose.

It is, however, necessary to follow Spencer as he worked out this conception to its logical conclusion.

Originally, in *Progress, its Law and Cause*, and in the first edition of the *First Principles*, he says 'he fell into the error of supposing that the transformation of the homogeneous into the heterogeneous constitutes evolution.'¹ Later he came to the conclusion that it was only a secondary aspect of the process of evolution, for 'the change from a confused simplicity to a distinct complexity' was everywhere 'incidental to the consolidation of the matter and the loss of its internal motion.'² And he found the right relations were to be expressed more logically as follows: 'Evolution is always an integration of Matter and dissipation of Motion: but it is in nearly all cases much more than this. The primary redistribution of Matter and Motion is accompanied by secondary redistributions'—the secondary redistribution being habitually 'a passage from homogeneity to heterogeneity.'

And further, he found that 'this change in the arrangement of Matter is accompanied by a parallel change in the arrangement of contained Motion.'³

¹ *First Principles*, § 119, note. ² *Ibid.*, § 187. ³ *Ibid.*, § 186 and § 187.

Putting all these conclusions together, Spencer was able to formulate his famous definition :—

‘ Evolution is an integration of matter and concomitant dissipation of motion ; during which the matter passes from a relatively indefinite, incoherent homogeneity to a relatively definite, coherent heterogeneity ; and during which the retained motion undergoes a parallel transformation.’¹

Having arrived at this conception of progress or evolution as a process inevitably going on, the next consideration is whether it goes on indefinitely or whether it reaches some goal or culmination. Needless to say, Spencer does not see ‘ one far-off divine event to which the whole creation moves.’ It appears that evolution results ultimately in equilibrium and then the reverse process of dissolution sets in, ‘ which forms the complement of Evolution and at some time or other undoes what Evolution has done.’²

Evolution and dissolution in fact appear as different phases of a single process, and ‘ there is a single metamorphosis universally progressing wherever the reverse metamorphosis has not set in.’³

‘ To the Earth as a whole,’ we are assured, ‘ Dissolution must eventually come,’ and the conclusion as regards the universe is this : ‘ While inferring that in many parts of the visible universe dissolution is following evolution, and that throughout these regions evolution will presently recommence, the question whether there is an alternation of evolution and dissolution in the totality of things is one which must be left unanswered as beyond the reach of human intelligence.’⁴

Progress, then, according to Spencer, is a mechanical necessity. It remains to state Spencer’s conception of its cause, which, as may be expected, is as mechanical as the process. The question is put by Spencer as follows : ‘ Why, Force being persistent, the transformation which Evolution shows us necessarily results’ ;

¹ *First Principles*, § 145.

³ *Ibid.*, § 188.

² *Ibid.*, § 190.

⁴ *Ibid.*, § 190.

and his answer is, that 'any finite homogeneous aggregate must lose its homogeneity through the unequal exposures of its parts to incident forces.'¹

As a slight digression consider Darwin's mild comment on this cause as defined by Spencer. Darwin remarks that 'as we have no facts to guide us, speculation on the subject is almost useless.'² How very remote this is from the simple cause, asserted by Darwin and originally accepted by Spencer, that differentiation is an advantage to animals as it enables them to 'perform their functions better,' that animals thus organized have an advantage in the struggle for existence, and so a better chance of surviving and leaving progeny.

Spencer's conception of progress is, then, final, futile, and a mockery of all human aspirations. But these are no evidences that it is false; and the great, the only, question that matters is: Is it true? is it in conformity with the known facts? And fortunately the facts as known are so difficult to reconcile with the theory, that it becomes possible to reject it as unproven and very possibly false.

What are the facts? They are, briefly, the evidences in regard to past life—the records of the rocks, and the prehistoric and historic records of the human race; and the evidences derived from present life—the constitution and distribution of living things existing on the earth to-day.

The principal objections to the doctrine that progress is a law of life, is in the nature of things, seem to be these:

- I. That throughout the world a multitude of the lowest forms of life still exist.
- II. That organization has frequently remained unchanged during immense stretches of time.
- III. That organization has at times not only ceased to advance; occasionally it has 'degenerated' or gone back.³

¹ *First Principles*, § 189.

² *Origin of Species*, ch. iv.

³ *Ibid.*

The same objections apply *mutatis mutandis* to human societies.

Taking natural history first, and dealing with the first objection, Lamarck appears to be the only advocate to tackle this difficulty, and he solves it by assuming that 'new and simple forms are continually being produced by spontaneous generation.'

Darwin simply remarks that Science has not yet proved the truth of this belief,¹ and the discoveries of Pasteur that germs were responsible for most of the supposed cases of spontaneous generation have made it even more difficult to prove to-day. It is clearly like the innate tendency to progress, pure conjecture and hypothesis.

On the second head, the evidence has been marshalled by Huxley. It appears that up to 1859 Huxley was an agnostic with respect to the doctrine of evolution as promulgated by Lamarck, Robert Chambers (*Vestiges of Creation*), and even Spencer, giving as one of his chief reasons that 'no suggestion respecting the causes of the transmutation assumed which had been made was in any way adequate to explain the phenomena.'² And here is Huxley's summary of the difficulties under this head:—

'Now palæontology shows us many facts which are perfectly harmonious with those observed effects of the process by which Mr. Darwin supposes species to have originated, but which appears to me to be totally inconsistent with any other hypothesis which has been proposed. There are some groups of animals and plants in the fossil world, which have been said to belong to "persistent types," because they have persisted, with very little change indeed, through a very great range of time, while everything about them has changed largely. There are families of fishes whose type of construction has persisted all the way from the carboniferous rock right up to the cretaceous; and others which have lasted through almost the whole

¹ *Origin of Species*, ch. iv.

² Essay on the reception of the *Origin of Species*.

range of the secondary rocks, and from the lias to the older tertiaries. It is something stupendous this—to consider a genus lasting without essential modifications through all this enormous lapse of time while almost everything else was changed and modified.' He further asserts that: 'Of some two hundred known orders of plants not one is exclusively fossil. Among animals there is not a single totally extinct class; and of the orders, at the outside not more than 7 per cent. are unrepresented in the existing creation.'¹

Again, certain well-marked forms of living beings have existed through enormous epochs comparatively unaltered.²

He goes on to say that examples are abundant, and gives instances among plants—specifying ferns, club mosses and coniferae—which have persisted unchanged from the carboniferous epoch.

Among animals, he instances 'Globigerina,' some genera of mollusca, and a species of crocodile, which have continued their race without change for more or less vast stretches of time down to the present.

It is proverbial that facts are stubborn things, and the facts of these persistent types as summarized by Huxley cannot be disputed. Nor can it be denied that they are inconsistent with any theory involving an innate tendency to progress. The ingenuity of progressionists may be able to reconcile them with their favourite persuasion, but at the best they remain a most formidable difficulty.

Retrogression or 'degeneration' is a more technical matter which, from its obscurity, the progressionists do not appear to have felt it incumbent on themselves to tackle. It is only in human history that it manifests itself as a formidable difficulty.

The parallel difficulties connected with the human race may now be considered.

The first difficulty has its analogy in the continued existence in historic times of the lowest forms of

¹ *Phenomena of Organic Nature.*

² Huxley, *Persistent Types of Animal Life.*

human life—naked savages and cannibals. Mention need only be made of the natives of Tierra del Fuego and the South Sea Islands, and of the aborigines of Tasmania, Australia, and America.

Under the second head we have examples in the fixed petrified civilizations of India and China.

On the third head we have conspicuous illustrations in the case of Egypt, Assyria, Greece, and Rome.

Henry George has discussed this point with his customary eloquence, and the following extracts¹ will illustrate this difficulty :—

‘ The moment that this theory of progression which seems so natural to us amid an advancing civilization, looks around the world, it comes against an enormous fact—the fixed petrified civilizations—how upon the theory that human progress is the result of general and continuous causes, shall we account for the civilizations that have progressed so far and then stopped. . . . The Hindoos and the Chinese were civilized when we were savages. They had great cities, highly organized and powerful governments, literatures, philosophies, polished manners, considerable division of labour, large commerce and elaborate arts when our ancestors were wandering barbarians. . . . While we have progressed from this savage state to nineteenth century civilization, they have stood still. If progress be the result of fixed laws, inevitable and eternal, which impel men forward, how shall we account for this ? ’

‘ But it is not merely these arrested civilizations that the current theory of development fails to account for. It is not merely that men have gone so far on the path of progress and then gone back. It is not merely an isolated case that thus confronts the theory, *it is the universal rule.*’²

‘ Every civilization that the world has yet seen has had its period of vigorous growth, of arrest and stagnation ; its decline and fall. Of all the civilizations that

¹ Henry George, *Progress and Poverty*, bk. x. ch. i.

² Italics by Henry George.

have arisen and flourished, there remain to-day but those that have been arrested, and our own, which is not yet as old as were the pyramids when Abraham looked upon them—while behind the pyramids were twenty centuries of recorded history.'

And apart from human societies, what about man himself?

Dean Inge, in his Romanes Lecture, 1920, maintained that there was no progress in main respects, whether physical, mental, or moral. The Greeks, it is asserted, were our masters in philosophy and the arts, and we can still learn the true lessons of statecraft and poetry from the Romans.

And here is a more recent verdict, based on a comparison with the civilizations of Egypt, by an authority who has had unique opportunities for judging these matters.

Mr. Howard Carter, in his lecture on the discovery of the tomb of Tutankhamen on 21st September 1923, said :—

'Archæological investigation showed us that such discoveries as the harnessing of those powers (steam, electricity, and the like) to our uses were the only real advantage, other than the science of medicine, that modern science might claim over the ancients.

'Culture in the way of intellectual development and the arts in general,' he said, 'were in ancient days higher in many ways than they are to-day.

'If we study the ancient Egyptian religious ideas—we shall feel that we have progressed beyond them. If once we have acquired the power to admire and understand their art, we do not for the most part entertain this view of æsthetic progress. We do so perhaps in minor details; but hardly any sensible person could ever imagine that he had got beyond the essentials their art embodies.'¹

According to Mr. Carter, then, all the advantages that present day civilization can claim over these ancient civilizations may be reduced to the science of

¹ As reported in the *Times*, 22nd Sept. 1923.

medicine and the benefits conferred by the industrial revolution.

'This,' says Emanuel Deutsch, 'is the end of all investigation into history or art. *They were even as we are.*'¹

There appear to be two conceptions by which progressionists are partly able to reconcile these very serious objections with their belief. The first is that which considers 'the alternate rise and fall of civilization, this retrocession that always follows progression' to be 'the rhythmic movement of an ascending line.'²

The second is that which considers that every civilization, like every living thing, has a natural term of existence beyond which it cannot prolong itself; and along with this belief it is possible to consider that succeeding civilizations are superior to their predecessors.

But in whatever way the idea of inevitable progress tries to accommodate itself to the facts, the concessions that it must inevitably make deprive it of so much of its force that it becomes exceedingly difficult to recognize. The exceptions are too great for the rule. The two hypotheses outlined above have no very strong warrant. There is a more modern hypothesis of at least equal validity which would, if it were true, nullify all the claims made for the former theories.

'Professor Elliot Smith, and with him a growing school . . . suppose that civilization was a unique creation of the valley of the Nile,' and a principal conclusion emerging from this belief is that 'if the existing races of man ruin the civilization they have inherited from Egypt, there is no evidence as to the possibility or probability of another ordering of life arising as an outcrop from barbarism. The necessary conditions may never recur.'³

From this conclusion, then, the overthrow of present day civilization might be final, and fatal to any rebirth.

¹ Quoted by Henry George, bk. x. ch. ii.

² Henry George, *Progress and Poverty*, bk. x. ch. i.

³ The Scientific Correspondent of the *Times*, 25th Sept. 1923.

These theories are all equally hypothetical, equally tenable, and mutually exclusive.

The one conclusion that matters is that for all practical purposes the doctrine of inevitable progress is absolutely useless. As a working hypothesis it is of no value.

Recent happenings have shown clearly what overwhelming disaster may follow defeat in war. And what nation to-day can regard itself as permanently secure from all the issues and hazards of war? In addition to dangers from without, industrial strife is a constant warning of a menace from within.

In any view of progress or history it is clear by every analogy that present day civilization may be utterly overthrown. It is small consolation surely to be informed that after centuries of anarchy and barbarism a new and greater civilization *may* arise and replace it.

To progressionists such a disaster would be as much in the nature of things as progress itself. Their doctrine does not offer any intelligible explanation of, or furnish guidance for averting, any such terrible catastrophe. Help and understanding can come only from a proper interpretation of history and human nature. Manifestly there has been as yet no true interpretation. The writer believes that this will come and can come only from the proper application of the Darwinian hypothesis, and having shown the considerations that compel the dismissal of theories associated with the idea of inevitable progress as devoid of value, and out of conformity with the evidence, it now becomes possible to consider the alternative theory put forward by Darwin.

CHAPTER II

NATURAL SELECTION: HOW WONDERFULLY IT WORKS WITH PLANT AND ANIMAL LIFE

THE facts show clearly that there has been progress, great and almost incredible progress, both in the world of nature and the realm of mankind. But the facts show with equal clearness that progress has not been continuous, that organizations may cease to exhibit the least improvement for millions of years—and in the human race especially it is seen that progress has frequently been arrested and often reversed. How does Darwin's theory fit these facts? As regards natural history there can be but one verdict—it worked wonderfully; the fact that it was Darwin's hypothesis which converted the scientific world to a belief in evolution might alone be adequate testimony on that head. But when the far more important matter of its interpretative value to the human race comes to be considered, the verdict of astounding success must be reversed, and the only possible conclusion is that it fails miserably.

Evidence on these two heads will now be briefly presented. First as to progress in the natural world, it is desirable to indicate how Darwin conceived natural selection to operate.

'Natural Selection,' he says, 'acts exclusively by the preservation and accumulation of variations which are beneficial, under the organic and inorganic conditions to which each creature is exposed at all periods of life. The ultimate result is that each creature tends to become more and more improved in relation to its conditions. This improvement inevitably leads to the

gradual advancement of the greater number of living beings throughout the world.’¹

And this is how he deals with the fact that organization does not necessarily advance :—

‘ If all organic beings thus tend to rise in the scale, how is it that throughout the world a multitude of the lowest forms still exist ? ’

‘ On our theory the continued existence of lowly organisms offers no difficulty, for natural selection or the survival of the fittest does not necessarily include progressive development—it only takes advantage of such variations as arise and are beneficial to each creature under its complex conditions of life. And it may be asked what advantage, as far as we can see, would it be to an infusorian animalcule—to an intestinal worm, or even to an earth-worm—to be highly organized. . . . ’²

‘ And geology tells us that some of the lowest forms, as the infusoria and rhizopods, have remained for an enormous period in nearly their present state.’ And later he says : ‘ The main cause lies in the fact that under very simple conditions of life a high organization would be of no service.’

Among other causes he considers that variations of a favourable nature may never have arisen, especially in the case of organisms which have been confined to peculiar and restricted stations. And, in any case, he asserts that there has never been adequate time for the utmost possible amount of development.

Retrogression of organization becomes equally intelligible on Darwin’s theory, and is thus explained :—

‘ Bearing in mind that all organic beings are striving . . . to seize on every unoccupied or less well occupied place in the economy of nature, it is quite possible for natural selection gradually to fit a being to a situation in which several organs would be superfluous or useless : in such cases there would be retrogression in the scale of organization.’³

¹ *Origin of Species*, ch. iv.

² *Ibid.*

³ *Ibid.*

The verdict of science on Darwin's theory, from the time of its publication up to the present, may readily be gathered from the few representative quotations that follow. Taking Huxley to begin with. He says :—

' Mr. Darwin's views have one peculiar merit, and that is that they are perfectly consistent with an array of facts which are utterly inconsistent with, and fatal to, any other hypothesis of progressive modification which has yet been advanced. It is one remarkable peculiarity of Mr. Darwin's hypothesis that it involves no necessary progression or incessant modification, and that it is perfectly consistent with the persistence for any length of time of a given primitive stock, contemporaneously with its modifications.' ¹

And again :—

' . . . That which we were looking for and could not find, was an hypothesis respecting the origin of known organic forms which assumed the operation of no causes but such as could be proved to be actually at work. We wanted, not to pin our faith to that or any other speculation, but to get hold of clear and definite conceptions which could be brought face to face with facts and have their validity tested. The " Origin " provided us with the working hypothesis we sought.' ²

And as a final verdict :—

' . . . I think it is either Mr. Darwin's hypothesis or nothing ; that either we must take his view or look upon the whole of organic nature as an enigma, the meaning of which is wholly hidden from us.' ³

Over sixty years have now elapsed since the *Origin of Species* was published, and despite the fiery ordeal of criticism it has gone through, the verdict of science is clearly unchanged. This is what Sir Ray Lankester says :—

' Since its first publication in 1859 the history of Darwin's theory has been one of continuous and decisive conquest, so that at the present day it is universally

¹ Huxley, *Phenomena of Organic Nature*.

² Huxley quoted at p. 145, Thomson and Geddes, *Evolution*.

³ *Man's Place in Nature*, ch. ix.

accepted as the central, all-embracing doctrine of zoological and botanical science.’¹

More recently, following attacks on Darwinism in America (occasioned by the admitted failure of the Mendelian method to explain the origin of species), the scientific correspondent of the *Times* defined the present views of scientists under the heading :—

‘ UNFASHIONABLE DARWINISM—
‘ NO ALTERNATIVE SOLUTION

‘ It is necessary, therefore, to state and re-state the actual position of these much-attacked doctrines . . . Darwin propounded his theory of Natural Selection, the survival of favoured races and individuals in the struggle for existence, as the chief agency, the *Deus ex machina* of evolution. He admitted the possible influence of subsidiary causes. Since he wrote, the subsidiary agencies which he discussed and many others, some of them within the sphere of natural science, others mystical, have been propounded, supported, and criticized.

‘ As has been explained in this column on several recent occasions, no single one of these subsidiary or alternative theories seems even on the way to general acceptance. Many of them have been abandoned by their own proposers. The Darwinian theory, so far, has survived all its competitors.’²

Sir John Lubbock asserts that : ‘ The great principle of Natural Selection is to biology what the Law of Gravitation is for astronomy.’³ While Wallace, referring to Darwin, says : ‘ Why is it universally felt that the only name with which his can be compared in the whole domain of science is that of the illustrious Newton ? ’⁴

These are not extravagant claims ; and fortunately

¹ Quoted by *Chambers' Encyclopædia*. Art. : ‘ Darwinian Theory.’

² The Scientific Correspondent of the *Times*, 11th April 1922.

³ Sir J. Lubbock, *Pre-Historic Times*, fourth ed., 1878, ch. xvi.

⁴ Wallace, Essay : ‘ The Debt of Science to Darwin.’

they can be very fairly tested by the layman, who can never hope and probably does not wish to be an expert in these matters. An elementary knowledge of botany, zoology, and geology, along with access to the countryside and to the museums of natural history, is sufficient to enable the layman to understand and put to the test Darwin's theory of natural selection. He will then be able to see nature with new eyes ; and while it may prove a wonderful revelation, it may be relied on to convince him that natural selection is what naturalists claim—a law as vital to biology as the law of gravitation is to astronomy.

In the language of pragmatism, it fulfils the principal test of truth—it works, and works wonderfully.

CHAPTER III

NATURAL SELECTION: HOW MISERABLY IT FAILS WITH MAN

THE writer is well aware that there are many ardent Darwinians who will strongly disagree with the title which heads this chapter. For their views the writer has every respect, and while recognizing that the subject is a matter of controversy, the writer can only express his own deep-felt convictions and indicate the grounds on which they are based.

While Wallace, the co-discoverer of natural selection, insisted that when the evolution of man was considered the theory of natural selection became utterly inadequate, and not only so, but no theory of his natural development was at all credible; while Wallace took this course, it must be recognized that Darwin refused to change his ground. In the *Descent of Man* he still regards the instrument of natural selection as the main agency, and he certainly endeavours to show in what way the ethical qualities of man could have been developed by natural means. His disciples may consider his exposition satisfactory, but to the writer it was, and is, most inadequate. The writer is in cordial agreement with the large number who hold that the development of man must have come about by natural means. But if the *modus operandi* of this process had been clearly demonstrated, antagonistic theories could not receive the advocacy and support which they claim and obtain to-day.

That there is serious dispute is obvious. Thus, Professor Bateman has asserted that Darwin 'speaks no more with philosophic authority,' and he remarks

that the 'mode and process' of evolution is as mysterious to-day as it was in 1859. Another authority, Dr. V. Kellogg, in his treatise on 'Evolution,' describes Darwinism as dead in modern science. And it is not impossible that the failure to explain 'man' has tended to discredit its validity in the natural world. This failure is not simply an academic matter, it is a profound disappointment. Because of Darwin's failure, one sees a chaos of conflicting theories. Thus, one gets the 'Superman' views with a demand for brand-new ethics. In opposition to this, human evolution is often explained as a subordination of individual selfish instincts to social requirements. Or if it be not explained in terms of morality, it is explained as due to a growth of intelligence. Mental power, it is asserted, is the motor of progress. Then there are the theorists who see the clue, not in a revolution of morality, but of the political constitution of societies. Socialism or communism is demanded, and Mr. H. G. Wells' very interesting *Outline of History* is considered to afford valuable support to this view. Again, there are mystical theories of which the most striking is embodied in M. Bergson's *Creative Evolution*.

All these views may be extremely interesting, and very plausible, but they are all obviously in conflict. The test of truth is not what it is possible to believe, but what it is impossible to *disbelieve*. And judged by this standard, they are all most unsatisfactory.

Yet, for all speculations regarding human development, the *Origin of Species* provides a sound foundation. And it may be gratefully acknowledged that Darwin's judgment was thoroughly to be trusted in seeking for natural reasons for the development of man, and more particularly in asserting that the development of ethical qualities could be largely attributed to natural selection. At the same time, the writer has no hesitation in reiterating that Darwin's demonstration was altogether unsatisfactory and inadequate. In this connection it is not without significance that in the *Descent of Man* no less than 629 out of the 947 pages

are devoted to the adumbration of a supplementary theory called 'Sexual Selection.'

A brief selection of the opposing views of naturalists may serve to reveal the peculiar difficulties of the problem. As the first point, the qualities which distinguish man from the brute may be considered.

First comes man's corporeal structure. Of all the primates 'man alone has become a biped,' and 'the hand supplies all instruments and by its correspondence with the intellect gives him (man) universal dominion.'¹ The hand has enabled man to invent and use weapons and tools. Then man has discovered the art of making fire and evolved the faculty of articulate language, a faculty that has clearly depended on and aided in promoting his powers of association.

Darwin summarizes his superiorities as follows: 'Man . . . is the most dominant animal that has ever appeared on this earth. He has spread more widely than any other highly organized form: and all others have yielded before him. He manifestly owes this immense superiority to his intellectual faculties; to his social habits which lead him to aid and defend his fellows—and to his corporeal structure.'²

As to the qualities which are unique in man, and the characteristics that are most difficult to account for on the theory of natural selection, there is the utmost disagreement. Darwin considers that 'the moral sense perhaps affords the best and highest distinction between man and the lower animals,'³ and further says that 'the high standard of our intellectual powers and moral disposition is the greatest difficulty which presents itself.'⁴

Wallace, on the other hand, finds numerous and far more formidable difficulties.

'Natural Selection,' says he, 'could only have endowed savage man with a brain a few degrees superior to that of an ape, whereas he actually pos-

¹ Sir C. Bell, quoted by Darwin, *Descent of Man*, ch. ii.

² *Descent of Man*, ch. ii.

³ *Ibid.*, ch. iv. p. 194.

⁴ *Ibid.*, ch. xxi. p. 930.

sesses one very little inferior to that of a philosopher.'¹

'The soft, naked, sensitive skin of man, entirely free from the hairy covering which is so universal among other mammalia, cannot be explained on the theory of natural selection.' He finds the 'foot, hand, human larynx unnecessarily perfect and so difficult to account for.'

'The mind of man,' he says, 'offers arguments in the same direction hardly less strong than those derived from his bodily structure—abstract notions of form, number and harmony could not have been developed by any preservation of useful forms of thought—and the development of a moral sense or conscience by similar means is equally inconceivable.'

Opinions as to the essential characters which distinguish man from the brute vary in a most extraordinary way. Huxley, for instance, considers the vital distinction to be language.

'What is it,' he asks, 'that constitutes and makes man what he is? What is it but his power of language—that language giving him the means of recording his experience—making every generation somewhat wiser than its predecessor—more in accordance with the established order of the universe?'

'What is it but this power of speech, of recording experience, which enables man to be man—looking before and after and, in some dim sense, understanding the working of this wondrous universe—and which distinguishes man from the whole of the brute world? I say that this functional difference is vast, unfathomable, and truly infinite in its consequences.'²

Another eminent naturalist, M. Quatrefages, however, dismisses the distinctions based on man's erect attitude, mental faculties, and even his powers of speech, and finds that the unique qualities are the moral and religious faculties. Says he:—

'We find in the mammalia nearly absolute identity

¹ *Natural Selection*, ch. ix.

² Huxley, *Man's Place in Nature*, ch. ix.

of anatomical structure, bone for bone, muscle for muscle, nerve for nerve—similar organs performing like functions. It is not by a vertical position on his feet . . . which he shares with the penguin, nor by his mental faculties, which though more developed are fundamentally the same as those of animals, nor by his powers of perception, will, memory, and a certain amount of reason, nor by articulate speech, which he shares with birds and some mammalia, and by which they express ideas comprehended not only by individuals of their own species but often by man, nor is it by the faculties of the heart, such as love and hatred, which are also shared by quadrupeds and birds, but it is by something completely foreign to the mere animal, and belonging exclusively to man, that we must establish a separate kingdom for him.' 'These distinguishing characters, he goes on to say, 'are the abstract notions of good and evil, right and wrong, virtue and vice, or the moral faculty, and a belief in a world beyond ours, and in certain mysterious beings, or a Being of a higher nature than ours, whom we ought to fear or revere ; in other words, the religious faculty.'¹

It might have been expected that the singling out of the moral and religious attributes would have met with the approval of religious leaders, but strangely enough, Dr. Sumner, an Archbishop of Canterbury, in discussing the matter insists that 'the essential distinction between mankind and the animal races lies in that power of progressive and improvable reason which is Man's peculiar and exclusive endowment.'²

Lyell quotes this with approval, and frequently alludes to the improvable reason of man as being the unique faculty which distinguishes him from the brute creation.

And not only is there remarkable disagreement as to the qualities which distinguish man from the brute, there is a similar disagreement as to the power of natural selection. Darwin makes large claims for its

¹ M. Quatrefages, quoted by Lyell, *Antiquity of Man*, ch. xxiv.

² Quoted by Lyell, *Antiquity of Man*, ch. xxiv.

instrumentality, particularly for man's intellectual powers, and says: 'It is highly probable that with mankind the intellectual faculties have been mainly and gradually perfected through natural selection.'¹ He seems somewhat staggered at Wallace's assertion that 'Natural Selection could only have endowed savage man with a brain a few degrees superior to that of an ape,'² and remarks mildly that he cannot understand it.

Darwin also claims that 'the ennobling belief in God is not universal with man; and the belief in spiritual agencies naturally follows from other mental powers.'³

As disagreement is so marked in regard to the distinguishing characteristics of man and as to the influence of natural selection, it is hardly surprising that there should be still greater disagreement as to the means or agencies by which man actually has developed. Some thinkers, unable to believe that any natural agency could be adequate, have had recourse to hypotheses of a supernatural kind. The majority of naturalists, however, appear to adhere to the belief that man's evolution has come about by natural means.

Wallace, of course, comes in the former class; he concludes that 'a superior intelligence has guided the development of man in a definite direction, and for a special purpose, just as man guides the development of many animal and vegetable forms.'⁴

Darwin, as previously indicated, belongs to the latter class; the chief supplementary agency he introduced was, as has been stated, sexual selection, 'which depends on the advantage which certain individuals have over others of the same sex and species solely in respect of reproduction.'⁵

And just as Darwin could give no approval to the

¹ Darwin, *Descent of Man*, ch. v. p. 196.

² Wallace, *Natural Selection*, ch. ix.

³ *Descent of Man*, ch. iv. p. 194.

⁴ *Natural Selection*, ch. ix.

⁵ *Descent of Man*, p. 322.

spiritual selection of Wallace, so Wallace was a severe critic of the sexual selection of Darwin, which explanation had, he says, 'staggered many evolutionists.'¹

Apart from sexual selection, Darwin asserted other agencies, and after indicating five of them, states there are 'perhaps others as yet undiscovered'!²

His summary is as follows:—

'Man tends to increase at a greater rate than his means of subsistence, consequently he is occasionally subjected to a severe struggle for existence, and natural selection will have effected whatever lies within its scope. . . .'

'We may feel assured that the inherited effects of the long continued use or disuse of parts will have done much in the same direction with natural selection.'

' . . . When one part is modified, other parts change through the principle of correlation, of which we have instances in many curious cases of correlated monstrosities.'

'Something may be attributed to the direct and definite action of the surrounding conditions of life, such as abundant food, heat or moisture.' And lastly:

'Many characters of slight physiological importance, some indeed of considerable importance, have been gained through sexual selection.'

'Through the means just specified, aided perhaps by others as yet undiscovered, man has been raised to his present state.'

This seems a rather remarkable multiplication of agencies, even though they be regarded as all under the control of natural selection.

This part of the subject may perhaps be concluded by indicating the views of an old and a modern scientist.

Lyell believes in the working of a creational law which added 'the moral and intellectual faculties of the human race to a system of nature which had gone on for millions of years without the intervention of any analogous cause.' 'If,' he says, 'we confound "Varia-

¹ Wallace, *Tropical Nature*, ch. v.

² *Descent of Man*, ch. xxi.

tion " or Natural Selection with such creational laws, we deify secondary causes or immeasurably exaggerate their influence.'¹

And here is the view of Sir Ray Lankester :—

' Man is held to be a product of Nature, a product of the definite and orderly evolution which is universal ; a being resulting from and driven by the one great nexus of mechanism which we call Nature.'

' The origin of Man by the Process of Natural Selection is one chapter in Man's history ; another one begins with the consideration of his further development and his diffusion over the surface of the globe.'

' The mental qualities which have developed in Man . . . are of such an unprecedented power, and so far dominate everything else in his activities as a living organism, that they have to a large extent, if not entirely, cut him off from the general operation of that process of Natural Selection and survival of the fittest which, up to their appearance, had been the law of the living world. They justify the view that Man forms a new departure in the gradual unfolding of Nature's predestined scheme.'²

Here in a most recent work the same view is held. Professor J. Arthur Thomson in *What is Man?* asserts man has thrown off natural selection : he must substitute other modes of selection.

The irony of these remarks lies in the probable fact that natural selection has not thrown off man, and though man may think he rebels, natural selection will not only give the verdict, but in due course execute the sentence.

Having now presented the views of the authorities on the evolution of man and as to the influence of natural selection in particular in bringing it about, the writer submits that the conclusion is very obvious that natural selection fails to offer any satisfactory explanation. There is the utmost disagreement as to the qualities that distinguish the human race from the rest

¹ Lyell, *Antiquity of Man*, ch. xxiii. p. 365.

² Sir Ray Lankester, *Nature's Insurgent Son*.

of the animal kingdom. And while some assert that no natural agency can possibly be adequate, of those that believe the contrary there is marked disagreement as to the power of natural selection, and *no one* claims that natural selection can be regarded as adequate in itself.

Thus while it is as the law of gravitation for plant and animal life, it is a most inadequate hypothesis for human life. For mankind it cannot be denied that the great engine of natural selection breaks down. It can be safely asserted that so far as any satisfactory interpretation is concerned it is grossly unsatisfactory and hopelessly disappointing.

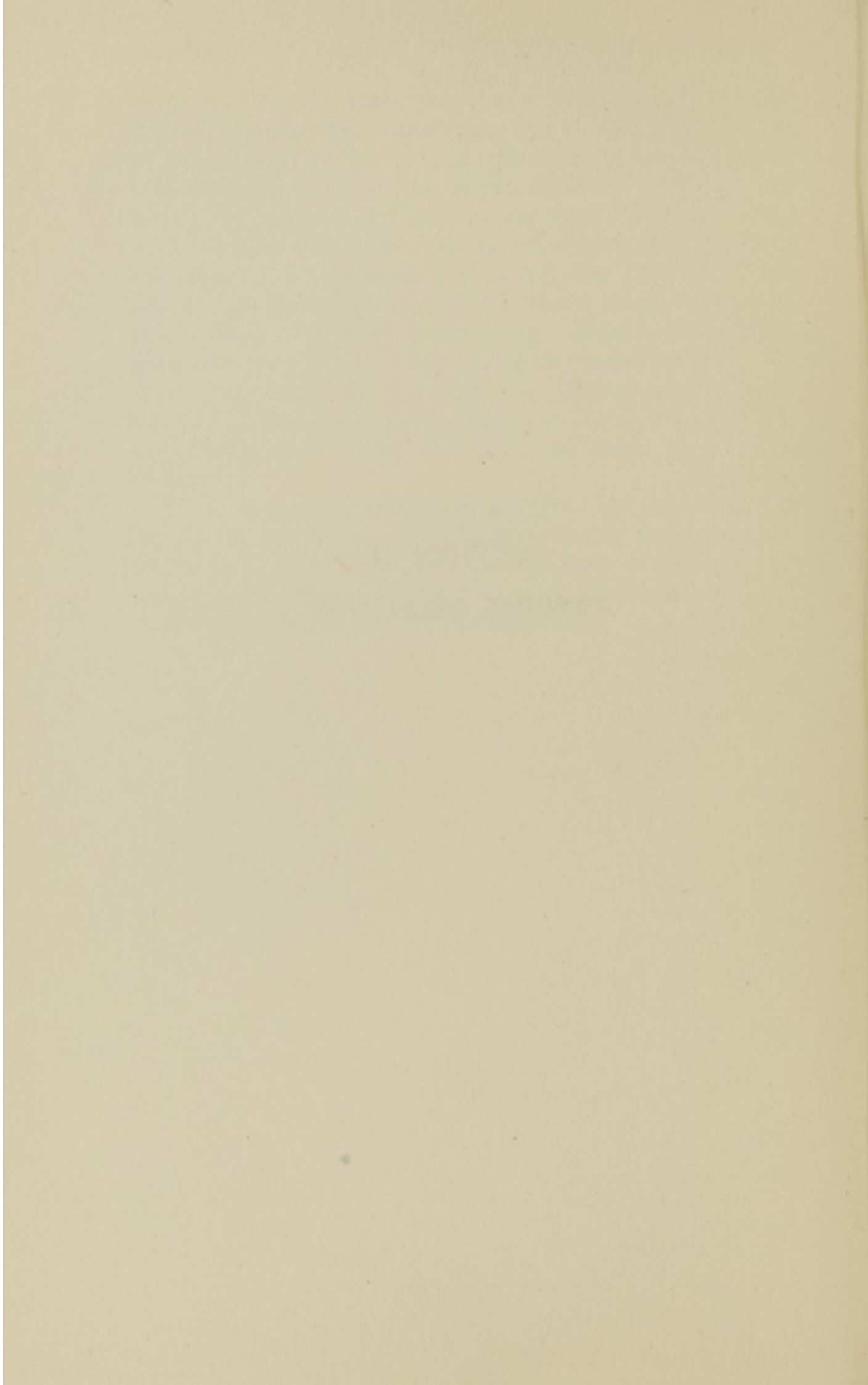
Yet the majority of naturalists believe that man has evolved from the ape and evolved by natural means. There are the strongest grounds for this view. Now, man emerged from the ape perhaps a million years ago, while life has been on the earth on a moderate estimate for a hundred millions of years. Natural selection has operated, it is believed, on the multifarious creatures of the earth during that tremendous period. Does it not seem extraordinary that it should cease to operate, to be the effective agency, for one form of life alone, and that during the last comparatively brief interval of time alone. For all life during all time it has been the great, the supreme law ; for one form of life alone during a comparatively brief period it has ceased to control and direct development. All other forms and vehicles of life become intelligible and instinct with meaning in the light of this interpretation ; only man remains—a mystery to himself—an enigma—baffled—utterly unable to comprehend himself, his nature, or his situation. For plants and animals the key has been found ; for the kingdom of man the key has *not* been found. And yet, what joy of knowledge and understanding lie beyond that impenetrable portal.

Darwin's theory, so full of hope, fails just where it is most needed. Can the idea be resisted that his hypothesis may not be in some way defective—that

error may not in some way have crept in? Is it not at least worth while examining his theory afresh from its beginnings to see if it is sound in its origin, in its construction and in its application? There must surely be a cause and reason for man's development. The Darwinian theory has shown reason and purpose throughout nature and reinforced the inherent persuasion of the truth-seeker that there must be a good and sufficient cause for everything. Reason and cause, then, for man's development there must be, and for those who dismiss supernatural hypotheses as unworthy of serious consideration, it is obvious that in the Darwinian theory lies the one hope of fruitful research.

This, then, is the case for inquiry—an investigation of the theory of natural selection in the hope of discovering why it breaks down at the human race, and of seeing whether it is in fact capable of explaining the *modus operandi* of human development.

SECTION II
NATURAL SELECTION



CHAPTER I

HOW DARWIN AND WALLACE GAINED THE IDEA OF NATURAL SELECTION

DARWIN'S attention was early called to the question of evolution. During his voyage on H.M.S. *Beagle* round the world he was much struck with various facts relating to natural history in South America. These seemed to throw light on that 'mystery of mysteries,' the 'origin of species.'¹ The facts clearly suggested they had been developed or evolved and not created. The great problem was, How had this development come about? What was the cause of evolution? As the best means of discovering some clue to the problem Darwin says he studied domestic productions and thus obtained a just idea of the power of human selection.² He then goes on to say:—

'As soon as I fully realized this idea I saw, on reading Malthus on Population, that Natural Selection was the inevitable result of the rapid increase of all organic beings; for I was prepared to appreciate the struggle for existence by having long studied the habits of animals.'³

The term 'Natural Selection' was then adopted by an analogy from human or artificial selection; or, as Darwin says, 'In order to mark its relation to man's power of selection.'⁴

Wallace arrived at the idea in a very similar way. Persuaded that species had been evolved and not created, he was constantly preoccupied with the inquiry

¹ See Introduction, *Origin of Species*.

² *Ibid.*, p. 3.

³ Introduction to *The Variations of Animals and Plants under Domestication*.

⁴ *Origin of Species*, ch. iii. p. 45.

as to what could be the cause. The question of ' *how* changes of species could be brought about,' says he, ' was rarely out of my mind . . . [while suffering from an ague fit] something led me to think of the positive checks described by Malthus in his " Essay on Population," a work I had read several years before, and which had made a deep and permanent impression on my mind. These checks—war, disease, famine and the like—must, it occurred to me, act on animals as well as on man. Then I thought of the enormously rapid multiplication of animals causing these checks to be much more effective in them than in the case of man ; and while pondering vaguely on this fact there suddenly flashed upon me the *idea* of the survival of the fittest—that the individuals removed by these checks must be on the whole inferior to those that survived.'¹

¹ Wallace, *Natural Selection*.

CHAPTER II

THE LAW OF MALTHUS: APPLICATION TO MAN

IT is obviously necessary to get first a clear understanding of the law of Malthus, then to see if it is true, and then to decide if it was properly applied by Darwin and Wallace.

The theory is perhaps most vividly expressed in the first edition.

'I think,' says Malthus, 'I may fairly make two postulata. First, that food is necessary to the existence of man. Secondly, that the passion between the sexes is necessary, and will remain nearly in its present state.'

'Assuming, then, my postulata as granted, I say that the power of population is indefinitely greater than the power of the earth to produce subsistence for man.'

In the second edition he defines the cause which has this necessary effect as 'the constant tendency in all animated life to increase beyond the nourishment prepared for it.'

The subject, he says, will be seen in a clearer light if we endeavour to ascertain :

- (1) 'What would be the natural increase of population if left to exert itself with perfect freedom.'
- (2) 'What might be expected to be the rate of increase in the productions of the earth under the most favourable circumstances of human industry.'

On the first head he takes his figures from the ascertained increase in population (excluding immigration) in the Northern States of America. There it appears that 'the population has been found to double itself

for about a century and a half successively, in less than twenty-five years.' In the back settlements this rate of increase was even exceeded, and 'the population has been found to double itself every fifteen years.' And even this rate, he asserts, has been exceeded for short periods in more countries than one.

His conclusion is that 'it may safely be pronounced, therefore, that population, when unchecked, goes on doubling itself every twenty-five years, or increases in a geometrical ratio.'

Malthus then turns to the possible increase of the food supply, and this rate, he remarks, 'will not be so easy to determine.' The rate can only be determined by considering the known properties of land and the power of agriculture to grow food upon it.

To consider the possible increase of the food supply under the most favourable circumstances he selects England and Scotland as being countries where the science of agriculture has been much studied, and goes on to say: 'If it be allowed that by the best possible policy and great encouragements to agriculture, the average produce of the island could be doubled in the first twenty-five years, it will be allowing probably a greater increase than could with reason be expected.'

'In the next twenty-five years it is impossible to suppose that the produce could be quadrupled. It would be contrary to all our knowledge of the properties of land.'

'... That we may be the better able to compare the increase of population and food, let us make a supposition which, without pretending to accuracy, is clearly more favourable to the power of production in the earth than any experience we have had of its qualities will warrant.'

'Let us suppose that the yearly additions which might be made to the former average produce, instead of decreasing, which they certainly would do, were to remain the same; and that the produce of this island might be increased every twenty-five years by a quantity equal to what it at present produces. The most

enthusiastic speculator cannot suppose a greater increase than this.'

'If it be allowed that the subsistence for man which the earth affords might be increased every twenty-five years by a quantity equal to what it at present produces, this will be supposing a rate of increase much greater than we can imagine that any possible exertions of mankind could make it.'

'It may be fairly pronounced, therefore, that considering the present average state of the earth, the means of subsistence under circumstances the most favourable to human industry could not possibly be made to increase faster than in an arithmetical ratio.'

'The necessary effects of these two different rates of increase when brought together will be very striking.'

'Taking the whole earth . . . the human species would increase as the numbers

1, 2, 4, 8, 16, 32, 64, 128, 256,

and subsistence as

1, 2, 3, 4, 5, 6, 7, 8, 9.

'In two centuries the population would be to the means of subsistence as 256 to 9; in three centuries as 4096 to 13; and in two thousand years the difference would be almost incalculable.'

'In this supposition no limits whatever are placed to the produce of the earth. It may increase for ever and be greater than any assignable quantity; yet still the power of population being in every period so much superior, the increase of the human species can only be kept down to the level of subsistence by the constant operation of the strong law of necessity acting as a check upon the greater power.'

Malthus then goes on to consider what are the 'checks to population which are constantly operating with more or less force in every society, and keep down the number to the level of subsistence.'

There are obviously only two ways of restricting the increase of population. One is by restricting the birth-rate, that is, by diminishing the gains; the other by increasing the death-rate, that is, by augmenting

the losses. Malthus in recognizing this fact terms the former method the preventive check and the latter the positive check.

The preventive check includes 'restraint from marriage, promiscuous intercourse, unnatural passions, violations of the marriage bed, and improper arts to conceal the consequences of irregular connections.'

The positive check includes 'every cause . . . which in any degree contributes to shorten the natural duration of human life. Under this head, therefore, may be enumerated all unwholesome occupations, severe labour and exposure to the seasons, extreme poverty, bad nursing of children, great towns, excesses of all kinds, the whole train of common diseases and epidemics, wars, plague, and famine.'

He then goes on to show that the pressure of population is the prime cause of poverty.

'In every country some of these checks are, with more or less force, in constant operation; yet notwithstanding their general prevalence, there are few states in which there is not a constant effort in the population to increase beyond the means of subsistence. This constant effort as constantly tends to subject the lower classes of society to distress, and to prevent any great permanent melioration of their condition.'¹

At this point it may be desirable to make a brief reference to the phrase used by Malthus, viz. the 'power of population.' Since he does not define it, it is desirable to have a clear idea of what he intended to be meant by this phrase, presumably the power of maintaining and increasing the population. Assuming this, it is important to bear in mind that this power does not depend solely on the powers of reproduction in the human race, but on the difference between those powers and the natural mortality to which the race is subjected. In other words, it depends on the difference between man's fertility and his mortality.

¹ Malthus, *An Essay on Population*, ch. ii.

CHAPTER III

THE LAW OF MALTHUS: APPLICATION TO PLANTS AND ANIMALS

HAVING given briefly the case for the Malthusian doctrine as applied to man, the next aspect of the subject that requires consideration is the application of this principle to the world of nature, an application which, as has been seen, led to the development of the Darwinian hypothesis.

In applying this doctrine to plant and animal life, three important differences have to be noted. One is that the preventive check, in so far as it means voluntary and deliberate restriction of the reproductive powers, is peculiar to man; the second difference is that fertility in the animal and plant world is generally very much higher; while the third difference is that plants and animals cannot artificially increase their food supplies as man can.

These differences, Malthus considered, would clearly make the pressure of population even more severe in nature than it is with man. Malthus himself had considered his principle to apply to all living things, and had defined the cause as 'the constant tendency in *all animated life* to increase beyond the nourishment provided for it.'¹

He goes on to say that 'throughout the animal and vegetable kingdom nature has scattered the seeds of life abroad with the most profuse and liberal hand; but has been comparatively sparing in the room and the nourishment necessary to rear them. The germs of existence contained in this earth, if they could freely develop themselves, would fill millions of worlds in the

¹ Malthus, *An Essay on Population*, ch. i. Italics are the writer's.

course of a few thousand years. Necessity, that imperious, all-pervading law of nature, restrains them within the prescribed bounds.'

'In plants and irrational animals the view of the subject is simple. They are all impelled by a powerful instinct to the increase of their species; and this instinct is interrupted by no doubts about providing for their offspring. Wherever, therefore, there is liberty, the power of increase is exerted; and the superabundant effects are repressed afterwards by want of room and nourishment.'

The application made by Darwin now requires consideration. From the foregoing it can hardly be considered surprising that Darwin thought he had found in this principle, the fundamental cause of that struggle for existence, which his experience had taught him existed everywhere in nature. The application of the principle to nature seemed as obvious to Darwin as it did to Malthus.

The following is a comprehensive statement of Darwin's views and of the application he made of the Malthusian doctrine:—

'A struggle for existence inevitably follows from the high rate at which all organic beings tend to increase. Every being which during its natural lifetime produces several eggs or seeds, must suffer destruction during some period of its life, and during some season or occasional year, otherwise, on the principle of geometrical increase, its numbers would quickly become so inordinately great that no country could support the product. Hence, as more individuals are produced than can possibly survive, there must in every case be a struggle for existence, either one individual with another of the same species, or with the individuals of distinct species, or with the physical conditions of life. It is the doctrine of Malthus applied with manifold force to the whole animal and vegetable kingdoms; for in this case there can be no artificial increase of food, and no prudential restraint from marriage. Although some species may be now increasing, more or less

rapidly, in numbers, all cannot do so, for the world would not hold them.' ¹

'There is no exception to the rule that every organic being naturally increases at so high a rate, that if not destroyed, the earth would soon be covered by the progeny of a single pair. Even slow breeding man has doubled in twenty-five years, and at this rate in less than a thousand years there would literally not be standing room for his progeny . . . the elephant is reckoned the slowest breeder of all known animals . . . it begins breeding when thirty years old and goes on breeding till ninety years old, bringing forth six young in the interval . . . if this be so after a period of from 740 to 750 years there would be nearly nineteen million elephants alive, descended from the first pair.' ²

This, then, is the foundation of Darwin's theory. To all appearances it seems so strong as to be unassailable. The fundamental principle 'that there is a constant tendency in all animated life to increase beyond the nourishment provided for it' seems obvious from the briefest considerations of the facts. The strength of sexual passion is known to every one. The need of restraining it is equally apparent.

The denial of his instincts, the postponement of marriage, and the limitation of families, are matters imposed upon man by his poor command over the means of subsistence. They are very unhappy realities within the experience of every one. If the human race followed their natural instincts and had offspring according to the natural fruitfulness of the species, it is obvious that population would increase at such a rate that it must inevitably press against the means of subsistence. Again, if nature be regarded, the facts seem equally obvious. An oak tree during its centuries of life produces hundreds of thousands of acorns, only one of which can achieve maturity and replace the parent tree. The hips, haws, and holly berries, reproductive germs of their respective species, brighten the hedges by their profusion during most winters. A puff-ball

¹ *Origin of Species*, ch. iii.

² *Ibid.*

when it bursts scatters a million reproductive germs to the winds. A pair of American oysters, it is said, produces on an average twenty million fertilized eggs.¹ Some insects have a most enormous fertility—the *Musca Carnaria*, for instance, is said to produce twenty thousand larvae.

Again, if domesticated animals are considered, it is clear that the stock of cattle, sheep, pigs, is maintained, although a large proportion are killed annually for food.

Putting all these facts together, it seems patent on the face of it that the fertility of living things is altogether excessive, and as subsistence is necessarily limited it would obviously follow 'that there is a constant tendency in all animated life to increase beyond the nourishment provided for it.'

Here is a very strong case—one, moreover, that led to the development of a theory of nature that was and still is accepted as a wonderful working hypothesis. Judged by its fruits, then, the Malthusian principle finds a further confirmation. But, as has been explained, Darwin's theory broke down at the human race, and it was this fact that suggested a re-examination of it from its first beginnings. The origins and foundations of this theory have now been stated as clearly and accurately as the writer has found possible. It may be said that in the beginning the writer was as convinced of their validity as any zealous Darwinian, the doubts and the difficulties came to him unsought, and the solution was equally unexpected.

The next step, then, is to undertake a close examination of the facts and considerations on which the doctrine of Malthus is based, and the further considerations which justified its application by Darwin.

¹ Sir Ray Lankester, *Nature's Insurgent Son*; note to Part 6.

CHAPTER IV

EXAMINATION OF THE LAW OF MALTHUS

THE best and fairest way of starting this examination seemed to be to look at the facts themselves, to leave books and theories for a while and examine nature at first hand.

There are few spaces in this country where nature has a free hand, where living things grow freely without human interference or regulation, but among them are the hedgerows of the countryside. Here on the margins of the lanes and roads the wild flowers grow and reproduce themselves year after year. These strips of nature are carpeted with wild plants. All the available space is fully occupied, and year after year the same plants and flowers appear in much the same proportion. If a census of the population of different species were taken, it would on the average be practically constant. Consider how this is achieved. Here is a fern throwing off countless reproductive germs. Here is a dandelion giving to the winds hundreds, perhaps thousands, of seeds, each attached to its tiny parachute. Now, as the numbers remain constant, obviously only one spore can give rise to and replace one parent fern, and only one dandelion seed can achieve maturity and replace the parent dandelion. Why, then, do they produce seed in such great abundance? Are all these reproductive particles, beyond one, superfluous—waste? A very little consideration shows that this is not so. Obviously these seeds are scattered abroad; some fall on places where they cannot germinate, others are eaten by insects and birds. Then the survivors, those that by chance find a vacant space and strike root, must compete with other seedlings and

plants for moisture and sunlight. Adequate room and sustenance are needed in order to achieve maturity. It is fairly obvious on the face of it that, in order to continue the race, every plant must produce not one, but many seeds. These facts have generally been recognized ; but as the causes of mortality in nature are somewhat obscure, while fertility is calculable with considerable exactitude, they have received by no means the same measure of attention.

Here is a clear appreciation of the facts by Herbert Spencer :—

‘ A plant produces thousands of seeds. The greater part of these are destroyed by creatures which live upon them, or fall into places where they cannot germinate. Of the young plants produced by those which do germinate, many are smothered by their neighbours, others are blighted by insects, or eaten up by animals ; and, *in the average of cases*,¹ only one of them produces a perfect specimen of its species, which, escaping all dangers, brings to maturity seeds enough to continue the race.’²

It is fortunately possible to take a more concrete view of this subject owing to an experiment carried out by Darwin. Darwin remarks that ‘ with plants there is a vast destruction of seeds, but from some observations which I have made, it appears that the seedlings suffer most from germinating in ground already thickly stocked with other plants. Seedlings, also, are destroyed in vast numbers by various enemies ; for instance, on a piece of ground three feet long and two wide, dug and cleared, and where there could be no choking from other plants, I marked all the seedlings of our native weeds as they came up, and out of 357 no less than 295 were destroyed, chiefly by slugs and insects.’³

In a further experiment ‘ on a little plot of mown turf (three feet by four) the vegetation was allowed to grow

¹ Italics are Spencer’s.

² ‘ General Considerations,’ *Social Statics*.

³ *Origin of Species*, ch. iii.

freely,' and it was found that 'the more vigorous plants gradually kill the less vigorous,' so that out of the twenty species growing there nine of these species perished.

Thus, apart from a vast destruction of seed, 83 per cent. of seedlings perished, and of more adult plants 45 per cent. of species perished.

Clearly, then, the mortality among plants is very high, and clearly there is a very heavy death-rate arising out of the conditions of life apart from any intestine strife arising through competition between members of the same species.

What applies to plant life applies in much the same way in animal life, and Darwin asserts comprehensively that 'each species even where it most abounds is constantly suffering enormous destruction at some period of its life, from enemies or from competitors for the same place and food.'¹

It is obvious, then, that if mortality in nature is inevitably high, then in order to persist the fertility of species must be equally high.

The important conclusion to which attention needs to be chiefly drawn is this—that *high* fertility is no evidence of *excessive* fertility.

What then becomes of Darwin's persuasion that pressure of population on the means of subsistence is the *cause* of the struggle for existence?

This recognition of a heavy mortality in the nature of things clearly suggests a doubt on this head.

But it will be said that, apart from this appearance of excessive fertility in nature, the facts in regard to the human race are conclusive that man's reproductive powers are obviously excessive. So much so, that they are deliberately and necessarily restricted.

The writer accepts this statement with regard to man. But if the application to nature rests on the analogy of man it is necessary to inquire whether this analogy is valid.

A brief consideration will suggest that man's position in this respect is peculiar, and due to the operation

¹ *Origin of Species*, ch. iii.

of a specific cause for which in nature there is no counterpart.

Consider the progress of the human race. Modern research with regard to prehistoric man has shown that for hundreds of thousands of years man was a hunter, living like other beasts of prey on the unaided products of nature. Then man learned to control and govern the animals which served him for food. He had herds and flocks of domesticated animals. Later he learned to regulate the plant life which served him for food, and became agriculturist. Increasing control over nature enabled him to withstand the rigours of climate, his intelligence and invention of weapons and tools freed him from danger from the savage beasts of the wild. The whole story of man is one of increasing command over the means of subsistence, and increased power to withstand injurious influences in his environment. Self-preservation is the first law of life, and the progress of man lies primarily in the increased power he has developed of preserving his own life. The obvious and inevitable corollary is that his death-rate has continually diminished—his mortality has continually grown less.

This fact is essentially a result of all progress. Herbert Spencer recognized it as follows: 'A high species of animal is distinguished from a low species in the respect that . . . its aggregate suffers less mortality from incidental destructive agencies.' And further alludes to 'the human race as a whole far lower in its rate of mortality than nearly all races of inferior kinds.' And with more particular reference to the present inquiry: 'Similarly it is with the civilized varieties of mankind as compared with the savage varieties. A still further diminished rate of mortality implies that there is a still larger proportion the members of which gain good from well-adapted acts and suffer evil from ill-adapted acts.'¹

The progress of civilization is distinguished by the same fact. Contrasting the nineteenth with the seven-

¹ *Principles of Ethics*, § 258.

teenth century, Macaulay remarks: 'The term of human life has been lengthened over the whole kingdom and especially in the towns. The year 1685 was not accounted sickly, yet in the year 1685 more than one in twenty-three of the inhabitants of the capital died. At present only one inhabitant of the capital in forty dies annually.' In the time of the Stuarts he asserts 'men died faster in the purest country air than they now die in the most pestilential lanes of our towns, and men died faster in the lanes of our towns than they now die on the coast of Guiana.'¹

Since 1838 civil registration has been enforced, and exact figures are obtainable. They show the same diminution of the death-rate. In the decennium 1841-1850 the rate for England and Wales was 22.4 per 1000. In 1901 it had fallen to 16.9 per 1000. When the Great War broke out it stood at 13.8. Since the War ended, despite the many troubles afflicting the nation, progress has continued. In 1919 it was 13.7; in 1920, 12.4; in 1921, 12.1; in 1922, 12.9. The figures for 1923 show a decline to 11.6—an absolute record, and one which shows that in that year 'the English people enjoyed an immunity from death and disease greater than has yet been recorded in the world for a population of the same size.'²

It is, then, clear that the progress of the human race has been marked by a continuous reduction in the death-rate. And while the mortality has been continually declining, the powers of reproduction have remained practically constant.³ This, then, furnishes a clear and simple explanation of the undeniable fact that the reproductive powers of civilized man are redundant to his situation; that is, they are redundant to the need of maintaining the population or of increasing the population at the slow rate of increase permitted by gradually expanding food supplies.

¹ *History of England*, ch. iii.

² Medical Correspondent of the *Times*, 1st Jan. 1924.

³ Darwin thinks it probable that they have actually *increased*—see *Descent of Man*, ch. ii.

It is submitted that this is the true cause of the superfluous procreative powers of the human race, a cause not recognized either by Malthus or Darwin, who consequently put forward various less acceptable reasons to account for an incontestable fact, and were thereby led into the error of assuming that what was true of human life was true of all life.

It may be desirable here to make a slight digression and deal with an objection that the orthodox Malthusian is sure to make. He will assert that the idea that man has reduced his death-rate, owing to his increased control over nature, is all moonshine. He will insist that the death-rate depends on two things, and two things only—the birth-rate and the rate of increase of the food supply. And he will conclude that man can only reduce his death-rate by increasing his food supply or by restricting his birth-rate, or both.

As an illustration he may instance that long civilized nation the Chinese, and point to the fact that their death-rate is enormously high, over fifty per thousand a year.

And what is the reason? The country is fully populated, no food is available for any additions; but the birth-rate is very high, over fifty per thousand, consequently the death-rate *must* be at the same figure. Since the population cannot increase, as many must die as are born, the subtractions must equal the additions. He concludes then that the death-rate is governed by the birth-rate.

It seems desirable to deal with this argument. Let a simple example be taken in order that the factors may be clear. Suppose a small island, say in the middle of the Pacific Ocean, isolated and totally dependent on its own resources. Assume that this island furnishes food to support a population of 100, and only 100, and that it has by some means become peopled, and its inhabitants number exactly 100.

Now, as long as the food supplies cannot increase, obviously the population cannot increase, and whatever number are born per annum, an equal number at

least must die. If the birth-rate is 5 per cent., then the death-rate must be at least 5 per cent ; if the former be 10 per cent., then the latter must be 10 per cent., and so on.

The Malthusian will ignore the remote possibility that the fertility of the people may not be at least equal to maintaining the numbers, and so for this example it may be assumed they are a fertile people who will not decay and decline. Then it may be agreed that the birth-rate governs the death-rate.

But imagine that by improvements in agriculture the food supplies may be increased to the extent of 1 per cent. per annum. Then, if the birth-rate be 10 per cent., the death-rate must be 9 per cent., that is, it must equal the birth-rate minus the food-rate. For at the end of the year the island will support 101 people, but there is an addition of 10, consequently there must be a subtraction of 9.

How will these 9 deaths be made up ? Some will die of old age, by disease, by accidents, by the attacks of venomous reptiles, or by what may be called natural causes. Thus, suppose 5 die from natural causes, the balance must die from want, or from the diseases and disorders generated by want. In any case 9 people must die, and of those that do not die from natural causes the balance must always be made up by deaths due directly or indirectly to privation.

Now the Malthusian will triumphantly assert, no matter how much these people advance in the control over their environment, however they improve in knowledge or skill, whatever the advance in medicine, building, and the various arts of civilization, so long as the food supply increases at the stipulated rate, all their progress will not and cannot affect their death-rate. If by progress their mortality from natural causes be reduced from 5 per cent. to 2 per cent., then their mortality from privation must increase from 4 per cent. to 7 per cent. All their improvements and developments will be nullified by the pressure of population on the food supplies ; their lot can only be permanently

improved, their term of existence can only be actually increased by either decreasing the birth-rate or by increasing the food supplies.

On the face of it this logic seems irrefutable, and one might be inclined to admit that the death-rate is absolutely governed by the birth-rate and the food-rate. But consider first what experience testifies would actually take place in practice.

Assume that these people have advanced like the human race in the knowledge and resources of civilization. Suppose they have learned to defeat disease, to live peacefully, to protect themselves against severe cold or undue heat, and suppose they find that their success in the war against disease, enemies, the elements, and so on, leads only to more and more of their population being doomed to die by starvation, what would these people do?—have they no remedy? All history shows that they have, and a very simple one—the practice of ancient nations and of savage peoples show that when oppressed by insufficient means, these peoples have always adopted a very simple if reprehensible method of restricting the birth-rate, by the elementary means of refusing life to the infants that are born. Infanticide has always been the simplest method of birth control, and the one most generally adopted. . . .

In the development of civilized man from savage man it is impossible to ignore this fact.

Yet the Malthusian is somewhat blinded to it; because with Christian nations this method is impossible and unthinkable, while with the animal tribes it is of course unknown. But between primitive man and Christian man it has been a remedy always available, and one to which recourse has generally been had.

Infanticide is highly injurious to the parental passions; moreover, the institution of marriage has tended to ensure that men shall bring no more children into the world than they can provide for, consequently infanticide is properly forbidden in advanced societies, and marriage has come to serve substantially the same end; but these facts should not blind the inquirer to

the fact that infanticide has always been of old times the most efficient and generally adopted method of 'birth control.'

Returning to the island society that was imagined, it may be readily seen that if they advanced in the arts of civilization, and so improved their lot, and reduced their mortality from natural causes, they would have readily available a remedy against the menace that threatened to cancel all the advantages secured by progress. They would contrive by one means as civilized man does by another to have no more children than they could provide for. Consequently, in practice it would ensue that the death-rate would *not* be governed by the birth-rate and the food-rate, but on the contrary *the birth-rate would be governed by the death-rate and the food-rate.*

Thus, if the death-rate from natural causes was 5 per cent. and the food-rate 1 per cent., the birth-rate could reach 6 per cent. without pressure on the food supplies. And the community would always endeavour to secure that the population should not increase at a greater rate than the food supplies. The reduction of the birth-rate has always been a comparatively easy problem, but the reduction of the death-rate has been man's constant aim ; it affords perhaps the best criterion of human progress, and his present success is the outcome of a struggle that has gone on for many thousands of years.

And this is the simple answer to the Malthusian objection. The aim of progress is to improve the lot of man ; its effect has naturally been to reduce his death-rate, and he endeavours to make good his improvements by securing that the population shall not increase at a greater rate than his power of providing for it. Consequently, with subsistence slowly advancing, a decreasing birth-rate appears as a general sequel to a decreasing death-rate.

But, reverting to the original proposition, it is obvious that man's *powers* of reproduction have not declined because their exertion is largely restricted.

His fertility remains substantially unaltered, although his birth-rate and death-rate continually decline.

His *powers* of reproduction are manifestly redundant to his situation. Obviously his power of increasing the population is very much greater than his power of increasing the food supply. The instinct to procreate is second only to the instinct of self-preservation. It is because this instinct must be restrained, and can only be restrained with great difficulty, that population tends to press on the means of subsistence.

What warrant is there for assuming that the same thing applies to plant and animal life? That with plant and animal life fertility also is excessive?

Malthus and Darwin adduced no evidence to warrant such an assumption. They do not seem to have recognized that there was any need to prove this proposition, so naturally they did not attempt, or even contemplate, the necessity of proving it.

The provisional conclusions arrived at then are that

- (1) The high fertility obtaining in the animal and vegetable kingdoms is no evidence of excessive fertility; and that
- (2) The analogy of man is not valid and does not warrant the assumption that the redundant powers of reproduction of mankind afford any sanction for the belief that the powers of reproduction are also redundant with other living things.

CHAPTER V

EXAMINATION OF MALTHUS IN REGARD TO MAN

As this brief consideration has clearly suggested that there is some reason to doubt the doctrine of Malthus as applied to the animal and vegetable kingdoms, it becomes necessary to subject it to a still closer examination.

The fundamental cause producing pressure of population and resulting in poverty and misery with mankind, and leading, as Darwin asserts, to a severe and unceasing struggle for existence, is defined by Malthus as 'the constant tendency in all animated life to increase beyond the nourishment provided for it.'

Malthus was concerned only with the human race, and it was only for the human race that he proved his proposition. He alluded to the natural world because the fertility of plants and animals seemed so obviously excessive that he thought it yielded confirmation, and Darwin took it for granted in much the same way. But as Darwin's theory is derived from the doctrine of Malthus in regard to man, it becomes necessary to inquire first whether the proposition of Malthus that there is a constant tendency in the *human population* to press on the means of subsistence is true and well founded. And then, secondly, whether Darwin's application of the Malthusian theory is justified.

Let the doctrine of Malthus in regard to man be then examined. The question which arises is: Is there a constant tendency in *human life* to increase beyond the nourishment provided for it?

The demonstration furnished by Malthus has already been briefly summarized. Carefully read, it remains

true and still carries conviction. It is certainly a fact that the human race can increase its numbers at a greater rate than it can increase its means of subsistence. Objection has been taken to this statement on the ground that plants and animals which serve man for subsistence would, if unrestricted for room or food, necessarily tend to increase in a geometrical ratio in the same way as the human race. But the statement of Malthus dealt with the actual facts as shown by agriculture, and is literally true. The *possible* rate of increase of plants, etc., is not relevant. Man can only increase his food supply by increasing the fertility of land or by replacing the plants and animals of the wild by food plants and domesticated beasts. And this is a process that has been and can be carried out only slowly. The rate of increase of food is then calculable with sufficient exactitude for the purpose, thus providing a rough guide based on the facts of experience. Malthus therefore was justified in saying that the means of subsistence could not be increased faster than in an arithmetical ratio.

The facts adduced for the American States showed that when the food supply was practically unlimited, and every mouth was accompanied by a pair of hands capable of supplying its needs, the power of increase was such that population doubled every twenty-five years over a period of one hundred and fifty years. But there are now no new continents to be discovered, no virgin lands to be exploited ; so that, considering the world in its actual state, Malthus was justified in asserting that food could not be increased faster than in an arithmetical ratio, while the natural tendency of population was clearly to increase in a geometrical ratio. It must therefore be allowed that there is 'a constant tendency in human life to increase beyond the nourishment provided for it.'

But it does not necessarily follow that this tendency will be allowed to materialize. If the above conclusion be examined it will be seen to resolve itself naturally into two parts :—

I. That there is a constant tendency to increase in the human race ;

II. That this tendency to increase causes pressure on the food supply.

Why is there a constant tendency to increase in the human race? The obvious answer is that man's fertility exceeds his mortality. He can produce members faster than they are destroyed. A glance at vital statistics is enough for this purpose. Taking the civilized races of mankind, the mortality varies from about twelve per thousand to about fifty per thousand. And what of the fertility?

The reproductive period for females of the Teutonic race is about thirty-five years. Gestation takes about two hundred and eighty days, and normally only one child is produced at a birth. What the natural fruitfulness of the human race would be if unrestricted it is difficult to say. It is, however, clearly possible and by no means unknown for a woman to bring twenty children into the world. And yet it is quite conceivable that civilized societies might maintain their numbers—allowing for infantile mortality and barren celibate members of the community—if every family were limited to three or four children. Indeed, in France before 1914 the population was increasing although the average number of children per family was less than three.

It is then evident that in regard to mankind there is a great power of increase. It is hardly necessary to observe that there is quite an adequate tendency to exercise that power. The instinct to procreate is clearly proportioned to the power to reproduce. If self-preservation is the first law of nature, reproduction of the species is the second. The sexual passion is second only to the instinct to live. Obviously this instinct to reproduce can be restrained only with great difficulty.

There is, then, not only a power of increase but a strong tendency to exercise that power. It may therefore be said that there is a strong natural tendency to increase in the human race.

It is plain that if human fertility were unrestricted, the birth-rate would greatly exceed the death-rate—there would be a tremendous rate of increase or survival rate—there would be, that is to say, but for one fact, that the food supply could not possibly keep up with the increase of population.

Where this fact has not been recognized in theory, the experience of mankind has forced them to recognize it in practice, and in one way or another practically every human society has found it necessary to restrict human fertility. Savages to-day, like the ancients, practise infanticide, while more modern nations achieve their end largely by stricter regard for the great institution of marriage.

Malthus expressed surprise that his principle had not previously been clearly recognized. But the obvious fact that man's fertility was excessive has been greatly obscured by the institution of marriage. A principal obligation of the marriage contract is that a man thereby becomes responsible for the maintenance of his wife and any offspring of the union. A general result is that a man is thereby precluded from marrying unless and until he is in a position to support a wife and family. A further consequence with civilized man is that he deliberately attempts to restrict his family to the number he can adequately provide for. Manifestly the institution of marriage has had a very great influence in restricting the reproductive powers of the human race, and, as it has generally been regarded as a divine institution (and is plainly a very necessary one), the actual rate of procreation following from its institution has been commonly regarded as indicating the proper fertility of the human race.

But when the fertility of man is regarded in the light of evolution it is at once manifest that the fruitfulness of mankind is far in excess of the needs of the race. That is, having regard to his mortality, his power of increasing the population is far greater than his power of increasing the food supply.

It is from this primary fact that the others follow.

There could be no pressure on the food supplies if there was no power to increase and no strong tendency to exercise that power.

It may make this conclusion clearer if it be remarked that there is no obvious reason in the nature of things why his fertility should be excessive; this follows simply because his powers of reproduction exceed his mortality—it arises solely from a disparity between these two factors. Had the fruitfulness of women been limited to a maximum number of three or four children, human fertility would not have been redundant. There is no necessary reason on the face of things why the women should be capable of bearing twenty or more children. Man's fertility is not the lowest in nature; the elephant can bear only six young in a lifetime of one hundred years, and had man's fertility been a little less than that of the elephant he would have been under no need to deny his instincts, or restrict his family. There could then have been no pressure on the means of subsistence.

Having, then, shown what is the fundamental reason for the tendency to increase in the human race, let the second question be considered: Will this tendency to increase cause pressure on the food supply?

With the human race this need not necessarily follow. Obviously mankind has two remedies that are peculiar to man:—

He can restrict his fertility.

He can increase his food supply by artificial means; that is, by reclaiming waste lands or by increasing the productivity of cultivated lands.

If he can regulate the population so that the increase of numbers does not exceed the increase of subsistence, then obviously the human race will not press on the food supply.

Whether as a matter of fact man does so regulate his increase, whether there is in fact a pressure of population on subsistence, is a question that is outside the scope of this inquiry. What this essay is primarily concerned with is not the cause of poverty but the

cause of natural selection. It is sufficient for this purpose that it has been established :—

That there is a natural power and tendency to increase in the human race.

That this tendency results from man's redundant powers of reproduction.

The first part of this inquiry can, then, be concluded.

A close analysis and examination has shown that the Malthusian doctrine in regard to man is fundamentally true.

Additional confirmation is gained from the fact that it is the orthodox doctrine of science and has been accepted by practically every thinker of repute.

Henry George in *Progress and Poverty* says : ' It was fought with a bitterness in which zeal was often more manifest than logic. But it has triumphantly withstood the ordeal, and in spite of the refutation of the Godwins, the denunciations of the Cobbetts, and all the shafts that argument, sarcasm, ridicule and sentiment could direct against it, to-day it stands in the world of thought as an accepted truth, which compels the recognition of those who would fain disbelieve it.'

As the Neo-Malthusians are so proud of reminding their readers, in 1877 the Lord Chief Justice of England in his charge to the jury in the trial of Bradlaugh and Mrs. Besant, pronounced the discovery of Malthus to be ' an irrefragable truth.'

Huxley said that the conclusions of Malthus have ' never yet been disproved and never will be.'¹ It is now a century and a quarter since the *Essay on Population* was first published, and after this lapse of time a modern judgment is this : ' The broad principles of the Essay can be doubted only by those who do not understand the question.'²

¹ *Man's Place in Nature*, ch. viii.

² T. Kirkup in *Chambers's Encyclopædia*.

CHAPTER VI

EXAMINATION OF MALTHUS IN REGARD TO PLANTS AND ANIMALS

CONSIDERATION is now directed to the application of the Malthusian doctrine made by Darwin.

Malthus had himself indicated that it applied to the animal and vegetable kingdoms, but it remained for Darwin to draw the conclusion that it must lead to a struggle for existence.

The relevant quotations of Malthus have already been given ; it may, however, be convenient to repeat the chief one here :—

‘ In plants and irrational animals the view of the subject is simple. They are all impelled by a powerful instinct to the increase of their species ; and this instinct is interrupted by no doubts about providing for their offspring. Wherever, therefore, there is liberty, the power of increase is exerted ; and the superabundant effects are repressed afterwards by want of room and nourishment.’

In other words, the fertility is high and unrestricted and so must lead to a superabundance of offspring, and the great majority of the superfluous progeny must be subsequently killed off through want of room and nourishment.

With Darwin the view is equally simple. One full quotation has been already introduced ; but in order to leave no room for doubt or suspicion of unfairness, the writer has extracted a succession of references from the *Origin of Species* alluding to the cause of the Struggle for Existence and showing how Darwin applied the doctrine of Malthus :—

‘ . . . the Struggle for Existence amongst all organic

beings throughout the world, which inevitably follows from the high geometrical ratio of their increase. This is the doctrine of Malthus applied to the whole animal and vegetable kingdoms. As many more individuals of each species are born than can possibly survive; and as consequently there is a frequently recurrent struggle for existence . . . ' ¹

' All plants and animals are tending to increase at a geometrical ratio . . . this geometrical tendency to increase must be checked by destruction at some period of life.' ²

' Each organic being is striving to increase in a geometrical ratio.' ³

' Many more individuals are born than can possibly survive.' ⁴

' If there be, owing to their geometrical rate of increase, a severe struggle for life at some age, season or year, and this certainly cannot be disputed . . . ' ⁵

' The struggle for existence inevitably follows from the high geometrical ratio of increase which is common to all organic beings.' ⁶

' . . . More individuals are born than can possibly survive.'

' Each species tends by its geometrical rate of reproduction to increase inordinately in number.' ⁷

It is patent that Malthus and Darwin took the matter for granted. Malthus devoted a whole book to proving his case for man, but only made a passing allusion to the seemingly prodigal fertility of nature, a fertility which to him appeared to be obviously and unmistakably superfluous.

Darwin does no more. More are born than can possibly survive, he says, therefore a struggle for existence must follow. The argument seems transparently simple and convincing until the facts are examined, and then one finds that cause and conse-

¹ *Origin of Species*, Introduction, p. 3.

² *Ibid.*, ch. iii. p. 48.

⁴ *Ibid.*, ch. iv. p. 58.

⁶ *Ibid.*, ch. xv. p. 386.

³ *Ibid.*, ch. iii. p. 57.

⁵ *Ibid.*, ch. iv. p. 96.

⁷ *Ibid.*, ch. xv. p. 388.

quence have been confused. Plainly a large number of eggs or seed *must* be produced in order that one or two, escaping all dangers, may achieve maturity. Species *must* have a high fertility or they would die out. Reproductive germs come into a theatre of strife, a hostile world, a place where they must struggle for existence. High fertility is absolutely necessitated by this struggle for existence which obtains in nature.

Manifestly it is begging the question to assert that high fertility must lead to a struggle for existence, when the contrary relation is equally tenable and far more probable. It is much the same with his other argument—that the struggle for existence inevitably follows from the high geometrical ratio of increase. But how does he know there is any rate of increase at all? Admittedly if there were an increase it must of necessity tend to be geometrical; there would be increase on the increase, and so on. But it is idle to discuss the rate before proving the fact. In nature, as it has been in historical times, the population of the great majority of species has remained practically constant, *i.e.* the population has increased at no rate at all; tendency to increase, if there has been such a tendency, has never materialized. How does he know there *is* such a tendency?

Darwin begs the question.

Plainly Malthus and Darwin took the matter for granted. They were very greatly impressed with the fact that man's reproductive powers were redundant. They had come to the conclusion that this powerful urge was the true cause of what had always heretofore been considered a great mystery, namely, the poverty and misery of the mass of mankind. It was a new doctrine, a powerful doctrine, and essentially a true doctrine. So when Darwin looked at nature and saw the vast profusion of seeds, of reproductive germs of all kinds, what more natural, what more inevitable than the persuasion, the inspiration that here was the same irresistible urge, the same power at work—a power that drove blindly and unceasingly to the increase of

all living things, one law for the whole of life, ' Be fruitful and multiply ' ?

And as this power could not fulfil itself, as this tendency to increase could not materialize, what more natural than that it should cause poverty and misery with mankind and a never ceasing struggle for existence with the rest of living things.

And this power that seemed so blind and so futile, so incompatible with a beneficent providence, was found to work through poverty and struggle to—' progress ! ' This merciless discipline was the cause and the key to progress and human advancement. So that it was not really futile. It lent itself readily to the adumbration of philosophic doctrines, and partly at least to theological persuasions.

It seems plain that Malthus and Darwin jumped to a conclusion, and that since it worked, since it yielded them a valuable instrument of interpretation, they never had occasion to call into question this primary conviction. They never took pains to analyse or examine it. They never sought to prove it. But Darwin's hypothesis broke down at the human race, a fact which probably did not trouble Darwin, who was a naturalist first and last and all the time. In this investigation, however, that failure is the primary concern ; it is a breakdown for which the cause and cure are being sought. And it is for this reason that these facts and considerations are being closely scrutinized.

Let, then, the examination be resumed ; and in order that no point may be overlooked it is desirable to return to the *Origin of Species* and inquire if Darwin introduced any minor arguments, other than the ones already quoted, in support of his belief that plant and animal life ' tends to increase beyond the nourishment provided for it.' He does introduce something of the kind in the chapter on Struggle for Existence, where he expands his argument as follows :—

' There is no exception to the rule that every organic being naturally increases at so high a rate, that if not destroyed, the earth would soon be covered by the

progeny of a single pair. Even slow breeding man has doubled in twenty-five years, and at this rate in less than a thousand years there would literally not be standing room for his progeny. Linnæus has calculated that if an annual plant produced only two seeds—and there is no plant so unproductive as this—and their seedlings next year produced two, and so on, then in twenty years there would be a million plants.'

What can be said of this argument? It shows the rate at which life would increase in a world where food and room were unlimited and death unknown. It cannot have any relevance to the actual conditions obtaining in this world where enemies abound, the seasons are unkind, and rivals a constant menace, and where consequently mortality is necessarily heavy. There can be no tendency to increase, unless organisms tend to be produced faster than they are destroyed. And the imaginary conditions obtaining in an ideal world can have no possible bearing on this point.

Another consideration of a similar but not so artificial a character is put forward by Darwin: 'Cases of the astonishingly rapid increase of various animals in a state of nature where circumstances have been favourable to them for two or three following seasons'; and also cases of the rapid increase of domestic animals which have run wild in parts of the world, for example cattle and horses in South America.

The former case shows what happens when there is a change of conditions. And one might with equal justice adduce the fact that many species of animals have not increased but become extinct in historic times from the same cause.

Obviously if enemies are reduced or the seasons become less rigorous and food supplies are expanded from a change in the conditions—whether climatic, geographic, or otherwise—a species so favoured will tend to increase until it fills its new place in the economy of nature. And then, what?—population will be limited by the means of subsistence, fertility will be related to mortality, and what evidence is there

that fertility will be excessive for the needs of the race and will cause pressure on the means of subsistence.

This example affords no evidence on the point, and no more does the expansion of domestic animals, if they are enabled to fill a vacant space in the economy of nature, or replace species not so well fitted for that particular sphere of existence.

The argument may now be summarized. In Darwin's view the fundamental cause, the driving force of evolution, derives from the pressure of population on the means of subsistence, or in the words of Malthus, from 'the constant tendency in all animated life to increase beyond the nourishment provided for it.'

Is this assertion true? is this belief justified? Apart from *appearances*, which are proverbially deceptive, it is clear that this belief has really derived from the relative facts with regard to the human race. It needs only to be recalled that civilized societies can maintain their population with an average family of less than three children, while nature has endowed females with the power of producing twenty or more offspring, to see clearly that the reproductive powers of the human race are redundant to the need of maintaining the population.

It needs only to be admitted that the instinct to reproduce is proportioned to the power to reproduce, to see clearly why there should be a constant tendency for population to press on the means of subsistence.

The actual reproduction of offspring may or may not be excessive; it is the *power* of reproduction, the natural fertility of the human race, that is clearly and indisputably redundant to the needs of the race.

It is confidently submitted that the pressure of human population on the food supply can be properly attributed to this cause and this cause alone—to man's redundant powers of reproduction, his excessive fertility.

The reason why man's procreative powers are superfluous has been clearly seen; it is due to the continuous reduction in his death-rate, a reduction that has been

the natural concomitant of the progress of the human race. But this is an evolution answer ; and naturally it was impossible for Malthus to arrive at such a solution, simple though it may be. And the confusion that has ensued has followed almost wholly from the explanation of the cause that Malthus furnished.

Malthus explained the phenomena by pointing out that while man's prolific powers would enable him to increase in a geometrical ratio, the limitations of agriculture would only permit the food supply to increase in an arithmetical ratio. It was the practical argument of a practical man and adequate for the purpose. It rested on empirical facts, not on philosophy, for as so often pointed out, the plants and animals which serve man for food have the same tendency to increase in *geometrical* ratio as man has.

The iniquity of this fallacious demonstration, and particularly of the emphasis on the tendency to increase in geometrical ratio, is the fact that it was taken to furnish evidence that all living things tended to press on their means of subsistence. And thus Darwin thought it sufficient to assert that a struggle for existence must inevitably follow from the tendency to increase in a geometrical ratio.

The fact that if organic beings tended to increase, the *rate* of increase would necessarily tend to be in geometrical ratio, or of the same nature as compound interest, furnishes no evidence that there is, in fact, any tendency to increase at all. Obviously it is idle to discuss the rate before proving the fact.

And the fact that there is a tendency to increase can be proved only by demonstrating that the powers of reproduction are redundant, that they are excessive for the need of maintaining the population. Plainly many seeds and many offspring must be produced by plants and animals, because the journey from infancy to maturity is a hazardous one, and the young suffer a heavy mortality. The species is carried on by the mature members who achieve reproduction. Every year a certain number of these adult members are lost by

natural causes of mortality. If the population is to be maintained, then every year these adult losses must be made good by young adults achieving maturity.

But obviously there will be no pressure on the food supply unless these recruits tend to exceed the natural adult losses. In such an event, and assuming that the area is fully populated, there would then certainly be an intestine strife for the limited food supplies available, a strife that would cause a struggle for subsistence and have the inevitable effect of accentuating the death-rate.

But in such a case the reproductive powers of the race would be excessive. The population could be maintained by a lessened prolificness, a diminished fertility. And no doubt natural selection would make the necessary adjustment, and achieve by natural means what man achieves by artificial means, by human regulation.

In any case the situation is clear. The pressure of population on the food supplies which Malthus and Darwin assert, and assume, can be proved only by proving that reproduction is redundant, that the fertility of animals and plants is redundant to the need of maintaining the population of the various species. There can be little doubt that Darwin would have recognized the validity of this test, though the view that undue prolificness is the primary cause of the alleged pressure on subsistence is implied rather than definitely asserted in the *Origin of Species*; for in the *Variation of Animals and Plants under Domestication* he does explicitly state that it is 'the redundant power of reproduction which inevitably leads to a struggle for existence, and as a consequence to the natural selection or survival of the fittest.'¹

¹ Last passage of last chapter.

CHAPTER VII

WHAT CONSTITUTES EVIDENCE OF EXCESSIVE FERTILITY

IT will now be considered as evident that the evidence on which Malthus and Darwin relied has been proved fallacious.

The question whether there is a struggle for existence in nature caused by the pressure of the animal and vegetable kingdoms on the means of subsistence has been found to depend on the answer to one question, and one question only, viz. 'Is the fertility of plants and animals redundant?'

How can this question be solved? In the first place, the struggle for existence that manifestly obtains in nature can be examined to see if there is evidence of mortality occasioned by pressure on the means of subsistence.

Secondly, all available independent evidence and considerations bearing on the question will require careful consideration.

It needs to be recognized that undue prolificness as a cause of mortality will not manifest itself in any very decisive manner. The evidences adduced by Malthus in regard to human societies show this. Barbarous societies of mankind, the herdsmen of Asia, and the savages of other lands have a very heavy death-rate. A reader of Malthus might imagine that this mortality was occasioned because of their failure to restrict their reproductive powers. But this high death-rate manifestly arises very largely from their precarious command over their means of subsistence, from their ill-regulated government and general aggressiveness. Uncivilized

peoples are of course unlikely to restrain their sexual instincts, and the indulgence in unrestricted reproduction might very possibly aggravate their condition by the pressure of numbers, a pressure that may eventuate in war, privation, and the diseases that follow privation. The mortality arising from natural causes would thus be accentuated. But in regarding any barbarous society it would be quite difficult to say what proportion of their mortality, if any, was due to pressure of population and what was inevitable, arising from the conditions under which they lived. But where pressure of population makes itself felt in such societies, there are generally some indications of its presence. Thus the ancient Germans organized migrations of the young men, the ancient Greeks distributed their surplus in numerous colonies, and where the redundant numbers could not find an outlet it was quite natural for peoples of this type to prevent further increase by the systematic destruction of their progeny. And where population is reduced in one or the other of these ways and yet the numbers of the society are fully maintained, it becomes evident that the powers of reproduction are redundant and that all the needs of the race could be satisfied with a restricted fertility. In nature, however, these remedies will not be available; if there be a pressure of population it can eventuate only in competition for the food or room available, and in elimination of the unsuccessful by privation and starvation. It will not be clearly apparent whether the natural mortality in any animal species is accentuated by this intestine strife or not.

The only real test for redundant fertility is this, that the population could be maintained with a restricted fertility as is the case with humanity. A competent naturalist might possibly test this with a species of wild flower by depriving it of a proportion of its ovaries or seed-bags and noting if the population of the species was maintained. But in the absence of such experiments evidence can be obtained only by

observation of available material, and then by consideration of all the relevant factors.

Let, then, the inquiry be first directed to noting whether there is any obvious indication of excessive fertility in the animal and vegetable kingdoms.

CHAPTER VIII

THE STRUGGLE FOR EXISTENCE

IT is now proposed to examine what Darwin has termed the Struggle for Existence. The examination will have two objects in view. To determine

- (1) Whether the struggle for existence affords any warrant for the assertion that reproduction is redundant.
- (2) Whether there is any cause for a struggle for existence apart from strife due directly or indirectly to redundant reproduction.

This inquiry really resolves into the question, What causes the mortality among animals and plants? If the agents of destruction are known, it will then be easy to ascertain whether privation or starvation is among them, and if so, what its necessary results must be.

It is not difficult to gather from a brief inquiry that animals and plants suffer a considerable destruction from enemies, from the rigour of the elements, and from the competition of rivals. And it is plain that these causes of mortality are not occasioned by pressure of population or inadequate food supplies. Whether there be famine in the land, or whether it be a land of plenty, individuals will be killed by enemies or destroyed by the severity of the elements or the competition of rivals.

In order to gain some idea of the destruction wrought by these agencies, it is proposed to give some quotations from Darwin, Wallace, Spencer, etc.

Mortality alleged to be due to hunger and lack of food will for the present be disregarded. Regard will be had to what may be termed natural and inevitable

causes of mortality. And to be comprehensive, it might be desirable to include an additional agency to those already specified, viz. deaths from old age, disease and accidents. These causes which are a principal cause of mortality in the human race do not appear to have by any means the same influence in the life of the wild. Little is known about them, but the burden of years is no doubt a contributing disability in some cases, such as forest trees, so that these agencies cannot very well be ignored.

Consequently, causes of natural mortality will be looked for under the following heads :—

Class A—

- (1) Destruction from enemies.
- (2) Destruction from the elements.
- (3) Destruction from old age, disease, and accidents.

While in a separate and very important class must be placed—

*Class B—*Destruction through the competition of rivals.

In considering the mortality of plants and animals it is very desirable to keep in mind that the young suffer a much greater destruction than the adults. Obviously young animals have less power of evading enemies, of resisting the rigours of climate, and of competing with rivals. It is clear that the mortality among the young must be very much greater than among the adults, but it is hardly possible, and hardly necessary, perhaps, to ascertain the proportion. In the review that follows it may, however, be advisable to bear this distinction in mind. Darwin recognized it clearly in asserting that ‘the real importance of a large number of eggs or seeds is to make up for much destruction at some period of life, and this period in the great majority of cases is an early one.’¹

As a first example it is proposed to take the familiar one of birds.

‘Nestling birds,’ says Wallace, ‘are often killed by

¹ *Origin of Species*, ch. iii.

heavy rains or blown away by severe storms or left to die of hunger if either of the parents is killed, . . . they offer a defenceless prey to jackdaws, jays, and magpies, and not a few are ejected from their nests by their foster brothers the cuckoos. When they leave the nest great numbers are destroyed by buzzards, sparrow-hawks and shrikes—those remaining in winter are greatly thinned by cold and starvation in severe winters; of those which migrate in autumn, a considerable proportion are probably lost at sea or otherwise destroyed before they reach a place of safety.’¹

Thus with birds. First there are enemies which eat the eggs; then there are various enemies which destroy the nestlings; there are again other enemies which seek to devour them when they have learned to fly. Enemies all the time, from the moment the egg is laid to the last day of the bird’s life.

Apart from enemies there is the severity of the elements. Birds that do not migrate must endure the most cruel nights of frost, the most severe tempests, and long-continued rains.

How severe is the destruction sometimes wrought may be gathered from an observation of Darwin that ‘the winter of 1854-5 destroyed four-fifths of the birds in my grounds.’²

Of the birds which prefer to escape the rigours of winter by migrating ‘a considerable proportion are probably lost at sea or otherwise destroyed before they reach a place of safety.’³

Here, then, is severe destruction wrought by enemies and the elements. A destruction caused not by want of food, not by any pressure on the means of subsistence. Does it afford any evidence that the reproduction of birds is redundant. The fertility of birds is not very heavy. ‘On the *lowest* calculation’⁴ Wallace estimates the progeny are each year twice as numerous as their parents. That is, every pair of birds has at least four offspring; and supposing the

¹ *Darwinism*, p. 25.

³ Wallace, *Darwinism*, p. 25.

² *Origin of Species*, ch. iii.

⁴ *Natural Selection*, ch. ii.

average were eight or even twelve, what warrant is there for asserting that the reproduction is redundant?

If the species of bird life is to persist, then every two parent birds that die must be replaced by two young birds who achieve maturity. Two old adults are lost to the species, two young adults must replace them. If the parent birds from their several hatchings send twelve young birds out to seek their living, are they adding an excessive number to the species? Is it not quite possible that out of the dozen only two will escape their numerous enemies, survive the rigours of winter, all the dangers that surround them from infancy to adult life, and so that two, and only two, will on the average achieve maturity, and become in their turn reproductive members of the race? No exact statistics are available, but on the evidence as it stands it may be safely stated that it affords absolutely no warrant for asserting that the fertility of bird life is excessive.

It may also be asserted with equal confidence that the conditions under which birds live make life hazardous and uncertain, that there is a struggle for existence due to the existence of enemies and the periodic rigours of climate, etc., a struggle that must obtain whether there is or is not an intestine struggle for inadequate food supplies.

But the fertility of bird life is comparatively low. As a second illustration, let a class of life be taken where the fertility is extremely high, so high as to seem on the face of it altogether superfluous. The class referred to is that great branch of invertebrate life known as insects.

With insects, the fertility, though generally high, is not invariably so. It seems in fact to be extremely variable. Thus Darwin says that 'One fly deposits hundreds of eggs, while another, like the hippobosca, a single one.'¹

As instances of extremely high fertility there is the assertion of Linné, who said in regard to *M. Vomitoria*

¹ *Origin of Species*, ch. iii.

that 'three of these flies will devour a horse as quickly as would a lion,'¹ this being possible owing to their enormous rate of reproduction.

Kirby and Spence note that one female of *S. Carnaria* will give birth to twenty thousand young, which in five days after being hatched attain their full size, and they thus conclude that there was some ground for Linné's assertion.

Herbert Spencer² instances the Gordius or hair worm, which lays eight million eggs in a day, and the African termite, which lays eighty thousand eggs in twenty-four hours.

Wallace³ says of *Musca Carnaria*, a flesh fly, that it produces twenty thousand larvae which reach their full size in five days; each parent fly may be increased ten thousandfold in a fortnight; in three months there would be one hundred million of millions of millions, a number greater, probably, than exists at any one time in the world.

Another example of the rate of increase in insects is afforded by the green fly (aphis). It is said that one fly to-day would mean, should all its descendants survive, sixteen thousand green flies in a week's time.

From these instances one might very possibly jump to the conclusion that the powers of reproduction in insect life are beyond all reason or necessity, and are evidence of a blind instinct to reproduce which has no reference to the welfare of the species. A little inquiry, however, serves to show that, with insects, destruction is equally prodigious, and arises out of the conditions of their life. Insects have little power of resisting life-destroying influences or of evading the enemies that feed upon them. Among these enemies are the great classes of birds and fishes which gain a large part of their subsistence from insect life. Kirby and Spence remark that 'the waters swarm with insects of every order as numerous in proportion to the space they

¹ Quoted by Kirby and Spence in *Entomology*, seventh edition, 1857, Letter ix.

² *Principles of Biology*, § 358 and § 360.

³ *Darwinism*, p. 25.

inhabit as those that fill the air, which form the chief nutriment of multitudes of our fishes and the partial support of almost all.'¹

Fly-fishers are well acquainted with this fact, and take advantage of it when following their craft.

Then, as to birds: 'The number of birds that derive the whole or a principal part of their subsistence from insects is, as is universally known, very great, and includes species of almost every order.'

In a pamphlet issued by the Royal Society for the Protection of Birds appears the following:—

'A great proportion of the commoner small birds of the countryside live ENTIRELY OR CHIEFLY ON INSECTS. The amount they consume is prodigious, for a bird will eat one-sixth of its own weight in a day. Beyond this comes the fact that even those species which as adults feed more or less on another diet, FEED THEIR YOUNG ON INSECTS—on grubs, worms, and flies. It is impossible to ignore the quantities of insect-food consumed by nestling birds. Young birds eat their own weight of food in twenty-four hours. A young robin (to quote a well-known computation) will eat fourteen feet of worm in twelve hours, and be ready for more. A moment's consideration of the number of nests and young, and of the number of times a day, an hour, in which food is brought to the ever-hungry brood, may suggest the MILLIONS UPON MILLIONS OF INJURIOUS INSECTS so destroyed, but no conception can realize the gigantic total.'

'Professor Newstead states that on a low average a starling visited its young with food 169 times in the 17 hours of its day (on certain days about 340 times). A great tit watched by the same observer made 384 visits in the day. "If 20 days are occupied in rearing the young, that gives us a grand total of 7680 visits to the nest, so that the single pair of birds would be responsible for the destruction of between 8000 and 9000 insects, chiefly caterpillars." The redstart has been seen bringing caterpillars to its nest 23 times an

¹ Kirby and Spence, *Entomology*, Letter ix.

hour, making, if even but one was brought each time, 2254 in a week. The flycatcher feeds its young with flies 500 times a day.'

'Nearly all the small birds of Great Britain are engaged in this work of destruction from March to August; and in a lesser degree all the year through.'¹

Birds and fish, then, inflict enormous destruction on the insect world. In addition to these terrible enemies, there are numerous carnivorous insects. The hedgehog and mole eat large quantities of wire-worms. Swine root up whole acres in search of grubs and cockchafers. Ant-eaters are especially adapted to live on ants; they have a tongue 'over 2 feet long, worm-like and wet with saliva,'² with which they swallow thousands at a time. There are even insectivorous plants.

Apart from enemies, insects have little power of resisting the elements and are rapidly destroyed by cold weather. The myriads of insects whose murmurous hum is said to be the true voice of summer, disappear as if by magic at the approach of winter.

Since insects persist, their fertility is obviously equal to the needs of the race and capable of making good the immense destruction to which they are subjected. But the facts, as shown, plainly afford no warrant for asserting that the fertility, though enormous, is in any way excessive. And there is clearly a struggle for life—to escape enemies and withstand the elements—that is independent of any intestine strife or competition for food.

Generally speaking, with animals, if there is a severe struggle against enemies and the elements, it would be expected that natural selection would lead to the development of remedial measures. And the fact that animals exhibit all sorts of adaptations which protect them against the one or the other is a good indication of the severity of the struggle that constantly goes on in the natural world.

¹ *Birds, Insects and Crops*, May 1917.

² Kirby and Spence, Letter ix.

Spencer gives a comprehensive account of these devices, and states that animals exhibit numerous adjustments by which in some cases 'they survive desiccation, they hibernate, they acquire thicker clothing, and so are fitted to bear unfavourable inorganic actions.'¹

As regards enemies, 'They are in many cases fitted passively to meet the adverse actions of other organisms, by bearing spines or armour or shells, by simulating neighbouring objects in colour or form or both, by emitting disagreeable odours, or by having disgusting tastes. And in more active ways they save themselves from enemies by developed powers of locomotion taking the shape of swiftness or agility or aptitude for changing their media; by their strength, either alone or aided by weapons; lastly, by their intelligence, without which indeed their other superiorities would avail them little.'

Animals are, of course, also wonderfully adapted and organized to obtain food and to get the necessary nourishment therefrom. This is very strikingly the case with carnivorous animals and with the digestive apparatus of herbivorous animals. But the fitness of an animal to obtain food is another question, and one that need not be considered here. Generally speaking, the faculties animals have developed for escaping enemies and withstanding the elements could not have been developed by any competition, however severe, for obtaining food. The speed of the deer, the warm fur of arctic animals, for example, is little or no advantage in obtaining food, and could not have been developed in a competition for inadequate food supplies; but such qualities are readily explained by natural selection operating on animals menaced by enemies or the elements.

As regards vegetable life, the testimony is very similar.

All animal life is supported, directly or indirectly, by the Vegetable Kingdom. And generally speaking,

¹ *Principles of Biology*, § 317.

as far as plants are concerned the whole animal world are enemies.

As regards the elements, plants are specifically adapted to the different stations determined by climate, moisture, etc., and are definitely fitted to their various places in the economy of nature.

In regard to seeds, it is well known they are frequently produced in vast quantities. There is one reason for this which does not apply in the case of young animals. The animal can wander abroad in quest of his food. But the seed has to reach a favourable situation in order that it may have a chance to germinate and grow. The means by which seeds are disseminated are remarkable for their diversity and ingenuity. But it is obvious that a large proportion of seeds must fall in unfavourable places. The puff-ball, for instance, produces a million spores, but the world is not filled with this particular fungus for the good reason that the stations where this plant can grow are very peculiar, and very limited, and of the million spores wafted abroad the vast majority must fall in places where they cannot germinate.

The waste suffered by the reproductive germs of plants in finding suitable places in the economy of nature is very great. To this loss must be added that of enemies and the elements.

As regards enemies, there is obviously a vast destruction of seeds by birds, insects, and other animals. For those that find a suitable place and germinate, other enemies are in waiting. In Darwin's experiment previously instanced, 83 per cent. of seedlings perished, chiefly by the attack of slugs and insects. Of the plants that achieve maturity, a large toll is taken by insects, browsing mammals, and other animals. As with animals, the fact that plants have developed qualities that make them inedible, is an indication of the severity of the struggle for existence. As Spencer remarks, 'Plants have various passive adaptations, as thorns, stinging hairs, poisonous and acrid juices,

repugnant odours, and the woolliness or toughness that makes their leaves uneatable.'¹

A careful consideration of the mortality suffered by the seeds of plants will surely make one pause before agreeing with the view of Malthus, that because nature scatters these seeds abroad 'with the most profuse and liberal hand,' therefore the supply is superfluous and must lead inevitably to an intestine strife for the limited room available.

Generally speaking, if a plant species is to persist seeds must be produced and scattered abroad in great abundance in order that one or two, escaping all dangers, may achieve maturity and continue the race.

On the face of it the facts afford no warrant for asserting that reproduction is redundant. But the facts do show with equal clearness that, apart from any supposed intestine strife for the limited room available, enemies, the elements, and the difficulties of dissemination do make this world a theatre of strife—that there is for plants, as for animals, a 'struggle for existence.'

Attention is now directed to a very different aspect of the struggle for existence. A species may withstand enemies and the severity of the elements, may find adequate sustenance, and maintain its numbers; it might indeed persist unchanged and unimproved and endure to the world's end, but for one vital fact—always it is menaced by the possible appearance of some rival type of life—a type better fitted to exploit the resources of that particular environment.

Thus the less developed animals and plants of Australia and New Zealand might have persisted indefinitely so long as they were not subjected to the competition of the more developed organisms of other continents. But once that irruption began, these living fossils became doomed. Thus Darwin remarks: 'The endemic productions of New Zealand, for instance, are perfect compared one with another; but they are now rapidly yielding before the legions of plants and animals introduced from Europe.'²

¹ *Principles of Biology*, § 317.

² *Origin of Species*, ch. vi.

Thus it is not enough to obtain food, to withstand enemies and elements—a species must not only do this, it must do so more efficiently than any rival species which comes into contact with it.

It seems to the writer that from this competition between rival types of life has largely come about that elimination of the inferior, that selection of the superior, which constitutes survival of the fittest and leads to evolution.

The evolution of terrestrial vertebrates reveals this process on a large scale. It represents the continual development of animal life better fitted to exploit the conditions obtaining on dry land. Thus reptiles were displaced and replaced by mammals; and so were marsupial mammals eliminated and replaced by placental mammals.

Darwin has given a large number of examples of this kind of competition between rival types.

After a customary allusion to the supposed intestine strife between individuals of the same species, he goes on to say: 'In the case of varieties of the same species, the struggle will generally be almost equally severe and we sometimes see the contest soon decided; for instance, if several varieties of wheat be sown together, and the mixed seed be re-sown, some of the varieties which best suit the soil or climate, or are naturally the most fertile, will beat the others and so yield more seed, and will consequently in a few years supplant the other varieties. To keep up a mixed stock of even such extremely close varieties as the variously coloured sweet-peas, they must be each year harvested separately, and the seed then mixed in due proportion, otherwise the weaker kinds will steadily decrease in number and disappear. So again with the varieties of sheep; it has been asserted that certain mountain varieties will starve out other mountain varieties, so that they cannot be kept together. The same result has followed from keeping together different varieties of the medicinal leech. It may even be doubted whether the varieties of any of our domestic plants or

animals have so exactly the same strength, habits and constitution, that the original proportions of a mixed stock (crossing being prevented) could be kept up for half a dozen generations, if they were allowed to struggle together, in the same manner as beings in a state of nature, and if the seed or young were not annually preserved in due proportion.'

'As the species of the genus usually have, though by no means invariably, much similarity in habits and constitution, and always in structure, the struggle will generally be more severe between them, if they come into competition with each other, than between the species of distinct genera. We see this in the recent extension over parts of the United States of one species of swallow having caused the decrease of another species. The recent increase of the missel-thrush in parts of Scotland has caused the decrease of the song-thrush. How frequently we hear of one species of rat taking the place of another species under the most different climates! In Russia the small Asiatic cockroach has everywhere driven before it its great congener. In Australia the imported hive-bee is rapidly exterminating the small stingless native bee. One species of charlock has been known to supplant another species; and so in other cases. We can dimly see why the competition should be most severe between allied forms, which fill nearly the same place in the economy of nature; but probably in no one case could we precisely say why one species has been victorious over another in the great battle of life.'¹

Wallace recognizes the same struggle between rival types, and gives an illustration with regard to the human race.

'It is the same great law of "the preservation of favoured races in the struggle for life," which leads to the inevitable extinction of all those low and mentally undeveloped populations with which Europeans come in contact. The Red Indian in North America and in Brazil; the Tasmanian, Australian and New

¹ *Origin of Species*, ch. iii.

Zealander in the southern hemisphere, die out not from any one special cause, but from the inevitable effects of an unequal mental and physical struggle. The intellectual and moral, as well as the physical, qualities of the European are superior; the same powers and capacities which have made him rise, in a few centuries, from the condition of the wandering savage, with a scanty and stationary population, to his present state of culture and advancement, with a greater average longevity, a greater average strength, and a capacity of more rapid increase,—enable him when in contact with the savage man to conquer in the struggle for existence, and to increase at his expense, just as the better-adapted increase at the expense of the less-adapted varieties in the animal and vegetable kingdoms, just as the weeds of Europe overrun North America and Australia, extinguishing native productions by the inherent vigour of their organization and by their greater capacity for existence and multiplication.’¹

Here, then, are excellent examples of elimination and selection among different kinds of wheat, sweet-peas, sheep, leeches, swallows, thrushes, rats, cockroaches, bees, charlock, and different branches of the human race. Why is it such a struggle goes on, and why is it so deadly and decisive? Wallace gives perhaps the best answer. Referring to the struggle which goes on between closely related species which fill nearly the same place in the economy of nature, he says the struggle almost always terminates in the destruction of one of them, because ‘they require nearly the same kind of food, are exposed to the same enemies and the same dangers. Hence if one has ever so slight an advantage over the other in procuring food or in avoiding danger—in its rapidity of multiplication or its tenacity of life, it will increase more rapidly and by that very fact will cause the other to decrease and often become altogether extinct.’

It may then be safely concluded that in nature as it is there exists a struggle against enemies and the elements,

¹ Wallace, *Natural Selection*, ch. viii. p. 177.

a struggle made especially severe through the severe competition of rival types. Assuming that food is in abundance, this type of struggle must still go on. And this brief survey has shown that the destruction inevitably suffered by living things in the world as it is is very high indeed. In view of this destruction, there is absolutely no warrant for asserting that the fertility of living things is excessive, that their reproduction is redundant. Let it be remembered that Malthus and Darwin assert that the reproduction of plants and animals *is* redundant.

This is a dogma based on careless scrutiny of the facts, and on a misleading analogy, but while insisting that it has never been proved, that the facts afford no warrant for the assertion, the writer does not claim that the facts disprove it, that the dogma has been demonstrated to be false.

This remains for the following chapter—all the conclusions claimed for the present chapter are that the facts disclosed by an examination of the struggle for existence—

- (1) Afford absolutely no warrant for asserting that reproduction is redundant.
- (2) That apart from any alleged intestine strife due to redundant reproduction there is in fact a struggle for existence due to the existence of enemies, the severity of the seasons, and the competition of rivals.

CHAPTER IX

DISPROOF OF MALTHUSIAN DOGMA

THE conclusion of the last chapter was that the dogma of redundant reproduction was without warrant, and it was asked could it be proved false.

While actual experiment could alone furnish absolute proof, there is a powerful argument which must make the strongest appeal to any one who appreciates and admits the efficacy of the great engine of natural selection. Darwin, of course, derived natural selection from redundant reproduction or the pressure on food supplies, and it might at first sight be thought that in discrediting the Malthusian dogma the writer is undermining the foundations of natural selection. But the writer does not think this. He believes in natural selection for two reasons. The first and most important is that it works ; the second is that natural selection really follows, not from redundant fertility, but from the struggle for existence. Darwin's argument was that (1) Redundant Reproduction caused (2) Struggle for Existence, which led to (3) Natural Selection.

All the writer has done is to cut out the first term, 'Redundant Reproduction.' Natural selection then follows, as it always has done, from the struggle for existence. The last chapter has been designed to show that there is a struggle for existence in the nature of things. It is taken as a fact of observation. What is its fundamental cause is unknown. But the proximate cause lies in the competition between rival types of life for the different places in the economy of nature, success in the struggle being determined by the relative success in withstanding the assaults of enemies, in

dealing with the severity of the seasons, and in exploiting the available food supplies. Darwin himself seems to recognize that this struggle is an empirical fact, for he remarks in his autobiography that he was 'well prepared to appreciate the struggle for existence which everywhere goes on from long-continued observation in the habits of animals and plants.'

Instead, then, of seeking for the reason why there are carnivorous animals which destroy herbivorous animals and why there are herbivorous animals which devour plant life; and instead of asking why the seasons are periodically severe and unfavourable to life; and why, again, rival types come into a competition that usually ends in the extinction of one type—instead of attempting to explore and solve all these problems, it is sufficient for the present purpose to take them as facts.

It is preposterous to suggest that all this strife is due to the redundant reproduction of living things, to a pressure of population on the food supply, and in dispensing with a fictitious explanation, the fact that there is a struggle for existence in nature is not in any way weakened.

The position is exactly similar to Darwin's. He took 'redundant reproduction' as a fact of observation. He never attempted to find a reason *why* reproduction should be redundant.

Mystery remains at one stage the same as the other. The writer is satisfied that there is a struggle for existence dependent on the external strife between species and species, and not on the alleged internal struggle between members of one and the same species. He submits that this furnishes all the conditions necessary to give rise to natural selection.

Relatively heavy destruction and correspondingly high fertility are all the material required for the operation of survival of the fittest. And as the never-ending succession of generations succeed one another, natural selection must have had ample scope to do all that work with which it is credited. Natural selection

is not then unseated from its throne, and remains the supreme arbiter of the natural world.

And here is the disproof of the Darwinian view. How can natural selection be reconciled with redundant reproduction? If natural selection is the great law of life, how is it possible that a species can waste its substance in futile fecundity? Illustrations have been furnished of the great competition between different varieties, and species, which fill the same, or similar, spaces in the economy of nature. If there be waste on reproduction, will not the prodigal be disadvantaged in this strife? Other things being equal, will not the victory fall to that type in which there is a minimum of waste or, better still, no waste at all?

This consideration is for the writer decisive. It is exactly analogous to the processes of reasoning and arguments employed by Darwin and Wallace to indicate how life has progressed. Differentiation, it has been seen, has developed because it made for efficiency. Physiological economy is pointed to throughout the animal world as evidence of the operation of natural selection. Nor in this instance can it be possible to deny the operation of the same principle. Superfluous reproduction, futile fecundity, must clearly be eliminated in a competitive world. Or to put it briefly, *excessive fertility is forbidden by natural selection.*

What really forbids an *internal* struggle, a waste on futile fecundity, is the fact that there is an *external* struggle—the fact that species compete with species. Of this competition between rival types Darwin has furnished numerous examples which have been already quoted, and if one kind of rat competes with another kind of rat, or one kind of wheat with another kind of wheat, and so on—surely any waste on redundant reproduction must be a disadvantage to the variety or species which indulges in this suicidal predilection. The species that waste little or waste none will be advantaged over their prodigal rivals. By all analogy natural selection must operate to eliminate the species which indulge in redundant reproduction. And as

natural selection has operated on the natural world for millions of years, it is only prudent to assume that the business of reproduction is as efficiently carried on as the business of preservation. And so far as the preservation of the individual is concerned, the wonderful efficiency and fitness of animal organization has long been noted and admired. Parts that become redundant, or in any way detrimental, are eliminated by natural selection. If, then, the strictest economy is seen in those matters which relate to the preservation of the animal, how can it be expected there should be waste and prodigality in the reproduction of the animal?

If the Darwinian will select a concrete example, and face the facts, it will readily be seen that he is on the horns of a dilemma. Thus the dandelion, which produces many hundreds, sometimes many thousands, of seeds, might be taken; but perhaps the facts are even more strikingly displayed in the case of the trees. Take, for instance, the common sycamore or maple. Every schoolboy knows these winged seeds, produced annually by the thousand, and in their due season given to the winds and scattered widely over the earth. During its long life the sycamore produces very possibly a million or more of fertile seeds.

Assuming that all the stations which the sycamore can occupy are filled, that its place in the economy of nature is fully populated, then it follows that, of these million or more seeds, only one can attain to full growth and in due course replace the parent tree.

To achieve this end, is it necessary to produce a million or more seeds? On the face of it, this seems hardly credible; the multitude of reproductive germs seems obviously excessive.

What is the answer to this question? Let it be assumed for a moment that the reproduction actually *is* redundant, that is, that a proportion of the seeds are superfluous to the need of reproducing the parent tree, of maintaining the population.

Then since fertility, like every other quality of organized beings, is variable, what must be the necessary

operation of natural selection? Must it not be that those trees in which the expenditure on superfluous seed is least will have a natural advantage over the other trees? Instead of being wasted on prodigal prolificness their income is reserved for personal use. Hence they will tend to have stronger growth, deeper searching roots, an overtopping stature. In competition with the comparatively stunted prodigals they will tend to be naturally selected. Alternatively to the stronger growth, or higher organization, permitted by a larger income, the saving on reproduction would permit them to seize on less favoured places in the economy of nature, and there thrive where their prodigal brethren would starve. But whatever the details of the mode of operation, it is manifest that selection of the fittest must work to eliminate wasteful expenditure on reproduction, wherever and whenever it occurs. If the sycamore were in truth unduly prolific, then in a state of nature natural selection would favour that variety in which there was the most economical production of seed, and the other and more prodigal varieties would be eliminated. And not only would the competition between varieties of the same species necessarily have this result, but the competition between species and species would also ensure it. For in a competitive world a wasteful species would inevitably be displaced and replaced by one that had a truer regard for economy.

In place, then, of the original proposition, that redundant reproduction was the cause of natural selection, must be put the very different but truer statement that natural selection forbids redundant reproduction, and must necessarily operate to eliminate it, wherever and whenever it occurs.

In the next chapter, Spencer's analysis of the reproductive and preservative factors will be given, and it will be submitted that the doctrines which he establishes give great support and considerable confirmation to the views advanced in this chapter.

CHAPTER X

SPENCER ON REPRODUCTION

HERE is the first elemental fact on which the existence of a species obviously depends :—

‘ Of every species it is undeniable that individuals which die must be replaced by new individuals, or the species as a whole must die. No less obvious is it that if the death-rate of a species is high the rate of multiplication must be high, and conversely.’¹

And this proportioning of reproduction to mortality, Spencer points out, is obviously necessary for all forms of life :—

‘ The requirement that a due number of adults shall arise in successive generations may be fulfilled in variously modified ways. . . .’

‘ Low creatures having small powers of meeting the life - destroying activities around and still smaller powers of protecting progeny can maintain their kind only if the mature individual produces the germs of new individuals in immense numbers so that, unprotected and defenceless though the germs are, one or two may escape destruction.’²

Spencer then goes on to point out that one important factor determining the degree of fertility lies in the amount of nutritive matter which is associated with the germ.

Says he : ‘ With each germ is usually laid up some nutritive matter available for growth before it commences its own struggle for existence. From a given quantity of matter devoted by the parent to reproduction there may be formed either a larger number of

¹ Spencer, *Principles of Sociology*, vol. i. § 272.

² *Ibid.*, § 273.

germs with a smaller quantity of nutritive matter each, or a smaller number with a larger quantity each. Hence result differences in the rate of juvenile mortality. Here of a million ova left uncared for, the majority are destroyed before they are hatched; multitudes of the remainder, with the feeblest powers of getting food and evading enemies, die or are devoured soon after they are hatched. . . . Conversely, when the conditions to be met by the species make it advantageous that there should be fewer ova and more nutriment bequeathed to each, the young individuals, beginning life at more advanced stages of development, survive longer.'¹

'All varieties in the proportion of these factors occur,' he remarks, and goes on to give instances.

By most fishes and amphibians, he points out, 'the spawn once deposited is left to its fate. . . . A cod, for instance, produces above a million eggs, and, surviving, does this year after year; but though the life of the parent is preserved, nine hundred and ninety-nine thousand and more of the progeny have their lives cut short at various stages on the way to maturity. In higher types of the class producing comparatively few eggs that are better provided for, this sacrifice is much less; and for the like reason it is much less also in the next highest group of vertebrates, the "Amphibia." Passing to birds, we find the young are so well fostered that out of a small number most grow up; while here perhaps a half, and there perhaps a fourth reach the reproductive stage.'

'In the highest class of vertebrates, the "Mammalia," there is a further reduction in fertility and there is also a reduction in the class itself ascending from its lower to its higher types. Thus a small rodent reaches maturity in a few months and has large and frequent broods—while the slowest breeding of all mammals, the elephant, has only six young in its hundred years of life. . . . When from the less intelligent of these higher vertebrates, which produce many young at

¹ Spencer, *Principles of Sociology*, vol. i. § 273.

short intervals and have to abandon them at early ages, we ascend to the more intelligent, which produce few young at longer intervals, we perceive that the rate of juvenile mortality is thus diminished.'

The requirement that a due number of adult recruits shall be added annually to the species is then fulfilled in a variety of ways, depending on the number of germs and the amount of nourishment and protection given to them—two factors which vary inversely.

But there is another important consideration governing reproduction. While the fund available may be distributed between the number of germs and the sustenance provided for them in such proportion as best suits the needs of the species, this fund is not unlimited; it depends on the surplus remaining after the expense of preserving the parents' life has been provided for.

Spencer gives a thorough explanation of the necessary relation obtaining between these two expenditures—on the parent and on the offspring.

'Genesis,' he remarks, 'is a process of negative or positive disintegration; and is thus essentially opposed to that process of integration which is the primary process of individual evolution . . . it is so much nutritive matter lost to the parent. . . .'¹

And again:—

'The molecules which make up a plant or animal have been formed by the absorption of forces directly or indirectly derived from the sun, and hence the quantity of matter raised to the form called organic which a plant or animal presents is equivalent to a certain amount of force. Another amount of force is expressed by the totality of its differentiation. A further amount of force is that dissipated in its actions. And in these three amounts added together we have the whole expense of the individual life.'

'So too the whole expense of establishing each new individual includes—first, the forces latent in the substance composing it when born or hatched; second,

¹ Spencer, *Principles of Biology*, § 324.

the forces latent in the prepared nutriment afterwards supplied; and third, the forces expended in feeding and protecting it. These two sets of forces being taken from a common fund, it is manifest that either set can increase only by decrease of the other. If of the force which the parent obtains from the environment much is consumed in its own life, little remains to be consumed in producing other lives; and conversely, if there is a great consumption in producing other lives it can only be where comparatively little is reserved for parental life.'

'Hence, then, Individuation and Genesis are necessarily antagonistic. Grouping under the word Individuation all processes by which individual life is completed and maintained; and enlarging the meaning of the word Genesis so as to include all processes aiding the formation and perfecting of new individuals, —we see that the two are fundamentally opposed.'¹

This necessary relation will be seen more clearly from a medical quotation which Spencer introduces.

'There is a certain degree of antagonism between the nutritive and reproductive functions, the one being executed at the expense of the other.'

'The reproductive apparatus derives the materials of its operations through the nutritive system and is entirely dependent on it for the continuance of its function. If therefore it be in a state of excessive activity, it will necessarily draw off from the individual fabric some portion of the aliment destined for its maintenance. It may be universally observed that when the nutritive functions are particularly active in supporting the *individual*, the reproductive system is in a corresponding degree undeveloped, and vice versa.'²

Here, then, are the essential facts clearly displayed. All the energy of an animal is derived from food. This represents his income, and this income is limited. The primary distribution of the income is between the

¹ Spencer, *Principles of Biology*, § 327.

² Quotation from a Dr. Carpenter at end of ch. i. part vi. *Principles of Biology*.

preservation of the individual and the reproduction of the individual. Then the expenditure on reproduction is further distributed between the number of germs and the nutritive matter or protection afforded them (and with plants might well be added the expense of distributing the seeds—whether by the association of edible matter tempting animals to devour and disseminate them, or by the provision of wings, plumes, hooks, etc., another means of dissemination).

Here, then, is a primary distribution and a secondary distribution; and all varieties in the proportion of these factors occur, depending on the type of organism and the conditions under which it must live and reproduce itself.

And what is it that determines the proportion of these factors and the method of reproduction? Spencer gives an excellent and illuminating answer.

‘If organisms have been evolved,’ says he, ‘their respective powers of multiplication must have been determined by natural causes. Grant that the countless specialities of structure and function in plants and animals have arisen from the actions and reactions between them and their environments continued from generation to generation; and it follows that from these actions and reactions have also arisen those countless degrees of fertility which we see among them. As in all other respects an adaptation of each species to its conditions of existence is directly or indirectly brought about; so must there be directly or indirectly brought about an adaptation of its reproductive activity to its conditions of existence.’¹

¹ *Principles of Biology*, § 315.

CHAPTER XI

NATURAL SELECTION: THE NEW CONCEPTION AND THE OLD

SPENCER'S answer is, then, that the adaptation of reproductive activity to the conditions of existence is brought about by 'natural causes.'

Now, Spencer's idea of evolution has been already indicated as the conception of a process inevitably going on. Natural selection as the great law of life he rejects; but, as the writer has previously indicated the reasons which made him a disciple of Darwin instead of Spencer, there is no occasion to attempt further analysis of Spencer's views of the causes of progress or adaptation. Naturalists have almost universally accepted natural selection as the cause of adaptation and progress, and there is clearly no need to reject it here. Whatever is an advantage to the life of the species would be acted on by natural selection, and the method of reproduction is clearly within its scope. It only needs, then, to substitute natural selection for what Spencer calls 'natural causes' to see that it is adequate to explain the countless degrees of fertility and the various methods of reproduction.

The primary reason for introducing Spencer's demonstration of the relations obtaining between reproduction and preservation (or genesis and individuation, as he terms them) was said to be that it would afford confirmation of the conclusion already arrived at, that in a competitive world no species could afford to waste its substance on futile fecundity.

And when it is seen that the forces maintaining and reproducing the individual are drawn from a common fund—and a fund that is strictly limited—it becomes

plain that extravagance or prodigality with reproduction must mean deprivation for the individual. The greater the waste on undue prolificness, the scantier become the funds available to maintain the individual. Clearly this cannot be an advantage to the species ; it cannot be compatible with the working of natural selection. Between rivals and competitive types of organization natural selection must surely operate to ensure survival of that species where the distribution is best fitted to secure the continuance of the race. Waste, whether on undue activities connected with preservation or reproduction, must be harmful to the type. Excessive fertility, therefore, whenever it tends to prevail, must tend to be eliminated by natural selection.

The vestiges of organs and appendages in animal organization show that organs which no longer serve a useful purpose tend to be eliminated ; and as this process is intelligible in the light of natural selection from the need for physiological economy, so fertility, if it becomes redundant through changing conditions or any other cause, must tend to be reduced by natural selection until it becomes fitted to the needs of the race.

It is interesting to observe that what is done in nature by natural means is done by the human race deliberately through an intelligent perception of consequences. Owing to an increasing mastery of his surroundings, fertility with man has become greatly redundant ; and recognizing this, man has deliberately and artificially restricted his natural fertility. Partly this is done by the institution of marriage whereby in general the male is precluded from mating unless, and until, he is able to support his partner and any offspring of the union, while, in part, it was formerly achieved by infanticide.

The writer will now take it for granted that the fundamental error in Darwin's hypothesis has been indicated and corrected.

A supplementary note may be introduced here.

Objections have been made to the writer that it is hardly proper to assume that Darwin adopted the doctrine of Malthus in its entirety. Thus the idea of Malthus is essentially that population presses on subsistence and hence causes poverty in the human race and a struggle for existence with plants and animals. The writer has contended that if this be the fact, it can be due to one cause and one cause only, the fact that reproduction is redundant, meaning by redundant that more progeny are produced than are required to maintain the population, or to expand the population at the maximum rate at which it is capable of expansion.

But it has been suggested that Darwin's argument is literally true. That it is an undoubted fact that 'more individuals are produced than can possibly survive,' so that 'there must in every case be a struggle for existence.' Plainly if Darwin derives the struggle for existence from the simple fact that all pairs of animals or plants have more than two offspring, no one could dispute the argument. The question whether more than two offspring are produced because otherwise the race would die out; or whether more than two progeny are produced because the instinct to reproduce is blind and inevitably runs to excess—a decision on this question would not then need to be made. The argument might thenceforward rest on the simple empirical fact. For those who are indifferent to the extent to which Darwin's doctrine depends on that of Malthus there is little need for controversy. All accept the conclusion that a struggle for existence obtains in nature, no matter what may be its primary cause, and this conclusion was all that was vitally necessary to Darwin's argument in the *Origin of Species*—an argument that is not invalidated in any way by a contention that error lies in its origins. The conclusion is right though the premises be wrong, and the theory works well enough as long as it is confined to botany and zoology.

What, then, is the writer's contention?

It is simply this, that so far as the Darwinian theory

involves the view that reproduction is redundant with plants and animals, then in so far it incorporates an error. Those who consider that views on redundant reproduction have no direct bearing on Darwinian doctrines may properly treat the writer's criticisms as of little importance.

But the writer certainly adheres to his view that Darwin based his theory on the doctrine of Malthus, though the dependence is more often implied than definitely stated, and although the application seems at times decidedly inaccurate. But in one place, at least, Darwin expressed his clear and unqualified acceptance of the idea which lies at the root of the Malthusian theory. In the *Variation of Animals and Plants under Domestication*, and in the concluding paragraph of the last chapter, he refers to 'the redundant power of reproduction which inevitably leads to a struggle for existence, and as a consequence to the natural selection or survival of the fittest.'

This seems to the writer the true statement of what Darwin really held ; and if this be the fact he is compelled to challenge it, because, as he has attempted to show, there is no warrant for the belief that reproduction is redundant, and there is one good reason against the belief, the fact that it is incompatible with the operation of natural selection. And while the error may be regarded as of little importance when nature alone is considered, its recognition and correction becomes of the highest importance when consideration is directed to the human race.

Having made this slight digression, a return may now be made to the main subject, and the question asked, granted that the Malthusian idea is all wrong in its application to nature, what difference does it make, of what importance is the error and the correction of the error ?

The essential difference is this ; that it compels a new view of that great agency 'Natural Selection.' It widens its scope and renders it in the writer's view what it never was before, viz. an adequate and

efficient instrument for interpreting the evolution of the human race.

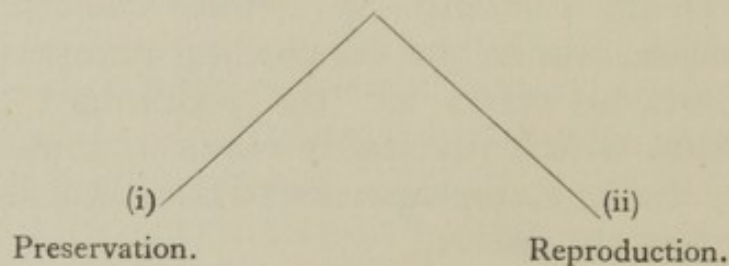
The simplest contrast is this—

Darwin's view is that

- (1) Redundant Reproduction causes
- (2) A Struggle for Existence, which gives rise to
- (3) Natural Selection.

On the present view the fundamental term is the 'Struggle for Existence,' and the chain of causation is as follows :—

- (1) The Struggle for Existence gives rise to
- (2) Natural Selection, which acts with equal force on



That is, on both the factors on which depends the life of the species. According to Darwin, reproduction was redundant ; according to Spencer, it was antagonistic to preservation ; but the present view is that it is COMPLEMENTARY. The competition essentially is between species and species, between rival types of life, and any advantage in the means of preserving the individuals or of reproducing the individuals advantages the species and makes it fitter to survive or persist. Regarding it as an individual contest Spencer named the process 'survival of the fittest,' but it is not a case merely of *survival* of individuals—regarding the struggle as being primarily between species a more accurate phrase would be 'persistence of the fittest.'

A similar criticism needs to be made in regard to Darwin's phrase 'Struggle for Existence.' He is thinking of the individual and its struggle to *exist*, *i.e.* to preserve its own life. But nature is as much concerned for the reproduction of the individual as for the continuance of the individual's existence. Both

are vital to the life of the race. And individuals not only struggle to preserve their own lives, they struggle also to reproduce. And a very literal struggle it often is. Mammals fight for their mates just as they fight for their lives. If self-preservation is the first law of nature, reproduction is clearly the second. And the reason is plain. Individuals that have not the power, or the capacity, to reproduce, are eliminated from the life of the race. They transmit none of their infirmities to descendants, for they have none. The next generation is recruited entirely from those who have achieved reproduction. And they inherit the instincts and powers that prompted and enabled their parents to reproduce.

So the struggle for existence is an inaccurate term ; a more fitting term would be 'the struggle to exist and reproduce,' or if regard be had to the species as a unit, 'the struggle to persist.' In the strife of nature the 'persistence of the species' is what would be looked for as a result of the operation of natural selection.

These points may help to indicate the distinction between the new and the old points of view. But more important conclusions remain to be drawn.

Darwin having based natural selection on excessive fertility, was handicapped in considering the reverse process, and in seeing what bearing natural selection had on the reproductive factor in life. This appears to be the essential reason why his hypothesis broke down and became inadequate to explain human development. It is interesting to observe how Darwin's instinct pointed him in the right direction, and how the original confusion in the terms of his hypothesis dogged his steps and frustrated his achievement. In the *Descent of Man*, the greater part of the book is devoted to the consideration of 'Sexual Selection.'

What is 'Sexual Selection' ? It is simply the theme of the great majority of novels and theatrical plays ; it is simply the business of mating as it obtains not with man but in the animal kingdom. Mating, Darwin

shows, depends either on the arbitrament of battle or on the selection of the female, on force or on favour. Many of the weapons and structures, and most of the ornaments of animals, are designed to subserve one or the other of these purposes. Darwin saw that with mating there must be selection and elimination, that unsuccessful suitors would not be able to continue the race. There was clearly scope for discrimination in this process, clearly a further elimination of the unfit. And in so far as sexual selection operated, it may properly be considered to supplement natural selection.

But the business of mating is only one part of the business of reproduction. To win an eligible mate is one part, to be a good parent is another. Progeny are benefited not only from having efficient parents, but even more greatly from having devoted and self-sacrificing parents. But this part of the process, the protection, feeding, and care of offspring, was largely shut off from Darwin's view, and it is this part that is the most important factor in reproduction.

The tremendous importance of this new point of view becomes apparent when the evolution of the terrestrial vertebrates, the progenitors of the human race, is considered. The great stages are represented by reptiles, monotreme mammals, marsupial mammals, placental mammals, savage man, and civilized man.

Darwin's criterion of progress was the amount of differentiation or specialization of parts of the same organic being.

But if one looks at the links in the great chain of evolution, this becomes a most inadequate definition. In the above list one great fact stands out. The development represents a continual increase in parental self-sacrifice. There is a constant increase in the power and the instinct to protect and nourish the offspring.

What is the primary distinction between the mammals and the reptiles? The chief difference, and that from which the former derive their name, is that mammals suckle their young. They elaborate a special nutritive

fluid, and have a special apparatus, by virtue of which they are enabled to feed their young for a more or less prolonged period after birth. While this is clearly an advantage to the young mammal as compared with the young reptile, it is not at first sight equally clear that it is an advantage to the species. In the struggle for existence parents who suckle their young must obviously be handicapped, whether it be the lioness that must seek prey, or the doe that must evade her. Is, then, the advantage to the young cancelled by the handicap it imposes on the parent? Have the mammals as a type of life an advantage over the reptiles by their method of reproduction?

A little consideration will show that they have a decisive advantage. The progeny receive the assistance when they need it most, when they are weakest, least able to evade enemies, least able to discover their own nutriment. They repay the debt when they can best afford it—in the fullness of their days, in the summer of their strength. The benefit received in infancy is far greater than the disadvantage suffered when fully grown. There is a clear balance of benefit to the individual and therefore to the species.

It is, then, very evident that this power and this instinct to protect and nourish its offspring are an advantage to the species—to the type of life in which they are developed. They represent a more effective and more economical method of reproduction. They are the primary distinction between mammals and the great army of reptiles displaced by the mammals.

And this same fact is equally marked in the development of the human race. From savage to civilized man there has been a constant increase in the instinct and the power to provide for offspring.

The offspring are advantaged by the care and protection of their parents, and their parents are not disadvantaged because they are only paying back what they themselves received. But they are not merely *not* disadvantaged, they are greatly benefited by the transaction, for they received the benefit in their hour

of greatest need ; they repay the debt when they can best afford it in their time of affluence and prosperity. Since this subordination is an advantage to the species, the agency of natural selection is clearly indicated. Is it not then reasonable to assume that natural selection, acting on this subordination, has been primarily instrumental in bringing about the elimination of reptiles, the development of mammals, and the development of man.

All these considerations and facts are in perfect harmony and exactly consistent with the facts of evolution and in conformity with the workings of natural selection.

It may be advisable to emphasize one further point. An organ is an instrument, and is of no value unless there exists also the power or the instinct for its proper use. It would be idle for the mammal to have lacteal glands and teats if it had no instinct to yield its milk to the young, or if the young had no instinct to suck. But these instincts, it is plain, invariably co-exist with the organs, and it is not difficult on the theory of natural selection to see why they do so.

And what is this instinct to nourish and protect its offspring ? What is it but the instinct of love ? Here is the spring of one of man's strongest emotions—the love of a mother for her child—one of the most powerful themes that have stirred poet, philosopher, or saint—one to which every one responds. And yet this great passion has had its origin in small beginnings—in the instinct and the power of the primitive mammal to nourish and protect its young.

And this power and this instinct, as is plainly seen, are an advantage to the species in the conditions in which it is placed. It can be legitimately claimed that parental love is an advantage in the struggle for existence, and it can be asserted that it has been developed through the discriminating agency of natural selection.

To a great extent, the development of parental care means a redistribution of energies. To use Spencer's terms, there is an increasing expenditure on 'genesis,'

and so a decreasing expenditure on 'individuation.' Of the force which a parent obtains from the environment, an increasing proportion is spent on reproduction and a decreasing proportion is reserved for parental life. It must be assumed that variations in the right direction would be acted on and accumulated by natural selection. And let it be noted that here is no case of increasing specialization; the advantage is given simply by a redistribution of energy, by a developing subordination of one instinct to another.

Man's reproductive organs are not more highly specialized than those of other placental mammals, he is advantaged not by superior organs but by the development of one faculty and the repression of another.

For purposes of convenience the writer proposes to use the term 'Subordination to Sex' to indicate this increasing subordination of parents to offspring. And having formulated this idea a further important development becomes possible. Man is essentially a social animal, and in the evolution of the human race natural selection has continually acted on the competitions between societies. The society and not the species becomes the new unit.

Consider the operation of natural selection on the struggle for existence between two societies of men. Imagine a contest between two savage tribes in, say, New Guinea. Numbers being equal, to whom will the issues of war incline?

Experience teaches that order, discipline, patriotism, leadership, all those qualities which mark the subordination of the individuals to the common end—these are the qualities that would confer an advantage. And the arbitrament of battle would tend to fall to that tribe in which subordination to the society was most developed.

And in the wars and contests between all types of human society this factor, which may be termed 'Subordination to Society,' would represent a great advantage.

Manifestly this has been one of the vital factors.

Zeal for the welfare of society engenders the sentiment called patriotism. It leads to the recognition of the need for leadership, to the voluntary submission to the leader, to self-sacrifice, to all the virtues of the soldier and to some of the citizen. Manifestly, then, those societies in which this subordination was developed would tend to be selected, the others to be eliminated. Here is a clear example of the operation of natural selection, and here is one of the great factors on which it has acted, and the importance of which is illustrated by the whole history of the human race. In 'Subordination to Sex' and in 'Subordination to Society,' then, are to be distinguished two of the principal factors which have led to the development of human nature and human societies. It need perhaps hardly be said that owing to his imperfect conception of natural selection, Darwin was precluded from recognizing these two subordinations. On the other hand, it is interesting to observe that Spencer actually distinguished these two factors. But so far as the writer can find he did not recognize their vital importance, and never worked them out to their proper conclusion. Having regard to his conception of evolution, this perhaps is hardly surprising. It may, however, not be uninteresting to give Spencer's description. Referring to the laws that govern the 'preservation and prosperity' of a species, he states them as '*First*, that among adults there must be conformity to the law that benefits received shall be directly proportionate to merits possessed : merits being measured by power of self-sustentation. *Second*, that during early life, before self-sustentation has become possible, and also while it can be but partial, the aid given must be the greatest where the worth shown is the smallest—benefits received must be inversely proportionate to merits possessed : merits being measured by power of self-sustentation. *Third*, to this self-subordination entailed by parenthood has in certain cases to be added a further self-subordination. If the constitution of the species and its conditions of existence are such that

sacrifices, partial or complete, of some of its individuals so subserve the welfare of the species that its numbers are better maintained than they would otherwise be, then there results a justification for such sacrifices.'¹

Though the idea is expressed in very abstract and vague terms, the two subordinations are clearly indicated. It may be advisable here to anticipate and partly explain the subsequent parts of this work. When an attempt is made to interpret the prehistoric and historic records of the human race by means of these two factors, it soon appears that they are not adequate for the task. In particular, the competitions between societies cannot be explained merely by looking to the degree of social subordination that the various peoples have developed. Another and more important factor soon emerges.

The competition between societies depends not only on the subordination of individual members, it depends even more on the size of the society and on the resources which the society can command. And the size and prosperity of societies have vastly increased by the change from a hunting life to pastoral life, and then from pastoral life to agricultural life, while a further change seems now in process in some societies—from an agricultural life to industrial life. But excluding from consideration the last-named change, the changes from hunting to pastoral and thence to agricultural life have been accompanied by very vast changes in the nature of human societies of which perhaps the most important is this: While hunting tribes can consist of only a few hundred men, pastoral or agricultural peoples may number many millions.

These changes in the mode of obtaining food have made possible an enormous increase in the population that may live together and form a single society.

And this change, this factor, has in the history of man been of much greater importance than the two subordinations to which reference has been made.

¹ *Principles of Ethics*, § 249.

Not that the subordinations have lost their value, they have been factors on which natural selection has acted and has therefore developed, but the change in the mode of life has clearly been the dominant factor. And it is this last factor with which the writer has been chiefly concerned in the following chapters. He has not thought it necessary to apply himself to the working out of the subordinations. Once indicated, their value and significance is fairly obvious, but the mode by which natural selection has brought about the changed and superior modes of obtaining subsistence is by no means so clear. It is therefore with the solution of this problem that he has been primarily concerned.

When the operation of natural selection on all these factors is considered, the writer believes that they afford a satisfactory explanation of the history of mankind, and that they yield a reasonable explanation of human nature as it is and of human societies as they are to-day.

It seems desirable at this point to notice a practical and philosophic objection to the view of natural selection based on the theory of Malthus. In Darwin's view the fundamental cause of progress is held to be the pressure of population on the means of subsistence. On the views advanced in this essay there is no real warrant for this opinion, and the true cause of progress must be looked for in another direction.

This difference in theory leads to very different views of the practical application of evolution philosophy.

In the first place, it can hardly be disputed that Darwin regarded evolution as primarily due to the pressure of population. He asserts explicitly that the struggle for existence is due to 'redundant reproduction' or to the tendency of all animals 'to multiply beyond their means of subsistence.'¹ Malthusians hold very properly that the Darwinian principle is that *Evolution is Malthusianism* in plants and animals. Henry George remarks on the fact that social improve-

¹ *Descent of Man*, ch. ii.

ment and the progress of the arts is on Darwin's theory attributed to the 'principle of increase.'¹

Holding this view that pressure of population is the root cause of progress, it is not surprising that Darwin also held that redundant reproduction must not be discouraged in man, although it led to great poverty and misery.

Thus he admits that 'it is impossible not to regret bitterly, but whether wisely is another question, the rate at which man tends to increase; for this leads in barbarous tribes to infanticide and many other evils, and in civilized nations to abject poverty, celibacy, and to the late marriages of the prudent.'²

Yet while recognizing the evils of redundant reproduction, he insists that 'our natural rate of increase, though leading to many and obvious evils, must not be greatly diminished by any means,'³ for the reason that otherwise man 'would sink into indolence,' and that if he is to advance 'he must remain subject to a severe struggle,' for 'man, like every other animal, has no doubt advanced to his present high condition through a struggle for existence based on his rapid multiplication.' This, then, is the central belief of Darwinian and Malthusian philosophy, that the root cause, the driving force, behind all evolution and all progress is the pressure of population on the means of subsistence, a pressure that inevitably gives rise to poverty, misery, intestine strife, and incessant carnage. The wretchedness of the masses and of mankind in general is thus regarded as hopeless and inevitable, since it is the necessary price of progress.

This is the sombre shadow that overhangs so much of evolution philosophy, and these are the gloomy and hopeless beliefs that must be entertained by the honest disciple of Malthus and Darwin.

It is for reasons of this nature that Huxley describes nature as a 'gladiatorial show,' and that Sir Ray

¹ *Progress and Poverty*, bk. II. ch. i.

² *Descent of Man*, ch. v.

³ *Ibid.*, ch. xxi.

Lankester alludes to nature's 'terrible selection of the fittest.' Mr. G. B. Shaw sums it up shrewdly when, while describing evolution as 'heavenly,' he stigmatizes natural selection as 'hellish.'

It remained for Nietzsche to carry these doctrines to their logical conclusion. For him survival of the fittest was literally survival of the strongest. Moral laws were a mere remnant of Christian superstition. His 'Superman,' contemptuous of pity and seeking only his own power and pleasure, was to be developed by giving unbridled freedom to the struggle for existence. And these views did not remain merely academic, advocated vigorously, and in more practical form, by Treitschke and Bernhardt, they are generally held to have had no small influence in forming the policy of Germany before, and during, the late war.

Perhaps Tennyson has most exquisitely expressed the feelings which evolution theories awake in the memorable verses :—

Are God and Nature then at strife
That Nature lends such evil dreams?
So careful of the type she seems,
So careless of the single life;

That I considering everywhere
Her secret meaning in her deeds,
And finding that of fifty seeds
She often brings but one to bear,

I falter where I firmly trod,
And falling with my weight of cares
Upon the great world's altar-stairs
That slope thro' darkness up to God,

'So careful of the type?' but no.
From scarp'd cliff and quarried stone
She cries, 'A thousand types are gone:
I care for nothing, all shall go.'

Who trusted God was love indeed
And love Creation's final law—
Tho' Nature, red in tooth and claw
With ravine, shriek'd against his creed.¹

¹ 'In Memoriam,' liv., lv.

Yet evolution philosophy is not to be condemned merely because it is harsh and repulsive ; fortunately it can be said in all sincerity, ' Thank God, it isn't true.' When the Malthusian conception of evolution is closely examined it breaks down, and it breaks down because it is out of conformity with the facts. In its practical applications it fails to meet the pragmatic test. It is not perhaps altogether without significance that Germany has fallen to utter and maybe irretrievable ruin, or that Nietzsche ended his days in the madhouse.

And these applications do violence to the qualities and characters of the human race as they are known. Obviously if civilized man is a product of evolution, then a true understanding of evolution must furnish an explanation of man as he actually is, as common sense and common experience show him to be.

War and patriotism are part of human experience. So are industry and thrift. So too are love and righteousness. If man has evolved, a true interpretation of the process must account for these facts, these qualities and sentiments, must indicate their origin and explain their purpose. Judged by this test, Darwin's application is by no means satisfactory. But if the problem be tackled with the aid of the corrected theory, it is confidently submitted that a much greater measure of success is possible.

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SECTION III

THE ASCENT OF MAN BY MEANS OF
NATURAL SELECTION

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PART I: THE FACTS

CHAPTER I

MAN THE HUNTER: THE FACT AND ITS SIGNIFICANCE

A THEORY is only of value as it fits the facts and as it explains the facts. Before considering the working of natural selection in regard to the human race, it becomes necessary to inquire what are the concrete facts of human progress. What has been the course of human evolution as shown by the indisputable evidence of history and the records of prehistoric man?

This is not an inquiry into the evidences of the missing link, but only of the progress of man as man, that is, from the lowest point at which he could be recognized as human although a savage; this progress in its main outlines is definitely known.

The essential and most significant facts furnished by these records are:—

- (1) For hundreds of thousands of years man was a hunter, living like a beast of prey on the unassisted products of nature.
- (2) Man learned to domesticate and breed certain animals which served him for food—he became herdsman and shepherd.
- (3) Man learned to cultivate edible plants, to plough and sow in order that he might reap—he became agriculturist.

The first of these stages occupied hundreds of thousands of years, a vastly longer period than the others. The duration of the second is obscure, and the last only very recent, a matter of a few thousand years.

These changes represent an increasing knowledge of and power over nature, and in particular an increasing command over the means of subsistence.

An attempt will now be made to marshal the evidence on which these conclusions are based, and to show how, even prior to their establishment, their significance was grasped by Herbert Spencer, how he drew from them his chief inspiration and how he failed to achieve the right interpretation, an interpretation that can be properly furnished by the doctrine of natural selection alone.

It is not without interest to note that long before the facts of the stone age had been discovered, meditative minds had suspected the truth. Gibbon, the philosophic historian, for instance, had discarded the traditional doctrine and made a good guess at the real facts.

‘The discoveries of ancient and modern navigators,’ he remarks, ‘and the domestic history or tradition of the most enlightened nations, represent the *human savage*, naked both in body and mind, and destitute of laws, of arts, of ideas, and almost of language. From this abject condition, perhaps the primitive and universal state of man, he has gradually arisen to command the animals, to fertilize the earth, to traverse the ocean, and to measure the heavens.’¹

The same shrewd suspicion had been entertained by another great thinker, John Stuart Mill, who in his *Political Economy* alludes to ‘that greatest of all past changes in human modes of existence, by which industrial life attained predominance over the hunting, the pastoral, and the military or predatory state.’²

It was not, however, until somewhat later that the tremendous antiquity and original barbarism of the human race received definite proof from the discovery of stone implements associated with the remains of extinct mammalia.

The various evidences were marshalled by Lyell in

¹ Gibbon, *Decline and Fall*, vol. ii., ‘General Observations,’ p. 485.

² J. S. Mill, bk. II. ch. xii. § 6.

the *Antiquity of Man*, published 1863. The stone age, once recognized, was seen to fall into two chronological divisions originally distinguished by the relative crudeness of the implements. For these Lord Avebury suggested in 1865 the terms Palæolithic and Neolithic, the former referring to the remoter ages when man fabricated stone implements solely by chipping, and the latter to the comparatively recent period when the implements were polished by rubbing.

But the significance of these discoveries, that the implements were representative of different stages of civilization, was only slowly recognized. Sir John Evans, in his *Ancient Stone Implements of Great Britain*, published in 1872, alludes to Palæolithic culture in terms of only moderate assurance as follows :—

‘ Living, as in all probability man must have done, by the chase, his numbers must necessarily have been small, as compared with those of the animals on which he subsisted.’

‘ Of what was the condition and stage of civilization of the men of that time, it is probable that the implements by themselves afford but insufficient means for judging. Many of them, though rude, may be matched in that respect by stone implements in use among the Australian savages of the present century ; while others again show great dexterity in working so intractable a material as flint, though in no way approaching that attained by some of the flint workers in Neolithic times. Comparing the implements of the two periods together, the main differences are that the forms are fewer, and, as a rule, larger and more rudely chipped in the earlier period ; and, beyond this, that the art of grinding to an edge appears to have been unknown. If we regard, as probably we safely may do, the remains of human art found in caves such as Kent’s Cavern, associated with bones of animals belonging to the same fauna as that of the River Drift, as attributable to the same age, and probably to the same race of people, we get some further insight into their habits and conditions of life. The evidence seems

to justify us in regarding these River Drift or cave folk as hunters, and probably nomads, subsisting to a great extent on the produce of the chase ; living, where possible, under natural shelters, to which they brought either the whole or portions of the slaughtered animals, the bones of which, fractured for the purpose of extracting the marrow, we find accumulated in the caves ; acquainted with the art of spearing fish by means of barbed harpoons ; and able to sew, though probably not to spin or to weave.’¹

As regards the Neolithic age, ample evidence from barrows, Swiss lake dwellings, and other sources, showed conclusively that man then possessed domesticated animals, and some rude beginnings of agriculture.

Modern research, more particularly in France, has, however, revealed a large amount of confirmatory evidence ; not only from the implements, but from the bones of animals associated with them and with human remains, and more strikingly from the unsuspected artistic efforts of Palæolithic man—evidence which, taken together, shows conclusively that Palæolithic man was a hunter. So unquestionable is this that Professor W. J. Sollas entitles his book on Palæolithic man *Ancient Hunters and their Modern Representatives*, the representatives being, of course, the hunting peoples of modern times. He remarks that ‘ the Stone Age as a whole is divided, not according to its most fundamental differences into a hunting and an agricultural stage, but according to the nature of its weapons, into the earlier flaked and the later polished Stone Ages.’

‘ The newer and older Stone Ages thus recognized have been conveniently named the Palæolithic and the Neolithic periods.’²

He notes that ‘ the débris of the caves bears witness

¹ John Evans, F.R.S., F.S.A., *The Ancient Stone Implements of Great Britain*, 1872, ch. xxiv.

² *Ancient Hunters and their Modern Representatives*, second edition, 1915, p. 117.

to man as the successful hunter, courageously maintaining his existence amidst a crowd of competing beasts of prey.'¹

And he gives illustrations of the enormous number of bones found in these situations. In one place (at Solutré) they form a mass over one hundred yards in length and in places as much as ten feet thick.

The essential fact is so striking that he suggests that the Palæolithic subdivisions would have been better named cainagreutic, neagreutic, etc., agreutic being from a Greek word meaning skilful in hunting, including fishing.²

And Professor Sollas gives a little description of Palæolithic man that may not be out of place here :—

'Man as we first meet with him is a hunter, not by choice but from necessity, winning a precarious existence from the chase of wild beasts and the collection of grubs, eggs and other edible products, especially those afforded by wild plants. Nature as he knew her was as yet untamed, though he had already wrested two great powers from the inanimate world, the first that of transforming energy into fire, and the next that of concentrating its power by means of an edge given to a stone.'³

'Many thousands of years attended only by a gradual advance were to elapse before he achieved any epoch-making victory which could compare with these, and then he made two great strides, which led him to the mastery of the organic world. He discovered that wild plants could be grown at will, and that herds of wild animals could be tamed and kept in a state of captivity. From hunter he became shepherd and farmer, abandoned his roaming hand-to-mouth mode of life, and, assured of ample means of subsistence, became attached to the soil ; settled communities thus arose, organized societies became possible, and all the

¹ *Ancient Hunters and their Modern Representatives*, second edition, 1915, ch. vi.

² *Ibid.*, ch. vii.

³ *Ibid.*, ch. v.

advantages which accrue from the subdivision of labour.'

'This triumph preceded by a long interval the discovery of metals.'

These elemental facts are now indisputable, but the first to recognize their tremendous significance was Spencer, and Spencer indicates that they gave rise to his life's work. Writing in 1879 he says that 'from 1842'—that is, from the age of twenty-two—'my ultimate purpose lying behind all proximate purposes has been that of finding for the principles of right and wrong in conduct at large a scientific basis,' and previously he says: 'This last part of the task it is to which I regard all the preceding parts as subsidiary.'¹

In 1893 he remarks, in the General Preface to the *Principles of Ethics*:—

'The ethical doctrine set forth is fundamentally a corrected and elaborated version of the doctrine set forth in *Social Statics* issued at the end of 1850 . . . the two works agree in their cardinal ideas. As in the one so in the other, Man, in common with lower creatures, is held to be capable of indefinite change by adaptation to conditions. In both he is regarded as undergoing transformation from a nature appropriate to his aboriginal wild life, to a nature appropriate to a settled civilized life; and in both this transformation is described as a moulding into a form fitted for harmonious co-operation. In both, too, this moulding is said to be effected by the repression of certain primitive traits no longer needed and the development of needful traits. . . .'²

It will not be uninteresting to glance at *Social Statics* and see how the problem then presented itself.

Referring to the present position of the human race, he says:—

'By the increase of population the state of existence we call social has been necessitated. Men living in

¹ *Principles of Ethics*, preface to Part I.

² *Ibid.*, General Preface, June 1893.

this state suffer under numerous evils. By the hypothesis it follows that their characters are not completely adapted to such a state.'

'In what respect are they not so adapted—what is the special qualification which the social state requires?'

'It requires that each individual shall have such desires only, as may be fully satisfied without trenching upon the ability of other individuals to obtain like satisfactions. If the desires of each are not thus limited, then either all must have certain desires ungratified, or some must get gratification for them at the expense of others. Both of which alternatives, necessitating pain, imply non-adaptation.'

'But why is not Man adapted to the social state?'

'Simply because he yet partially retains the characteristics appropriate to an antecedent state. The respects in which he is not fitted to society are the respects in which he is fitted for his original predatory life.'

' . . . All sins of men against one another, from the cannibalism of the Fijian to the crimes and venalities we see around us; the felonies which fill our prisons, the trickeries of trade, the quarrellings of class with class and of nation with nation, have their causes comprehended under this generalization.'

'Man needed one moral constitution to fit him for his original state; he needs another to fit him for his present state; and he has been, is, and will long continue to be, in process of adaptation.'¹

Perhaps an extract from the body of his *Principles of Ethics* may serve to illustrate his dominant persuasion still more clearly:—

'This general cause of derangement operating on all sentient beings has been operating on human beings in a manner unusually decided, persistent, and involved. It needs but to contrast the mode of life followed by primitive men wandering in the forests and living on wild food with the mode of life followed by rustics, artizans, traders and professional men in a

¹ 'The Evanescence of Evil,' *Social Statics*, p. 20.

civilized community to see that the constitution, bodily and mental, well adjusted to the one is ill adjusted to the other. It needs but to observe the emotions kept awake in each savage tribe chronically hostile to neighbouring tribes, and then to observe the emotions which peaceful production and exchange bring into play, to see that the two are not only unlike but opposed.'¹

Spencer's contention, then, amounts to this, that civilized man has inherited not only his constitution but his principal instincts and sentiments from his savage progenitors. It is this human nature transmitted to him by laws of heredity that unfits him for the labours by which in a civilized community he must earn his livelihood. His instincts are still attuned to war and the chase. He sighs for an active physical life in the open air. His eye sparkles, his pulse quickens for the things he may not have, for the life that is left behind him. He is doomed to ceaseless drudgery in office, factory, or mine, and he cannot as yet be reconciled to his fate.

With the intuition of genius, Spencer diagnosed the fundamental cause of the social ills and maladies of the human race. He saw the present state of mankind, and in a general way how it had come about.

But it is one thing to diagnose the disease, it is quite another to find its cause, and it is still more important to discover the remedy. Spencer looked at life with the aid of his famous formula, and if his formula was unsound his success may have been prejudiced.

In every work regard the end,
Since none can accomplish more than they intend,

says Pope, and his advice may well be applied in the present case.

Spencer has defined his aim with his customary precision, that of 'finding for the principles of right and wrong conduct at large a scientific basis.'

Now let his own verdict on his success or failure be given. In June 1891 he completed his *Principles of*

¹ *Principles of Ethics*, § 34.

Ethics—the coping-stone of his synthetic philosophy, and he remarks in the preface :—

‘ Now that . . . I have succeeded in completing the second volume of *The Principles of Ethics* which some years since I despaired of doing, my satisfaction is dashed by the thought that these new parts are less definite in their conclusions than I had hoped to make them.’¹

‘ . . . Private conduct must in most cases be partly determined by a judicial balancing of requirements and avoidance of extremes.’

‘ Justice does indeed introduce us to conclusions which are in large degree definite—there enters the ruling conception of equity or equalness—in Negative and Positive Beneficence—we enter a region in which the complexities of private conduct are involved with the complexities of relations to the no less complex conduct of those around ; presenting problems for the solution of which we have nothing in the nature of measure to guide us, and must commonly be led by empirical judgments.’

Does that conclusion indicate that he had succeeded in finding a scientific and satisfactory basis ‘ for the principles of right and wrong conduct at large ’? Surely the man must be strangely constituted and easily satisfied who can be contented with such a confusion of complexities.

Here is no ringing note of triumph ; the tone is rather one of disappointment, and to the majority who seek some substitute for religion in the synthetic philosophy it will probably appear as a just judgment. Essentially Spencer failed ; for practical purposes his ethics do not carry conviction and have little power to direct and control human conduct.

But the writer believes that Darwin’s theory will yield a large measure of success in explaining the problems which Spencer indicated and so signally failed to solve.

¹ *Principles of Ethics*, Preface to vol. ii.

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TABLE SHOWING THE SUCCESSION OF LIFE IN CAINOZOIC (RECENT LIFE) ROCKS.

		DURATION IN YEARS*	GEOLOGICAL PERIOD	HUMAN RECORDS, &c.
QUATERNARY	10,000 Years	RECENT		Man the Agriculturist
	400,000 Years	PLEISTOCENE		Palaeolithic Man Eolithic Man Man the Hunter
	500,000 Years	PLIOCENE		
900,000 Years	MIOCENE			
TERTIARY	1,200,000 Years	OLIGOCENE		Beginning of numerous existing families of Mammals
	1,200,000 Years	EOCENE		Primitive Mammals

* Note.—Time estimates taken from Professor Sollas' *The Age of the Earth*, 1908, and *Ancient Hunters*.

According to more modern estimates [see Bulletin No. 769, United States Geological Survey, published 1925], the thickness of the rocks of the Pliocene, Miocene, and Eocene series is now computed to be double that estimated by Professor Sollas. The estimates of duration of these periods would consequently need to be doubled.

CHAPTER II

FOR HOW LONG WAS MAN A HUNTER?

IN order to gain a due sense of proportion it is desirable to have some general idea of the length of time for which man's ancestors were hunters depending for their sustenance on wild food.

Evidences of man or man's handiwork have now been found throughout the Pleistocene period, and it is generally believed that stone implements can also be traced in the preceding age—the Pliocene period.

The plain man can only be guided by the authorities in these matters, and as the authorities are often strikingly at variance, he may often find the matter somewhat confusing. Opposing views are frequently held with regard to every piece of evidence, but taken on the whole there can be no reasonable doubt, and a rough chronology adequate for the present purpose can be accepted with full confidence.

First as to the age of the Pleistocene epoch, which includes and in a general way coincides with the glacial ages, Professor Sollas, who appears to take very conservative views, says :—

‘ The geological scale of time, though far from exact, is sufficiently so for the purpose, and judged by this standard, the duration of the latest epoch of terrestrial history known as the Pleistocene cannot have exceeded some three or four hundred thousands of years. It corresponds with the chief period of human development, and includes four complete oscillations of climate.’¹

Other authorities appear to require a more extended

¹ Sollas, *Ancient Hunters*, ch. i.

period. Mr. H. G. Wells in his *Outline of History* says :—

‘Time guesses about the periods of the great age of cold are still vague, but we will follow H. F. Osborn in accepting as our guides the estimates of Albrecht Penck and C. A. Reeds. These give the First Glacial Age as at its maximum about five hundred thousand years ago.’¹

The beginning of the Pleistocene age may, then, be placed roughly as half a million years ago. It ended comparatively recently, and with it, Palæolithic man, man the hunter, disappeared from Europe, and was replaced by Neolithic man, who was principally a herdsman. Mr. H. G. Wells says : ‘It was about twelve thousand or fewer years ago that with the spread of forests and a great change in fauna, the long prevalence of the hunting life in Europe drew to its end.’²

But in Egypt and Mesopotamia the Neolithic phase of human affairs probably began some thousands of years earlier.

Professor Sollas arrives at estimates of seventeen thousand years for the interval which separates our time from the beginning of the end of the last glacial episode, while he considers that seven thousand years ago the ice had accomplished its full retreat.³

In round figures, then, it may be considered that the Pleistocene period lasted five hundred thousand years, and came to an end somewhere between ten and twenty thousand years ago.

What are the evidences of man the hunter throughout this Pleistocene age? They are essentially human remains, and human implements. There is, as indicated, much disagreement. Thus, of the rudest stone implements, the Rostro Carinates and some of the Eoliths are referred to the Pliocene period; and Mr. H. G. Wells says that though the Eoliths were at first

¹ H. G. Wells, *Outline of History*, bk. I. ch. vii.

² *Ibid.*, ch. x. § 4.

³ *Ancient Hunters*, p. 567.

flouted and derided by archæologists, to-day the scientific world recognizes their quasi-human origin.¹

There are no human remains approaching the antiquity claimed for these implements.

Professor Sollas says with regard to Eoliths that, owing partly to theoretical views, 'Anthropologists are divided into two opposing, almost hostile, camps.' He himself takes an adverse view, which he expresses as follows:—

'The supposed Tertiary Eoliths judged entirely on their merits, apart from all considerations of theory, do not exhibit such unequivocal marks of design as to compel universal belief in their artefact (*i.e.* human) origin.'²

And what is to be said with regard to human remains? The most ancient are the Java Ape-man or *Pithecanthropus erectus*, the Heidelberg man and the Piltdown man.

'The age of *Pithecanthropus* is still an open question; it is probably either Upper Pliocene or Lower Pleistocene.'³

Professor Sollas remarks that it is 'a creature so ambiguous that the most distinguished naturalists when presented with its fragmentary remains cannot agree whether it should be classed with apes or men.'⁴

It appears, however, that Professor G. Elliot Smith has decided that the features of the brain prove *Pithecanthropus* to belong to the human family.⁵

Until recently the Heidelberg man might claim to be the oldest known European, but now the Piltdown man disputes his place.

The Heidelberg man is known only by a single lower jaw. Though it has a retreating chin and other ape-like peculiarities, it is considered to be undoubtedly that of a man. Professor Sollas holds that the Heidel-

¹ *Outline of History*, bk. II. ch. viii. § 2.

² *Ancient Hunters*, ch. iii. p. 85.

³ *Ibid.*, p. 30.

⁴ *Ibid.*, pp. 38, 57.

⁵ *Ibid.*, note to p. 38.

berg man and the Piltdown man both belong to the *latter* half of the Pleistocene.

The Piltdown man comprises a skull and a jaw found close together. If they belonged to the same individual, it must have 'combined a human brain case with an ape's jaw.' Professor Sollas remarks: 'Some have regarded such a being as an improbable monster and have suggested that the jaw may not have belonged to the skull, but to a true ape. The chances against this are, however, so overwhelming that the conjecture may be dismissed as unworthy of serious consideration.'¹

However, another great authority, Sir Ray Lankester, after reviewing the evidence, considers that the facts are well worthy of serious consideration, and concludes: 'So I think we are stumped and baffled! The most prudent way is to keep the jaw and the cranium apart in all argument about them.'²

Thus Sir Ray Lankester finds difficulties with the principal antiquity of European man but accepts the evidence of the implements—Eoliths and Rostro Carinates; while Professor Sollas does precisely the reverse. He dismisses the Eoliths and accepts the fossil!

By way of independent evidence, the *Guide to the Fossil Remains of Man*, issued by the Natural History Museum, may be quoted. This says:—

'True man, though of very low degree, had certainly reached Europe by the end of the Pliocene or beginning of the Pleistocene period. He had even spread so far as the southern part of England, as proved by the discovery of portions of a remarkable skull and lower jaw in a river gravel at Piltdown . . . in 1912.³ Man . . . also lived in Europe so early as the beginning of the Pleistocene period, but he is known only by a single lower jaw found in 1907 in a sand pit at Mauer near Heidelberg. This specimen occurred in a river-

¹ *Ancient Hunters*, ch. ii. p. 54.

² Quoted by H. G. Wells, ch. viii.

³ *Guide to the Fossil Remains of Man*, p. 8.

deposit associated with numerous bones . . . which can scarcely have survived later than the early part of the Pleistocene period.'¹

It is interesting to note that generally the more ancient the remains the more marked are the simian characters they show. The guide summarizes it as follows :—

'The general conclusion is that the further human remains are traced back in geological time, the more marks they retain of an ape-like ancestry. The Pilt-down skull, which is the oldest human skull known, is almost certainly more like the skull in the adult ancestral apes of Miocene times (still to be discovered) than any later human skull.'²

' . . . The ovoid Pilt-down brain-case, without brow-ridges but with a large face, is indeed naturally associated with the most ape-like human lower jaw hitherto discovered. The lower jaw of the Heidelberg man is more clearly human, but still has a retreating bony chin. The lower jaw of the later Neanderthal man is more modern in having a nearly vertical bony chin.'

The evidence, then, though confused and somewhat conflicting, is sufficient to justify the conclusion that Palæolithic man, man the hunter, had a duration of approximately half a million years.

But consideration must also be directed to the equally important and even more immense interval between man and the ape, when man must have been more definitely a beast of prey dependent on claws and fangs to kill his quarry.

The chief physical difference between man and the anthropoid apes is obviously the fact that man has two feet in place of two hands. He is a 'ground ape,' an ape modified for progression on the ground instead of in the trees. This distinction plainly suggests that the ape began its approach to man when it ceased to be an arboreal creature. But an animal will only change its habits, its mode of life, by force of necessity, and

¹ *Guide to the Fossil Remains of Man*, p. 25.

² *Ibid.*, p. 33.

the only theory that can be plausibly entertained is that the ape could no longer find its sustenance in the trees, but was forced to seek it on the ground. Such a change would easily come about through climatic changes, of which this earth has witnessed so many. Professor Sollas appears to find this cause in the glacial age itself and considers that man is 'a product of the Pleistocene epoch—the latest child of time, born and cradled amongst those great revolutions of climate which have again and again so profoundly disturbed the equilibrium of the organic world.'¹

Another suggestion is that the change was due to the upheaval of the Himalayas which cut off a race of apes from their accustomed food. Here is an expression of this theory :—

'All the available evidence points to Asia as the most likely home of the first man.'

'In that part of the world, before the great upheaval which gave birth to the Himalayan system, there existed a race of apes of exceptional brain capacity who are believed to have been the precursors of the human family. When the impassable barrier of the Himalayas arose they were cut off from the abundant food supplies provided by the luxuriant vegetation to the south, and confined to Central Asia, were forced to sharpen their wits, seek their sustenance on the ground instead of in the trees, and begin that intellectual development which produced the first man more than half a million years ago.'²

Whatever the cause, this development of the brute until he became recognizable as man, must add another great stretch of time to the period during which man was essentially a hunter. Sir Ray Lankester suggests that the beginning would then be thrust into Lower Miocene times.

'Judging from analogy,' says he, 'it is not improbable that it was in the remote period known as the Lower Miocene—remote even as compared with

¹ *Ancient Hunters*, p. 57.

² Scientific Correspondent of the *Observer*, 8th July 1923.

X The Tibetan legend of the monkeys who had to turn to grass seed for food.

the gravels in which Eoliths occur—that Natural Selection began to favour that increase in the size of a large and not very powerful semi-erect ape which eventuated, after some hundreds of thousands of years, in the breeding out of a being with a relatively enormous brain-case, a skilful hand, and an inveterate tendency to throw stones, flourish sticks, protect himself in caves, and in general to defeat aggression and satisfy his natural appetites by the use of his wits rather than by strength alone, in which, however, he was not deficient.’¹

This view of man’s immense antiquity is confirmed by another high authority, Sir Arthur Keith, who says in his most recent work: ‘There is not a single fact known to me which makes the existence of a human form in the Miocene period an impossibility.’²

Though not strictly relevant to this inquiry, it is not uninteresting to note how man’s development may be supposed to have come about. Professor Sollas deduces the following from a consideration of Piltdown man, which combined a human brain-case with an ape’s jaw.

‘Nor,’ says he, ‘need the combination of characters presented by *Eoanthropus* occasion surprise. It had indeed been long previously anticipated as an almost necessary stage in the course of human development.’³ This will appear from the following quotation:—

‘Given a strong ape-like animal with social instincts wresting his sustenance from the wild beasts of the plains, and the evolutionary path to man lies open. The erect attitude, the dexterous hand and the enhanced intelligence are not inconsistent with the possession of brute force and brutal characters, but once acquired, they render possible another acquisition, and this of tremendous import. A pointed stick and the notion of using it to thrust, and we have the primitive spear. Once armed with this the necessity for natural weapons disappears. The massive jaws and fighting teeth can

¹ *Kingdom of Man*, p. 12.

² *The Antiquity of Man*, 2nd Ed.

³ *Ancient Hunters*, p. 54.

now be dispensed with and may safely undergo a retrogressive development with adaptation to purely alimentary functions.'¹

Professor Sollas remarks : ' In *Eoanthropus Dawsoni* we seem to have realized precisely such a being as is here imagined, one, that is, which had already attained to human intelligence but had not yet wholly lost its ancestral jaws and fighting teeth.'

Vague and debateable as all the evidence is in detail, taken on the whole it gives solid scientific warrant for the antiquity of man, an antiquity that is disputed by none, and must on an average estimate represent at least half a million of years. Subsequent to the fragmentary evidence of the beginnings, the human remains and implements become more and more numerous ; the former, as with Neanderthal man, are incontestably human, and the latter indubitably of human manufacture. The animal bones, tools, weapons, and drawings associated with later Palæolithic man show beyond all question that he was a savage subsisting on such animals as he could capture and kill, and on such edible products of vegetation as were found in the natural state.

¹ Quotation from anniversary address of the President, *Quarterly Journal of the Geological Society*, 1910, LXVI., p. lxxxv.

CHAPTER III

HUNTER AND HERDSMAN

IT has been shown that with the close of the glacial epoch, the Palæolithic hunters vanished, and were succeeded by the Neolithic folk who brought with them a pastoral or agricultural mode of life.

Did the Palæolithic people then become utterly extinct? It is interesting to note that according to Professor Sollas they still survive in the savage races that exist, or did exist until recently, in the remote corners of the globe. Says he:—

‘If the views we have expressed in this and preceding chapters are well founded, it would appear that the surviving races which represent the vanished Palæolithic hunters have succeeded one another over Europe in the order of their intelligence; each has yielded in turn to a more highly developed and more highly gifted form of man. From what is now the focus of civilization they have one by one been expelled and driven to the uttermost parts of the earth; the Mousterians survive in the remotely related Australians at the Antipodes, the Aurignaceans are represented by the Bushmen of the southern extremity of Africa, the Magdalenians by the Eskimos on the frozen margin of the North American continent and as well perhaps by the Red Indians.’¹

It was, according to the same authority, at the close of the glacial age that the Old World was cleared of the ancient hunters and repopulated with herdsmen and agriculturists from the south.

‘Evidently,’ he remarks, ‘the close of the glacial epoch was marked by a great movement of peoples.

¹ *Ancient Hunters*, ch. xii. p. 520.

The ancient limits to the habitable regions of the globe had receded towards the pole ; freshly afforested areas, fresh pastures, offered ample room for expansion.'

' If the practice of Agriculture was, as we have supposed, first established at the close, or soon after the close, of the Magdalenian age in, say, the regions bordering the Mediterranean and the Red Sea, where some two thousand years later the first great kingdoms of the world arose, then the presence of the farming tribes, slowly but steadily encroaching on the surrounding land, as they required room for their increasing families and their crops and herds, would have supplied a " vis à tergo " which, in the absence of any great resistance in front, would have led to that general expansion, or even migration, of the hunting tribes towards the North and East which we have already had reason to suspect.'¹

From the Old World, then, the hunters were gone, and had been succeeded by Neolithic people who had domesticated cattle, sheep, goats, and pigs. Neolithic man, says H. G. Wells, ' was a huntsman turned herdsman of the herds he once hunted.'

What happened then is fairly clear. A new variety of human society had been developed somewhere in the south, and as the great ice barrier retreated to the north this type of society displaced and replaced the hunting societies in Europe and Asia.

When this happened also may be estimated with some accuracy ; it had its first beginnings, according to Professor Sollas, not more than ten thousand years ago, but according to other authorities, double that time, or twenty thousand years ago.

What happened is clear ; when it happened and where it happened is equally known. But does that dispose of the matter ? Assuredly not ; it is of infinitely greater importance to discover *how* it happened. And it is in this respect that natural selection comes to the rescue and permits of the attainment of some intelligible interpretation.

¹ *Ancient Hunters*, ch. xiii. p. 546.

Mr. H. G. Wells gives an account that from his point of view was no doubt adequate for the purpose. Speaking of the Neolithic people he remarks : ' It is evident that we have here a way of life already separated by a great gap of thousands of years of invention from its original Palæolithic stage. The steps by which it arose from that condition we can only guess at. From being a hunter hovering upon the outskirts of flocks and herds of wild cattle and sheep, and from being a co-hunter with the dog, man by insensible degrees may have developed a sense of proprietorship in the beasts, and struck up a friendship with his canine competitor. He learnt to turn the cattle when they wandered too far ; he brought his better brain to bear to guide them to fresh pastures. He hemmed the beasts into valleys and enclosures where he could be sure to find them again. He fed them when they starved and so slowly he tamed them.' ¹

Thus Mr. Wells seems to suppose that man, aided perhaps by the co-operation of the domesticated wolf, by insensible degrees, and through growing intelligence, voluntarily converted himself from hunter to herdsman. It is the smooth sort of explanation that naturally suggests itself—especially to those who conceive evolution as simply a matter of developing brain power. Unfortunately it is not consistent with facts as they are known ; in particular it is opposed to the plain fact, that man, like most animals, will change his habits and mode of life only with great reluctance, and only under the stress of imperious necessity.

Independent testimony from various quarters may make the appreciation of this difficulty more easy.

Malthus, after a comprehensive review of the Red Indians of America, in which the enormous hardships necessarily incidental to their mode of life are clearly brought to light, concludes :—

' It is not therefore . . . that the American tribes have never increased sufficiently to render the pastoral or agricultural state necessary to them ; but, from some

¹ *Outline of History*, ch. xi. § 3.

cause or other, they have not adopted in any great degree these more plentiful modes of procuring subsistence, and therefore have not increased so as to become populous. If hunger alone could have prompted the savage tribes of America to such a change in their habits, I do not conceive that there would have been a single nation of hunters and fishers remaining; but it is evident that some fortunate train of circumstances, in addition to this stimulus, is necessary for the purpose.'¹

He draws a like conclusion after a review of the life of modern pastoral nations. Speaking of the Tartars of Turkestan and referring to their restless and aggressive mode of life, he remarks that 'though they are often very ill-treated in these incursions, and the whole of their plunder is not equivalent to what they might obtain with very little labour from their lands, yet they choose rather to expose themselves to the thousand fatigues and dangers necessarily attendant on such a life, than apply themselves seriously to agriculture.'²

He further says: 'The mode of life among the other tribes of Mahometan Tartars presents the same uniform picture, which it would be tiresome to repeat.'

He observes with good reason that 'they are compelled from necessity to a degree of abstinence which nothing but early and constant habit could enable the human constitution to support.'

And he concludes that 'it may be said, of the shepherd, as of the hunter, that if want alone could effect a change of habits, there would be few pastoral tribes remaining.'³

In his descriptions of the hunting races still extant or only recently extinct, Professor Sollas recognizes the same invincible reluctance to a change in their mode of life.

Referring to the Bushmen—a hunting race of Africa now practically extinct—he alludes to their 'unconquerable love of a wild life,' and asserts: 'They

¹ *Essay on Population*, bk. I. ch. iv.

² *Ibid.*, ch. vii.

³ *Ibid.*, ch. vii.

could not assimilate their life to the life of the white race—they could not serve the Boers as servants in cultivating the land or in breeding stock. It seems almost as if they preferred death before civilization.'¹

Professor Sollas is moved to an unusual eloquence in describing the fate of this people.

'They loved their country,' says he, 'and showed an unfailing devotion to their chiefs; they possessed all the noblest of the primitive virtues, and, not least, unflinching bravery and unquenchable love of freedom. It was this last which came to be accounted to them as their greatest crime. They found it impossible to become slaves to strange masters in their own land. Equally impossible was it for a hunting race to maintain its existence in proximity to an encroaching agricultural people of European blood.'²

The inevitable result was the war in which the Bushmen were practically exterminated, only a small and dwindling remainder surviving in the Kalahari desert. And here is their epitaph: 'In their golden age, before the coming of civilized man, they enjoyed their life to the full, glad with the gladness of primeval creatures. . . . They haunt no more the sunlit veldt, their hunting is over, their nation is destroyed.'

Much the same picture is presented of the naked savages that constitute the aborigines of Australia. They cannot or will not change their mode of life, and it is not difficult to understand their reluctance. Here is a picture of their character: 'Courageous in open warfare, he was timid in face of the unknown. He exposed the children he could not rear, but he was an affectionate father to those who were suffered to live. Though he might ill-treat a girl in order to possess her, he was a loving husband when she became his wife. He was a generous fighter and forbore his own advantage. He was hospitable, kind towards his relatives and dutiful towards the aged. His intelligence was equal to his needs.'³

¹ *Ancient Hunters*, ch. ix.

² *Ibid.*, ch. ix. p. 420.

³ *Ibid.*, ch. vii.

The same fate that overtook the Bushmen seems in store for the Australian. All their lands of any use for agriculture or pasturage are appropriated by the white man, and the native is quietly being edged out of existence.

Much the same story seems true for the other hunting peoples. Despite the efforts made to preserve the remnant, the aborigines of Tasmania became extinct. The Red Indians of America too are a dying race.

These facts should not be surprising. If evolution be true, the ancestors of civilized man lived the same wild life for countless generations. Their blood is in his veins; their instincts and their passions form a large part of his heritage; there are rudiments of instinct as well as of structure, and the pulse of man still quickens to the call of the wild; war and the chase make their old appeal, and man to-day still feels the impulse to return to that life for which he was originally designed.

How clearly this may be recognized, although the implications are probably not understood, will be seen by the following extract from Henry George's *Progress and Poverty*. Says he:—

'I am no sentimental admirer of the savage state. I do not get my ideas of the untutored children of nature from Rousseau or Chateaubriand or Cooper . . . but nevertheless I think no one who will open his eyes to the facts can resist the conclusion that there are in the heart of our civilization large classes with whom the veriest savage could not afford to exchange. It is my deliberate opinion that if, standing on the threshold of being, one were given the choice of entering life as a Terra del Fuegan, a blackfellow of Australia, an Esquimaux in the Arctic Circle, or among the lowest classes in such a highly civilized country as Great Britain, he would make infinitely the better choice in selecting the lot of the savage.'¹

These considerations should be sufficient to counter the smooth suggestion that the hunter automatically

¹ *Progress and Poverty*, bk. v. ch. ii.

became a stock-breeder when his intelligence became adequate to enable him to see the material benefits accruing from the change, and when his native ingenuity enabled him to bring it about.

It seems evident that the hunter would not turn herdsman save under the pressure of necessity and through the operation of natural selection. If, by a change of climate or so forth, man became unable to gain a subsistence from wild food, it is then possible to imagine that some tribes having a tendency to protect and control the herds on which they depended would possess an advantage. Protection during the breeding season from beasts of prey might have a very great influence. But such tendencies could only be fostered, such changes could only be brought about, by natural selection operating in circumstances where they became inevitable for the continued existence of the human race. Where, and when, and through what concurrence of circumstances this change took place cannot now be known. Let it be remembered that 'Nature trusts to the chapter of accidents for variation,' and that when beneficial variations happen to arise they will be preserved 'only under certain favourable circumstances.'¹

It can be seen dimly that some such circumstances as were suggested for the change of the arboreal ape to primitive man would be necessary for the conversion of man from his hunting life. But failure of his original sustenance alone would not suffice. The possibility of achieving sustenance by different means must also be present; then if variations in the right direction presented themselves they would tend to be accumulated. It is not impossible to conjecture how such concurrence of circumstances might present themselves. It appears that Labrador, a territory as large as France, is inhabited by a few thousand Indians who follow the one great herd of caribou as it wanders north and then south again in pursuit of food.²

¹ *Origin of Species*, ch. vii.

² See H. G. Wells, *Outline of History*, ch. xiii.

It needs but to imagine a rigour of climate that made pasture scarce, and human food scanty in consequence, to see that greater care and protection of their one herd might be the condition of the continued existence of these people.

Given the horse to ride, and the dog to aid, and the power and the need to control these herds are both in being.

It would not necessarily follow that the Indians would then adopt the course of wisdom, but in such circumstances it is not difficult to imagine that some time, somewhere, some people would submit themselves to the discipline of caring for and protecting the herds that served them for food.

In America there was no horse and the pastoral life never arose, or at least never persisted. It is difficult to resist the persuasion that the domestication of the horse together with the dog had much to do with the power and possibility of controlling herds of wild animals.

It is not impossible that Palæolithic man adopted an agricultural life before a pastoral life. The great objection is that this change of life is much greater and therefore would be effected with vastly increased difficulty ; but the art of agriculture, so far as knowledge was concerned, was as easy of discovery as the art of stock-rearing. The women of savage tribes collect the seeds of grasses and other plants for winter storage, and this is a very near step to agriculture.

But whatever applies to the great natural reluctance of man to change from hunter to herdsman clearly applies with greater force to the change from hunter to agriculturist ; yet, once effected, the issues so far as natural selection is concerned would be the same. A decision on this point is not therefore necessary to this inquiry.

It has been concluded that the hunter would change his mode of life only when compelled by necessity and permitted by opportunity. Sufficient discussion of the incipient beginnings has been given. Let it be assumed

that pastoral societies had developed in some part of the Old World or North Africa, and let it be considered what would be the course of events in the light of natural selection.

What would be the necessary result of the competition between pastoral societies and hunting societies?

This problem admits of an easy answer, an answer that is confirmed by all history. A hunting society is necessarily small, is necessarily limited in numbers. A pastoral society is practically unlimited in size. The resulting disparity is enormous. Consequently, if hunting peoples and pastoral peoples come into conflict for the rights over any stretch of territory, there can be no question as to the side towards which the issues of war would incline.

Adam Smith puts the matter in a nutshell. Says he : ' An army of hunters can seldom exceed 200 or 300 men. The precarious subsistence which the chase affords could seldom allow a greater number to keep together for any considerable time. An army of shepherds on the contrary may sometimes amount to 200,000 or 300,000. As long as nothing stops their progress, as long as they can go on from one district of which they have consumed the forage, to another which is yet entire, there seems to be scarce any limit to the number which can march on together.' ¹

In Neolithic times, the struggles for grazing grounds between pastoral societies must have tended to the natural selection of the larger groups. Other things being equal, the largest society must conquer, and with shepherds there was no such barrier to increase as the thinly scattered means of subsistence imposed on hunters. Consequently pastoral societies must have tended to grow to a size that far overshadowed the hunting societies ; and whenever they clashed, whenever there was conflict as to whether any particular territory should be hunting ground or grazing ground, the decision of war must constantly have inclined in favour of the herdsmen. Survival of the fittest could

¹ *Wealth of Nations*, bk. v. ch. i.

have no other effect. In the history of mankind the elimination of Palæolithic man from the Old World seems to have been most abrupt. This is quite in accordance with the theoretical results of conflict between Palæolithic and Neolithic man. In a few centuries the pastoral and agricultural societies might well have expanded and displaced and replaced hunting societies throughout Europe and Asia.

The strength of pastoral societies has been indicated, and will need to be further considered when their conflict with settled peoples is under consideration. It may therefore be necessary here only to furnish a few illustrations in confirmation of the above remarks by giving some examples of the necessary military weakness of hunting peoples.

Malthus remarks that 'the great extent of territory required for the hunter has been repeatedly stated and acknowledged.'¹

Professor Sollas says: 'The extravagant demands made by a hunting life on the land is shown by the fact that in a fertile district it required more than 100 square miles to support 300 people.'² (*hunters*)

In another place he remarks that 'the chase is extravagant in the demands it makes upon territory; possibly a thousand farmers could exist on the land which would only support a single hunter.'³ Sir John Lubbock has calculated that with the North American Indians the proportion of men to the animals on which they subsisted is about 1 to 750.⁴

As previously alluded to, Labrador, a country as large as France, is said to support only a few thousand Indians who live on the caribou there.

The helplessness of the hunting peoples against civilized peoples is obvious. Wherever the European has coveted their lands he has taken them without difficulty. Nevertheless it comes as a shock to one's boyhood recollections of Fenimore Cooper to find

¹ *Essay on Population*, ch. iv.

² *Ancient Hunters*, ch. vii.

³ *Ibid.*, ch. xii. p. 515.

⁴ Quoted by Sir A. Evans in *Ancient Stone Implements*, p. 573.

such an allusion to the Red Indians as this of Adam Smith : ' Nothing can be more contemptible than an Indian war in North America.'¹ Yet by the standards of history this judgment cannot be disputed.

Natural selection, says Darwin, acts wherever and whenever opportunity offers. And wherever and whenever pastoral or agricultural societies made their appearance, it is clear that in the struggle for existence with hunting societies, the former must have prevailed and the latter have been eliminated. The struggle, judged by prehistoric standards of time, was probably short and decisive. The arbitrament of war in the light of natural selection makes it evident that the hunting societies of the Old World would be rapidly displaced and replaced by the pastoral and agricultural peoples.

¹ *Wealth of Nations*, bk. v. ch. i.

CHAPTER IV

HERDSMAN AND AGRICULTURIST

‘ THE transition between the Palæolithic and Neolithic Ages is still very obscure. We suddenly find a different culture and different kinds of implements, which indicate a different way of life ; but we cannot say exactly how or where the old order gave place to the new. There are some who hold that the cave dwellers are divided by a great lapse of time from their Neolithic successors ; that there was an absolute break in continuity, during which the populous centres of the older Stone Age were deserted ; and that the new culture was introduced by the invasion of another race bringing the elements of a new civilization in its train. How, it is asked, can the occupation of Western Europe have been continuous when in the caves the remains of the two periods are constantly separated by layers of stalagmite which must have taken a long time to form ? ’¹

The above extract indicates that the transition of Palæolithic man, the hunter, to Neolithic man, who was herdsman and agriculturist, is very obscure.

The evidence for the civilization of Neolithic man is derived largely from the burial mounds known as long barrows, and from the Swiss lake dwellings, and partly from another type of evidence furnished by philology.

From general knowledge of human and animal nature it would, as previously contended, be confidently expected that man the hunter would become herdsman before he became a sedentary agriculturist.

¹ British Museum's *Guide to the Antiquities of the Stone Age*, 2nd Ed., p. 82.

A certain crude agriculture is compatible with a pastoral life, and a limited concern with domesticated animals is almost invariably associated with agriculture. But if the needs of the herdsman dominate, there is constant need to seek new pastures, and in temperate climates there is usually a north and south migration during summer and winter respectively. Such a migratory or nomadic life is not consistent with anything but rude agriculture and snatch crops. But it is clear that such a mode of life would be less disagreeable to man the hunter than the settled life of agriculture, with its monotonous labour and long interval between sowing and reaping. But of man as primarily herdsman, and forming a large bridge between man the hunter and man the agriculturist, there is no considerable body of evidence. The Swiss lake dwellings show the mode of life lived by these Neolithic people ; but they were a settled people who had devised this mode of dwelling from the need for security, and the facts show that they early acquired a knowledge of wheat, barley, and millet, from which they made a rough kind of bread.¹ The number of domesticated animals they possessed was at first small, and food was still largely derived from the chase. There is, then, no conclusive evidence showing that for a vast period man was a herdsman, and that this mode of life preceded the settled agricultural life. On the other hand, knowledge of early Neolithic and pre-Neolithic times is so vague as to furnish no rebutting testimony to this hypothesis.

It may, however, be desirable to indicate that such vague evidence as is available does suggest that these different modes of life arose in chronological order as would be expected. Thus Lyell in the *Antiquity of Man*² remarks : ' We learn, from the Danish peat and shell-mounds, and from the older Swiss lake-settlements, that the first inhabitants were hunters who fed almost entirely on game, but their food in after ages

¹ British Museum's *Guide to the Antiquities of the Stone Age*, 2nd Ed., p. 128.

² Ch. xix.

consisted more and more of tamed animals, and still later a more complete change to a pastoral state took place, accompanied as population increased by the cultivation of some cereals.'

It is generally thought that the Aryan language was forced upon the aboriginal inhabitants of Europe towards the end of the Neolithic period, and their original culture has been strongly suggested by a comparison of the various languages, Sanskrit, Greek, Latin, German, Keltic, etc., which derive from the primitive Aryan language.

'A study of their vocabulary . . . shows that in their original home they had reached a stage of culture that is best illustrated by the earliest remains discovered in the lake-dwellings in Switzerland. According to the late Canon Taylor, they were nomad herdsmen who had domesticated the dog, and possessed ox-waggons and dug-out canoes, but no metals except possibly copper. During summer they lived in huts, during winter in pits. Their dress consisted of skins sewn together, and they knew how to kindle fire and to count up to one hundred. It is doubtful whether they tilled the ground, but they probably pounded wild cereals, such as spelt and barley, in stone mortars. Marriage was a recognized institution, but they were polygamists.'¹

In the presidential address to the anthropological section of the British Association, 17th September 1923, Professor P. E. Newberry remarked that 'an immense vista has been opened out before our eyes by the discoveries of the last thirty years, and now in Egypt better than in any country in the world, we can see man passing from the primitive hunter to the pastoral nomad, from the pastoral nomad to the agriculturist, and then on to the civilized life that begins with the art of writing.'²

The evidence, then, scanty as it is, suggests that these modes of life followed one another in order of

¹ British Museum's *Guide to Bronze Age*, p. 12.

² As reported by the *Times*.

time. The dawn of history shows that nomadic herdsmen and shepherds occupied practically the whole interior of Europe and Asia. Agriculture had its beginnings in lands which were not only fertile but naturally secure from invasion, such as Egypt; and the course of civilization shows that from its beginnings until the last few centuries it has been constantly threatened and frequently overthrown by nomad peoples.

The primitive Aryan epics all tell the same story. Thus the Greek *Iliad*, ascribed to Homer and written down perhaps 600-700 B.C., depicts the Greeks as barbarous nomads breaking up an existing civilization.

The *Rig Veda*, the chief of the old Sanskrit epics, tells a very similar story to that underlying the *Iliad*, the story of a fair, beef-eating people—only later did they become vegetarians—coming down from Persia into the plain of North India and conquering their way slowly towards the Indus.¹

Again, the Irish *Iliad* or the *Tain* is the story of a cattle raid. Here, too, the same social order appears as in the *Iliad*—there is a cattle-keeping life in which war chariots are still used and war dogs also.

Mr. H. G. Wells sums up the conditions that are seen at the dawn of history in this way:—

‘It was inevitable that nomad folk and the settled folk should clash.

‘. . . Along the fringes of the developing civilizations there must have been a constant raiding and bickering between hardy nomad tribes and mountain tribes and the more numerous and less warlike peoples in the towns and villages.’

‘For the most part this was a mere raiding of the borders. The settled folk had the weight of numbers on their side; the herdsmen might raid and loot, but they could not stay . . . but ever and again we find some leader or some tribe amidst the disorder of free and independent nomads, powerful enough to force a sort of unity upon its kindred tribes, and then woe

¹ See *Outline of History*, bk. III. ch. xv.

betide the nearest civilization. Down pour the united nomads on the unwarlike unarmed plains, and there ensues a war of conquest. Instead of carrying off the booty, the conquerors settle down on the conquered land, which becomes all booty for them; the villagers and townsmen are reduced to servitude and tribute-paying, they become hewers of wood and drawers of water, and the leaders of the nomads become kings and princes, masters and aristocrats. They too settle down, they learn many of the arts and refinements of the conquered, they cease to be lean and hungry, but for many generations they retain traces of their old nomadic habits, they hunt and indulge in open air sports, they drive and race chariots, they regard work, especially agricultural work, as the lot of an inferior race and class.'

'This in a thousand variations has been one of the main stories in history for the last seventy centuries or more.'

'... The aristocrat . . . becomes a part of the civilization he has captured. And as he does so, events gather towards a fresh invasion by the free adventurers of the outer world.'¹

The great and seemingly secure civilization of Egypt was not exempt from nomad attack and invasion, and was at one time conquered by nomadic Semites who founded a shepherd dynasty, the 'Hyksos.'

The last great and overwhelming triumph of the nomadic herdsmen was the invasion and destruction of the western Roman Empire, from which appalling catastrophe civilization emerged only after the lapse of centuries.

The invention of firearms has precluded the possibility of any further overthrow of civilization by barbarous peoples, and civilization has in the last century clearly made strides that put it far in advance of any previous civilization.

Such then, in brief, are the essential facts in the progress of the human race. To make the sequence

¹ *Outline of History*, ch. xvi. § 1.

of events clearer it will not be uninteresting to take a brief journey backwards in the excellent Time Machine provided by Professor Sollas.¹

‘ Let us now cast a brief retrospective glance over the history of mankind, beginning with this present year of grace, or, let us suppose for greater convenience, from the year 2000 A.D.’

‘ Before we have journeyed backwards five hundred years we have already left behind us the age of coal and the immense wealth of energy it supplies, and reached the reign of Queen Elizabeth when, ignorant of the potency of coal, the people of these islands produced great men and did mighty deeds ; one thousand years and we have passed the whole history of England since the Norman Conquest ; another thousand takes us to the birth of Christ : as we approach the third millennium we leave behind the beauty that was Greece, the glory that was Rome, and find ourselves under the dominion of the great Kingdoms of Egypt and Assyria. So far the age of iron extends, but very soon we enter a time when iron was unknown and men made their weapons and implements of bronze ; as we leave the fourth millennium this also disappears, and copper takes its place ; a little farther, as we approach the fifth, even this has gone ; there are no more metals, and all man’s handiwork is in bone and wood and stone. A little farther, and all the Egyptian dynasties are gone, there are no longer any great cities, nothing but little villages, built, many of them, on piles in the shallows of some lake. Still through the whole of this long journey, down to the sixth millennium, the basis of society has always remained the same—the farmer who tills the soil and the shepherd who tends his flocks ; but now as we pass the seventh millennium we lose this also, and man depends for his subsistence on the natural products of the soil, the roots and fruits, which it is the especial duty of the women to collect, and occasional fish and meat which are contributed by the men. We are in the hunting age ! ’

¹ *Ancient Hunters*, ch. xiv. p. 567.

Here, then, are the essential facts relating to the progress of the human race.

From this sequence of events has arisen or developed human life and human societies as they now are. To penetrate the mysteries of human nature, to understand the situation of man, is the problem which presents itself; and the solution of the problem will depend on the interpretation of the facts. It is necessary to see not only what has happened, but, what is still more important, how it has come about. By deciphering cause and effect, by showing the essential agency, it may be possible to illuminate 'that mystery of mysteries, the problem of evolution, for which no ingenuity, however great, has yet furnished a solution.'¹ Thus says Professor Sollas. But while agreeing that the problem of evolution is the great unsolved 'mystery of mysteries,' the writer has the strongest belief that this problem is quite capable of being solved if it is tackled with the aid of the great engine of natural selection.

¹ Ch. xiv.

*PART II: THE INSTRUMENT OF
INTERPRETATION*

CHAPTER V

THE INSTRUMENT: NATURAL SELECTION

BEFORE the problem of human evolution is explored in the light of natural selection, it is obviously desirable to gain a clear conception of the nature and mode of working of this instrument of research. Various extracts and allusions have already been made which showed Darwin's conception of natural selection and his view of the manner in which it operated; and although the writer has disputed the validity of its derivation and endeavoured to show that its scope must be greatly enlarged, Darwin's conception of this great instrument and of the manner in which it functioned remains unchanged in all vital respects.

He therefore now proposes to give a more systematic account of this great engine, and to indicate its salient features as Darwin conceived them.

In the first place, the following comprehensive explanation is selected as most lucidly showing Darwin's idea of his theory and its *modus operandi*:—

'All organic beings, without exception, tend to increase at so high a ratio that no district, no station, not even the whole service of the land or the whole ocean would hold the progeny of a single pair after a certain number of generations. The inevitable result is an ever-recurrent Struggle for Existence. It has truly been said that all nature is at war; the strongest ultimately prevail, the weakest fail, and we well know what myriads of forms have disappeared from the earth.¹

¹ Introduction to *Variations of Animals and Plants*.

‘ If then organic beings in a state of nature vary even in a slight degree, owing to changes in the surrounding conditions, of which we have abundant geological evidence, or from any other cause ; if in the long course of ages inheritable variations ever arise in any way advantageous to any being under its excessively complex and changing relations of life ; and it would be a strange fact if beneficial variations did never arise, seeing how many have arisen which man has taken advantage of for his own profit or pleasure ; if then these contingencies ever occur, and I do not see how the probability of their occurrence can be doubted, then the severe and often-recurrent struggle for existence will determine that those variations however slight which are favourable shall be preserved or selected, and those which are unfavourable shall be destroyed.’

‘ This preservation during the battle for life of varieties which possess any advantage in structure, constitution or instinct, I have called Natural Selection ; and Mr. Herbert Spencer has well expressed the same idea by the “ Survival of the Fittest.” ’

‘ On the principles here briefly sketched out there is no innate or necessary tendency in each being to its own advancement in the scale of organization. We are almost compelled to look at the specialization or differentiation of parts or organs for different functions as the best or even sole standard of advancement ; for by such division of labour each function of body and mind is better performed. And as natural selection acts exclusively through the preservation of profitable modifications of structure, and as the conditions of life in each area generally become more and more complex from the increasing number of different forms which inhabit it and from most of these forms acquiring a more and more perfect structure, we may confidently believe that on the whole organization advances.’

‘ I believe in the truth of the theory because it collects under one point of view and gives a rational explanation of many apparently independent classes of facts.’

The most vivid illustrations of the working of natural selection have, perhaps, been furnished by Wallace. In the following remarks he shows its mode of operation by contrast with the theory it superseded—that of Lamarck. He says :—

‘The hypothesis of Lamarck—that progressive changes in species have been produced by the attempts of animals to increase the development of their own organs, and thus modify their structure and habits—has been repeatedly and easily refuted by all writers on the subject of varieties and species, and it seems to have been considered that when this was done the whole question has been finally settled ; but the view here developed renders such an hypothesis quite unnecessary, by showing that similar results must be produced by the action of principles constantly at work in nature. The powerful retractile talons of the falcon and the cat tribes have not been produced or increased by the volition of those animals ; but among the different varieties which occurred in the earlier and less highly organized forms of these groups, *those always survived longest which had the greatest facilities for seizing their prey.*¹ Neither did the giraffe acquire its long neck by desiring to reach the foliage of the more lofty shrubs, and constantly stretching its neck for the purpose, but because any varieties which occurred among its antitypes with a longer neck than usual *at once secured a fresh range of pasture over the same grounds as their shorter necked companions, and on the first scarcity of food were thereby enabled to outlive them.*² Even the peculiar colours of many animals, more especially of insects, so closely resembling the soil or leaves or bark on which they habitually reside, are explained on the same principle ; for though in the course of ages varieties of many tints may have occurred, yet those races having colours best adapted to concealment from their enemies would inevitably survive the longest.’³

¹ Italics are Wallace's.

² Italics are Wallace's.

³ *Natural Selection*, ch. ii.

From these extracts it will be patent that natural selection is the instrument which acts on variations in organic life, accumulating beneficial variations and eliminating injurious ones.

The cause of variations is generally obscure, but it is recognized that change of conditions must be largely influential in producing modifications. Change of climate must have some direct influence on living things; geographical changes which introduce fresh rivals and enemies, etc., must also have had considerable influence. Change of conditions will operate more specifically on the activities of animals; new enemies that can be evaded or food that can be obtained only with increased exertion will necessarily call into play organs and instincts previously less extended, and these activities by a certain plasticity inherent in animal organization will cause a natural development of such organs and instincts. This is termed the law of exercise or the effect of use and disuse, and although the validity of this Lamarckian law has been severely criticized, it was accepted by Darwin, and is still difficult to ignore completely. It is, however, clearly impossible to account for many properties of organization by this agency, especially in the vegetable kingdom. The mistletoe, for instance, requires the agency of insects to fertilize the ovules, and the agency of birds to disseminate the seeds. These instrumentalities must have been developed by other means than the law of exercise, and it can only be supposed that variations in the right direction have been presented fortuitously.

Darwin sums up his views as follows :—

‘ Our ignorance of the laws of variation is profound. Not in one case out of a hundred can we pretend to assign any reason why this or that part has varied.’

‘ Changed conditions generally induce mere fluctuating variability, but sometimes they cause direct and definite effects—use in strengthening and disuse in weakening and diminishing organs appear in many cases to have been potent in their effects.’

to the
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+ insects!

‘ Whatever the cause may be of each slight difference between the offspring and their parents—and a cause for each must exist—we have reason to believe that it is the steady accumulation of beneficial differences which has given rise to all the more important modifications of structure in relation to the habits of each species.’¹

Natural selection has nothing to do with the *cause* of variations. To prevent misunderstanding on this point Darwin remarks that ‘ some writers have imagined that natural selection induces variability, whereas it implies only the preservation of such variations as arise and are beneficial to the being under the conditions of life.’²

Ignorance of the cause of variations is so great that it is said that ‘ Nature trusts to the chapter of accidents for variation.’ But as no doubt there is an adequate cause, this is not to be taken too literally, and Darwin remarks : ‘ I have hitherto sometimes spoken as if the variations—so common and multiform with organic beings under domestication, and in a lesser degree with those under nature—were due to chance. This, of course, is a wholly incorrect expression, but it serves to acknowledge plainly our ignorance of the cause of each particular variation.’³

The conclusion to be noted is that although the cause of variations is largely unknown, the point is not important. There is no doubt, in fact, that variations do occur, and however occurring, they will be acted on by natural selection. It is equally indifferent to Darwin’s theory when they occur or where they occur.

He makes this clear in the following statement : ‘ It may metaphorically be said that natural selection is daily and hourly scrutinizing, throughout the world, the slightest variations ; rejecting those that are bad, preserving and accumulating those that are good ; silently and insensibly working, *whenever and wherever*

¹ *Origin of Species*, Summary, ch. v.

² *Ibid.*, ch. iv.

³ *Ibid.*, ch. v.

*opportunity offers,*¹ at the improvement of each organic being in relation to its organic and inorganic conditions of life.'²

So these problems are not relevant to the theory, nor does it matter when or where variations occur; there is no doubt they do present themselves, and therefore furnish the necessary material for natural selection to work upon.

It is desirable to note that natural selection can act only through and for the good of each being.³ Darwin is confident enough to make that fact one of the tests of his theory, asserting that 'if it could be proved that any part of the structure of any one species had been formed for the exclusive good of another species it would annihilate my theory, for such could not have been produced through natural selection.'⁴

As the impulse to variation probably derives from change of conditions, it must not be supposed that evolution goes on continuously. Darwin makes this clear and explains: 'I do not suppose the process . . . goes on continuously; it is far more probable that each form remains for long periods unaltered and then again undergoes modification.'⁵

In another place he further alludes to this point, remarking that 'although each species must have passed through numerous transitional stages, it is probable that the periods during which each underwent modification, though many and long as measured by years, have been short in comparison with the periods during which each remained in an unchanged condition.'⁶

It is desirable to emphasize that natural selection acts not only on the organization but with equal force and effect on the instincts of animals. In the first extract quoted from Darwin in this chapter he asserts that natural selection acts on any advantage in 'struc-

¹ Italics are Darwin's.

² *Ibid.*, ch. iv.

³ *Ibid.*, ch. iv.

⁴ *Origin of Species*, ch. iv.

⁵ *Ibid.*, ch. vi.

⁶ *Ibid.*, ch. xi.

ture, constitution or instinct.' He may be further quoted on this matter :—

' No one will dispute that instincts are of the highest importance to each animal. Therefore there is no real difficulty under changing conditions of life, in natural selection accumulating to any extent slight modifications of instinct which are in any way useful.'¹

He also regarded it as incumbent on him to explain the more wonderful examples of animal instinct, and demonstrates that ' the most wonderful of all known instincts, that of the hive bee, can be explained by natural selection having taken advantage of numerous successive slight modifications of simpler instincts.'²

It may be desirable to conclude this part by giving one striking illustration of the manner in which natural selection renders intelligible the otherwise inscrutable mysteries of nature. The example selected is that of colour ; the beautiful colours and scents of wild flowers, the colours of fruits, and many striking features in the coloration of animals are intelligible on this theory and shown to serve utilitarian ends.

Darwin's argument is as follows :—

' Flowers rank amongst the most beautiful productions of Nature ; but they have been rendered conspicuous in contrast with the green leaves, and in consequence at the same time beautiful, so that they may be easily observed by insects. I have come to this conclusion from finding it an invariable rule that when a flower is fertilized by the wind it never has a gaily coloured corolla. . . . A similar line of argument holds good with fruits ; that a ripe strawberry or cherry is as pleasing to the eye as to the palate,—that the gaily coloured fruit of the spindle wood tree and the scarlet berries of the holly are beautiful objects, will be admitted by every one. But this beauty serves merely as a guide to birds and beasts in order that the fruit may be devoured and the manured seeds disseminated ; I infer that this is the case from having as yet found no exception to the rule that seeds are always thus

¹ *Origin of Species*, ch. viii.

² *Ibid.*, ch. viii.

disseminated when embedded within a fruit of any kind (that is within a fleshy or pulpy envelope), if it be coloured of any brilliant tint, or rendered conspicuous by being white or black.'¹

It needs to be remarked, perhaps, that although flowers have gained colour, scent and nectar in order to make themselves conspicuous and attractive to insects, that does not yield the reason why they are attractive to man. Reason for man's pleasure in the beauty of flowers there must be, and this is clearly independent of the causes by which the reproductive organs of plants acquired those structures which give man a sense of aesthetic delight.

Apart from sexual ornaments and colours, colour in animals is generally either protective for concealment or conspicuous to serve as warning.

Animals that are preyed upon generally have obscure colours which serve to make them difficult of perception. Their acquisition of hues that serve for camouflage is easily understandable in the light of natural selection.

Warning coloration is more interesting. It is usually either an 'advertisement of inedibility' or a signal that the animal has hidden weapons like the bee or the skunk. Examples of the former type are furnished by many caterpillars which have a most striking or conspicuous coloration. There are many other examples in the butterfly world, while sea-anemones and sea-slugs are further illustrations. These animals have generally acquired qualities that make them nauseous and repulsive to creatures that would otherwise eat them.²

The advantage of bright coloration is that it helps to keep them immune from attack. The skunk and the bee can have no wish to use their weapons unless compelled, since their employment destroys the latter and leaves the former defenceless. Nor is the caterpillar benefited by being pecked. But clearly the

¹ *Origin of Species*, ch. vi. p. 151.

² Wallace, *Tropical Nature*, ch. v.

animals who make these experiments will soon learn by experience, and the attacked species is thereby advantaged by displaying those signals which secure its members from repetition of the assault. Warning coloration is thus an advantage to the species, and its acquisition by means of natural selection is clearly understandable.

A sufficiently full account has now perhaps been furnished of the principle of natural selection and its mode of operation.

It is next necessary to refer to a misconception that is prevalent and must be guarded against. Darwin named his principle Natural Selection by analogy from Human Selection. Spencer re-christened it 'Survival of the Fittest,' and Darwin gave the new name his approval, saying 'it is more accurate and is sometimes equally convenient.'¹

Unfortunately survival of the fittest lends itself to a modification which is by no means appropriate and has become highly misleading. It is often considered synonymous with 'Survival of the Strongest,' and this phrase is not infrequently used. This change has lent countenance to the idea that natural selection is the expression and endorsement of the brutal adage, 'They shall take who have the power and they shall keep who can.' Sir Ray Lankester has very lucidly exposed this fallacy in the *Kingdom of Man*. He remarks :

'A more objectionable misinterpretation of the naturalist's doctrine of the survival of the fittest in the struggle for existence is that made by journalists and literary politicians, who declare, according to their political bias, either that science rightly teaches that the gross quality measured by wealth and strength alone can survive, and should therefore alone be cultivated, or that science (and especially Darwinism) had done serious injury to the progress of mankind by authorizing this teaching. Both are wrong, and owe their error to self-satisfied flippancy and traditional

¹ *Origin of Species*, ch. iii.

"The Elimination of the unfit"
"might be better."

ignorance in regard to Nature-Knowledge and the teaching of Darwin. The "fittest" does not mean the "strongest." The causes of survival under natural selection are very far indeed from being rightly described as mere strength, nor are they baldly similar to the power of accumulating wealth. Frequently in Nature the more obscure and feeble survive in the struggle, because of their modesty and suitability to given conditions, whilst the rich are sent empty away and the mighty perish by hunger.'¹

Any one who considers the course of evolution and realizes that the monstrous prehistoric reptiles and the enormous extinct mammals have been succeeded and replaced by the modern fauna, would readily guess that there was a good reason, and that size or strength was not the only quality that contributed to 'fitness' and made for survival. Such monsters might well be advantaged, as is the elephant to-day, by being secure from destruction by beasts of prey, but it is equally clear they would also be disadvantaged by being under the constant necessity of finding supplies of food proportionate to their bulk. A sheep will thrive where a cow would starve, and a slight change in conditions might easily cause the extinction of these prehistoric monsters while animals of smaller bulk would survive. Darwin has recognized this fact, as the following shows: 'I have heard surprise repeatedly expressed at such great monsters as the mastodon and the more ancient dinosaurians having become extinct; as if mere bodily strength gave victory in the battle of life. Mere size on the contrary would in some cases determine, as has been remarked by Owen, quicker extermination from the greater amount of requisite food.'²

But although he has repudiated it, Darwin himself has given countenance to this mischievous error by speaking of survival of the strongest as if it were synonymous with natural selection. Here are two instances the writer has noticed. In one place he

¹ Sir Ray Lankester, *Kingdom of Man*, note to ch. i. § 6.

² *Origin of Species*, ch. xi.

alludes to 'one general law leading to the advancement of all organic beings—namely multiply, vary, let the *strongest* live and the weakest die.'¹ And in another place he remarks: 'It has been truly said that all nature is at war; the *strongest* ultimately prevail, the weakest fail.'² The importance of guarding against this error will become more manifest in succeeding chapters.

What is the general result of the application of natural selection to the interpretation of living things?

It suggests the general conclusion that 'every organ, every part, colour and peculiarity of an organism must either be of benefit to an organism itself or have been so to its ancestors.'³

This conclusion has, however, been much contested, and many details of structure are instanced which it is said could be of no use to the possessor. Darwin fully admits 'that many structures are now of no direct use to their possessors and *may*⁴ never have been of any use to their progenitors.' There are clearly various inherited structures that are of no appreciable advantage or disadvantage to an organism, and these would therefore not be acted on by natural selection, but with these exceptions Darwin believes that 'the structure of every living creature either now is, or was, formerly of some direct or indirect use to its possessor.'⁵

His attitude is summed up in the following:—

'When we no longer look at an organic being as a savage looks at a ship, as something wholly beyond his comprehension; when we regard every production of nature as one which has had a long history; when we contemplate every complex structure and instinct as the summing up of many contrivances, each useful to the possessor . . . when we thus view each organic being, how much more interesting—I speak from experience—does the study of natural history become.'⁶

¹ *Origin of Species*, end of ch. viii.

² *Variations of Animals and Plants under Domestication*. Introduction.

³ Sir Ray Lankester.

⁴ *Origin of Species*, ch. vi.; italics are the writer's.

⁵ *Ibid.*, ch. vi.

⁶ *Ibid.*, ch. xv.

It may, then, be said that Darwin regards the organs, structures, and instincts of living things as developed and designed in order to subserve the preservation of the possessor.

The writer has previously indicated his opinion that Darwin, having derived natural selection, primarily (and erroneously), from redundant reproduction, was unable to see clearly that natural selection must act on the reproductive factor with the same force as on the preservative factor. Reproduction being postulated as the cause, could not be clearly seen also as an effect. When this apparent error is corrected, selection of the fittest must have a double application, and fitness must be defined, not only as fitness to survive, but also as fitness to reproduce the type. Any improvement in either respect must be an advantage to a species in competition with other species, and therefore be acted on by natural selection.

This view emphasizes what is very obvious, that the evolution both of plants and animals has been accompanied, or occasioned, very largely by improvements in the mode of reproduction. The development of mammals from reptiles is paralleled by the development of *angiosperms* from *gymnosperms*. In both cases probably the principal distinction, and that which has been used in naming these great divisions, is the method of reproduction.

The cause of the struggle for existence remains somewhat obscure, but it is clear the species must be taken as the unit. There is good reason to suppose that all life originated in the waters and only subsequently became adapted for life on the land. It is not difficult to suppose that various types of life developed in different places on the earth's surface, and filled similar places in the economy of nature. When by geographical or other changes these types were brought into competition, the fittest would survive and the others would be eliminated, fitness being determined by success in coping with enemies and the elements, and in exploiting the food supplies.

In any case, it is plain that in the human race the reproductive factor has been one of the outstanding features in the development of mankind. From savage to civilized man, care for offspring—the power to aid and the instinct to help—has almost continuously increased. With the mammal, care may be limited to a few weeks or a few months. With savage man it may continue for some years. With civilized man it often endures throughout life and persists after death. In other words, children are where possible maintained and trained until the age of manhood, while the parent persists in industry and abstinence throughout his days, in order that when they are ended he may bequeath to his children further advantages in the shape of accumulated wealth. Such advantages can be given only in civilized societies ; but the instinct that prompts them is the instinct of love, and if love between parents and offspring yields advantages of this character, it is clear that this is an instinct which must have been acted on and developed by natural selection.

Natural selection is not so easy an agency to understand as it is sometimes represented to be, and for a more thorough appreciation the reader can only be referred to the expositions given by Darwin and Wallace, and more particularly to those furnished in that bible of the evolutionist, the *Origin of Species*. But the foregoing account, however inadequate, may be sufficient to excuse an attempt being now made to interpret the outstanding features of history, of human nature, and human societies in the light of natural selection.

*PART III: EXAMINATION OF THE FACTS
IN THE LIGHT OF NATURAL SELECTION*

CHAPTER VI

ASSOCIATION AN ADVANTAGE

MAN is pre-eminently a social animal. This is one of the great facts by which he is distinguished from the rest of the brute creation. With an animal or vegetable species the members usually have commerce with one another only for the purpose of reproduction. Otherwise each member independently seeks his own sustenance and endeavours to provide for his own security. With the human race there is not only association for the purpose of procreation, there is also, normally, combination both for the purpose of finding subsistence and for attaining security. Manifestly man owes many of his superiorities, including the art of language, to the fact that he is a social being. The question which naturally arises is, How is it that man has this faculty of forming societies?

The time was when it would have been readily answered, that it is due to the fact that man has a herding instinct, that he is a gregarious animal.

But this is one of the type of answers which explain nothing. Under the influence of Darwinism the further question would have to be asked, How and why did man acquire this gregarious instinct? The old answer would have been that it was implanted in his constitution by his Maker. But the disciple of Darwin would expect a more concrete answer; he would suspect that men have acquired a gregarious instinct, that they have tended to combine, because association must have advantaged them in the struggle for exist-

ence. This is undoubtedly the primary reason, and confirmation is afforded by the fact that animals also form elementary forms of association for what seems clearly a like reason.

Fortunately this fact has been recognized and clearly discussed by Spencer. While Spencer emphatically proclaimed his independence of Darwin, and pointed to the fact that in his *First Principles* he had found occasion to allude to Darwin's theory in only one paragraph; yet in his later works, particularly the *Principles of Sociology and Ethics*, he constantly has recourse to arguments derived from the operation of natural selection. Like King Charles's head with Mr. Dick, he seems unable to keep survival of the fittest out of his discussions. This has the great advantage for the present writer that he can frequently use Spencer's illustrations in the present inquiry.

In the present case Spencer has ably discussed the reasons for association in the light of natural selection. He first considers combination among animals. Here are examples of animals which combine in order that they may be better protected from their enemies.

'Simple association, as of deer, profits the individual and the species only by that more efficient safeguarding which results from the superiority of a multitude of eyes, ears and noses over the eyes, ears and nose of a single individual. Through the alarms more quickly given, all benefit by the senses of the most acute. . . . This, which we may call passive co-operation, rises into active co-operation among rooks, where one of the flock keeps watch while the rest feed, or as among the cimarrons, a much hunted variety of mountain sheep in Central America, which similarly place sentries.'

'We read of bisons that, during the calving season, the bulls form an encircling guard round the herd of cows and calves, to protect them against wolves and other predatory animals; a proceeding which entails on each bull some danger, but which conduces to the preservation of the species. Out of a herd of elephants

about to emerge from a forest to reach a drinking place, one will first appear and look round in search of dangers, and not discerning any, will then post some others of the herd to act as watchers ; after which the main body comes forth and enters the water. Here a certain risk is run by the few in order that the many may be the safer. In a still greater degree we are shown this kind of action by a troop of monkeys, the members of which will combine to defend or rescue one of their number, or will fitly arrange themselves when retreating from an enemy—the females, with their young, leading the way, the old males bringing up the rear—the place of danger ; for though in any particular case the species may not profit, since more mortality may result than would have resulted, yet it profits in the long run by the display of a character which makes attack on its groups dangerous.’¹

Other animals combine, not for defence but for attack, and Spencer instances wolves, where by ‘a plan of attack in which the individuals play different parts, prey is caught which would otherwise not be caught.’

Another type of combination, that for necessary labour, is illustrated by beavers, ‘where a number work together in making dams.’

Animals which develop the faculty of combination also develop the instinct to maintain their societies by punishing or expelling members who by their misbehaviour make themselves a menace to its continued existence. Thus a ‘rogue’ elephant is one which has been expelled from the herd, ‘doubtless because of conduct obnoxious to the rest.’ It is said that beavers will banish an idler from their colony, and, as is well known, drones when no longer of use to the hive are killed or driven off by worker bees.²

And what is Spencer’s conclusion ?

‘Speaking generally,’ he says, ‘we may say that gregariousness and co-operation more or less active establish themselves in a species only because they are

¹ *Principles of Ethics*, § 253.

² *Ibid.*, § 253.

profitable to it ; since otherwise survival of the fittest must prevent establishment of them.'

Clearly, then, association is developed only when it is advantageous, and the instrumentality of natural selection is plainly adequate to cause this development.

For the human race there is no difficulty in believing that men form societies for exactly analogous reasons, and it is evident that the size and character of the societies will be determined by competition between them, which will lead to the survival of those best fitted for the particular conditions.

Spencer summarizes the facts as follows :—

' More clearly in the human race than in lower races, we are shown that gregariousness establishes itself because it profits the variety in which it arises ; partly by furthering general safety and partly by facilitating sustentation. And we are shown that the degree of gregariousness is determined by the degree in which it thus subserves the interests of the variety. For where the variety is one of which the members live on wild food, they associate only in small groups ; game and fruits widely distributed can support these only. But greater gregariousness arises where agriculture makes possible the support of a large number on a small area ; and where the accompanying development of industries introduces many and various co-operations.'¹

In the light of natural selection, then, the formation of human societies is clearly understandable. Man was advantaged by being a member of a group. Combination gave him greater protection and security, a better chance of surviving in the struggle for existence.

In contests for hunting grounds, the strongest groups would be advantaged ; weak combinations, and men who pursued a solitary path, would tend to be eliminated. So survival of the fittest would lead to the selection of the most efficient groups.

But with hunting tribes, combinations could not increase indefinitely. The large territory required to

¹ *Principles of Ethics*, § 259.

support such people puts a definite limit on the number who can live in permanent association. Consequently, with primitive man, the value of association is limited.

With the advent of pastoral and agricultural life this obstacle was removed. Much larger combinations became not only possible but profitable. This will be discussed later.

The only conclusion which needs to be drawn here is that the cause of association was the advantage it conferred on those who combined. And the instrumentality of natural selection is plainly indicated as an agency adequate to bring this about.

CHAPTER VII

THE ARBITRAMENT OF WAR

IN the history of mankind war has been one of the dominant factors. War between human societies corresponds largely to the struggle for existence in nature. And the arbitrament of war is final and decisive. In these contests of brute force, by all analogy, it must be assumed that the fittest have survived and the less fit have been eliminated. This conclusion, consonant as it is with the facts of history and experience, is often regarded as repugnant to the moral sense. If might alone determines the existence of a people, what becomes of right? Later discussions will show that 'right' and the arts of civilization are factors which have considerable influence on the struggle between societies. Morality contributes to social prosperity and leads, other things being equal, to an advantage in military power. At the same time, when society comes in conflict with society, it is obvious that the virtues and arts of civilization affect the issue only in so far as they have an influence on the factors making for victory or defeat. The arbitrament of war is plainly decisive, and no higher court exists to which appeal can be made.

Having recognized this grim and incontrovertible fact, the question that inevitably arises is, What is the reason for war? For what is it that men fight?

The answer will be that men as a group fight for the things which advantage the group. Wealth is the produce of labour applied to the land, and it is this wealth and this land for which societies primarily dispute. In the primitive state of mankind, when man was a hunter, wealth was for all practical pur-

poses non-existent, and men fought solely for land, for the monopoly of a certain area, so that they might gain the privilege of appropriating its products. In other words, men fought essentially for hunting grounds.

Let some illustration be furnished of these propositions.

'A society lives,' says Spencer, 'by appropriating matters from the earth—the mineral matters used for buildings, fuel, etc., the vegetal matters raised on its surface for food and clothing, the animal matters elaborated from these with or without human regulation.'¹

In discussing property which essentially constitutes wealth Spencer amplifies the previous assertion. Says he: 'Since all material objects capable of being owned are in one way or other obtained from the Earth, it results that the right of property is originally dependent on the right to the use of the Earth. While there were yet no artificial products, and natural products were therefore the only things which could be appropriated, this was an obviously necessary connexion. And though in our developed form of society, there are multitudinous possessions ranging from houses, furniture, clothes, works of art, to bank-notes, railway shares, mortgages, Government bonds, etc., the origins of which have no manifest relation to use of the earth; yet it needs but to remember that they either are or represent products of labour, that labour is made possible by food, and that food is obtained from the soil, to see that the connexion though remote and entangled still continues.'²

Henry George recognizes the same facts in a more eloquent strain. He remarks that 'the land is the source of all wealth. It is the mine from which must be drawn the ore that labour fashions.'³

'Land is the habitation of man, the storehouse upon which he must draw for all his needs, the material to

¹ *Principles of Sociology*, 3rd Ed., § 240.

² *Principles of Ethics*, § 299.

³ *Progress and Poverty*, bk. v. ch. i.

which his labour must be applied for the supply of all he desires. . . . On the land we are born, from it we live, to it we return again—children of the soil as truly as is the blade of grass or the flower of the field.’¹

The arbitrament of war, it has been remarked, is decisive. Societies that are destroyed by other societies are eliminated from the history of the human race. It is the process of natural selection applied to the combinations of men. The factors and issues of war as they affect the various types of civilized societies will have to be considered in future chapters, but it may be desirable here to consider the issues of war between hunting societies so that the operation of natural selection may receive some concrete illustration.

Writers on the barbarous peoples have all seemed to recognize that these savages fight for the best hunting grounds. Equilibrium between these peoples seems to be never more than temporary. It is not difficult to understand how changes of climate or pressure of population or other causes will constantly set these savage tribes at one another’s throats. A hunting ground once acquired is jealously guarded ; as it has been gained by force, it can be retained only by the same means.

Malthus refers to these peoples as follows :—

‘ The tribes of hunters, like beasts of prey, whom they resemble in their mode of subsistence, will consequently be thinly scattered over the surface of the earth. Like beasts of prey they must either drive away or fly from every rival, and be engaged in perpetual contests with each other.’

Referring to the Red Indians, he states that ‘ the rudest of the American nations are well acquainted with the rights of each community to its own dominions. And as it is of the utmost consequence to prevent others from destroying the game in their hunting grounds, they guard this national property with a jealous attention.’²

¹ *Progress and Poverty*, bk. v. ch. ii.

² *Essay on Population*, ch. iv.

He remarks that they ' . . . live in a perpetual state of hostility with each other,' and observes that ' the very act of increasing in one tribe must be an act of aggression on its neighbours.'

But a temporary conclusion to this strife must be reached, and the ' . . . contest will continue till the equilibrium is restored by mutual losses or till the weaker party is exterminated or driven from its country.'

The same phenomena are observed with other hunting peoples. Professor Sollas, referring to the Australian aborigines, remarks that the tribal unit ' possesses exclusive rights over a well-defined hunting ground ' ;¹ and of the Bushmen of Africa he says : ' The hunting grounds of each family were strictly delimited and the boundaries were faithfully observed.'²

To infringe the boundaries of any tribe is to break ' the most sacred law of the jungle.'

Sir John Lubbock discussing ' Modern Savages ' in *Prehistoric Times*, says : ' Different races of savages have but little peaceful intercourse with one another. They are almost always at war. If their habits are similar, they are deadly rivals fighting for the best hunting grounds or fisheries.'³

Darwin gives a convenient summary in the following remarks :—

' All that we know about savages or may infer from their traditions and from old monuments, the history of which is quite forgotten by the present inhabitants, show that from the remotest times successful tribes have supplanted other tribes. Relics of extinct or forgotten tribes have been discovered throughout the civilized regions of the earth, on the wild plains of America and on the isolated islands in the Pacific Ocean.'⁴

Clearly there has been a constant struggle for existence between different tribes of hunting peoples. How will natural selection have acted ? Providence, it is

¹ *Ancient Hunters*, ch. vii.

³ Ch. xv.

² *Ibid.*, ch. ix. p. 419.

⁴ *Descent of Man*, ch. v.

said, is usually on the side of the big battalions ; but, owing to their mode of life, a limit is placed to the number of savages that can combine. Wild food widely scattered will support small groups only. Natural selection, since it cannot in this case lead to aggregation, can only act on such qualities as courage, strength, subordination, and leadership. Improvements in weapons would also be fostered, but development in any one direction would not necessarily be decisive. Evidence from savages in historical times shows little indication of progress. The implements and traces left by Palæolithic man, however, show that over a sufficient period of time progress does become evident, and Professor Sollas thus sums up the evidence : ‘ The history of the hunting races is marked by a fluctuating progress ; the movement is on the whole forwards, but it is always open to retarding influences by which it is sometimes arrested or even reversed.’¹

Though the irregular march of progress and its occasional retrogression may puzzle those who hold that progress is in the nature of things and part of an inevitable process, these facts will seem quite natural to Darwinians who recognize that all developments in the arts of civil life are governed by the arbitrament of war, and that no refinements or improvements in social life are likely to have any permanence unless they conduce to, or are at least compatible with, the power of self-preservation ; which is, for the society as for the individual, the first law of life.

¹ *Ancient Hunters*, ch. xiii. p. 522.

CHAPTER VIII

AGRICULTURE: WHAT IT IS, WHERE, WHEN AND HOW IT BEGAN

AGRICULTURE consists in the cultivation of the ground or the art and science of rearing crops. Clearly there is one great distinction between the life of the hunter and herdsman, and the life of the agriculturist. The life of the former is essentially nomadic or migratory. The animals which serve them for food must move continuously in quest of pasture, and men who subsist on them must move in the same manner. The quest of grazing grounds, accentuated as it often is by seasonal migrations, necessarily implies a more or less nomadic life. But with agriculture the reverse is the case. Agriculture implies primarily a settled state. Man must plough and sow before he can reap, and in the interval he must see that his growing crops are not interfered with. The beginnings of agriculture are plainly the beginnings of civilization. Not until man became a permanent resident in a certain area would he think of building any kind of permanent habitation; not until then would the first rude roads and cities be built; not until then could the art of writing be developed.

A certain amount of stock raising is of course quite consistent with an agricultural life; but herds and flocks must clearly be restricted by the pasturage available within a certain range. The hunting of wild animals is also possible on the same condition that it does not entail the abandonment of the fixed habitation.

An agricultural life is comparatively a sedentary life, and other activities have necessarily to be restrained within the limits it imposes.

These facts are generally recognized. 'Agriculture,' says Adam Smith, 'even in its lowest state, supposes a settlement; some sort of fixed habitation which cannot be abandoned without great loss.'¹

In defining civilization, H. G. Wells is thinking of much the same thing. 'Civilization,' says he, 'is the settlement of men upon an area continuously cultivated and possessed, who live in buildings continuously inhabited.'²

Where did agriculture first begin? Neolithic man plainly had some knowledge of agriculture, and to some limited extent applied his knowledge. But as the pastoral and agricultural modes of life appear to be more or less confused in the life of Neolithic man and have been previously discussed, it is not necessary to deal with the matter in further detail. The view of Professor Sollas is sufficient for the present purpose. He supposes that agriculture was first established 'at the close or soon after the close of the Magdalenian age, in the regions bordering the Mediterranean and the Red Sea where some two thousand years later the first great kingdoms of the world arose.'³

According to Professor Sollas this beginning is to be placed some ten thousand years ago; but other authorities would place it twenty thousand years back.

With this brief indication of what agriculture is, and where and when it began, consideration may now be directed to the more difficult problem of *how* it began.

Man no doubt discovered the nutritive value of wild graminiferous grass seeds long before he learned to sow and cultivate the kind of plant that yielded them.

It has been suggested that grains put with the dead to serve his spirit for food would tend to germinate and produce a luxuriant growth, and thus savage man would discover the art of sowing. But there are plainly many ways in which the observant savage might discover the part played by fruits and seeds in the economy of nature.

¹ *Wealth of Nations*, bk. v. ch. i.

² *Outline of History*.

³ *Ancient Hunters*, ch. xiii.

It does not, however, follow that the knowledge when obtained would be put into practice. There is a great gulf between the art and the science of agriculture.

Everything that has been said in a previous chapter in regard to man's reluctance to change his habits or mode of life applies with great force to that change which agriculture would necessitate.

The hunting peoples of historical times have died out or are dying out because they will not or cannot adopt an agricultural mode of life. Plainly this is not from any ignorance of this more plentiful mode of obtaining sustenance, but from an invincible reluctance to submit to those restraints which it imposes, and those constraints which it necessitates. It seems far easier for man to pass from a pastoral to an agricultural mode of life than from the wild life of the hunter to the quiet life of the farmer. In this respect the negroes of the United States furnish a marked contrast with the native aborigines.

The remarks of Professor Sollas in regard to the Bushmen of Africa are pertinent to this point. Says he: 'The vegetable kingdom was ransacked for all that it could afford, even the seeds of wild grasses were collected and stored for winter use. How short a step it seems from this to agriculture; but to take this step requires qualities that the Bushman never possessed, and inconsistent with his unconquerable love of a wild life.'¹

While the Bushman died out rather than turn farmer, it does not seem that his women folk would have made the same choice. And Professor Sollas suggests that: 'Since it is the women of primitive hunting tribes who collect and store the seeds, is it not possible that it was also a woman who was the first agriculturist?'²

It appears that two German writers have investigated this question and given an answer in the affirmative.

It is quite conceivable that the women of some savage

¹ *Ancient Hunters*, ch. ix.

² *Ibid.*, ch. ix. p. 396.

peoples were the first to practise agriculture. And it needs but to imagine a time of dearth, giving tribes who had this additional means of sustenance an advantage over other tribes, to see how such tribes might survive where others died out. The occasional recurrence of such conditions would entail a continual combing out of the tribes with the poorest agriculture and the selection of those where it was more developed. There would be a constant tendency to the displacement of non-agriculturists by agriculturists until the practice of tillage became habitual with some peoples, and the work, instead of being confined to the women, would be shared by the old men and the boys, and later by the reluctant adult. How familiar an illustration of the workings of natural selection the above speculations furnish! Nature trusts to the chapter of accidents for variation and works wherever and whenever opportunity offers. It is some further confirmation of this suggestion to remember that with the ancient Germans (the chief ancestors of modern Englishmen) the management of the land and cattle was delegated to the old and the infirm, to women and to slaves. The superior male, when he wasn't drinking or gaming, spent his energies in war and the chase. 'To solicit by labour what might be ravished by war was deemed unworthy of the German spirit.'¹

Plausible as this suggestion is, it is offered by way of illustration and hypothesis and in order to confute the usual presumption that these changes are merely a matter of intelligence; that once the knowledge of sowing was acquired and its more fruitful results recognized, its practice would automatically follow.

Mr. H. G. Wells, for instance, in alluding to the high fertility of Mesopotamia, remarks that 'in such countries men would cease to wander and settle down almost unawares!'

But enough has probably been said to refute such presumptions. Exactly how agriculture arose is not known; that somehow, somewhere, natural selection

¹ Gibbon, *Decline and Fall*, vol. i. ch. ix.

was instrumental in securing its practice is the most probable hypothesis; that it could not have arisen without the operation of some such agency may also be asserted with equal confidence.

The incipient beginnings having been discussed, consideration may now be directed to the conditions under which it could be perpetuated and developed.

Poor lands which may support flocks of sheep or goats will obviously not repay the labour of tillage. Fertility of land is plainly a pre-requisite. But another factor almost equally essential is security.

After discussing the life of modern shepherds, Malthus remarks that 'A certain degree of security is perhaps still more necessary than richness of soil to encourage the change from the pastoral to the agricultural state.'¹ Manifestly the development of agricultural societies depends first on securing the fertile lands, and secondly, on retaining possession of such lands.

And while combination for a hunting life was seen to be limited to small numbers, combination for agriculture, like association for pastoral life, permits the growth of comparatively enormous societies. So far as any menace from hunting peoples was concerned, agriculture, once it had developed a population of sufficient size, would have complete security for the possession of its lands.

But how about the pastoral people? It is not material whether the farmers developed from the shepherds, or whether both developed independently from the hunters. So long as pastoral and agricultural societies co-existed it was inevitable that they should come into collision. And it is clear that agriculture could not develop, civilization could not progress, unless the farmers remained for long generations in possession of their land. Countries that are naturally fertile, and are also, owing to their situation, naturally secure, are not numerous. Pre-eminent among them is Egypt.

¹ *Essay on Population*, ch. vii.

Egypt has always been the land of mystery and romance, but to-day it is being endowed with a new character. In the scheme of evolution it is becoming recognized that Egypt is the birthplace of civilization. Until recently it was supposed that civilization had various distinct origins and had developed independently in various parts of the world such as Egypt, China, and even America ; but now, owing largely to the vigorous representations of Professor Elliot Smith, the view is rapidly gaining ground that civilization has had a single origin, and that origin is in Egypt. Menes, the founder of the first great dynasty, is dated back to at least 3400 B.C. Long before this, the valley of the Nile was occupied by a 'Brown race,' who 'invented agriculture and irrigation, the working of metals, the crafts of the carpenter and of the stone mason, architecture and shipbuilding, the measurement of the year from the periodic floodings of the Nile, the art of writing, social organization, methods of government, religious beliefs and ritual.'¹

It is interesting to note this view and observe that it is congruous with the ordinary facts of zoology and botany for which the 'ideas of multiple origin' are being dispelled, and 'the history of civilization is thus falling into line with other aspects of the tree of life and is becoming part of the general science of evolution.'²

This view is certainly more consistent with the general view of evolution by means of natural selection, whereby a superior type of organization displaces inferior types and rapidly expands and replaces them throughout the space they fill in the economy of nature.

But whether this fascinating hypothesis is a fact or not is not a matter in any way vital to this inquiry.

Egypt is certainly one of the principal centres where civilization developed, and it is interesting to note that Egypt was very favourably situated for such a

¹ Scientific Correspondent of the *Times*, 22nd May 1923.

² *Ibid.*, 25th Sept. 1923.

development. For, besides a great natural fertility due to the periodical flooding of the Nile, it has natural barriers which give it a large measure of protection from invasion. Thus Egypt has sea to the north, desert to the west, desert and sea to the east, while to the south she has only negro peoples.

What state the peoples of Africa were then in, it is difficult to say ; a century ago it was a country divided into ' a thousand petty states ' ¹ constantly at war with one another, and having a climate unfavourable to exertion, and therefore not likely to be a menace to an agricultural society of any size.

Only the isthmus of Suez furnished a gateway for the nomadic peoples of Asia. Consequently it is understandable that the people of Egypt enjoyed a large immunity from conquest and invasion. Only once, it appears, did Egypt receive a conqueror from Africa when in the eighth century B.C. she fell under an Ethiopian dynasty. Once, at least, she was conquered by a race of shepherds, the ' Hyksos.' But conquest by a people who simply displace and replace the native aristocracy, though not favourable to the advancement of a society, is not by any means fatal. This country survived the Norman Conquest and assimilated the invaders, and the civilization of Egypt did not collapse by her forced submission to its invaders.

The civilization of Egypt may have spread to the Phœnicians, to Crete, and to Greece. Later came the rise of Rome and Carthage and the tremendous contest which resulted in Carthage being blotted off the map and left Rome as the potential mistress of the world. The long struggles for supremacy in Western Asia between Assyrians, Babylonians, and Persians were terminated by the triumphs of the Greek ; and what remained of the Macedonian conquests was subsequently absorbed in the empire of Rome.

' In the second century of the Christian era,' says Gibbon, ' the Empire of Rome comprehended the

¹ Malthus, *Essay on Population*, ch. viii.

fairest part of the earth and the most civilized portion of mankind. It extended to the Atlantic on the West, to the Rhine and Danube on the North, to the Euphrates on the East, and was stayed only by the sandy deserts of Arabia and Africa on the South.’¹ Gibbon computes that it contained a population of one hundred and twenty millions, a number which, he remarks, probably exceeded the population of Europe of his day (1737-1794).

Here, then, in the Old World was the great empire of Rome. In the far confines of Asia was another great settled society, that of China, while the whole interior was filled by herdsmen and shepherds: ‘The whole territory from the confines of China to the shores of the Baltic was peopled by a various race of barbarians, brave, robust and enterprising, inured to hardships and delighting in war.’²

The beginnings of history, then, reveal the Old World parcelled out between two different types of human society. In the more secure and fertile countries bordering the sea were settled agricultural peoples. In the vast interior were numerous tribes of nomadic herdsmen.

¹ *Decline and Fall*, ch. i.

² *Essay on Population*, ch. vi.

CHAPTER IX

AGRICULTURE AND NOMADS

THE progress of man, the progress of civilization, means essentially the development of settled agricultural societies. Civilization cannot arise from the hunting life, nor can it arise from the unsettled life of the herdsman and shepherd. Civilization can arise only from settled peoples who occupy the same land generation after generation. In the course of centuries durable habitations are constructed, villages become towns, the countryside is drained, irrigated, fenced, and intersected by roads. The arts of the carpenter, the mason, and later the smith, naturally develop. The whole land becomes a vastly improved estate where labour constantly tends to secure a better return. And provided that population does not press too closely on the expanding means of subsistence, the people will naturally increase not only in numbers, but in prosperity. With a wealthy and populous state, division of labour becomes an advantage; leisured people can pursue the arts and sciences and develop the various refinements of civilized life. But manifestly all this apparatus of civilization has a material basis. It represents a vastly increased command over the means of subsistence. And this command can only be the outcome of the industry and accumulation of many generations—of a society that has persisted in favoured situations for many scores of years.

What has been the course of civilization? what has been the story of the progress of mankind? The facts are sufficiently plain; the writer is now in the region of recorded history—of records that begin with the art of writing, an art that is one of the first great

products of a settled state. The inscribed records go back in Egypt to the first great dynasty 3400 or more B.C.

The writer can only attempt to deal broadly with the history of civilized man. He can only attempt to indicate the broad elemental principles of human progress. And it is only in the light of natural selection that these elemental facts are thrown into high relief. It is only in and by the light of natural selection that any intelligible understanding of history becomes possible. But with the aid of this instrument of research history becomes a part of the process of evolution ; it reveals the operation of the same law, of the same simple yet all-powerful principle—constant competition with continuous elimination and selection, a continual weeding out of the less fit, and renewed competition among the fit and favoured survivors.

Obviously, with the human race the unit is not the individual nor the species, but primarily the society. Man could no longer exist as a unit ; competition forced him to combine, to associate. Those that could not or would not combine were eliminated. Competition went on among the different combinations of men. They fought first for hunting grounds, then for grazing grounds, then finally for fertile lands adapted for agriculture. Where size was an advantage, the smaller societies were extirpated or absorbed by the larger societies until only larger societies survived. So long as size was an advantage, natural selection would operate in this manner to eliminate the smaller and select the larger. And the process would go on until size no longer gave an advantage. With hunting societies this limit was early reached.

When the next type of human society—the herdsman—came into existence, a new and tremendous factor came into operation. The society was no longer limited to a few hundreds, but could grow into hundreds of thousands. A pastoral society is in fact limited in population only by the area of pasturage available. On the great plains of Europe and Asia,

grazing lands extended for hundreds and thousands of miles. Here was herbage that could support flocks and herds of enormous numbers. And the population of the herdsmen could expand to the limits of the food supply at their command.

These vast aggregates of herdsmen were not only possible in theory, but did in fact actually exist in historical times. It is not difficult to see how they would arise. One group of herdsmen would fight another group for possession of grazing grounds, and other things being equal, the larger society would be victorious. Malthus remarks that the contests between the tribes 'would be so many struggles for existence, inspired by the reflection that death would be the punishment of defeat, and life the prize of victory.'¹

Here is a striking instance of the use of Darwin's phrase, the struggle for existence, and the obvious sequel must be drawn that the fittest would survive. The more fruitful regions would be coveted by all, and would be won by the most valiant, most numerous, and best disciplined tribes. And they would retain them only so long as they possessed those characters. Other things being equal, natural selection would favour size until it ceased to be profitable. Too large a society would be handicapped in the constant quest for water and pasturage, and would naturally tend to disintegrate. Just as with settled peoples, too vast an extent of territory, too large an empire, cannot be administered from one centre, cannot be so ruled as to act as a unity.

The essential fact to be borne in mind is, that while societies of hunters were limited to a few hundred men, societies of herdsmen or agriculturists were comparatively unlimited in size.

So far as herdsmen go, it is this fact that has obviously been a principal cause in arresting, thwarting, and even reversing the progress of civilization.

When the curtain rises on the drama of history it shows civilized peoples around the Mediterranean and

¹ *Essay on Population*, ch. vi.

in the Far East, while ' from the confines of China to the shores of the Baltic ' were barbarous peoples who lived a pastoral life. It is difficult, it comes even as a shock, for civilized people to-day to realize that these barbarous herdsmen could ever have been a serious menace to civilized societies. But the cold facts of history compel this recognition. For many thousands of years, indeed, it seems that the issue was as to which of these two types of society would survive and inherit the earth. Civilized peoples had no decisive superiority over the nomads. It may indeed be said that only the invention of firearms put the issue once and for all beyond doubt. How many civilizations, lit perhaps by the torch from Egypt, were ruined and overthrown by nomadic peoples before the dawn of history, will probably never be known. Archæological research is continually uncovering the ruins of unknown civilizations that have perished from causes equally unknown ; but of these causes the most probable was destruction at the hands of pastoral peoples.

What are the principal factors that would determine the issue of war between nomad and civilized peoples ? According to Adam Smith they appear to be these :—

ARMIES OF PASTORAL SOCIETIES.	ARMIES OF AGRICULTURAL SOCIETIES.
<i>Numbers</i> — May amount to 200,000/300,000 men.	<i>Numbers</i> — Even larger armies possible.
<i>Mobilisation</i> —Always mobilised.	<i>Mobilisation</i> — Mobilised with difficulty.
<i>Better</i> soldiers.	<i>Not</i> so good soldiers.
<i>Can choose</i> their moment to attack.	<i>Must fight</i> when their opponents choose.
<i>If repulsed</i> —Can withdraw and are little worse off.	<i>Must stand</i> their ground ; to retreat is fatal ; to be defeated is to lose all they have acquired by their exertions and all they have inherited from their ancestors.

Adam Smith has discussed this matter, and the following extracts will illuminate the working of these principles.

Dealing first with pastoral peoples, he remarks :—

‘ Among nations of shepherds, a more advanced state of society such as we find it among the Tartars and the Arabs, every man is a warrior. Such nations have commonly no fixed habitation, but live either in tents, or in a sort of covered wagon, which are easily transported from place to place. The whole tribe or nation changes its situation according to the different seasons of the year, as well as according to other accidents. When its herds and flocks have consumed the forage of one part of the country, it removes to another, and from that to a third. In the dry season it comes down to the banks of the rivers ; in the wet season it retires to the upper country.’¹

‘ The whole nation being accustomed to a wandering life easily takes the field in time of war.’

‘ If they conquer, whatever belongs to the hostile tribe is the recompense of the victory. But if they are vanquished, all is lost, and not only their herds and flocks, but their women and children, become the booty of the conqueror. Even the greater part of those who survive the action are obliged to submit to him for the sake of immediate subsistence. The rest of the tribe are commonly dissipated and dispersed in the desert.’

‘ An army of hunters can seldom exceed 200 or 300 men. The precarious subsistence which the chase affords could seldom allow a greater number to keep together for any considerable time. An army of shepherds, on the contrary, may sometimes amount to 200,000 or 300,000.’

‘ As long as nothing stops their progress, as long as they can go on from one district, of which they have consumed the forage, to another which is yet entire, there seems to be scarce any limit to the number which can march on together. A nation of hunters can never be formidable to the civilized nations in their neighbourhood. A nation of shepherds may. Nothing can be more contemptible than an Indian war in North

¹ *Wealth of Nations*, bk. v. ch. i.

America. Nothing, on the contrary, can be more dreadful than a Tartar invasion has frequently been in Asia. The judgment of Thucydides, that both Europe and Asia could not resist the Scythians united, has been verified by the experience of all ages. The inhabitants of the extensive but defenceless plains of Scythia, or Tartary, have been frequently united under the dominion of some conquering horde or clan ; and the havoc and devastation of Asia have always signalized their union. The inhabitants of the inhospitable deserts of Arabia, the other great nation of shepherds, have never been united but once ; under Mahomet and his immediate successors. Their union, which was more the effect of religious enthusiasm than of conquest, was signalized in the same manner.'

According to Adam Smith, then, the shepherds, when united, were invincible ; ' the experience of all ages ' testifies that ' both Europe and Asia could not resist the Scythians united.'

It is plain, then, that civilization was always endangered, always menaced. Egypt, China, India, and even Rome were at one time or another conquered by these barbarian peoples. It is not then difficult to understand why human progress has been so frequently arrested, so often reversed.

And now consider the settled societies. Here is Adam Smith's verdict on the soldierly qualities of the more purely agricultural states :—

' In a yet more advanced state of society among those nations of husbandmen who have little foreign commerce, and no other manufactures but those coarse and household ones which almost every private family prepares for its own use, every man, in the same manner, either is a warrior or easily becomes such. They who live by agriculture generally pass the whole day in the open air, exposed to all the inclemencies of the seasons. The hardiness of their ordinary life prepares them for the fatigues of war. They are soldiers, but soldiers not quite so much masters of their exercise.' ¹

¹ *Wealth of Nations*, bk. v. ch. i.

When a society continues in security for many generations or centuries, industry of various kinds tends to arise and develop. The state becomes more prosperous, but the people lose their martial qualities—‘ the natural habits of the people render them altogether incapable of defending themselves ’ ; and yet, though less capable of defending themselves, they are more than ever liable to attack. ‘ An industrious, and upon that account a wealthy, nation is of all nations the most likely to be attacked.’

Obviously the existence and development of such a society (and it is on such development that civilization depends) would be impossible unless some new factor came into operation.

And that factor does show itself. An industrious and wealthy nation can alone develop and maintain a permanent defensive force—a section of the community whose sole business it is to become efficient in the art of war and defend the people from every enemy.

Adam Smith is dogmatic on this point. Says he :—

‘ When a civilized nation depends for its defence upon a militia, it is at all times exposed to be conquered by any barbarous nation which happens to be in its neighbourhood. The frequent conquests of all the civilized countries in Asia by the Tartars sufficiently demonstrate the natural superiority which the militia of a barbarous has over that of a civilized nation. A well-regulated standing army is superior to every militia. Such an army, as it can best be maintained by an opulent and civilized nation, so it can alone defend such a nation against the invasion of a poor and barbarous neighbour. It is only by means of a standing army, therefore, that the civilization of any country can be perpetuated, or even preserved for any considerable time.’¹

It needs, then, to be recognized that industry leading to wealth enabled civilized peoples to achieve security by maintaining standing armies. But this security was by no means absolute, as the overthrow of the western

¹ *Wealth of Nations*, bk. v. ch. i. pt. i.

Roman Empire clearly demonstrated. But industry and wealth have now achieved a superiority that is absolutely decisive. The issues of war no longer depend on physical strength and valour, but principally on explosives and machinery. Writing in the eighteenth century, Adam Smith recognized that the invention of gunpowder and firearms had worked a revolution by giving a decisive advantage to industrious and wealthy nations.

‘In modern war,’ says he, ‘the great expense of firearms gives an evident advantage to the nation which can best afford that expense ; and consequently, to an opulent and civilized over a poor and barbarous nation. In ancient times the opulent and civilized found it difficult to defend themselves against the poor and barbarous nations. In modern times the poor and barbarous find it difficult to defend themselves against the opulent and civilized. The invention of firearms, an invention which at first sight appears to be so pernicious, is certainly favourable both to the permanency and to the extension of civilization.’¹

The issue of war between pastoral and civilized societies, an issue that was for thousands of years in the balance, has then been long decided in favour of civilization. A varied conjunction of circumstances has given the decision in favour of the one and has eliminated the other. Pastoral peoples now exist only on sufferance in places not desired by agricultural peoples.

The principal factors leading to this decision have been population and prosperity ; but there is a third to which allusion has not been made—and that is patriotism.

An army is formidable not only on account of its great numbers, or by virtue of the prosperity of the state which enables it to equip and maintain a multitude of men, an army is formidable also by virtue of the spirit which animates it.

Savages may rely on naked valour, standing armies

¹ *Wealth of Nations*, bk. v. ch. i. pt. i.

become efficient through enforced submission to discipline and exercise. But a common enthusiasm, a single passion shared by all—such as love of country or religious zeal—is far more effective, far more capable of making an army all-conquering and unconquerable. A single-minded determination to achieve a great end leads readily to the recognition of, and submission to, the means for obtaining that end.

If training, subordination, and devotion to duty make for victory, then those whose hearts are set on victory will readily submit themselves to this discipline, will readily subscribe to these necessities. But patriotism is of course quite a natural thing. All who have a stake in their country, all who have property, a post of profit, or anything to lose by the defeat of their country, will naturally fight for the continued existence of the society, for the defence of the native land which is the common property of the nation.

The influence of patriotism, raised almost to the rank of a religion, was strikingly exemplified by the Romans, and as the rise and fall of the Roman Empire also illustrates very remarkably the influence of the chief causes on which the progress of mankind depends, the following chapter will be devoted to this subject.

CHAPTER X

ROME

THE story of Rome is a large part of the history of mankind. It covers a period of eleven hundred years, from the foundation of Rome until the capital of the Empire was removed to Constantinople, and a further eleven hundred years until that capital at length yielded to the assaults of the Turk. It is the tale of 'a city which swelled into an empire'—'a singular prodigy,' Gibbon quaintly observes, 'which may deserve the reflection of a philosophic mind.'¹

As war is the final arbitrator in the struggle for existence between human societies, let consideration be first directed to the military causes which led to the successes of the Roman arms.

The first outstanding fact is that military defence was not only a duty but a privilege. It was confined to those citizens who had some property in the state. The fidelity of the army to the state was thus assured; their interests were one, and their interest coincided with their duty. Says Gibbon: 'In the purer ages of the commonwealth the use of arms was reserved for those ranks of citizens who had a country to love, a property to defend, and some share in enacting those laws which it was their interest as well as their duty to maintain.'²

He further remarks that 'the poorest rank of soldier possessed above forty pounds sterling, a very high qualification, at a time when money was so scarce, that an ounce of silver was equivalent to seventy pounds' weight of brass.'

The all-conquering armies of Rome were imbued

¹ *Decline and Fall*, vol. ii., General Observations.

² *Ibid.*, vol. i. ch. i. p. 6.

with patriotic fervour. And although patriotism implies self-sacrifice, it must naturally be greatly fortified if it be based on self-interest. Self-interest alone can supply an enduring foundation for that public spirit which requires individual sacrifice. Gibbon recognizes this clearly, and remarks that 'that public virtue which among the ancients was denominated patriotism, is derived from a strong sense of our own interest in the preservation and prosperity of the free government of which we are members.'¹

He also asserts that it was this sentiment of patriotism which 'had rendered the legions of the republic almost invincible.' And Gibbon gives an admirable account of the sentiments and institutions which made the Roman republic so successful :—

'The fidelity of the citizens to each other, and to the state, was confirmed by the habits of education, and the prejudices of religion. Honour as well as virtue, was the principle of the republic, the ambitious citizens laboured to deserve the solemn glories of a triumph, and the ardour of the Roman youth was kindled into active emulation as often as they beheld the domestic images of their ancestors. The temperate struggles of the patricians and plebeians had finally established the firm and equal balance of the constitution ; which united the freedom of popular assemblies, with the authority and wisdom of a senate, and the executive powers of a regal magistrate. When the consul displayed the standard of the republic, each citizen bound himself, by the obligation of an oath, to draw his sword in the cause of his country till he had discharged the sacred duty by a military service of ten years. This wise institution continually poured into the field the rising generation of freemen and soldiers ; and their numbers were reinforced by the warlike and populous states of Italy, who, after a brave resistance, had yielded to the valour, and embraced the alliance, of the Romans.'²

¹ *Decline and Fall*, vol. i. ch. i. p. 6.

² *Ibid.*, vol. ii., General Observations, p. 480.

The successes of the Roman arms, then, were clearly due largely to the spirit of patriotism which animated the soldiers. And this spirit had its springs primarily in the fact that the army was composed of citizens who had a vote and some share in the property of the state, whose interests and glory it had to defend and advance.

It has been previously noted that a wealthy state alone can support a powerful standing army, and that only by means of such an army can such a state continue to exist in security. It appears that from the end of the second Carthaginian War till the fall of the Roman Republic the armies of Rome were in every respect standing armies.

Adam Smith asserts that 'the history of all ages, it will be found, bears testimony to the irresistible superiority which a well-regulated standing army has over a militia.'¹

The standing armies of Rome, he remarks, were in general much superior to the German and Parthian militias; they easily overcame Greece, Syria, and Egypt, and ultimately vanquished Macedon, which, owing to its possession of a standing army, was able to make a much stronger resistance than the rest.

The wealth of Rome enabled them to maintain standing armies that were not only large in numbers but were also excellent in equipment. In the age of the Antonines, Gibbon says the infantry had the following defensive equipment :—

- (1) An open helmet with a lofty crest.
- (2) A breastplate or coat of mail.
- (3) Greaves on their legs.
- (4) Buckler on their left arm.

While for offensive weapons they had :—

- (1) A ponderous javelin (pilum) 'whose utmost length was about 6 feet,' terminated by a massy triangular point of steel of 18 inches. (There was no cavalry durst venture within its reach, nor any shield it would not penetrate.)
- (2) A lighter spear.

¹ Adam Smith, *Wealth of Nations*, bk. v. ch. i.

(3) A sword—short, well-tempered Spanish blade with double edge.¹

Contrast this with the equipment of the barbarian :—

‘The face of a German army displayed their poverty in iron swords and the longer kind of lances they could seldom use. Their “*frameæ*” were long spears headed with a sharp but narrow iron point.’

‘Their military dress, when they wore any, was nothing more than a loose mantle.’

‘A variety of colours was the only ornament of their wooden or osier shields.’

‘Few of the chiefs were distinguished by cuirasses, scarce any by helmets.’²

Here, then, is the great empire of Rome defended by professional soldiers wonderfully equipped for offence and defence. It seems hardly conceivable that these barbarians could have dared to face the hosts of Rome in the field of battle ; on the face of it they seem to have had as little chance of victory as naked savages of Africa would have against European soldiers equipped with rifles and machine-guns.

Gibbon recognizes the disparity in these terms :—

‘When we recollect the complete armour of the Roman soldiers, their discipline, exercises, evolutions, fortified camps, and military engines, it appears a just matter of surprise how the naked and unassisted valour of the barbarians could dare to encounter in the field the strength of the legions, and the various troops of the auxiliaries, which seconded their operations. The contest was too unequal.’³

Yet the day was to dawn when the barbarians would prove the masters of Rome. How did it come about ? Plainly it could have been made possible only by the decay of the military power of the Romans.

What were the causes of this decay ? It is important to consider them, because they furnish excellent illustrations of the principles which govern the rise of civilization and the progress of mankind.

¹ *Decline and Fall*, vol. i. ch. i.

² *Ibid.*, p. 139.

³ *Ibid.*, vol. ii. ch. xxvii.

The more elemental factors will be considered first.

The first point to notice is, that with the extension of conquest the legions ceased to be composed in actual fact of Roman citizens—those who had ‘a country to love, a property to defend,’ and some share in directing the policy of the state, and were recruited instead from mercenaries to whom war was merely a trade. To some extent this change may have been necessitated by the extension of conquest, to some extent it was due to the fact that the Romans were demoralized by riches and reluctant to submit to the hardships of military life. ‘The citizens of Rome,’ says Finlay, ‘were considered entitled to a share of the revenues of the provinces which they had conquered and which were long regarded in the light of a landed estate of the republic.’¹ An example is given in the immense quantity of grain received as tribute from the provinces and publicly distributed. Caesar found 320,000 persons receiving this gratuity.

‘The Romans,’ remarks Finlay, ‘after their Asiatic conquests present the loathsome picture of a whole people throwing aside all moral restraint and openly wallowing in those vices which the higher classes elsewhere have generally striven to conceal.’²

It is not then surprising that the legions, instead of being recruited from Romans filled with patriotic fervour and martial zeal, were ‘drawn from the meanest and very frequently the most profligate of mankind,’ although the armies ‘were still commanded for the most part by officers of a liberal birth and education.’³ But with the ranks the sentiment of patriotism must clearly have vanished. It was attempted to supply the deficiency by an almost incredible severity of discipline, and by making ‘rank and reputation’ dependent on valour. As to discipline, Gibbon remarks: ‘. . . It was impossible for cowardice or disobedience to escape the severest punishment. The centurions were author-

¹ Finlay, *History of Greece*, vol. i. ch. i.

² *Ibid.*

³ Gibbon, *Decline and Fall*, vol. i. ch. i.

ized to chastise with blows, the generals had a right to punish with death ; and it was an inflexible maxim of Roman discipline that a good soldier should dread his officers far more than the enemy.'¹

All these expedients became ultimately of no avail. The Roman Empire depended for its existence on large armies of mercenaries. But inevitably in the course of time the army came to realize its power and its authority ; it ceased to be the servant and became the master. It remained the protector, but it became also the despoiler. The Emperor who was its governor became also its tool. The Emperor and the civilians, those whose labours sustained the whole Empire, had only one resource, only one remedy—to weaken and weaken the army until they reduced it once more to subjection. The disunion between different branches of the army seems to have made this possible. If the Roman garrison presumed to sell the throne, the provincial armies might well dispute their title to dispose of this office and to pocket the proceeds.

Ultimately, however, the armies were weakened and subordinated—but the remedy proved even more fatal than the disease. They were weakened so much that, finally, they were unable to contend with the previously contemptible barbarians, with the result that the western empire collapsed.

Gibbon sums it up as follows : ‘ The story of its ruin is simple and obvious ; and instead of inquiring *why* the Roman Empire was destroyed, we should rather be surprised that it had subsisted so long. The victorious legions, who in distant wars acquired the vices of strangers and mercenaries, first oppressed the freedom of the republic, and afterwards violated the majesty of the purple. The emperors, anxious for the personal safety and the public peace, were reduced to the base expedient of corrupting the discipline which rendered them alike formidable to their sovereign and to the enemy ; the vigour of the military government was relaxed and finally dissolved by the partial institu-

¹ *Decline and Fall*, vol. i. ch. i.

tions of Constantine ; and the Roman world was overwhelmed by a deluge of barbarians.'¹

The final causes are clearly indicated by the following observations on the military power : ' . . . It is the just and important observation of Vegetius, that the infantry was invariably covered with defensive armour from the foundation of the city to the reign of the Emperor Gratian. The relaxation of discipline and the disuse of exercise rendered the soldiers less able and less willing to support the fatigues of the service ; they complained of the weight of the armour, which they seldom wore ; and they successively obtained the permission of laying aside both their cuirasses and their helmets. The heavy weapons of their ancestors, the short sword, and the formidable " pilum " which had subdued the world, insensibly dropped from their feeble hands.'

' The cavalry of the Goths, the Huns and the Alani had felt the benefits and adopted the use of defensive armour, and as they excelled in the management of missile weapons, they easily overwhelmed the naked and trembling legions, whose heads and breasts were exposed, without defence to the arrows of the barbarians. The loss of armies, the destruction of cities ineffectually solicited the successors of Gratian to restore the helmets and cuirasses of the infantry. The enervated soldiers abandoned their own and the public defence ; and their pusillanimous indolence may be considered as the immediate cause of the downfall of the empire.'²

' The Roman army,' says Adam Smith, ' degenerated into a corrupt, neglected and undisciplined militia, incapable of resisting the attack of the German and Scythian militias.'

' The fall of the western empire,' he remarks, ' was brought about by the irresistible superiority which the militia of a nation of shepherds has over that of a nation of husbandmen, artificers and manufacturers.'

¹ *Decline and Fall*, General Observations, end of vol. ii.

² *Ibid.*, vol. ii. ch. xxvii.

‘The Suevi, the Vandals, the Alani, the Burgundians, passed the Rhine never more to retreat. The conquerors who first settled, were expelled or exterminated by new invaders. Clouds of barbarians seemed to collect from all parts of the northern hemisphere. Gathering fresh darkness and terror as they rolled on, the congregated bodies at length obscured the sun of Italy and sunk the western world in night.’¹

‘In two centuries from the flight of the Goths across the Danube barbarians of various names and lineage had plundered and taken possession of Thrace, Pannonia, Gaul, Britain, Spain, Africa and Italy.’

¹ Malthus, *Essay on Population*, ch. vi.

CHAPTER XI

ROME: PROSPERITY AND SECURITY

NATIONS fight for two main reasons: one to achieve or increase security, the other to promote prosperity. Now, security manifestly depends on military power. And military power depends generally on population, on patriotism, and on prosperity. Had the Romans been content to form the natural aristocracy of their empire, to officer and rule the army and the government, to give security, order, and justice to every part of their dominions, had they been content to advance in prosperity only as the prosperity of their Empire advanced—then twentieth-century civilization might have been antedated by many centuries. But it is perhaps idle to speculate on what might have been; the philosophy of Christianity had yet to run its course and to work out its influence on human minds, and it is probably vain to conjecture the course of a possible European civilization which had not been subjected to the meliorating influence of Christianity.

Whatever might have happened, the actual course of events was certainly not the most admirable, and culminated as every one knows in the humiliation and ruin of a great Empire. The Romans, it seems clear, were demoralized and debauched by success. They had conquered a vast estate, all the fairest portions of the known world; but intoxicated with their triumph they became too idle to defend it, too lazy to superintend it. For security they relied on agents—multitudes of mercenaries for whom Rome was only a wealthy employer. The superintendence was vested in another agent who became Emperor. In time the Senate, the

principal organ of the republic, ceased to elect the Emperor and merely acquiesced in accepting the nominee of the army.

In enjoying the fruits of victory, the control of their estate gradually slipped out of their fingers. The Roman citizens ceased to rule—the Empire became an invertebrate body without a head, devoid of a firm, centralized government. But while the demoralization of the Romans, the fact that patriotism had been dissipated by victory, was one of the elemental causes of their subsequent downfall, it becomes incumbent to notice another most important contributory factor. They not only lost their patriotism, but they ruined their prosperity. And this latter fact helped very considerably to weaken their military power.

Given the bounty of nature, prosperity depends on industry and thrift. And those painful virtues will only be cultivated where men are assured that they will reap the fruits of their labours, only when they have security for the enjoyment of that which they have earned or saved. The successive forms of government of the Roman Empire all had a common effect in weakening this sense of security, in destroying the springs of industry and thrift. Whatever party had control of the government apparently had but one aim—to exploit the Empire for their own benefit.

Thus while the Roman citizens retained power, ‘they were considered entitled to a share of the revenues of the provinces which they had conquered and which were long regarded in the light of a landed estate of the Republic.’¹

And later, when the power of choosing the Emperor had been surrendered to the army, ‘the soldiers, as soon as they fully comprehended the extent of their power in conferring the imperial dignity, strove to make the Emperors their agents in the management of the Empire, of which they considered themselves the real proprietors. The Army was consequently the

¹ Finlay, *History of Greece*, vol. i. ch. i. p. 42.

branch of the Government to which all the others were considered subordinate.’¹

Later on, the army abused their powers and lost their authority. ‘The disorders committed, and the defeats experienced by the troops at last weakened their influence, and enabled the Emperors to reduce the Army into a mere instrument of the Imperial authority.’² The Government approached more nearly a despotism, and during the reign of Constantine Finlay states that : ‘During no period was the maxim of the Roman Government, that the cultivators of the soil were nothing but the instrument for feeding and clothing the Imperial Court and the Army, more steadily kept in view.’³

The temporary owners and controllers of the ‘Roman estate,’ then, whoever they happened to be, appear to have seized wealth wherever and whenever the opportunity presented itself. First of all, the accumulated wealth of the different provinces was squandered, and then necessarily recourse had to be had to taxation. Says Finlay : ‘Until the time of Augustus, the Romans had maintained their armies by seizing and squandering the accumulated capital hoarded by all the nations of the world. They emptied the treasuries of all the Kings and States they conquered ; and when Julius Caesar marched to Rome he dissipated that portion of the plunder of the world which had been laid up in the coffers of the Republic. When that source of riches was exhausted, Augustus found himself compelled to seek for regular funds for maintaining the Army : “And it came to pass in those days, that there went out a decree from Caesar Augustus that all the world should be taxed.” A regular survey of the whole Empire was made, and the land tax was assessed according to a valuation taken of the annual income of every species of property. A capitation tax was also imposed on all the provincials whom the land tax did not affect.’⁴

¹ Finlay, *History of Greece*, vol. i. ch. ii.

² *Ibid.*

³ *Ibid.*

⁴ *Ibid.*, ch. i.

But taxation is not so injurious if, although heavy, it be impartial and fairly proportioned to the abilities of the people to pay it. But the Romans had little scrupulosity on this head. Wealth was seized, wherever it appeared, on one pretext or another. The customs were farmed, and one of the ordinary punishments for infringing the revenue laws was confiscation of the goods of the offender. This was made a systematic means of extortion. Inability to pay the taxes was punished with equal severity, and for this fictitious offence free Greeks were constantly sold as slaves.

A principal benefit of the title to Roman citizenship was the fact that it gave a large measure of freedom from the burden of taxation. And the Roman magistrates who had the power of granting this immunity established a 'regular traffic in citizenship.'¹

All the officers of the government appear to have been almost equally corrupt and avaricious. 'All the vigilance of the Emperor,' it is said, was required to prevent the tax-gatherers destroying the source of the public revenues by utterly ruining the taxpayers.²

As to the higher officials: 'Provincial governors enriched themselves by plundering their subjects, and the Emperors filled their treasuries by accusing the senators of those crimes which entailed confiscation of their fortunes.'³

The Emperor had another improper source of revenue in the constant depreciation of the coinage, and Finlay remarks that 'the laws which regulate the distribution, the accumulation and the destruction of wealth, the demand for labour and the gains of industry, attest that the depreciation of the currency was one of the most powerful causes of the impoverishment and depopulation of the Roman Empire in the third century.'⁴

The ultimate result of all this avarice and extortion was that the governors killed the goose which laid the golden eggs. By ruining their estate they ruined themselves. Partly it was the result of ignorance; referring

¹ Finlay, *History of Greece*, vol. i. ch. i.

³ *Ibid.*, ch. i.

² *Ibid.*, ch. ii.

⁴ *Ibid.*

to the Romans, Finlay says : ' The rude state of society in which they lived at the time of their first great successes, prevented their perceiving that by carrying off or destroying all the movable capital in their conquests they must ultimately diminish the amount of their own revenues.' ¹

And what of industry and thrift, the virtues on which not only the prosperity but the very existence of peoples depends ? Finlay gives the following verdicts : ' The extortions of the Roman magistrates were more injurious and rendered property more insecure than the violence of the banditti.' ²

' Honest industry was useless in trade,' ³ and ' No economy or industry could enable his subjects to accumulate wealth.' ⁴

Consider this illustration of the workings of industry and abstinence : ' . . . In a land like Greece, ages of labour and the accumulated savings of generations are required to cover the arid limestone mountains with olive and fig trees, and to construct the cisterns and canals of irrigation which are necessary to render a dry soil capable of yielding abundant supplies of food.' ⁵

Prosperity of this kind could not develop under the misgovernment of the Romans. In these circumstances where labour and self-denial reap no reward they will not arise ; when the wealth they have acquired is once stolen it will not be replaced. It is small wonder that prosperity disappeared from the provinces of Rome. Patriotism had departed, prosperity had decayed, and when the western empire of Rome at last fell before the barbarians it was only a shadow of its former self. ' Every civilization that has been overwhelmed by barbarians has really perished from internal decay,' ⁶ says Henry George. And though the generalization is probably too sweeping, it certainly seems to apply in the case of Rome.

Subsidiary influences there were. Christianity, for

¹ Finlay, *History of Greece*, vol. i. ch. i. p. 42.

² *Ibid.*, ch. i. p. 56.

³ *Ibid.*, ch. i.

⁴ *Ibid.*, ch. ii.

⁵ *Ibid.*, ch. i.

⁶ *Progress and Poverty*, bk. x. ch. i.

example, had considerable effect in abating martial zeal and patriotic fervour, while the transference of the seat of government to Constantinople had the practical effect of dividing the Empire, and thus of weakening its unity. But the elemental cause of the overthrow of Rome is plainly the decay of military power, and this declension was due principally to the disappearance of patriotism and to the loss of prosperity.

And it is the influence of these two principles that the writer has sought to illustrate in this brief survey of the history of Rome.

CHAPTER XII

AFTER ROME

THE conquest and settlement of the western Roman Empire were followed by horrible devastations; famines and pestilences raged; wars and anarchy generally prevailed. Out of the welter of disorder feudalism at last emerged, it seems, as the first step towards law and order. Each strong castle as it was built became a little centre of security, giving government and some guarantee of safety to the surrounding district. Feudalism seems essentially a surrender of liberty, a giving of service and of payments in return for security and protection. Such systems have risen independently in different parts of the world—notably in Japan and China—and this suggests strongly that they are a natural outcome of certain conditions and are generally steps towards local order and security in times of confusion. As feudalism is an outstanding feature in history, a brief consideration of it may be desirable. Like the story of Rome, it appears to furnish an illustration of the workings of natural selection.

Hallam remarks that the feudal state 'was the natural result of a vast and barbarous Empire feebly administered, and the cause, rather than the effect, of the general establishment of feudal tenures.'

For a clear and vivid picture of feudal society the following is abstracted from Guizot's *History of Civilization*¹ :—

'The single word Castle awakes the idea of feudal society, it seems to rise up before us. Nothing can be more natural. These castles which covered our soil and the ruins of which are still scattered about, it is

¹ F. Guizot, *History of Civilization*, vol. iii., Fifth Lecture.

feudalism which constructed them ; their elevation was, so to speak, the declaration of its triumph. Nothing of the kind existed on the Gallo-Roman soil. Before the German invasion the great proprietors lived either in cities or in beautiful houses, agreeably situated near cities or in rich plains upon the banks of rivers. In the country districts properly so called were dispersed the " villae," a species of farms, great buildings serving for the improvement of estates and for the dwelling of the labourers or serfs who cultivated them.'

' Such was the distribution and habitation of the various classes, which the Germanic nations found in Gaul at the time of the invasion.'

' It must not be supposed that they disliked and were eager to change it ; that they immediately sought the mountains, steep and savage places, in order to construct new and entirely different dwellings. They first established themselves in the habitations of the Gallo-Romans, whether in the cities or in the villae, amidst the country districts and the agricultural population, and rather in the latter dwellings, whose situation was more conformable to their national habits. Accordingly the villae, of which constant mention is made under the first race, were the same, or almost the same, as they had been before the invasion ; that is to say, they were the centre of improvement and habitation of great domains ; buildings scattered throughout the country districts where barbarians and Romans, conquerors and conquered, masters, free men, labourers, slaves, lived together.'

' Still, a change soon became visible. The invasion continued ; disorder and pillage were incessantly renewed ; the inhabitants of the country districts of ancient or new origin had need to guard themselves incessantly and keep on the defensive. We find the villae gradually becoming surrounded by moats, ramparts of earth, with some appearance of fortifications.'

He goes on to say that many a villa ended as a castle. ' Even before the invasion was consummated and in order to resist its disorders, to escape its dangers,

the population of the country districts had begun in many places to seek refuge in the heights, in places difficult of access, and to surround them with fortifications.'

'In the dreadful anarchy of the following centuries, the causes which had impelled the population to seek such places of refuge and to surround them with fortifications became more and more pressing; it was necessary for it to fly from places easy of access, to fortify its dwelling. And not only did men thus seek security, they also found in it a means of abandoning themselves, without fear, to depredation, and to secure to themselves its fruits. Among the conquerors many still led a life of hunting and pillage; they were forced to have a receptacle where they might shut themselves up after an expedition, repel the vengeance of their adversaries, resist the magistrates who attempted to maintain any order in the country. Such was the aim which originally caused the construction of many of the feudal castles. It was more especially after the death of Charlemagne . . . that we find the country covered with these haunts.'

Following the disintegration of the big society of the western Roman Empire came anarchy and then the natural formation of a multitude of small societies. In the competition and warfare between these small societies the larger groups would tend to have the advantage. The smaller lords would be subjugated or would make their submission to those who were more powerful. The issues of war must have had a natural tendency to favour the survival of the more powerful aggregates. More particularly must this have been felt when kingdom made war on kingdom.

'The feudal system,' says Hallam, 'was certainly little adapted for the defence of a mighty kingdom, far less for schemes of conquest.' But so long as it prevailed alike in several adjacent countries, 'none had anything to fear from the military superiority of its neighbours.'

It appears that the feudal system decayed owing to

the exigencies of international warfare, owing to the rivalry and struggles between nations.

These struggles made unity, law, and order within the state a principal factor determining the issues of war.

Spencer has expounded the principles very clearly as follows :—

‘ Not only is the primary function of government that of combining the incorporated individuals for war, while its secondary function of defending its component members against one another is step by step established ; but this secondary function arises by differentiation from the primary one.’¹

‘ . . . This rude enforcing of justice by private wars is changed into public administration of justice not because of the ruler’s solicitude to maintain equitable relations, but much more because of his solicitude to prevent that weakening of his society which internal dissensions must produce. Be he primitive chief or be he captain of banditti, a leader must check fights among his followers ; and what is by these shown on a small scale was shown on a large scale when in feudal times kings forbade private wars between nobles during the times when international wars were going on. Manifestly a king’s desire to maintain a social order which conduces to fighting efficiency prompts the practice of arbitrating between antagonist followers ; and manifestly appeals made to him by the injured, recognizing as they do his authority, and responded to for this reason, tend more and more to establish his judicial and legislative powers.’

‘ Once established, this secondary function of the State goes on developing ; and becomes a function next in importance to the function of protecting against external enemies.’

Unity within the state can be achieved only by the ruler acquiring increased power. ‘ A house divided against itself cannot stand.’ This is a very obvious necessity—and what force has governed, determined,

¹ *Principles of Ethics*, § 357.

and brought into existence these necessities save a natural force ; what law can be seen in operation but that of natural selection ; what principle but that of the survival of the fittest. This country was successively conquered and settled by Celtic invaders, Brythons, Goidels, Belgae, until the Romans welded it into a unity by military force. On their departure came further streams of invaders, Angles, Saxons, and Jutes. Had the new conquerors combined to defend their estate they might well have kept it inviolate. But they were disunited, and so some of the fairest parts of their lands had to be surrendered to fresh despoilers—the Danes. Still disunion, and Harold, fresh from repelling one invader, falls before another. The Normans, a dominating race like the Romans, welded the whole kingdom into a unity with iron bands. Ruthless as rulers, they were, nevertheless, capable protectors of their conquered estate, and since their day, since England was at last united, more than eight centuries have elapsed and England has never again been conquered, never again successfully invaded.

The unity and organization imposed on this country by a conquering race was more slowly achieved on the Continent. Hallam, after remarking on the continued acquisitions, by the Crown, of legislative and judicial authority, says that the French kings acted upon a system for two or three centuries. ‘ By escheat, by forfeiture, by bequest or purchase, by marriage or succession a number of fiefs were merged in their increasing domain.’¹

International warfare operated in still another manner to subvert the feudal system. It became apparent that standing armies were far superior to the feudal militia—that the gage of victory would fall to the country which commanded the services of a professional soldiery.

Under the feudal system the smaller gentry were limited to forty days’ service and then paid. Hallam remarks that ‘ when the Kings of France and England

¹ *Europe during the Middle Ages*, part II. ch. i.

were engaged in wars . . . the inefficiency of the feudal militia became evident.'

'It now became manifest that the probabilities of war inclined to the party who could take the field with selected and experienced soldiers. The command of money was the command of armed hirelings more sure and steady in battle, as we must confess, with shame, than the patriot citizen.'

'The Crusades,' he remarks, 'had probably a material tendency to effectuate this revolution by substituting what was inevitable in those expeditions—a voluntary stipendiary service for one of absolute obligation.'

The obligations of the feudal system were then gradually replaced by pecuniary payments, and so that system of society 'settled after the lapse of ages into the free constitution of England, the firm monarchy of France, and the federal union of Germany.'

From a purely military point of view the sequence of events was as follows :—

'The feudal military tenures had superseded that earlier system of public defence which called upon every man, and especially every landholder, to protect his country. The relations of a vassal came in place of those of a subject and a citizen. This was the revolution of the ninth century. In the twelfth and thirteenth another innovation rather more gradually prevailed and marks the third period in the military history of Europe. Mercenary troops were substituted for the feudal militia.'

And so in the course of events this country passed from the grim protection of Rome through anarchy and feudal tyranny until it gradually achieved law and order within, security from aggression without.

The future course of events in Britain—the story of history—largely resolves itself into a matter of economics. Owing to her political unity and to her fortunate geographical position, her national integrity was never again seriously imperilled. But while this country had so large a measure of security, other

European countries were not so fortunately circumstanced. In the development of civilization it has been noted that only those settled peoples who had attained a certain height of population and prosperity could acquire any large measure of security against invasion from nomads. Only such peoples could maintain a standing army, and only by means of a standing army could civilization then be preserved and perpetuated. But while a standing army gave security to the nation it imperilled the liberty of the individual. With Rome it has been noted that inability of the society to control the institution which protected it led ultimately to the ruin of the state.

Somewhat similar problems appear to have confronted European peoples when Feudalism had been subordinated to Monarchy. The menace of the nomads had disappeared. But in the contests between different states the advantage of a standing army was found decisive ; it was plainly necessary to the security of the state. But the king who secured command of such a force almost inevitably became a despot ; and military despotism was fatal to liberty and to the economic development of a people.

Macaulay thus explains the course of events in Europe and the principles that governed them :—

‘ It soon appears that peasants and burghers, however brave, are unable to stand their ground against veteran soldiers, whose whole life is a preparation for the day of battle, whose nerves have been braced by long familiarity with danger, and whose movements have all the precision of clockwork. It is found that the defence of nations can no longer be safely entrusted to warriors taken from the plough or the loom for a campaign of forty days. If any state forms a great regular army, the bordering states must imitate the example or must submit to a foreign yoke.’¹

‘ But, where a great regular army exists, limited monarchy such as it was in the Middle Ages can exist no longer. The sovereign is at once emancipated from

¹ *History of England*, ch. i.

what had been the chief restraint on his power : and he inevitably becomes absolute, unless he is subjected to checks such as would be superfluous in a society where all are soldiers occasionally, and none permanently.'

'It was utterly impossible that, without a great and extensive system of taxation, he (the Prince) could keep in constant efficiency a great body of disciplined troops.'¹

Before the end of the fifteenth century the continental Powers were compelled to maintain large standing armies, and compelled as a consequence to impose heavy taxes on their subjects. As a consequence parliamentary institutions sank into utter insignificance, or ceased to exist. The abuses and the impoverishment caused by these arbitrary powers vested in a single governor were terminated in France only by a bloody revolution.

Britain, made secure by her ocean boundaries, passed the sixteenth and seventeenth centuries still without a standing army. Freed in large measure from the dangers that menaced the continental powers, Parliament continued to insist on, and finally established, its right to determine taxation and the strength of the military powers to be vested in its governor.

'At the commencement of the seventeenth century,' says Macaulay, 'the fate of the Spanish Cortes and of the French States-General had given solemn warning to our Parliaments ; and our Parliaments, fully aware of the nature and magnitude of the danger, adopted in good time a system of tactics which after a contest protracted through three generations was at length successful.'

With the expulsion of the last of the Stuarts and the ascent of William of Orange, the maintenance of a standing army was put on a firm basis. In 1689 the first Mutiny Bill was passed establishing court-martials and so putting the professional soldiery under a most rigorous and relentless discipline. Macaulay justifies it in the following words : 'For the general safety a

¹ *History of England*, ch. i.

summary jurisdiction of terrible extent must, in camps, be entrusted to rude tribunals composed of men of the sword.'¹

The powers vested in the sovereign were, however, conferred but for a year ; and every year it was the privilege and the duty of Parliament to review and renew them, and every year the estates of the realm 'grant to the Sovereign an extraordinary power to govern a certain number of soldiers according to certain rules during twelve months more.'

By these means a standing army has been maintained, and yet made to subserve the interests of society. Dangerous as the experiment was considered, 'it was proved by experience,' says Macaulay, 'that in a well-constituted society professional soldiers may be terrible to a foreign enemy and yet submissive to the civil power.'

¹ *History of England*, ch. xi.

CHAPTER XIII

WEALTH

IN the previous chapters an attempt has been made to indicate the most salient in that procession of events of which Europe has been the theatre. And this attempt to select essentials shows very clearly that in the struggle between different societies, it is war—the arbitrament of the sword—that decides the issue. However strong may be the reluctance to recognize this elemental fact, it is folly and worse than folly to deny it. In the contests between nations it is war that selects naturally the society fittest to survive. The arbitrament of war is final, and from its decision there can be no appeal.

Regard, then, has now to be had to the factors which determine success in the struggle between combinations of men.

The first and most obvious fact is that providence is on the side of the big battalions. Other things being equal, a larger society must always have the advantage over a smaller society. Since herdsmen could combine in larger numbers than hunters, this fact alone makes it easy to understand why hunting peoples would be eliminated and replaced by pastoral peoples.

In the struggles between pastoral and agricultural societies it was not, however, the factor of population that determined the issue, but the emergence of a new factor and one of tremendous importance—that of wealth.

The growth in the prosperity of settled societies enabled them ultimately to maintain and keep constantly in being a body of professional soldiers, whose

duty it was to defend and advance the interests of the society. War is not merely a matter of valour and strength, it is also an art and a science, and it is not difficult to agree with the historians that a professional soldiery, a standing army, would be enormously superior to any militia, to any improvised army of civilians hastily trained and imperfectly disciplined.

Ultimately it was the wealth of the settled peoples that decided the issue of their age-long conflict with the unsettled peoples.

Since that day pastoral peoples have existed only on sufferance, the 'fittest' societies have indubitably been those of settled civilized men.

And in the struggles between civilized peoples it is the same two factors—numbers and wealth—that have been mainly instrumental in deciding the issues. The factor of size or population is sufficiently obvious. But there are natural limits to the aggregation of large and scattered populations under a single government, to ensure that heterogeneous peoples shall act as a unity—as a society. And only the effort of Rome can be said to have had any great and enduring success. The factor of wealth, while less obvious, is clearly one that has been of steadily increasing importance. It need perhaps hardly be said that, population and other things being equal, the wealthy society has an overwhelming advantage over the poorer society. The contests between settled societies have largely depended on the ability to maintain professional armies and navies. And this ability has depended principally on the wealth of the nation. More especially is this the case to-day when the machinery of peaceful production is so readily convertible to the production of the necessary apparatus of war.

But wealth is not only a direct advantage to a nation in the struggle with other nations, it also confers an indirect and very important advantage in that it leads almost inevitably to an increase of population. This fact is recognized by Adam Smith, and will be readily admitted by any one who has the least regard for the

Malthusian doctrine. It is obvious if one considers the industrial revolution; it was not the pressure of population that brought about this great change, it was not increased population that led to increased prosperity, but vice versa. The development of machinery, steam power, and mechanical transport led to a vast increase in wealth. The development of industry permitted the support and required the services of a greater population. And it is notorious that the population expanded to unprecedented dimensions. Consequently the military power of this country, for example, by reason of the increase of wealth and population, is enormously greater than it was a century ago.

And wealth is not only an advantage to the state in the struggle for existence, it is also an advantage to the individual in his struggle to live and reproduce his kind. In fact, it may well be asserted that it is the growth of prosperity, the increasing command over nature, that is the fundamental fact of evolution. From the savage to present-day civilization it is the one outstanding fact of progress. To the conquest and exploitation of nature—of energy and matter, including the mineral, vegetable, and animal kingdoms—all other developments have been subordinate, for it is this conquest that has given the decisive advantage in the struggle for existence. Evolution is thus primarily not an account of the growth of brain power, of 'goodness,' of social subordination, of increasing differentiation, or the development of super humanity, but of these only as they may have contributed to the improvement of man's estate, to his increasing understanding and control over his environment—to his growing prosperity.

The following chapters will, then, be devoted to a consideration of the facts which justify and compel the above conclusion.

In the present chapter it will be necessary to seek out and emphasize the essential factors in economics as they appear in the light of natural selection; while in the following chapter a more particular inquisition

will be made into the causes of progress, of the *increase* of national and personal prosperity.

Consider the prosperity, the wealth of a state—on what does it depend? Obviously on the sum of the wealth of the individuals composing it. And it is equally clear that kings and governors can increase the prosperity of their state only by increasing the prosperity of the people who constitute the state. And how can the prosperity of a people best be promoted?

All wealth, all necessary or desirable goods are obtained by labour from the things found in or upon the earth—they are the produce of labour applied to land.

Essentially all wealth is the result of industry.

Now, man has a natural aversion to labour.

But man has a strong natural disposition to enjoy the fruits of labour.

Men desire the end but shun the means.

They desire to consume but not to produce.

There is plainly but one great condition which can furnish the principal stimulus to industry.

To secure that each man shall enjoy the fruits of his own labour.

To ensure that no man shall be deprived of the products of his own industry.

To secure, in short, that each man shall consume only what he produces. That his enjoyment shall be proportioned to his pains. That property and the produce of property shall be secured to the possessor and the producer.

Thus, while the first duty of a governor is to keep the state—the common property of the community—secure from the invasion of other peoples, his second duty is to give to every individual of the society security in the possession and enjoyment of his own individual property.

So far as a ruler is concerned, this second duty is the natural complement of the first, since the security of a state is largely dependent on the prosperity of the people. And since a governor only enjoys dominion

and power so long as the state continues to exist, his duty manifestly coincides with his interest.

Security of the nation and security for the individual are clearly the two conditions conducive to increasing prosperity ; and increasing prosperity repays the debt by again giving the power of increasing security.

The primary condition for progress is therefore security of property.

These elemental facts were recognized by Spencer. As previously quoted, he remarks : ‘ Not only is the primary function of government that of combining the incorporated individuals for war, while its secondary function of defending its component members against one another is step by step established ; but this secondary function arises by differentiation from the primary one.’¹

But for clear appreciation and illustration of these elemental facts the writer will appeal to Adam Smith, the one philosopher whom all economic schools equally hail as their master.

Thus Adam Smith first distinguishes the two primary duties of a governor in a way similar to Spencer’s.

Thus he says : ‘ The first duty of the sovereign is that of protecting the society from the violence and invasion of other independent societies.’ While ‘ the second duty of the sovereign ’ is ‘ that of protecting as far as possible every member of society from the injustice or oppression of every other member of it, or the duty of establishing an exact administration of justice.’²

Adam Smith discusses the origin and nature of property from an historical and, whether by accident or design, from quite an evolutionary point of view. In the first state of society, that of hunters, there can necessarily be no material acquisition of property or accumulation of wealth. The wandering life, the uncertainty and the impracticability of providing for the future, preclude any such possibility.

¹ *Principles of Ethics*, § 357.

² *Wealth of Nations*, bk. v. ch. i. pt. i.

'It is,' remarks the great economist, 'in the age of shepherds, in the second period of society, that the inequality of fortune first begins to take place, and introduces among men a degree of authority and subordination which could not possibly exist before. It thereby introduces some degree of that civil government which is indispensably necessary for its own preservation: and it seems to do this naturally, and even independent of the consideration of that necessity. The consideration of that necessity comes, no doubt, afterwards to contribute very much to maintain and secure that authority and subordination. The rich, in particular, are necessarily interested to support that order of things, which can alone secure them in possession of their own advantages. Men of inferior wealth combine to defend those of superior wealth in the possession of their property, in order that men of superior wealth may combine to defend them in the possession of theirs. All the inferior shepherds and herdsmen feel that the security of their own herds and flocks depends upon the security of those of the great shepherd or herdsman; and the maintenance of their lesser authority depends upon that of his greater authority, and that upon their subordination depends his power of keeping their inferiors in subordination to them. They constitute a sort of little nobility, who feel themselves interested to defend the property and to support the authority of their own little sovereign, in order that he may be able to defend their property and to support their authority.'¹

But the increase of wealth, the development of property in the sense recognized by civilized peoples, becomes possible only with the settled state necessitated by agriculture. It seems primarily a development of agriculture and a development of those industries which are based on agriculture. It may first be desirable to indicate what the economists understand by property and then to furnish one or two illustrations of the development of agricultural lands.

¹ *Wealth of Nations*, bk. v. ch. i. pt. ii.

‘Private property,’ says J. S. Mill, ‘in every defence made of it, is supposed to mean, the guarantee to individuals, of the fruits of their own labour and abstinence.’¹

‘The institution of property, when limited to its essential elements, consists in the recognition, in each person, of a right to the exclusive disposal of what he or she have produced by their own exertions, or received either by gift or by fair agreement, without force or fraud, from those who produced it.’

‘The foundation of the whole is the right of producers to what they themselves have produced.’²

Now consider this illustration already alluded to from ancient Greece :—

‘. . . In a land like Greece ages of labour and the accumulated savings of generations’ were required ‘to cover the arid limestone mountains with olive and fig trees, and to construct the cisterns and canals of irrigation which are necessary to render a dry soil capable of yielding abundant supplies of food.’³

And now it may be more interesting to take the example of this country.

Says Macaulay : ‘It can easily be proved that, in our own land, the national wealth has, during at least six centuries, been almost uninterruptedly increasing ; that it was greater under the Tudors than under the Plantagenets ; that it was greater under the Stuarts than under the Tudors ; that in spite of battles, sieges, and confiscations, it was greater on the day of the Restoration than on the day when the Long Parliament met ; that in spite of maladministrations, of extravagance, of public bankruptcy, of two costly and unsuccessful wars, of the pestilence and of the fire, it was greater on the day of the death of Charles the Second than on the day of his Restoration. This progress having continued during many ages, became at length, about the middle of the eighteenth century,

¹ *Political Economy*, bk. II. ch. i.

² *Ibid.*, ch. ii.

³ Finlay, *History of Greece*, vol. i. ch. i.

portentously rapid, and has proceeded during the nineteenth, with accelerated velocity.'

He then gives a more vivid illustration.

'Could the England of 1685 be by some magical process set before our eyes we should not know one landscape in a hundred. . . . Many thousands of square miles which are now rich corn land and meadows, intersected by green hedgerows, and dotted with villages and pleasant country seats, would appear as moors overgrown with furze, or fens abandoned to wild ducks. We should see straggling huts built of wood and covered with thatch, where we now see manufacturing towns and seaports renowned to the farthest ends of the world.'¹

Descending to arithmetic, he indicates that agricultural production has multiplied threefold.

'At present an average crop of wheat, rye, barley, oats and beans is supposed considerably to exceed thirty millions of quarters.'²

According to computations of that time the quantity of these same crops then grown was somewhat less than ten millions of quarters.

To what does the historian attribute this unprecedented increase in the prosperity of this country?—to the primary fact that property has been held secure.

'In consequence,' he remarks, 'partly of our geographical and partly of our moral position, we have during several generations been exempt from evils which have elsewhere impeded the efforts and destroyed the fruits of industry.' In this country, he asserts, 'public credit has been held sacred: the administration of justice has been pure: even in times which might by Englishmen be justly called evil times, we have enjoyed what almost every other nation in the world would have considered as an ample measure of civil and religious freedom. Every man has felt entire confidence that the State would protect him in the possession of what had been earned by his diligence and hoarded by his self-denial.'

¹ *History of England*, ch. iii.

² *Ibid.*

‘ Under the benignant influence of peace and liberty science has flourished, and has been applied to practical purposes on a scale never before known. The consequence is that a change to which the history of the old world furnishes no parallel has taken place in our country.’

Macaulay belonged to the first half of the nineteenth century, and in the one hundred and fifty years before his day he shows that the agricultural produce and the population of this country had increased threefold; and the people had not only increased in numbers, they had advanced in prosperity. It need hardly be said that as a consequence Britain had greatly increased in military strength, had more than held her own among the advancing societies of Europe. Plainly the security of the state depends largely on the prosperity of the people. And the prosperity of the people depends primarily on the security of property. And the provision of this security is one of the chief duties of civil government.

Adam Smith makes some striking remarks on this point. ‘ Civil government,’ says he, ‘ so far as it is instituted for the security of property, is in reality instituted for the defence of the rich against the poor, or of those who have some property against those who have none at all.’

‘ It is only under the shelter of the civil magistrate that the owner of that valuable property, which is acquired by the labour of many years, or perhaps of many successive generations, can sleep a single night in security. He is at all times surrounded by unknown enemies, whom, though he never provoked, he can never appease, and from whose injustice he can be protected only by the powerful arm of the civil magistrate continually held up to chastise it. The acquisition of valuable and extensive property, therefore, necessarily requires the establishment of civil government.’¹

The acquisition of wealth, the acquirement of property, it has been said hitherto has been the result of

¹ *Wealth of Nations*, bk. v. ch. i. pt. ii.

labour applied to the land. This is strictly accurate, but it becomes necessary to distinguish a subordinate but most important factor on which alone depends the *increase* of wealth. No matter how industrious a man might be, so long as he regularly consumed the fruits of his labour he could never advance in prosperity. He can only increase in wealth by refraining from consuming the whole of his income and by applying this reserved portion to the improvement of his estate or the increase of his capital. The instances already given in the cases of Greece and this country furnish graphic illustrations of the influence of labour and abstinence to improve a man's estate.

By improving his estate, by increasing his capital, a man permanently increases his income, and not only his own income but that of his descendants. If the members of a society generally strive to improve their condition, then each generation hands down to the next an improved and developed property, and in this way national prosperity constantly advances. With industrial peoples it is not only the land that is improved, but mechanical apparatus of all kinds are developed and handed down. Hence wealth is more frequently referred to as capital—which has been thus defined:—

‘In the history of civilization a vast system of appliances have, under the name of capital, been developed and accumulated by the labour, ingenuity, and foresight of men for more effective operation on nature.’¹

But whether capital, wealth, or property be the term employed, it is plain that these can be increased only by industry and thrift.

Adam Smith recognizes this fact as follows:—

‘Parsimony and not industry, is the immediate cause of the increase of capital. Industry indeed provides the subject which parsimony accumulates. But whatever industry might acquire, if parsimony did not save and store up, the capital would never be the greater. Parsimony, by increasing the fund which is destined

¹ Article ‘Political Economy’ in *Chambers's Encyclopædia*,

for the maintenance of productive hands, tends to increase the number of those hands, whose labour adds to the value of the subject upon which it is bestowed. It tends therefore to increase the exchangeable value of the annual produce of the land and labour of the country.'

And again : ' Capitals are increased by parsimony, and diminished by prodigality and misconduct. . . . As the capital of an individual can be increased only by what he saves from his annual revenue or his annual gains, so the capital of a society, which is the same with that of all the individuals who compose it, can be increased only in the same manner.'¹

J. S. Mill recognizes the importance of the same fact as follows :—

' All capital is the product of saving, that is, of abstinence from present consumption for the sake of a future good.'²

National prosperity, then, depends on industry and abstinence ; and these two virtues will only be cultivated where the individual is secure in reaping the fruits of his labours and denial. As Mill expresses it, ' Industry and frugality cannot exist, where there is not a preponderant probability that those who labour and spare will be permitted to enjoy. And the nearer this probability approaches to certainty, the more do industry and frugality become pervading qualities in a people.'

¹ *Wealth of Nations*, bk. II. ch. iii. p. 259.

² *Political Economy*, ch. xi.

CHAPTER XIV

THE INCREASE OF WEALTH

ONCE property becomes secure it necessarily follows that the majority of men—all those who have saved nothing and inherited nothing—must earn their living by labour. The urge of hunger and love will compel a certain minimum of industry. Without food the individual would die, while without love the society would perish. But a society may persist indefinitely so long as man's industry is just adequate to maintain himself and his family. Yet it is very plain that in a world of advancing societies, such stagnant societies are doomed. And since wealth gives a decisive advantage in the struggles between nations, and since the advance of prosperity is the outstanding feature of civilization, it becomes very necessary to inquire what is the cause of *increasing* wealth—what is the cause of material progress.

In the last chapter it was seen that the fundamental condition was security. Security for the nation first, for the native land is the common property of the nation. Security for the individual second, to ensure that every man shall be safeguarded in the possession of the fruits of his own labour.

It was then noted that industry applied to the land was the sole source of wealth. It was more particularly seen that only by superimposing the virtue of abstinence on that of industry could wealth be *increased*—that self-denial was the true source of any advance in prosperity. The man must produce more than he consumes; his industry must exceed the amount required to supply the necessaries of life, and he must abstain from consuming the surplus. His savings may

thus be said to come either from additional industry or from abstinence in consumption ; but while industry is necessary in order to live, man must cultivate quite a new virtue, that of abstinence, in order to prosper. Without industry there can be no abstinence, but without abstinence there can be no progress.

In considering the increase of private and public wealth, the primary necessity of self-denial thus becomes obvious.

Having thus considered the conditions and the means by which wealth increases, it is necessary to examine a more intimate and perhaps more vital aspect of the subject, that is, the motives, the stimuli which will prompt individuals and societies to increase their material well-being.

And just as abstinence had to be distinguished from industry as the essential cause of progress, so in regarding human motives the motive that is principally operative is very apt to be overlooked.

What are the motives that prompt men to seek wealth? The answer seems obvious. Men earn in order that they may spend, they toil in order that they may enjoy. 'Consumption,' says Adam Smith, 'is the sole end and purpose of all production,' a maxim, he remarks, that 'is so perfectly self-evident that it would be absurd to attempt to prove it.'

He also furnishes the following definition: 'The principle which prompts to save, is the desire of bettering our condition, a desire which, though calm and dispassionate, comes with us from the womb and never leaves us till we go into the grave.'¹

And he makes the following assertion: 'The uniform, constant and uninterrupted effort of every man to better his condition' is 'the principle from which public and national, as well as private opulence is originally derived.'²

According to the great economist, then, a man seeks wealth solely in order 'to better his condition,' a desire which 'comes with us from the womb and never leaves

¹ *Wealth of Nations*, bk. II. ch. iii.

² *Ibid.*

us till we go into the grave.' And this desire to better his condition is the root cause of public and private opulence.

This would perhaps on first sight be generally accepted as a fair statement of the motives which prompt men to seek prosperity.

But there can be no doubt it is a most misleading and a grossly inadequate one. It ignores one of the strongest passions, one of the principal stimulants which urge men to seek wealth. A passion on which the permanent increase of private and public opulence almost wholly depends. This passion is parental love, the love a man bears for his children.

The recognition of this fact is vital to this inquiry, and needs to be clearly apprehended.

For consider, if men had no children, or had no love for their children, what would they do with their wealth? Leave it to that impersonal entity, the state? or to a posterity in which they had no lot or part? There is no sentiment in human nature powerful or persistent enough to persuade men to such a course.

If it were not for his own flesh and blood, his own kith and kin, a man would toil only that he might enjoy, would produce only that he might consume, would deny himself in the present only that he might indulge himself in the future. If by diligence and denial he increased his capital in his young days, it would be to the end of enjoying the increased revenues and consuming the capital in his later days. What motive could induce a man to accumulate and leave wealth behind him when his days were done? He might do so by accident but scarcely by design.

Clearly the one motive which prompts men to leave wealth behind them is the desire to benefit their children. If they leave less than they inherit, their children are the poorer and so is the state; if they bequeath more than they inherit, their children are the richer and so is the state. Only by one generation leaving an improved inheritance to the next can the national prosperity be advanced.

Industry and abstinence give men the power to do this, but only love for their offspring gives them the will to do so. Abstinence which is only consumption deferred has no power to advance national wealth, but abstinence which hands down a constantly improving property from parent to progeny is alone effective to this end.

Having thus obtained some clear idea of the conditions, the means, and the motives on which the progress of a society depends, it becomes possible to recognize a further very important factor, one which tends to nullify all the advantages that may be obtainable from increasing prosperity—and that is, increasing population.

In examining the application of the Malthusian law to man in the second part of this work, it was concluded that if the increase of population could be so regulated that it did not exceed the increase of subsistence, then population would not press on subsistence, and the 'power of population' would not lead to privation and poverty. It is equally clear that people can only increase in prosperity if they obtain an *increasing* command over the means of subsistence. The average income of a people depends on the total income of the community divided by the number of individuals composing it. For individual prosperity to increase, then, it is clear that wealth must increase at a greater rate than population. If population increases faster than wealth, then the fruits of labour and love are more than cancelled. Experience shows that it is difficult to increase wealth, and it is equally difficult to restrain the increase of population. What is true for a nation as a whole is equally true and more easily to be recognized in individual families.

Parents who inherit, say, £5000 may by diligence and denial increase it to £10,000, and bequeath this sum to their children. But if they have ten children, the prosperity of the individual children will not be advanced but diminished. Each child will start life at a lower level. The increase of family will more

than cancel the increase in wealth. Clearly the children can only be advantaged if their numbers are limited. Here is a factor that with the advance of civilization has become increasingly prominent, is becoming more and more clearly recognized.

A parent's concern is for the welfare and happiness of his children; and as he can provide for only a limited number, this sentiment prompts him not only to increase his wealth but also to restrict his family. And experience shows that this is one of his most difficult problems.

As regards societies, it is clear there is a constant tendency for population to press on the means of subsistence. It is this tendency which is generally held to be the essential cause of poverty in an advancing civilization. The procreative powers of man undo all that labour and thrift can do. Malthus asserted that this was the great cause that has 'hitherto impeded the progress of mankind towards happiness.' Since he prominently brought this factor to public notice, more than a century has elapsed; and during that time experience, observation, and reflection have only brought increasing confirmation. The essential truth of this fact is generally recognized. While the writer has had occasion to criticize and has attempted to refute its application to the vegetable and animal kingdoms, he unhesitatingly accepts it for the kingdom of man. Except for a few idealistic writers, whose utopian schemes are not based on history or experience, and whose natural bias has led them to attempt to discredit and disprove the Malthusian doctrine, this principle has been generally recognized and accepted. The causes for this pressure of population having been previously analysed and indicated, it is not necessary to discuss them further at this point. Some examples of the manner in which it applies to the human race may, however, fittingly be given. Thus Darwin says :—

'It is impossible not to regret bitterly, but whether wisely is another question, the rate at which man tends

to increase; for this leads in barbarous tribes to infanticide and many other evils, and in civilized nations to abject poverty, celibacy, and to the late marriages of the prudent.'¹

J. S. Mill recognized the same thing as a principal cause of poverty, and considered that only by restricting their families could the working classes hope to improve their condition. He remarks that 'it is but rarely that improvements in the condition of the labouring classes do anything more than give a temporary margin, speedily filled up by an increase of their numbers. The use they commonly choose to make of any advantageous change in their circumstances is to take it out in the form which, by augmenting the population, deprives the succeeding generation of the benefit—the most promising schemes end only in having a more numerous, but not a happier people.'²

In his day it appears there was a conspiracy of silence on this matter, and he remarks that, in lamentations over the wretchedness of the labourers, there is 'a tacit agreement to ignore totally the law of wages, or to dismiss it in a parenthesis with such terms as "hard-hearted Malthusianism" as if it were not a thousand times more hard-hearted to tell human beings that they may, than that they may not, call into existence swarms of creatures who are sure to be miserable, and most likely to be depraved.'³

Pressure of population is still a matter of national concern. The Malthusians do not let people forget that a Lord Chief Justice pronounced the discovery of Malthus to be an 'irrefragable law.' While their slogan, 'Large families mean poverty,' is a truth widely exemplified.

And here is a pronouncement of two modern prophets, Mr. H. G. Wells and Dean Inge.

Dealing with a utopian work of H. G. Wells, the Dean remarks: 'He has diagnosed our social maladies

¹ *Descent of Man*, ch. v.

² *Political Economy*, bk. I, ch. x.

³ *Ibid.*, bk. II, ch. xi. § 6.

correctly. Especially valuable is his insistence on the Biblical aphorism, "If riches increase, they are increased that eat them." Until the world regulates its population, every discovery which might have made life easier and more comfortable will be promptly nullified, and there will be no release from our other two maladies, wars between nations and the bitter struggle for existence within the national groups. Our pundits will wriggle and shuffle a little longer to escape this unwelcome conclusion, but in the end it will be forced upon them, for Mr. Wells' diagnosis is unquestionably right.'¹

The Dean recognizes the difficulty of applying the remedies for social ills, remarking very justly that 'we are pulled back by the whole weight of the past history of our race.'

One of the sequels of the late war is the problem of unemployment. It has attracted attention to the population question, and Mr. J. M. Keynes has stated the case in a very clear way in the following:—

'Nevertheless, even though we may still hope to get relief from the progress of science, the accumulation of capital, and more good will and skill, in their respective functions, from workmen and from employers; yet, if the young men entering on their working life continue to exceed in number the old men completing theirs by 100,000 to 250,000 every year, sooner or later knowledge, saving, industry, and skill may be out-paced, and the standard of life decline.'²

He therefore concludes that the problem of unemployment is already, in part, a problem of population.

It is clear that the population of any country cannot increase beyond the means of subsistence it can command. It seems equally clear that population can expand only as prosperity expands. To increase the former without the latter means a degradation of the standard of living. General poverty cannot be compensated for by an increase of numbers. No one could

¹ Article in *Evening Standard*, 28th March 1923.

² Letter to *Times*, 15th February 1923.

desire a more populated England if it meant that this country was to be converted into a mass of slums. But while increase of population must be injurious to individuals and the state while wealth remains constant, increase of numbers is not only desirable but seems automatically to follow any expansion of prosperity. Such an increase is a clear indication of increasing wealth.

The industrial revolution signally illustrates this fact. The population of England and Wales, which was at the time of the Norman Conquest probably under two millions and in 1650 only five and a half millions, increased as follows :—

1760	.	.	.	.	6½ millions.
1801	.	.	.	.	9 „
1841	.	.	.	.	16 „
1851	.	.	.	.	18 „
1861	.	.	.	.	20 „
1871	.	.	.	.	22¾ „
1881	.	.	.	.	26 „
1901	.	.	.	.	32½ „

This illustrates Adam Smith's remark that 'the most decisive mark of the prosperity of any country is the increase of the number of its inhabitants.'¹

'The liberal reward of labour,' he asserts, 'as it is the effect of increasing wealth, so it is the cause of increasing population.'

Though the population of this country and of Europe has increased with the advances in wealth occasioned by agricultural and industrial development, it has increased but slowly compared with the growth of population in the United States.

That this comparatively slow increase is not due to the unfruitfulness of European women or to any undue aversion to parenthood by the European peoples is clear when it is remembered that the United States itself was principally recruited from this stock. The example of the United States shows plainly that the

¹ *Wealth of Nations*, bk. I. ch. viii.

procreative powers and instincts of man may be safely trusted to increase population wherever potential wealth makes increase desirable and not conducive to human misery.

The practical problem that confronts good parents and civilized peoples is how to restrict their increase so that the nation may increase not only in the number of the individuals, but the prosperity of each individual as well. No civilized people can seek to emulate the state of China, where there is a huge population of some four hundred millions, the great majority of whom are doomed to unceasing drudgery and the most miserable poverty. In this huge society, prosperity and patriotism have been cancelled by population. Consequently their military power is almost contemptible, and they are protected from exploitation mainly by the jealousy of rival powers, any one of which could dominate the country perhaps as easily as the three hundred millions of India are dominated by the people of Great Britain, whose numbers are not one-sixth of those of their great empire.

Population without prosperity plainly does not benefit a society ; and with the individual the like fact is plain. Large families do not compensate for poverty. The instinct of parental love, one of the most valuable sentiments of civilized peoples, while it constrains a man to disagreeable toil and to equally disagreeable denials in order that he may improve his condition and that of his children, cannot but be rendered nugatory by persuading him to bring more beings into the world than he can properly provide for. Love is a principal stimulant to industry and thrift ; but its power is lost not only where there are no children to call it into being, but also where there are so many children that its influence is rendered of little or no avail.

The proper ambition of every man is to advance his own condition and that of his children. In order that this stimulus may have its due weight, it is clear his ambition must be within the scope of his powers. The sentiment of love can only develop under such

conditions. The only course consonant with reason and with the truest moral sentiment is that a man should restrict his family so that his children should have at least as good, and if possible a better, chance in life than himself.

True love prompts to this end, the full development of man's powers is necessary to ensure it; and these conditions alone provide the best stimulant to diligence and denial and are best calculated to advance both individual and national prosperity.

But whatever opinions may be held with regard to the restriction of families, it will hardly be denied that those children are advantaged whose parents not only maintain and protect them but seek also by thrift and abstinence to ensure that their children shall have a better situation and improved opportunities in the world. If, then, abstinence and parental love are the causes of advancing prosperity, it may be confidently affirmed that progress is based on the great virtues of self-denial and self-sacrifice.

CHAPTER XV

LAW AND RELIGION

IT now becomes necessary to consider briefly the fundamental conditions on which civilization is based, the conditions which may be said to be necessary not merely to its material progress, but to its very existence.

In considering the persistence of species it was found there were two factors : the first 'preservation,' the second 'reproduction.' When regard is had to a continuing society it seems clear the same two factors must be involved.

In the preceding chapters attention has been confined chiefly to the preservation factor. It is obvious that in a settled society the securing to every man the fruits of his own labour is the elemental condition of peace and prosperity. Without security of property a society must dissolve into anarchy and decay, and so fall a ready prey to any invader.

But if security of property is the primary law for maintaining the existence of a state, quite another primary law is necessary for its continuance and persistence. And the secret of this law is found in the institution of marriage. This institution is not, of course, peculiar to Christian peoples, but in one form or another seems common to all nations, even to savages.

If one considers that with mammals the possession of the females depends on the law of battle, and if one contrasts marriage with its opposite state of promiscuity, it readily appears that what this institution actually does consists of two things :—

- (1) It determines the ownership of the females.
- (2) It determines the paternity of the children.

If order and unity are to be maintained in a society it is clear that internal dissensions must be prevented. And if it is advantageous to society to prevent contests between its members for the possession of goods and chattels, it is not difficult to realize that it is desirable, also, to prevent contests for the females. Hence it can be readily understood that natural selection would favour societies where the ownership of property and of females was decided according to the justest rules—in accordance with 'right' and not with 'might.'

In ancient times the female was no doubt considered the property of the father, who could sell her to the highest bidder, or otherwise dispose of her as he wished. And to-day, although the authority of the father has largely diminished, the marriage contract serves the same purpose of deciding the ownership of the female.

But what is even more important is, that marriage fixes the paternity of the children. And this has had the most important results, in that it enables a society to fasten responsibilities on the male parent, of which the most important is that he shall maintain them until they are able to maintain themselves. So that, while natural selection has implanted in the mother the strongest solicitude for her offspring, human regulation has decreed that the father shall behave, for all practical purposes, as if he were similarly endowed. It can hardly be disputed that it is a great advantage to children to be ensured in the protection and support of a father as well as the love and solicitude of a mother. Nor can it be denied that some legal coercion is desirable in the male, however superfluous it may be in the female.

To sum up, then, it may be said that civilization is based on two fundamental facts. They may be expressed as duties or as rights. Thus a man has two primary duties :

- (1) To earn his own living.
- (2) To maintain his wife and children.

And he has two rights :

- (1) To the fruits of his own labour.
- (2) To the possession of his wife and children.

For convenience of speech these two obligations may be referred to as security for property and person.

And this appears to have been the principal difficulty which societies have had to overcome. This has been the great problem of all peoples and of all governments.

It is equally plain that two great agencies have been operative on societies to bring about this end : one the agency of laws and their efficient application ; the other the influence of religion in extending its hold over the minds and imaginations of men.

Men cannot be made laborious and thrifty by Act of Parliament. But governments and churches can and have achieved a large measure of success in preventing offences, in securing that every violator of property shall have a just apprehension of punishment in this world or the next.

When offences cannot be committed with impunity, when idleness and profligacy receive their natural punishment in misery and destitution, then the material government of a society is well established. Men can then only hope to reap where they have sown, to consume what they have produced. The gratification of their appetites or their ambitions can be achieved only by one avenue—that of honest labour. Men have then the maximum stimulus to exertion.

This is an end which all governments have sought to secure ; for on the industry and prosperity of the people depend the prosperity and security of the state, and likewise the prosperity and security of its governors.

The conditions under which alone civilized peoples can survive and prosper are, then, clear enough. So, too, are the duties and interests of governments. The first step towards this end is an obvious one, that of making rules or laws forbidding all those violations of property which are conveniently summed up in the words ' theft ' and ' adultery. ' ' Thou shalt not steal ' is the first great social commandment, and ' Thou shalt not commit adultery ' the second. But it is one thing to make laws, it is quite another to see that they are

obeyed. It is easy to detect an offence, since there must always be an injured party ready to announce the fact ; but it is quite another to discover the offender, since the offender will exercise all his native ingenuity, will often make deep and cunning plans, in order to avoid detection or discovery.

The prevention of crime, then, has been the great problem of civilized societies.

In the light of evolution it is quite easy to appreciate this difficulty. All men have inherited the instincts of their barbaric progenitors. These ancestors were inured to bloodshed ; they preserved themselves only by the constant exercise of strength, skill, and courage. These were their virtues, the attributes they held in the highest esteem. And although bound together in a tribe by a common need, it needs to be recognized that men are naturally rivals the one of the other. In contests for the females, in tribal advancement and other ways, rivalry must always have had opportunity for asserting itself. And since in such contests defeat means deprivation, hatred must have been a general accompaniment. 'Men hate one another,' says Pascal, a man of unusual insight ; and it has been truly said that men instinctively feel pleasure in the misfortunes even of their friends. These instinctive feelings are clearly explicable in the light of human ancestry, and it is probably wiser to recognize and counteract them, than simply to deny their existence.

Considering man's inherited aptitudes and instincts, it is not difficult to see why he has a natural and ineradicable aversion to the labours necessitated by civilized life. That he should have an equally strong inclination to gratify his appetites by violence and theft is equally understandable. He is thereby achieving satisfactions by the exercise of his native instincts ; and, as just noted, the injury he inflicts on his victim would more probably be productive of pleasure than the reverse. It may, then, be said generally that while men have a natural aversion to labour they have an equally natural inclination to the commission of

criminal offences. It has been remarked that the legislature cannot make industry and thrift compulsory; but, as the administration of justice has become more and more efficient, governments have been constantly more and more successful in preventing offences. This matter need not be discussed in detail. The essential problem was to catch the criminal. Society can then compel restitution, and can prevent a repetition by reforming the criminal if possible, or, if not, by inflicting punishment so severe as to act as a deterrent; or failing that, it can deprive him of his liberty, or, if necessary, of his life.

When offences were not so readily detected, justice made itself more respected by exemplary punishments, by public whippings, hangings, and disembowelings—penalties which, in the circumstances of the time, may have been necessary and expedient.

It now becomes possible to consider the great part which religion has played in the development of civilization by seeking to influence men to refrain from offences against property and person. In the perspective which evolution makes possible, this seems the principal office of religion. And this end is plainly the same as that sought by social regulation, by civil government. The influence of laws and of religion has been directed essentially to a common end—the prevention of offences. Though religion denounces as sins what the law describes as crimes, the offences which both reprobate are substantially the same.

From this point of view, religion may be defined as that interpretation of man's nature and situation which has the practical effect of regulating his conduct to those ways which are most conducive to the welfare of the race.

Judged by this standard, different religions have obviously differed greatly in value. But natural selection has acted on religions and on societies which adhered to different religions. By the general doctrine it will be expected that the fittest religions have survived and that societies have been advantaged or other-

wise by the relative values of the doctrines which have secured their adhesion.

What are the essential doctrines which religion, and more particularly the Jewish and the Christian religion, teaches ?

While civil governments threaten material punishments for every infringement of law and are only able very inadequately to discover and punish offenders, religion teaches that there is an Almighty God, an 'all-seeing eye,' from whom no transgression can be hid and who will certainly punish every offence in this world or the next.

Instead of the anger of princes who may be deceived, malefactors are threatened with the wrath of a spiritual power who cannot be cheated.

Considering man's ignorance and his fear of the unknown, it is not surprising that conceptions of this sort should be vividly imprinted on his mind ; and they must in this event have had no inconsiderable influence on his behaviour.

The connection between civil government and religion has manifestly through the ages been a very close one. Leaders of religion have frequently been also the heads of the state, and the rulers more particularly in peace, and not infrequently in peace and war.

Moses, who led Israel out of Egypt and gave them a code of laws, sought to give the Ten Commandments the highest authority by asserting he had received them direct from the Almighty.

And as this code is among the most ancient of social ordinances, it may be instructive to submit it to a brief examination.

The first three commandments are purely connected with religious observance and the need for having a single clearly-defined faith. The fourth contains a weekly provision for religious observance and opportunity for rest from labour. The fifth seems somewhat singular to modern eyes, and is reminiscent of the honour claimed for parents in Chinese ancestor

worship. Parental authority may in those days, perhaps, have been a valuable means of securing social regulation and subordination. Of the remaining five, numbers seven and eight, denouncing adultery and theft, stand out as indicating the great elemental social offences.

As to number six, murder—since there is no advantage to be gained from killing people, and the practice involves some danger, it must be assumed that there would be no incentive to the commission of this crime unless there was some ulterior advantage to be gained from it—unless it were antecedent or consequent to robbery or rape, or in some way connected with the achievement of these improper ends.

The same remark applies to the prohibition of 'bearing false witness'—number nine. While the tenth commandment condemning covetousness is obviously connected with robbery or adultery; for unless the property or person belonging to some one else were first coveted, the attempt to secure possession by criminal means would never be made.

Apart, then, from religious observances and the injunction to honour parents, the prohibitions resolve themselves essentially into an indictment of robbery and adultery; a conclusion which confirms the view previously put forward that security of property and person are the primary aims of law and religion, of temporal and spiritual laws.

But let it be noted that both law and religion seek to secure the prevention of offences by fear—fear of social or of supernatural penalties; and the greater the apprehension, the more rigorously the individual restrains his impulse to seek his satisfaction by improper means, the more peaceful and prosperous will be the society, and so much easier will be the duties of civil government. Spencer recognizes this fact in the following words: 'Evidently, if men are to live together, the absence of internal power to rule themselves rightly towards each other necessitates the presence of external power to enforce such behaviour

as may make association tolerable.'¹ And remarks in another place: 'The diminution of external restraint can take place only at the same rate as the increase of internal restraint. Conduct has to be ruled either from without or from within. If the rule from within is not efficient, there *must* exist a supplementary rule from without.'²

If individuals can, then, be persuaded by religious influence to restrain themselves from committing offences, a society will plainly be considerably advantaged. But the influence of these persuasions varies very considerably with different peoples at different times, and no society has yet been able to dispense with the majesty of the law and its grim apparatus of gaols and scaffolds. Yet while religion has never been fully efficacious, its influence has always been so considerable that no society has succeeded in dispensing with its valuable aid, or if it has attempted to do so has not ultimately lived to regret its misguided efforts.

Gibbon gives an interesting if somewhat cynical account of the value and utility of the various religions that were extant in the Roman Empire. After remarking that 'the various modes of worship which prevailed in the Roman world were all considered by the people as equally true, by the philosopher as equally false, and by the magistrate as equally useful,' he goes on to say: 'The magistrates respected as the firmest bond of society the useful persuasion, that either in this or a future life the crime of perjury is most assuredly punished by the avenging gods,'³ perjury being singled out, no doubt, because it constituted the greatest obstacle to the discovery of the offender.

The close connection between war and religion is also remarkably exemplified in the case of the Mahomedans, the founder of whose faith was not only the author of their religion, but in his lifetime their governor in peace and their leader in war. This connection

¹ *Social Statics*, 'General Considerations.'

² *Ibid.*, 'The Constitution of the State.'

³ *Decline and Fall*, ch. i.

still persists, or persisted until very recently, and says Gibbon : ' From the Atlantic to the Ganges, the Koran is acknowledged as the fundamental code not only of theology, but of civil and military jurisprudence—and the laws which regulate the actions and the property of mankind, are guarded by the infallible and immutable sanction of the will of God.'¹

Though the code of Confucius is not perhaps regarded in the ordinary sense as a religion, it serves the same purpose to the Chinese ; and, in this instance again, the same association of civil and religious laws is to be noted, and ' . . . instead of Parliaments and papers the will of the ruler is checked by the accepted code of Confucius, which lays down the proper code for sovereign as well as for subject, and by the vigilant and unsparing criticism of the Board of Censors, who are always comparing the acts of to-day with the precedents of the past, and who apparently need little excuse to set their pointed pens in motion. The check on a Chinese Emperor is therefore the very effectual one of an educated public opinion with perfect freedom to give expression to it.'²

The connection of the civil code with religious commands, while it gives a sanction and authority to social rules which otherwise they would lack, is probably not an unmixed advantage. Principles which have a divine sanction do not lend themselves to modification, and rules that were established many centuries ago have not always been found well suited to more modern conditions ; such governments have consequently a difficulty in establishing more suitable laws without injuring the susceptibilities of the faithful.

With Christianity and Buddhism, the other two great religions, this difficulty has not been experienced. They were not at their inception state religions ; and the more advanced peoples of Europe in particular have been able to exercise a certain discretion and

¹ *Decline and Fall*, ch. L.

² Demetrius Charles Boulger, *History of China*.

modify their legislation in accordance with the necessities of modern times and in the light of history and experience.

The influence of civil laws and religion has now perhaps been sufficiently expounded. The coercion of society and the persuasion of priests have clearly been the great agencies by which men have been deterred from following their natural impulses. These have been the great instrumentalities of change, and the development of civilization shows that they have been in the main effective. Human activities have been radically changed and human nature has been to some extent modified to fit these new activities.

But while recognizing the power of the magistrate and the priest, it is important to realize also their limitations. Religion in particular makes the most far-reaching claims, generally asserting that piety and sinlessness are not means to an end but ends in themselves, that goodness is the true goal of man, and that the world is merely a school for character and a means of winning salvation. But, in the perspective which evolution affords, the office of the various religions in the life of man seems decidedly more limited. In cooperation with civil government it has sought to constrain men from evil courses, it has sought to bar them from following the old ways ; but it has plainly had no power to impel them on the new ways. Progress, the advancement of individual and national prosperity, is not due to religion or civil government. It is due to the desire of men to better their own condition and that of their children. And when law and order are so secure that prosperity can be achieved in only one way, that is the way that men must follow. It is the prospect of wealth that is the motor of progress, and the only means by which this prize can be obtained in a properly constituted society is through industry and thrift.

The office of civil government, and more particularly of religion, is then essentially negative. Love and righteousness may win a man a heavenly crown, they

can never earn him his daily bread. For his daily sustenance, for the means of maintaining his life from day to day, man is dependent on labour, on industry and toil: 'In the sweat of thy face shalt thou eat bread'; 'Cursed is the ground'; 'In toil shalt thou eat of it all the days of thy life.'

All those things which are conducive to his preservation—food, clothing, housing, fire, light, means of locomotion, and so forth—are the products of human labour, the results of industry and abstinence.

The business of governors is to preserve the chief stimulus to production by securing to each man the fruits of his own labours. To this end the state must ensure the security not only of the individual property, but also of the national property.

The security of individual property has been the first duty of civil government, of civil laws, and it is in the discharge of this duty that religion has been such a powerful auxiliary. And these duties are plainly not creative but protective, not positive but negative.

Nevertheless they have been of enormous importance in securing the development of those two dismal but essential virtues, industry and thrift.

Only the confident hope of prosperity and happiness, and the no less certain fear of poverty and misery, respectively attaching to their presence and absence, only by such strong fears and hopes could human nature have resigned itself to the practice of these virtues.

All men having like natures, the state could never confidently select any men to act as its agents, as magistrates and governors, without fear of their corruption. But though men cannot be made good by Act of Parliament, they have certainly been made good to a great extent through the influence of religion.

Human nature has on a wide enough view most certainly been modified in the direction of virtue, and for this result religion must be given a large measure of credit.

CHAPTER XVI

THE VALUE OF RIGHTEOUSNESS, OR THE ADVANTAGE OF CONFORMITY

RIGHTEOUSNESS may be briefly defined as a compliance with the necessary rules of civilized society ; but in a proper perspective it means much more than this. If evolution be true, it means conformity, adaptation, the getting fitted to new conditions, and its great importance lies in the fact that the power of exploiting these new conditions is dependent on the degree of success in adaptation.

To make the problem clear it only needs to recall the elemental facts of evolution, to remember that the ancestors of modern man only quitted the life of the hunter some ten to twenty thousand years ago, while for a period perhaps a hundred times as long they lived the wild, savage life of primitive man. In the blood of civilized man are the instincts of his forebears made organic by the life lived in that vast stretch of time.

A machinery designed for one purpose has now to be applied to very different purposes. From the life of hunter and warrior man has passed to the sedentary life of agriculture and industry. In place of brute strength and physical skill, his situation now requires the monotonous toil of manual and mental labour.

Only those societies have advanced in which property and person have been made increasingly secure, and in such societies it necessarily follows that violations of property and person must have been made increasingly hazardous. The advantage of right doing has thus increased *pari passu* with the growing security for property and person.

But while the increased efficiency of the law, the fear

of the police, the magistrate, and the prison cell, have been remarkably efficacious in compelling an improvement of behaviour, it cannot be asserted that there is a corresponding amelioration of human nature. The natural man is good not from conviction but through compulsion ; his conscience is moved mainly by a fear of consequences ; he bows to necessity but does not abandon the hope of escape, seeks to give as little and take as much as he can, follows the line of least resistance, and is prompt to take an improper gain where he thinks there is no fear of detection. This on the general theory must be the disposition all men have inherited ; all tend to throw back, their compliance is reluctant, their nature rebellious.

It is not surprising that the masses should menace property, that the idea of sharing up the wealth of the nation should appeal to them as a most laudable thing to do. They cannot be expected to have much regard for future generations, or to recognize that if they destroy the right to inherit, they destroy likewise the incentive to save and bequeath.

But the native instincts of the propertied classes are much the same. Adam Smith appears to have been under no illusion on this matter. 'Landlords,' he remarks, 'like all other men love to reap where they never sowed.'¹ In another place he indignantly refers to the rapacity of rulers, remarking that, 'All for ourselves, and nothing for other people, seems in every age to have been the vile maxim of the masters of mankind.'²

It is fairly obvious that all men are naturally disposed to shirk labour and seize wealth, and it is equally clear that civilized societies have been increasingly successful in combating this propensity, and in making robbery and rape more and more unprofitable.

But the point of this chapter is whether righteousness is an advantage to civilized man, and much weightier considerations are available to decide this question.

¹ *Wealth of Nations*, bk. I. ch. vi.

² *Ibid.*, bk. III. ch. iv.

The issue will become clearer if the natural man is contrasted, not with the malefactor, but with the man who has espoused righteousness from conviction, who is a moral enthusiast.

The great difference is this : that when a man puts out of his mind all thought of winning happiness by illegitimate ways, he gradually but inevitably comes to see how happiness may be won by legitimate ways.

He sees that goodness is not merely negative but positive ; it means not merely denial but development ; it becomes, as Spencer says, not only the repression of traits no longer necessary, but the development of new traits, and traits that are highly profitable.

For in civilized society it is clear there is only one definite way in which a man can improve his estate, and that is by increasing the value of the services he can render his fellow-men. By giving more valuable service he automatically increases the value of his labour.

This, then, is the chief reason why righteousness is an advantage in the struggle for existence ; the recognition of righteousness leads to the development of worth.

In civilized society survival of the fittest may be well interpreted as survival of the most worthy, worth referring to those qualities which advantage the individual in the conditions imposed by civilized life. Consider, for example, the immense value of education : the acquisition and application of knowledge play a chief part in every branch of social life, and, while not so obvious in the industrial world, they form practically the whole part of such functions as those of the doctor and the lawyer. But a trained intelligence must be linked with the power of steady application if it is to yield the highest results, and this submission to the discipline of labour is as difficult of attainment as the cultivation of learning and skill.

As the life of civilized society depends on its productive powers (since it can consume only what it produces and what it obtains in exchange for that part

of the production not consumed), so the production, distribution, and exchange of commodities constitute the life of society.

In these spheres the greatest services are to be rendered and the highest prizes won. Yet industry, transport, and commerce, while they require a vast material apparatus, demand also the service of efficient human beings, and, other things being equal, it is plain that natural selection will act on the moral and intellectual qualities of the individual agents.

These are the traits that, as Spencer says, require development, and these are the traits that, however and wherever acquired, will confer an advantage in the struggle for existence.

But, it will be objected, if character and intelligence reap a material reward, will not that fact afford a sufficient motive to their development? That such an expectation does have great weight cannot be denied, but to hold that the mercenary motive is sufficient in itself would be contrary to all experience. In this world there are certain elements of chance, the reward is not always proportioned to the worth, and human nature is rebellious, self-discipline cannot be maintained unless the individual entertains the liveliest conviction that the course he is pursuing is the course of wisdom.

Hitherto it must be admitted that the faith of Christendom deserves the principal credit for persuading men to righteousness. Philosophy has been comparatively barren—not wholly so, indeed, if such as Socrates and Marcus Aurelius are called to mind, but philosophy has had no finality; reason can be employed with equal force to justify the epicure or the stoic, can set Omar Khayyám against Emerson, and only by a very expensive experience could it be ultimately decided that virtue was better than the vine, that sobriety yielded a higher dividend than sensuality.

Man is pulled back by the whole weight of his past history, by a magnetism that never ceases. His conversion could be effected only by a power equally

strong and equally persistent. It need not then be wondered that religion was so vigorously, so violently preached, that it employed lurid images, threatened hells of fire and promised heavens of bliss. Without such drastic measures it could never have been successful.

But it will be objected again, granted that religion has been instrumental in promoting righteousness, in repressing robbery and rape and so forth, yet its object in making people good was to ensure their future salvation, and certainly not merely to promote their worldly welfare.

Indeed, it will be asserted that the pursuit of riches is contrary to the whole spirit of religion.

All this may be admitted, and yet, whatever the original intention, it may be confidently asserted that the cultivation of virtue has in fact been largely responsible for the increase of material prosperity. However Christianity may condemn Mammon, it cannot be denied that the wealthiest nations of the world are the Christian nations. Nor can the fact arouse surprise, if it be recognized that the recognition of righteousness leads almost inevitably to the cultivation of worth.

Hitherto the belief in righteousness has been based chiefly on religion, but on Darwin's theory this is of little importance. If the belief be of advantage, then, wherever and however arising, it will have a survival value, and those who adopt it will tend to be naturally selected.

The springs of moral enthusiasm have hitherto been derived from sources which are fast drying up. Can evolution supply the deficiency? can evolution supply motives to the pursuit of righteousness, incentives that will have an efficacy equal to those that have now to be abandoned?

Of the urgency of the need there can be little doubt. Spencer recognized it very clearly: 'The establishment of rules of right conduct on a scientific basis is a pressing need,' he remarks; 'now that moral injunctions are losing the authority given by their supposed

sacred origin, the secularization of morals is becoming imperative. Few things can happen more disastrous than the decay and death of a regulative system no longer fit, before another and fitter regulative system has grown up to replace it.'¹

There should be little doubt that evolution as interpreted by Darwin can make good the deficiency.

Instead of righteousness being the passport to a better world, evolution asserts that righteousness confers an advantage in the struggle for existence, because it leads to the development of worth, the achievement of prosperity, and so to the promotion of happiness.

The change which a belief in evolution necessitates has much in common with the phenomena of conversion.

Once a man sees clearly the fundamental necessity for those changes that are so irksome, he seeks to conform not reluctantly and rebelliously but deliberately and voluntarily, with all the energies of heart and mind. By accepting his chains he makes himself free.

It means that the whole problem of civilized life is envisaged afresh ; there comes about a revolution in the natural attitude to life.

The whole life is organized anew ; the energies are marshalled, the faculties are directed to the clearly seen end, to the development of man's powers, the increase of his worth, the enhancement of the value of the services he can render his fellow-men.

It is a case of adaptation, and of a development that naturally follows the adaptation.

The necessity of industry and thrift has been discussed in previous chapters, but the development of character and intelligence naturally permits an accelerated opportunity of progress, for the value of labour is determined as much by its quality as by its quantity.

Yet it must not be thought that righteousness or conformity will necessarily guarantee success ; all that can be promised on the general doctrine is that they

¹ *Principles of Ethics*, Preface to Part I.

give the *best* chance of success, that they confer a great advantage in the struggle of modern life.

But it is plain there can be no improvement, no development of individual worth unless, and until, the individual has espoused righteousness, has deliberately shut out from his thoughts the hope of improper gain.

This involves a change of heart as well as a change of practice ; there is necessarily a deliberate attempt to inhibit covetousness and lust. And all these changes require wisdom as well as will. Adaptation and development is an art, not a mere mechanical matter of iron restraint and rigid compulsions. Human nature can be modified only with difficulty ; if the strains to which it is subjected are unduly severe, the constitution may readily be deranged. But this aspect of the subject is dealt with in a later chapter.

It may occasion some surprise that the increase of prosperity is held to constitute a large part of the justification of righteousness, and yet, while, on the side of reproduction, evolution represents an increasing development of parental love, on the side of preservation it is represented essentially by the conquest of nature, and of this conquest the increase of wealth is the natural continuation and result. It cannot be doubted that wealth is an advantage to societies in their contests with one another, nor can it be denied that wealth properly used is an advantage to the individual in his struggle to live and reproduce his kind.

The deprecation of wealth arises largely from the fact that it is so open to abuse. Riches make possible every indulgence and release men from all discipline, enabling them to pursue the unbridled gratification of the senses. Since all men have a tendency to throw back, it is not surprising that wealth frequently leads to moral and physical ruin ; especially strong must this tendency be in men who inherit wealth and have not been subjected to the discipline necessary for its acquisition. Yet while admitting that riches frequently lead to prodigality and dissipation, it can be emphatically

asserted that poverty means the degradation of human beings, while wealth governs the pursuit of every form of human culture, of every power of self-development, and of every power to serve the community and advance civilization.

Wealth is essentially the result of the conquest of nature to the service of man, and this conquest is the condition of man's elevation.

It may then be confidently concluded that righteousness is an advantage in the struggle for existence, because from man's free acceptance of his situation comes the desire to adapt himself and the will to develop himself. He thus fits himself not only to the conditions but for the conquest of his environment, and is necessarily advantaged over men who are not so fitted.

Those who accept these precepts in theory may be promised that their truth will be confirmed in practice.

The righteous man is manifestly in tune with the process of evolution, with that remarkable scheme of things of which civilization represents the advancing front.

It would not be possible to conclude this chapter without noticing a supplementary but very powerful advantage which is available to honest men. Wrong-doing, ill-doing is the great impediment to the spread of love between man and man.

But between righteous men this obstacle is removed, and good-will between men conduces to all kinds of profitable co-operations and extracts the maximum benefit from every form of association.

As love can only proceed from righteousness, so love is best fitted to recognize the supreme value and necessity of righteousness.

The most impartial testimony on this problem comes from parents. A mother is the one who above all has the happiness of her children at heart. And a mother desires her child to be first and foremost, not a clever boy, but a good boy. If he has talents, so much the better: they shall be added unto him. But a mother

knows beyond argument that a boy's best prospect of happiness, his best hopes of winning a prosperity that shall not be Dead Sea fruit, lies in his being, not clever, but first, foremost, and all the time 'good,' honest, sincere, upright, doing his work in that state to which it has pleased God to call him.

The righteous man, then, represents the type best qualified to survive in that struggle for existence which obtains in modern life. By all analogy it must be expected that he and his seed will be naturally selected ; it is they who will inherit the earth.

CHAPTER XVII

THE PROFIT OF LOVE

IT is now possible to deal with one of the most profound problems in the evolution of life and the history of man. And fortunately it is possible to escape from the vague exalted rhetoric, the metaphysical mysticism with which this sentiment is usually associated, and to attempt, at least, to deal with it in a plain, common-sensible way. In the light of evolution, interpreted by natural selection, love becomes simply a sentiment that confers an advantage in the struggle for existence.

In this chapter consideration will be chiefly devoted to the question of love between man and man. Of love for children enough has been said to indicate its extraordinary importance in the evolution of the human race. Love for offspring, the power to nourish and protect their progeny, was the principal distinction between mammals and reptiles. The care and protection of offspring has steadily advanced from savage to civilized man.

The advantage of maternal love is sufficiently obvious and not likely to be disputed. With the settled life of agriculture the advantage of paternal love also was clearly seen. The desire to benefit children was found to be the mainspring of progress, the chief cause of advancing prosperity. Those children were clearly benefited who had self-sacrificing and self-denying parents. If love between parents, and love of children for parents, may also be held to have aided to induce this self-denial and self-sacrifice, then the genesis and value of affection between all the members of a family becomes strikingly apparent. Though it is

a controversial question, the writer has also submitted that the limitation of offspring will give a further stimulus in the same direction.

The family is the essential unit of society, and parental love, filial love, family affection are clearly indicated as a cause and consequence of human progress.

But in the present chapter regard is directed to a very different application of the sentiment of love.

This is the problem of love between man and man, between neighbour and neighbour, between class and class, between all the members of the community. The founders of Christianity and of Buddhism preached love between all men. So persuaded were they of its overwhelming value, its unlimited efficacy, that they were intolerant of any and every obstacle which impeded its development. Differences of wealth, distinctions of caste were alike denounced. Non-resistance to evil was advocated so that no strife could henceforth be possible.

These wonderful ideals have never been consummated ; they remain as visions which men still fondly long for and vainly despair of ever achieving.

What has evolution to say on this tremendous problem ? Does this ideal fit into any place in that vast perspective which evolution affords ?

There seems little doubt of the answer ; in the light of natural selection love between man and man is equally explicable, equally intelligible, and receives as simple an interpretation as all the other factors that have gone to the evolution of the human race.

In evolution this problem resolves itself into the extension of love to all the members of a society. It is a question of a sentiment, originating in and normally confined to a family, being developed and extended through all the members of a community.

Three questions present themselves. Is it desirable ? is it possible ? and if so, how can this end be achieved ?

That love and good-will between man and man is a

consummation devoutly to be desired is borne out by the testimony of all ages. It has been the great ambition of all religions and has had eloquent advocacy from great statesmen. All men who have had the love of a good mother are conscious of its inestimable value. It is plain that this sentiment would bring about the ideal state. The value of association in the development of man has been conspicuous, and all the values of association are most fully secured when the co-operation is harmonious. Good-will would clearly allow the maximum profit to be derived from every form of association whether for work or recreation; while on the other hand it would provide a mutual insurance against accidents and misfortune, against sickness and distress. Its unequalled efficacy in family life would be shown on a larger scale and with corresponding benefits if the community were also one large family animated by the same sentiment. But it is not necessary to dwell on a theme where mankind is practically unanimous. Let it be assumed that the end is desirable and would certainly prove highly profitable.

The great problem is, whether it is possible and how it is to be brought about. And on this subject evolution should furnish common-sense guidance and reasonable prospects for an advance to the end desired.

It must be realized and clearly emphasized that there is a world of difference between love for one's own flesh and blood and love for one's neighbour, between family affection and good-will towards all the members of a community. Parental love is in man's blood, is one of his strongest instincts, is native to his constitution. But love for his fellow-man is not inbred; in fact, as Pascal asserted, 'men hate one another,' and as another authority has it, they are full of envy, malice, and all uncharitableness. A man takes an instinctive delight in the misfortunes even of his nearest friend. Men are naturally rivals, and always have been, in the lists of love and the business of the world. The failure of a rival is the success of his competitor; and the man

who succeeds is conscious of a secret pleasure in the downfall of his competitor.

These sentiments are inbred, inherent, and native to the human race. Law and religion have incessantly worked to prevent these envies and hatreds blazing into fratricidal strife, and to confine competitions to those methods which will ensure the survival of the fittest. The laws of free competition are devised to this end. Manufacturers compete to supply some commodity in the most economical way. The most successful undercuts his rivals and so achieves the privilege of supplying the public. Doctors compete to win patients. Grocers compete for the privilege of supplying retail commodities to the neighbourhood. The one who renders the best service prevails. Competition supplies the proper stimulus, and the community is benefited and invigorated by its operation. But all these rivalries are governed by rules, are kept in due bounds by social ordinances. Yet this rivalry keeps alive the embers of envy and ill-will between man and man, and it is plain that good-will cannot develop until ill-will is nullified, while ill-will can be nullified only when righteousness is triumphant. Property is now tolerably secure in advanced societies, but it is kept so only by constant coercion. Men still fiercely dispute as to their rights and wrongs. There is even as yet no general agreement as to what constitutes right and wrong. Parliament is the theatre of unceasing contests between the opposing interests of different trades and classes. In particular there is the age-old struggle between those who have inherited nothing and acquired little, and those who have inherited much and acquired much. The doctrines of the gospel borne out by the practice of the early Church certainly lend countenance to the doctrines of communism and socialism. Brotherly love is held to be incompatible with great distinctions of wealth. And the masses are readily persuaded that religion warrants them in plundering the rich.

Until there is general agreement as to the rules by

which wealth may be legitimately won and honestly enjoyed, there can be no peace between men. And such agreement can never be arrived at save by a true knowledge of the laws of progress, a true interpretation of history and of economics. To the writer it seems that such an interpretation can come only through a proper understanding of evolution in the light of natural selection.

If the power of benefiting children is an essential stimulus to industry and thrift, and if the continued prosperity and security of the community depend on industry and thrift, then this stimulus cannot be impaired without danger. The power of bequest, the right of inheritance must be preserved.

If undue prolificness leads to poverty, the evil cannot be cured by palliating the consequence. The remedy must be sought in the cause.

When a society is seen to have a continuous life through the centuries, it should not be impossible to discover the necessary rules that make for progress and prosperity.

When these rules are formulated, these principles clearly expressed, it may be possible to achieve a philosophy of social life that will command general assent.

Men must accept their physical inheritance, and it seems equally clear that they must accept their financial heritage.

Wealth may not always have been achieved by honest means. But it is not possible to remedy all the iniquities of the past. It is and should be possible to secure that in the present and future men shall be rewarded according to their deserts, that they shall receive no more and no less than the fruits of their labours.

Be this as it may, it is plain that love can only develop when righteousness is established. This is clearly the chronological sequence. Just as in history security had to be attained before prosperity could develop, so history shows that it is sought to establish righteousness before it becomes possible to preach the doctrine of love.

It is the vital difference between the Old Testament and the New, between the laws of Moses and the teachings of Christ, between the Ten Commandments and the Sermon on the Mount.

The laws of Moses are directed to the prevention of wrong-doing. It is not love your enemy and turn the other cheek, but an eye for an eye, a tooth for a tooth. The majesty of the law had to make itself respected ; men had to be awed into some regard for justice ; the Jewish race had to be subjected to an age-long discipline before righteousness could be well established. Then, and not till then, was it possible to preach love to all men. Only when the occasions for ill-will had been reduced to a minimum was it possible for the advantages of good-will to be forcibly presented to the minds and imaginations of men.

Much the same course of events seems to have been the case with the other great religion of Buddhism in its relation to Brahmanism.

But when the necessary rules of society are clearly recognized, when men are self-disciplined to perform in practice what they accept in theory, when duties are honestly performed and rights cheerfully conceded, then the occasions for ill-will between man and man will disappear. Causes for grievance being eliminated, it will become possible for good-will to develop.

Righteousness is the foundation upon which alone the more resplendent edifice of love can erect itself.

Once ill-will has disappeared, the profit of good-will must become manifest. Then love can establish itself between man and man, neighbour and neighbour, class and class. The rich will not despise the poor, the poor will not hate the rich. The poor will receive compassion and help, the rich will be regarded with esteem and respect, their estate will provoke not envy, but admiration and emulation.

And while the ideal may be remote, let it be recognized that every step towards the goal has a cumulative advantage. For if righteousness makes love possible, love confirms and strengthens righteousness. Where

men love they cannot hurt. The religions of the past were ignorant of the essential conditions of righteousness; they sought to secure this end almost solely through the agency of love, but they clearly recognized that where there was love there could be no wrong. This is strikingly exemplified in the following quotation from an early Buddhist work :—

‘ All the means that can be used as bases for doing right are not worth the sixteenth part of the emancipation of heart through Love. That takes all those up into itself, outshining them in radiance and glory. Just as whatsoever stars there be, their radiance avails not the sixteenth part of the radiance of the moon. That takes all those up into itself, outshining them in radiance and glory—just as in the last month of the rains, at harvest time, the sun, mounting up on high into the clear and cloudless sky, overwhelms all darkness in the realms of space, and shines forth in radiance and glory—just as in the night, when the dawn is breaking, the Morning Star shines out in radiance and glory—just so all the means that can be used as helps towards doing right avail not the sixteenth part of the emancipation of heart through Love ! ’ ¹

Here love is claimed to be sixteen times more efficacious than any other agency in promoting righteousness. And while these eloquent discourses lose somewhat of their force because the rules of right and wrongdoing in a society are not clearly appreciated, it may be well to recognize that every step towards righteousness makes love more possible, and love repays the debt by strengthening the will to do what is right. Clearly love and righteousness act and react on one another, and love may well deserve cultivation before righteousness can have an ideal establishment. They are reciprocal activities and in practice the one aids the other. But to guard against all excess in sentiment, it is well to recognize that righteousness is the surer and stronger. Righteousness can alone afford a proper basis, and

¹ T. W. Rhys Davids, *Early Buddhism*, ch. iv. Quotation from Itivuttaka.

righteousness must be slowly and laboriously established before the great passion of love can win its true dominion over the hearts of men.

The extension of love between all the members of a community seems the present essential goal of evolution. Societies will thus realize their highest character, achieve their maximum efficiency, and contribute to the greatest happiness of their individual members.

But what of the relation between society and society?

If love is so difficult of attainment between the members of the same community, it is obvious it must be vastly more difficult of achievement between men of different nations and different races. It would be folly as things are to call on Englishmen to love Spaniards, Hindoos, or Chinamen. Such professions could only be lip service. Love between the members of one community must be achieved before any further advance can be possible. Emerson was a great idealist, but he placed a higher value on sincerity. 'Go love thy infant; love thy wood-chopper,' he remarks to a zealot, 'be good-natured and modest; have that grace; and never varnish your hard uncharitable ambitions with this incredible tenderness for black folk a thousand miles off. Thy love afar is spite at home.'¹

In the present state of the world, conflict of interests, and of vital interests, between different nations there must be, as throughout history there always has been. Nations, and particularly industrial peoples, are rivals in the lists of progress to-day. Advancement of industrial power, of civil prosperity, has by a strange chance become almost synonymous with increase of military power. The apparatus of industry furnishes the decisive machinery for war. The world is entering on a new phase. More powerful and more prosperous types of societies are being evolved. Concomitant difficulties are making themselves increasingly prominent, but the general issues remain the same. The advance of the human race is represented essentially

¹ *Essay on Self-Reliance.*

by the struggle to understand and subjugate nature and by the contests between societies for the opportunity of exploiting the resources of nature. And so, for the near future, it is likely to remain. No vague desire for universal brotherhood and general disarmament can be indulged in if it conflicts with the passion and needs of patriotism. Love between nations, as between individuals, can eventuate only when righteousness is established. When international law and compulsory arbitration between nations become really effective, good-will may well expand with universal benefit. Until the dawn of that happy day, nations must seek the advancement of their own prosperity and security. The development of trade and industry, access to markets, the securing of raw materials, the knitting tighter of the bonds of empire—these things are plainly marked out as the immediate practical needs which all good citizens and patriots should seek to forward.

In his speech at the opening of the British Empire Exhibition, the King referred to the Empire as the 'family estate,' and emphasized the need for 'family affection,' thus putting in the simplest words a vast conception and a great ideal. 'Business relations between strangers,' he remarked, 'may or may not lead to friendship; co-operation between brothers for the better development of the family estate can hardly fail to promote family affection.'¹

Security and prosperity are, then, the immediate needs, and the recent exchange of communications between the late Premiers of this and an adjoining country form interesting illustrations of the concrete value attached to these abstractions. But in the internal affairs of the community righteousness and love are the essential aims not only of statesmen but of all men of good-will. This is the true goal of law and religion; this is the true end of the community; and this aim is one that is not impossible of attainment.

Asserting, then, the fundamental duty of patriotism,

¹ Quoted in *Times* of 24th April 1924.

it is plain that ethics must be based on economics ; but when the necessity, the morality, of distinctions of wealth are willingly recognized and accepted, then the development of love, of good-will, between man and man can proceed freely and fully with benefit to all concerned. There is then no further impediment to the enthronement of this sentiment in the hearts of men.

With the acceptance of this primary law, love at once becomes a sentiment that profits the individual in the struggle for existence. It 'blesseth him that gives and him that takes.' It may then be confidently expected that the further progress of mankind will be forwarded and bound up with the extension of love towards all the members of the community, so that good-will towards men may be not merely the aspiration of the past, but the noblest triumph of the future.

CHAPTER XVIII

THE STRAINS OF THE NEW LIFE

It has been noted that the outstanding feature in the evolution of man has been the development of agriculture all over the world. The forces of nature are harnessed, the mineral world is exploited, and vegetable and animal life on the earth is regulated, all to one end—to serve the purposes and promote the welfare of the human race. The development of locomotion linking up the various countries of the globe has enabled manufactures previously confined to towns to be concentrated in whole countries. Specialization of industry and agriculture respectively, has thus become intensified and localized and in its allocation has reference to the whole world.

The change of activities necessitated by agriculture has been already noticed, and manufacturing industry has obviously required a still greater change in the labours to which man must apply himself. If man found it difficult to apply himself to the tedious monotony of farm labour, it is plain he would find it far more difficult to resign himself to the still more unnatural labour required in mines, factories, and offices. The difficulties and problems of adaptation have clearly been aggravated and accentuated by industrial life. In the following remarks, regard will be directed chiefly to industrial life as representing the problem in its severest form.

Consider civilized man as he is to-day. He is under constraint to disagreeable labour—a constraint that begins in childhood and ceases only in old age—a daily and unceasing necessity to apply himself to

displeasing labours as the only means by which he can procure his daily bread.

It follows that his nature must be under a corresponding restraint from following that call to a wild life to which he is naturally disposed. Only rarely and by way of recreation can he seek this alleviation.

Again, since abstinence or thrift represents the sole means by which he can increase his prosperity, provide for old age, or benefit his children, he is under a constant urge to practise this virtue—one which means a restraint from consumption, a voluntary denial of available gratifications.

To these two restraints must be added a third. Sexual satisfactions can be achieved no longer by force or favour, but only through marriage. And marriage, under the rules of civilization, is a partnership voluntarily contracted by two consenting parties—and one which entails very serious obligations, of which to the man the most important is the duty of supporting both wife and family. This institution, therefore, has the effect of requiring most men to restrain their sexual inclination for a large part of their days, and then to indulge it only in the knowledge that they are thereby incurring economic penalties.

Here, then, is modern man suffering under daily compulsion to disagreeable labour and to restraints upon the indulgence of his native appetites—restraints on consumption, on the desire for an active physical life, on the achievement of sex by the law of combat or the choice of the female. In literal truth may he say, 'We must not do those things which we would do, And we must do those things which we would not do.'

Society is now so organized that he has little choice but to obey. The priest is ever urging him to root out evil impulses; the policeman is ever ready to detect and the magistrate to punish every social offence.

By labour and thrift, and by labour and thrift alone, can he achieve satisfaction of his desires. Only by

labour and thrift can he hope to win prosperity and freedom.

And while fear prevents man offending and induces him to toil, the prospect of wealth is a most powerful stimulus to industry and abstinence. If his earnings and savings be great enough he achieves prosperity and independence. And with prosperity comes release from these obligations to toil and abstain. By submission to discipline he may at last free himself from the need for discipline. By subordination and toil he may at last become his own master and toil no more. These appear to be the elemental obligations of civilized society, and they indicate generally the nature of the strains to which modern man is necessarily subjected. 'Man is everywhere in chains,' and the shackles are forged by law and riveted by religion.

To all men, toil and denial mean a more or less greater degree of misery. Now this change of activities and these restraints do not influence human organs so much as human instincts. The work of the body is said to be chiefly a matter of muscle and chemistry, and while the organization may deteriorate from lack of exercise, it is stronger and coarser and not so profoundly affected as the nervous system which is the seat of the instincts, of the mental faculties, and of the powers of regulation and control. The unhappiness of man cannot in general be readily recognized in the functions of this controlling system; but when the strains and inhibitions become too severe, the nervous system shows a very marked reaction in the well-known phenomenon of insanity. And this derangement does afford a measure of judging and a means of realizing the severity of the strain to which human nature is being subjected by the life of civilization.

The observations of Spencer on this head are not merely figurative and may deserve repetition here. He says: 'This general cause of derangement operating on all sentient beings has been operating on human

beings in a manner unusually decided, persistent and involved. It needs but to contrast the mode of life followed by primitive men wandering in the forests and living on wild food, with the mode of life followed by rustics, artisans, traders and professional men in a civilized community, to see that the constitution, bodily and mental, well adjusted to the one is ill adjusted to the other.'¹

Here is a medical expression of the same belief :—

'Mental instability as a whole, excluding that group caused by organic disease, is to-day believed to be due to the inability of the individual to bear the strain of forcing his diverse natural instincts into the common mould of conventional and legal demands.'

'This problem is with us from the cradle to the grave, and the mental stability of the individual is merely the measure of his faculty for solving it.'²

Brain disorders may, of course, be congenital or caused by physical violence, such as concussion, or by disease ; but apart from such more easily recognizable cases it is clear that insanity is considered to be largely a disease of civilization. So clear is the diagnosis considered, that curative methods have naturally derived from them and the same doctor says : 'the treatment of insanity has as its basis the resolution of these problems of reconciling primitive instincts and social dictates, if possible before the patient has become disorganized under the strain. It is preventive medicine applied to the mentally unstable.'³

Insanity has until the last century been a great puzzle to mankind. Only in the light of evolution does it now seem to become intelligible. It is worth while noting how medical men all seem to be looking towards evolution for guidance and interpretation on this matter. Let it be remembered that insanity has never been satisfactorily defined, and is held to show and define itself almost wholly in the abnormality of

¹ *Principles of Ethics*, § 33.

² Dr. Harold Dearden in *Daily Mail*, 19th January 1922.

³ *Ibid.*, 2nd December 1921.

a person's conduct. Dr. A. F. Tredgold, dealing with the relation of insanity to crime, remarks that 'certain abnormal mental states may directly lead to crime,' and says: 'I think our present knowledge may be expressed shortly as follows. Behaviour is primarily based upon certain inherent impulses. These are for the most part egoistic and either a-social or definitely anti-social. They are incompatible with the requirements of civilization, hence man has gradually evolved a mechanism of control. If this control is absent primitive impulses will have unfettered sway and conduct becomes anti-social and criminal.'¹

What this amounts to is that civilized man must exercise a severe control over himself, and if the strain becomes too severe the control breaks down, he reverts to crime or lapses into insanity.

And this human wreckage affords tangible evidence of the difficulty with which man constrains and restrains himself in the conditions necessitated by civilization. The ships that come to port may not afford evidence of the tempests they have survived; but these wrecks furnish a solemn and unmistakable warning. Human nature is an arena of conflict, and man needs wisdom as well as virtue to guide him. This is how Dr. Bernard Hollander recognizes the fact: 'The morality of conduct rests on the everlasting conflict between the animal passions which urge towards self-gratification and self-preservation, and those affections and sentiments which arise out of social life and urge for adaptation to the herd.'²

This is rather a crude analysis; for, like previous analyses, it recognizes principally the antithesis between individual and social needs as the cause of conflict. But the chief cause of derangement has been shown in this inquiry to be the profound change in those activities whereby man earns his subsistence.

It is very interesting to observe how the arguments

¹ Letter to *Times*, 11th December 1923.

² From Review Article in *Observer*, 7th July 1922.

of evolution have recently been applied in interpreting man's psychology. It appears that Freud is the founder of the modern doctrine which has come to be known as psycho-analysis. These views are quite in accordance with the foregoing and are worth noting. The following extract shows this very lucidly.

A medical correspondent, discussing the attitude of medical men and judges to insanity, says: 'Two new schools exist, the school which regards insanity as a disease in the physical sense, and the school which regards it as the outcome of a hitch in mental evolution. The first group point to the fact that certain states of the mind are now definitely referable to disease. The second group, though not every member admits it, is really under the influence of Freud's doctrine, which has come to be known as psycho-analysis. The essence of this doctrine is that a desire which cannot be satisfied is suppressed or forgotten and passes into what is called the "unconscious mind."

'The patient no longer remembers it, or, indeed, has any consciousness of it. Yet it is said to remain active, and is spoken of as an unresolved "conflict." This conflict is continuously seeking resolution and as continuously being repressed from consciousness. Thus it can only reach consciousness (and so, as it were, make its demands known) under a disguise. What is said to happen is that the conflict attaches itself to all sorts of experiences and emotions and enormously intensifies these. In this way a slight irritation becomes, with the conflict added to it, a violent outburst of rage or passion.'

'The patient, being unaware of his conflict, imagines that the slight cause for annoyance is the real and only cause of his outburst, and so, in order to satisfy his reason, exaggerates the annoyance into a great insult or even into a persecution. The doctor's attitude is that these outbursts, which may result in crime, are really beyond control, since the whole force of the old and repressed conflict is behind them. Had there

been no conflict and no repression long ago there would have been no crime to-day.'¹

It may be well to close these illustrations with a final judgment which clearly asserts that insanity is a product of evolution :—

'Insanity is commonly the final breakdown which shows that many previous generations had broken the laws of nature in their lives.'

'It is the outcome of a civilization in which the true principles of evolution for human beings had not been understood and assisted.'²

Whether or not insanity as a whole is increasing—a fact that is contested—there appears to be a general agreement that mental instability and neurotic disorders tend to be more generally prevalent.

As insanity represents the final and indisputable evidence of mental breakdown, so it will on the evidence presented in this book be proper to regard it as evidence and indication of the mental misery suffered by the mass of mankind, through the unescapable demands of civilization. For every man who is wrecked there are no doubt thousands who have been and are severely strained, but who in some way manage to survive.

The general cause of modern man's troubles is, then, fairly obvious. It is due to the restraints and constraints to which he is subjected, and the short phrase, 'Work without joy,' illuminates the most important. Rousseau, with that true instinct which so often distinguishes men who seek passionately for truth, was looking in the right direction for light. 'Man is born free,' he asserts, 'and everywhere he is in chains.' Then he asks sorrowfully, 'How did this change come about?' And confesses, 'I do not know.' Fortunately the doctrine of evolution has furnished a clear and intelligible answer to this question. And having found the cause, it becomes possible to seek for remedy

¹ A medical correspondent in *South Wales Echo*, 13th December 1921.

² Dr. T. S. Clouston in *Chambers's Encyclopædia*, Article 'Insanity.'

or palliatives. Rousseau's happy savage does perhaps resemble a Man Friday more than the real article, but he is not in great error in comparing the life of primitive man with the life of civilized man.

Many a so-called 'wage slave' may agree that times have little changed since Rousseau asserted, 'We see around us hardly a creature in civil society who does not lament his existence: we even see many deprive themselves of as much of it as they can, and laws human and divine together can hardly put a stop to the disorder.'¹

The problems of civilized life are, then, fairly plain, and so is the cause. Rousseau's remedy perhaps would be to revert to barbarism. But this is impossible. To go back is to commit suicide. To fall out of the race is to seek ruin. Competition between societies makes it plain that retrograde peoples are doomed.

It is clear, then, that there can be no going back; civilization must be accepted and made the best of.

Is there then no remedy for the miseries of civilized life? are there no palliatives? While any radical remedy would probably be worse than the disease and subversive of civilization itself, palliatives and powerful palliatives there undoubtedly are.

Before dealing with these it may be desirable briefly to consider religion, for whose consoling and healing power the largest claims are frequently made.

For a large number, religion has no doubt been the salvation; because religion teaches resignation and submission to a system which it represents as the will of God, or at least as permitted by the Deity for His own good purposes.

But the mass of mankind are by no means wholly susceptible to religious influences, and a large part of the working classes are inclined to the persuasion that changes in the constitution of society would prove a sovereign remedy for all their afflictions. The wish is probably father to the thought, and history shows the

¹ *The Origin of Inequality*, Part I.

fallacy of these beliefs, while it does not minimize the possible dangers that may ensue from the attempt to realize them in practice. And it can hardly be denied that the industrial state is a new thing in the history of mankind, and there are no precedents available for the solution of the problems that now present themselves. Yet, while the validity of the primary economic laws must remain unimpaired, and while prosperity can only continue so long as the stimulus to industry persists, the teachings of the Gospels lend much countenance to the persuasions of socialism and communism, and society is menaced by the encouragement social revolutionaries discover in the idealism of the Gospels—an idealism that is evidently impracticable.

A newer and truer gospel of life based on evolution is plainly one of the most crying needs of the day. But before attempting any adumbration of what must be the nature and principles of this truer philosophy, let consideration be given to the natural palliatives available.

CHAPTER XIX

THE NEED FOR RECREATION

SOCIETIES seek to develop patriotic, law-abiding, industrious, and prosperous citizens, and societies through internal and external compulsions are forced to encourage the development of such virtues and discourage the relative vices. But while society dare not retrogress, it is equally plain that it must not seek to progress too rapidly. Men cannot be turned into machines in a minute. Human nature can be modified only by slow degrees. Inbred in man's constitution are the instincts and impulses developed in the wild free life of hundreds of thousands of years. Let repressions be too strenuous, compulsions too severe, and nature revenges herself. The man ceases to be an asset and becomes a burden.

Society may hide these human wrecks out of sight in prisons, asylums, workhouses, and hospitals, but their fate and their numbers constitute a signal warning.

Progress pre-eminently requires caution; slow and sure is a good motto; more haste, less speed, is frequently wise counsel.

For society as a whole, then, the law is plain; there can be no retrogression, and while development means danger society must with all possible care and caution continue to advance.

But what holds with the society as a whole does not hold in the same way with the individual. While the state may never 'throw back,' may never take a holiday, this is not only possible but strongly to be recommended for the men who compose it. While there is clearly no radical remedy for the evils of civilization, powerful palliatives are possible for the individual

units of the state. Evolution interprets and justifies the practices which experience has shown to be wise and politic. Children out of school hours must play, and adults casually or regularly have recourse to nature, and indulge in recreation, and particularly those forms of recreation conveniently summarized in the word *Sports*.

Recreation—the word itself is illuminating; it implies not rest, not quiescence, but a new type of activity which re-creates vitality, renews energy and the appetite for life. It does this by permitting normality of function to the nervous and muscular systems, by giving release and exercise to those organs and instincts which are inbred in man—organs and instincts which are so dominant in man's make-up that prolonged disuse causes not atrophy, but nervous derangement and constitutional disorder.

For the individual, then, the true medicine for the ills of civilization, for the undue strains and stresses to which he is subjected, is to throw back to the life of his forefathers. To allow his mechanism of muscle and nerves to function in those ways for which they were designed. For all men this physic is occasionally or periodically necessary, while for some men at some time it may be the only remedy for complete breakdown—the only antidote to insanity or death.

But, it will be objected, how can civilized man throw back to the strenuous life of the hunter and warrior? The most valuable members of a society are not infrequently delicate in physique and incapable of reverting to the rigorous requirements of so wild a life. This is manifestly the case, and permits of a distinction being made. Some workers may and do find solace and recreation in hunting, shooting, fishing, boxing, and so on—activities which are a mild image of the past, and afford appropriate opportunities for necessary exercise. Industrial workers may also find solace in a smaller dose of atavism by reversion to agricultural life—to work on a farm or its milder substitute the garden. But all men can seek recreation in 'play,'

in 'games' of some sort or another—and these provide a universal medicine. For what is play? Not only children but puppies and kittens have the same instinct for these activities. The lamb frisks and gambols, the young colt races. They are really, though they are unaware of it, going to school—nature's school—and are practising the things, developing the organs and faculties, which would be necessary for them in the adult life of nature.

But children are not so much practising for the life of civilization as for the life that is thousands of years behind them. Yet the play and games of children are plainly necessary to their development and schooling—the discipline of learning has to accommodate itself to this fact. Children have to be trained and equipped for civilization—much as horses have to be broken to harness and the service of man. The acquisition of knowledge, the discipline of labour can be achieved only by gradual measures. This fact is plainly recognized and indicates why cricket as well as Latin is compulsory in public schools. A curious and striking testimony to the need and value of proper recreation for the young is to be found in the report of the Commissioners of Prisons for the year ended 31st March 1924. They remark that: 'A brighter side to the picture is the success of those forms of social service which provide healthy recreation and mental outlook for young persons of both sexes. Even in present circumstances it is rare for a lad or a girl to be received into prison who has been a member of a good boys' or girls' club, a boy scout or a girl guide, a member of the Church Lads' Brigade, etc. The voluntary workers in these and other similar organizations are rendering a public service of which the value cannot be over-estimated.'

It is not surprising that boys have an innate aversion to studies, but it is rather unusual to hear it commended as wholesome, and thus it is interesting to note that a prominent headmistress complains that 'girls are not naturally protected, as boys are, by a

healthy dislike to work. They suffer from an undisciplined conscience that prompts them to forget fatigue in effort.'¹

And while games of some kind are so vitally necessary for the young, it is not so clearly recognized that they are equally needed for adults suffering from the undue stresses of civilization. The tired worker may be unfitted for strenuous games such as football or hockey, but may recreate and recuperate his energies with cricket, tennis, or golf. It cannot be without significance that the great industrial peoples of the United States and Britain have developed such an enthusiasm for tennis and golf. Grave statesmen and professional men of all kinds may be seen in an earnest rivalry endeavouring to impel a little ball through the air, and coax it into a little hole perhaps a quarter of a mile away in the minimum number of strokes.

On the significance of play and sport in general the following extracts from a leading article in the *Observer*, headed 'Sports and Life—Democracy and its baulked Inheritance,' may repay perusal.

Says the writer: 'There can be no more terrible satire on "progress" than a map of London. . . . Such an imprisonment of youth in particular—such segregation from air, light, and the opportunities of instinctive exercise—the past, with all its accumulation of ignorance and addiction to torture, never inflicted. It is a cynical heirdom of all the ages—a mocking achievement for the foremost files of time—that for the first time in the world's experience children should have nowhere to play. Play is the natural scaffolding of education in man and the higher animals.'

As regards the masses in general, he remarks: 'It is a sound instinct in every way that sends those to watch games who cannot play them. Sport in the eye is the next best thing to sport in the limb,' and he observes that 'there is something profoundly moving

¹ Miss F. R. Gray, President of the Association of Headmistresses, June 1924 meeting, in *Times* of 13th June 1924.

in the way that democracy pursues this lost inheritance.'

He further recognizes the great value sport has in the opportunity it affords for different classes to associate and learn to understand one another, and says that 'the interests of sport are often the only available field of inter-class comradeship. They are a more vital tie than has been realized in preserving that sense of social solidarity upon which there is an increasing strain. We commend reflection upon what the outlook of class-warfare might be if we had a proletariat uninterested in sport and impervious to its ideals—with no distraction from the deadly monotony of repetitive work in prison cities beyond what alcohol and agitation could supply.'

This second-hand sportsmanship is of course only a poor substitute for the real thing, and the great difficulty of providing facilities for general recreation, and the severity of the privation, are well expressed in the following :—

'No country in the world is handicapped in such a contest by having so great a mass of its population pent up so that they can never glory in their limbs or attain to physical excellence. Nowhere have the natural rights of growing life and bodily vigour been so manacled as in our great British cities. Multitudes have no real chance of recreation at all ; other multitudes can reach it only by tiring travel.'¹

The proper preparation for the life of the hunter and warrior was the development of physical strength, activity, and agility, the skill of the hand, the accuracy of the eye. Along with these he needed courage, that quickness and steadiness of his nerves and mental faculties which enabled him to size up a situation and best apply his faculties to its favourable solution. Strength, skill, and courage, the ability to control his faculties in moments of danger and emergency, these represented the development of organs and instincts which best fitted him to survive under the conditions

¹ *Observer*, 1st April 1923.

in which he lived. These were the qualities acted on by natural selection, and they still are the human attributes which men instinctively admire.

Civilized man has inherited the same constitution, and it needs the same schooling, the same exercise, if it is to be kept functionally fit. More particularly does the nervous system need that exercise for which it was originally designed. Sport and games, though they no longer furnish the necessary training for achieving subsistence, are still clearly the proper means for retaining constitutional vigour and mental stability. Man's machinery, though applied to new ends, can retain its efficiency only if exercised in the old ways.

What general conclusion, then, needs to be drawn in regard to the part which physical recreation should play in the life of civilized man? Manifestly, that recreation is as much a duty as work, that man should deliberately seek this alleviation to the extent necessary to maintain his physical and mental fitness and his working efficiency.

Physical sports are clearly the first great palliative of the evils of civilization. They constitute the principal remedy to which he is recommended alike by inclination and a clear sense of duty.

It may be objected that sports and games are not the only form of recreation. This is certainly the case. But evolution and experience show that these activities are the most natural and the most efficient means of recuperation.

Art, music, drama, and the like, have no doubt a great recreative value. But in their influence they resemble spectacular games. The man who is entertained through the ear or the eye as a spectator, or a member of an audience, is passive, his muscles are inert although his nervous system may be energized in other ways. Music, as the expression of emotion, is capable of waking corresponding emotions in the listener. By the seduction of sound or dramatic representation he may play again the part of the lover, the warrior, and so forth, and be cleansed by 'pity and

terror.' But it is a vicarious activity. His emotions may be deeply roused, but his faculties are not thoroughly exercised. The co-ordination of muscle and nerve is absent. It is an activity which lies midway between the true business of life and the phantasm of dreamland. While a high value may be placed on these types of recreation as a means of recuperation, and as sources of pleasure, it is plain that they can be no substitute for those activities in which all the organs and parts of the man are strenuously engaged and the individual thus exercised literally as an individual, in which instinct and muscle each play their part in concert and in co-ordination.

While art, then, as a recreation, can be only supplementary to sport, it has its place and purpose in modern life. It is interesting to observe how even art is now being interpreted with reference to the past life of the race. Mr. Lennox Robinson, a capable dramatic critic, manager and producer for eight years of the Abbey Theatre, Dublin, which is claimed to be the most distinguished repertory theatre in the British Isles, gives the following definition of art in general and of dramatic art in particular :—

' That art, like all arts, is an escape from life, or rather, an escape into life, an escape in the sense of a setting free of the life which is within us, an expression of ourselves. We do not go to the theatre to forget, we go to remember, and nothing pleases us there that does not stir some memory, it may be only a race-memory, of a part of our submerged self. From that stirring springs our joy, the joy all great art brings us.'¹

While recreation is the true panacea for the unnatural labours of civilization, civilization of course imposes further restraints for which relief must be sought in other directions. Of these the principal is the restraint from sex, and while this is a very controversial matter it seems probable that early marriage with birth control indicates the wiser palliative, and one which experience may prove a truer remedy than

¹ Article in the *Observer*, 27th January 1924.

those counsels of perfection—absolute continence and celibacy—usually advocated by the ministers of religion.

Further aid and help may be looked for from that truer understanding of life which it is to be trusted will follow from that clearer knowledge of the nature and situation of man which evolution affords.

CHAPTER XX

MAN—A NATURAL PRODUCTION

IT now becomes possible to attempt to get some clear idea of what man is, by regarding him not as a divine manufacture, but as a natural production, the outcome of a process of incessant competition and selection which has gone on for millions of years.

It will be advisable to regard him in the light of his history.

First consider man as an animal. The general features of his organization are those common to all mammals. He has a body, a head, and four limbs. Deprived of his limbs he can still live ; they are clearly auxiliary aids and adjuncts. Generally devised and adapted for locomotion, in man two limbs have been specialized for that purpose, and the other two have been specialized and adapted to serve very different ends. By virtue of his hands and arms man can use tools and wield weapons. 'The hand supplies all implements,' it has been said, 'and by its correspondence with the brain gives man universal dominion.' No doubt this differentiation had much to do with man's development and success as a ground ape, as a hunting animal.

But it is not necessary to dwell on this point. What of the body? In its upper part are the organs of circulation and respiration, the means whereby an oxygenated fluid is kept circulating throughout the whole body. In the lower part is the digestive apparatus, the organs of elimination, and the organs of reproduction.

The nervous system is the recipient of all sensations

and the originator of all activities, the director and controller of the whole organization.

Leaving this for a moment, consider the animal body as a machine, as composed of organs operated by energy.

Now, food is the sole source of the energy of an animal. It represents his total income. As an engine can consume only a limited amount of fuel, so animal organization can utilize only a limited amount of food. An animal has, therefore, a limited income of energy.

And what of the expenditure? The primary distribution is that between energy spent on preservation and energy spent on reproduction. This has been previously discussed, and the proportioning of this expenditure was held to be determined by natural selection.

The expenditure on reproduction is occasional, periodical, and more readily calculable. The expenditure on preservation is somewhat more complex. It will include all the energy required for the upkeep of the physical machinery, the energy spent in evading enemies, in withstanding rigours of climate, and in securing and digesting food. All these expenditures must be reimbursed, all the energies of the body must be constantly recruited, the vital income cannot be constantly exceeded without constitutional insolvency and physical bankruptcy. Consequently the provision of food must be adequate in quantity and quality to the necessary demands of the animal, and the expenditure of energy must be limited to the amount properly available.

So much for the mechanics of the problem. And now consider an animal as a sentient creature and see how these ends are subserved.

An animal does not say to himself, 'My liabilities are so and so, I need so much proteid, I require so many calories.' What happens is that the animal feels a sense of hunger; it is a sense of distress, a disagreeable state of being. Supervening on this he

becomes conscious of a desire for food ; he is aware of food as something that would relieve his distress and yield considerable satisfaction. His appetite being awakened, his instinct directs him to the ways in which food can be obtained. And when obtained, his instinct prompts him to pass the food into his stomach. The sense of distress thereupon disappears, hunger is appeased, and a feeling of satisfaction and well-being ensues. What applies to the appetite for food applies in a very similar way to the appetite for sex. And other senses direct him to the care for other necessities. Thus sensations more or less painful may originate in all parts of the body through accident or disease ; and these sensations prompt to actions which have the effect of allaying the hurt by remedying the injury. Thus the sense of touch—the one sense which is said to be common to all animals—warns the animal of all injuries to the external envelope, the outer line of defence. Cuts, bruises, burns, produce well-known sensations and prompt to palliative measures. Fear of pain acts in advance of the actual hurt and prompts the creature to escape enemies and evade dangers. Thus fear becomes recognizable as an anticipatory and precautionary emotion.

Generally it may be said that his senses acquaint him with all his needs and all his dangers, and his senses also acquaint him with the ways in which he can satisfy his needs and avoid his dangers.

Many animals have neither ears nor nostrils, several are without eyes ; but higher animals have all these senses and are therefore better fitted to cope with their environment.

But in all these processes the animal is conscious only of his feelings, of certain agreeable or disagreeable states of consciousness ; he is not aware that in all these activities he is tending to the preservation of his existence and the reproduction of his type. Yet it is plain that through these agencies nature works to secure the persistence of the species ; and in the light of natural selection it is possible to understand clearly

the process by which this end is subserved. Fortunately, Spencer has recognized this fact and has given a clear demonstration of the mode in which survival of the fittest must have operated :—

‘ . . . In treating of conduct under its biological aspect we are compelled to consider that inter-action of feelings and functions which is essential to animal life in all its more developed forms.’¹

He goes on to say that : ‘Necessarily throughout the animal world at large, pains are the correlatives of actions injurious to the organism, while pleasures are the correlatives of actions conducing to its welfare’ ; since ‘ it is an inevitable deduction from the hypothesis of Evolution, that races of sentient creatures could have come into existence under no other conditions.’²

The argument is as follows :—

‘ If we substitute for the word Pleasure the equivalent phrase—a feeling which we seek to bring into consciousness and retain there, and if we substitute for the word Pain the equivalent phrase—a feeling which we seek to get out of consciousness and to keep out ; we see at once that, if the states of consciousness which a creature endeavours to maintain are the correlatives of injurious actions, and if the states of consciousness which it endeavours to expel are the correlatives of beneficial actions, it must quickly disappear through persistence in the injurious and avoidance of the beneficial. In other words, those races of beings only can have survived in which, on the average, agreeable or desired feelings went along with activities conducive to the maintenance of life, while disagreeable and habitually avoided feelings went along with activities directly or indirectly destructive of life ; and there must ever have been, other things being equal, the most numerous and long-continued survivals among races in which these adjustments of feelings to actions were the best, tending ever to bring about perfect adjustment.’

¹ *Principles of Ethics*, § 32.

² *Ibid.*, § 53.

He therefore concludes:—

‘ . . . If we contemplate developed creatures as now existing, we see that each individual and species is from day to day kept alive by pursuit of the agreeable and avoidance of the disagreeable.’

‘ Sentient existence can evolve only on condition that pleasure-giving acts are life-sustaining acts.’

With animals, then, it is clear that their activities proceed from one emotional state and terminate in another emotional state. But these feelings are subservient to the law of nature; they are means to an end, that end being the persistence of the species.

How can animal life then be defined, recognizing that states of consciousness are the first and last of experiences in all sentient creatures? These abstractions approach too near to metaphysics to lend themselves to concrete definition. But natural history suggests a more practicable definition in terms of instincts and organs. In the light of this inquiry it may be said that ‘ an animal consists of a set of organs and a complement of instincts all designed to subserve his preservation and the reproduction of his type.’

And what of man? Animals follow their appetites, and their instincts direct them to the means by which their appetites can be gratified. Animal instinct is a true guide, and in following these impulses the animal is pursuing species-preserving ends in the best possible way. Man has the same appetites, the same needs, but his instincts no longer furnish proper guidance; if followed they would lead him not to the consummation of his desires, but to frustration and ruin. The reason is plain. Men must now seek their sustenance by activities profoundly different from those for which they were designed. Desirable things may now be procured only by labour. Man must follow different ways to achieve the old end. But the end is still the same. Food and love are still his ultimate needs. Self-preservation is still the first law of his nature and reproduction the second. And man, like all sentient life, seeks to achieve an agreeable state of

consciousness. Happiness is the ultimate aim and object of all his endeavours.

But man's instincts no longer serve to direct him to this end. The acts that give immediate pleasure are no longer life-sustaining acts, but the reverse. The reason is plain as Spencer phrases it. There has been a cause of derangement 'operating on human beings in a manner unusually decided, persistent and involved. It needs but to contrast the mode of life followed by primitive men wandering in the forests and living on wild food, with the mode of life followed by rustics, artisans, traders and professional men in a civilized community, to see that the constitution, bodily and mental, well adjusted to the one is ill adjusted to the other.'¹

Spencer's view of the importance of these facts may be realized from his reference to his demonstration as 'an ultimate truth underlying all estimation of right and wrong,' though he admits that 'the naked enunciation of it will in many if not in most cause astonishment.'

Man, then, is able to achieve the old ends in new ways and more efficient ways. He is able to subordinate and regulate instinct owing to his development of reason and morality. Though it requires continual readjustments, nature sees to it that happiness shall attend on success in preserving his life and reproducing his kind.

It is then possible to furnish a definition of man regarded as a natural production.

Spencer defined man as follows: 'Man consists of a congeries of faculties qualifying him for surrounding conditions.'² In the light of natural selection this is most inadequate, the kind of definition that inevitably suggests itself is to the following effect: 'Man consists of a set of organs, a complement of instincts and mental faculties all designed to subserve his preservation and the reproduction of his type.' His instru-

¹ *Principles of Ethics*, § 34.

² *Social Statics*, 'The Limits of State Duty.'

ments and faculties, in short, are all designed to secure the persistence of the species or the society to which he belongs.

The nature and constitution of men having been considered, it is now desirable to give a brief glance to the female portion of the community.

How has natural selection acted on women ?

Two principal factors at once show themselves.

Every generation is recruited from the mothers of the previous generation. It is they alone who transmit the physical and emotional characters and the instincts that are in the blood.

In every generation all those women who fail to win mates are eliminated, and, secondly, those who acquiring mates fail to bear children are likewise eliminated.

In every age the spinsters and the barren are thus weeded out. They transmit none of their qualities to future generations. They have no part or lot in the future life of the race.

It seems clear, then, that natural selection would act on those qualities which are favourable to mating and maternity.

What are these qualities ? Consider mating first. With civilization the ownership of property would constitute an attraction. In more ancient times, however, this element being absent, the qualities acted upon would be almost wholly the personal attractions of the female. It is plain that women have standards of value, the most attractive win the best husbands, and they advance themselves or the reverse according to the value of the husband they secure.

What, then, constitutes the desirableness, the relative worth, of the female ? Much is plainly included in the term beauty. Physical beauty is evidenced in the build, the carriage, the clearness of the complexion, the brightness of the eyes. These are the marks of physical health and constitutional fitness.

Apart from physical characters the nature of the disposition counts for a great deal. Since maternal

love is a great advantage to offspring, it might well be expected that evidences of an affectionate disposition would come to be highly regarded by the male.

Thus to physical vigour and vivacity, the signs of constitutional fitness, needs to be added that sweetness, amiability, and unselfishness of nature which conduces to successful maternity.

But qualities of body and mind alone are not necessarily potent to waken the passions of men.

These qualities may be present in a man's sister, but they do not in that case call forth anything but admiration and brotherly love.

Darwin has shown that throughout the animated world cross breeding is vital to successful reproduction. Close breeding, in-breeding, is markedly injurious. Some slight difference of blood, of nature, seems a pre-requisite to the efficient reproduction of all life.

And what obtains in all other forms of life may be expected to obtain with man. If difference of blood advantages reproduction, man's instinct must have been modified in that direction. And it will be expected that some difference of nature, some 'strangeness,' something enigmatic, some qualities slightly incomprehensible, will be necessary to evoke the full strength of sexual passion.

Physical qualities, mental qualities, and some differences of blood, of the essential nature, are then the presumptive attributes which would be expected to constitute the attractions of the female.

Let a brief glance be given to the activities of women. While man has passed from the wild life of the hunter and warrior to the sedentary life of civilization, woman's mode of life has changed comparatively little.

With savage peoples the women are held in little esteem; they are burdened with the drudgeries of the household and the labours of child-rearing. They are accustomed to a sedentary life, inured to confinement, confirmed in the practice of patience. Consequently with civilization the activities and nature of

women have undergone little change. The home is still the theatre of her life ; the preparing of food and the rearing of children still her principal occupations. She still has two main duties : one to win a husband ; the second to rear children. Her nature, her instincts and sentiments seem very clearly to be adapted to these ends.

And recognition of these facts gives an understanding of the increasing importance of the part women play in civilized life.

From one cause or another, women are more inclined to leave their accustomed sphere, and to earn their own living—to compete with men in the work of the world.

It is not difficult to appreciate that females are as well if not better adapted than men for many of the labours of modern life. The confinement in office, factories, schools, and so on under which men chafe, is not in itself irksome to women. Her whole history has fitted woman for a sedentary life, has schooled her to patience. Thus it is that in many ways she is better fitted than man for the labours of civilization, and thus it happens by one of those curious turns of fortune's wheel, that women are reaping perhaps higher benefits from civilization than the men who must be credited with the chief responsibility for making it.

What the race and civilization owe to mother love has become very evident in the course of this inquiry. Mother love has been the fountain and source of family love ; it has been the mainspring of human hope, an inspiration most potent in the making of religions. Mother love has conduced largely to father love, and parental solicitude has proved a primary cause of the progress of civilization itself.

It may be advisable to touch on other developments of sentiment almost peculiar to the female. Long before Pasteur proved that microbes had their lurking places in the dirt, woman had acquired a passion for cleanliness. Her hatred of dirt was perhaps intuitive, since she would no doubt have been unable to give any intelligible account of this instinctive aversion.

Yet this sentiment has manifestly been powerful to good ends. Proverbially, cleanliness ranks next to godliness, and this appraisal was decided by the intuition of women long before it was verified by the discernment of man.

The nature of human beings having been briefly reviewed, it becomes possible to come to closer grips with the question, Is man a natural production or a divine manufacture ?

Consider the spread of man on the earth. Here on this earth are some fifteen hundred millions of human beings, and this enormous population is renewed two or three times every century. And consider man in time ; half a million of years ago his hunting tribes were scattered over the earth. Slowly and painfully under the compulsion of a natural law the race has worked itself up to the swarming busy life of civilization.

On the face of it, does it appear a natural process or a wonderful scheme presided over and directed by spiritual agency ?

Progress is intelligible considered as a natural sequence of events, but no supernatural or mystical hypothesis has yet been framed which can in any way explain the facts.

Striking confirmation of this is afforded if one considers some of the minor sentiments and facts of human life.

How strong is man's sense of the approbation of his fellows. Yet how natural is this sentiment when man's history as a social being is considered. He has always been conscious of the value of the approval of his fellows. He has experienced the advantages of approbation and felt the weight of condemnation. Societies have absolute power over individual members, and have never had any reluctance to exercise it. Undesirable members may be deprived of their property, their liberty, or their lives. On the other hand, good service is rewarded with honours and emoluments. Privilege, place, and power are accorded to the worthy. As these benefits and penalties attach to weighty

things, so in all minor matters approval or disapproval make their influence felt. Thus it is that to be 'sent to Coventry' is regarded as a severe punishment, and solitary confinement is one of the most drastic penalties of the penal system.

All these results are referable to the herding instinct ; they are a natural result of a recognition of the values of association.

Consider another sentiment of which religion has made peculiar use—consider the fear of death. This dread is generally regarded as an infliction under which man alone suffers, and the beast of the field is regarded as fortunate in that he is conscious of no such apprehension. Thus Darwin, after displaying nature 'red in tooth and claw,' says, 'We may console ourselves with the full belief' that in the war of nature 'no fear is felt,' and 'that death is generally prompt.'¹

But it is clear on the briefest consideration that, like pain, fear is profitable to mankind. It is a warning of impending danger, and its office is to awake all the faculties and prompt the employment of all means to escape the injury that threatens. Fear, in general, is fear of pain, and pain is a signal that the constitution is suffering injury in some way. Fear, therefore, is the forerunner of pain, and a timely admonition. To be forewarned is to be forearmed. And though a man may not always escape the catastrophe that threatens, he has a better chance of doing so by being prepared for it when it comes. Fear of death is therefore an advantage to the species in that it conduces to the prolongation of individual lives.

If attention be directed to the reproductive factor, enough has already been said to warrant the belief that the institution of marriage is of natural and not of divine origin. The devising of means which determine the ownership of females and the paternity of offspring has clearly been very desirable, and of the highest benefit to all societies of the human race.

¹ *Origin of Species*, ch. iii.

If the organs of man be considered, the evidence is even more striking.

If man is a divine manufacture, why is it that the entrance to the womb serves also as the outlet by which the waste fluids of the body are discharged? There is absolutely no necessity for this conjugation, a conjugation that mocks the modesty of mankind and degrades the passion of love.

What is so inexplicable on the theory that man was designed and created by supernatural power is clearly intelligible in the light of evolution.

Animals are not conscious of any impropriety in this disposition of their organs, nor would be the remote ancestors of man. Regarding man as a natural production, this physical inheritance is a perfectly simple matter. It is a clear admonition that man is descended not from angels but from animals.

A like problem is suggested by another human function. If man is of divine manufacture, why should the processes of elimination be made so repulsive? What is inexplicable on the supernatural hypothesis is readily to be understood by natural law. Eliminated substances consist of useless and injurious matter. It is obviously necessary that with animals they should evoke a strong instinctive aversion. The vast importance of this sentiment is easily appreciated when it is remembered that a slight contamination with such effete matters, a contamination too slight to be detected by the senses, is capable of giving rise to a host of dangerous diseases. Consequently this repugnance is recognizable as a natural and useful instinct.

One might allude to various other matters of a more trivial nature. Human organs, instincts, and sentiments in general lend themselves to interpretation in the light of evolution. And all these considerations illustrate and confirm the same truth. Man is not a divine manufacture, but a natural production. Though he may aspire to the heavens he is certainly descended from the animals.

Modern man can understand himself by consider-

ing that he is a compound of those faculties and instincts which he has inherited and those which he has subsequently acquired. He is the heir to the past, the outcome of a stupendous process. A truer knowledge of his nature and his situation is plainly his greatest need in the present. Knowledge is power, and with knowledge man may reach the consummation of all his hopes ; with knowledge his dreams may yet come true. 'The proper study of mankind is man,' but hitherto man has remained an enigma, an impenetrable mystery, to himself. The clouds are lifting ; the dawn is breaking ; as Lord Avebury affirmed,¹ man is still only 'on the threshold of civilization,' he has as yet but the vaguest premonition of his future destiny on this earth.

¹ *Prehistoric Times*, ch. xvi.

CHAPTER XXI

THE TEACHING OF EVOLUTION V. THE TEACHING OF RELIGION

It now becomes desirable and necessary to compare and contrast the teachings of evolution with those of religion. This task may not prove uninteresting, while it should be of value in giving a more definite view to the principles elucidated in this essay, by showing them in sharp contrast with those of theology.

In the first place, it may be desirable to emphasize what they have in common. There is, perhaps, little need to say that the belief common to both is a conviction of the supreme value and necessity of righteousness and love. In this respect evolution is at one with all religions; for it is a matter of common knowledge that, while the doctrines of the different great religions are most remarkably varied, in the realm of ethics their teachings are substantially the same, an agreement that must be regarded as a substantial testimony to the truth of ethics. It is curious to note, indeed, that the strongest argument of the faithful is frequently, that they find religious precepts work so remarkably well in practice, that they conclude the ethics must be right. This again furnishes a strong presumption that the doctrines on which they are based are right also.

Exactly the reverse attitude is taken by the sceptical. The doctrines are patently incredible, therefore the practical teachings are regarded with much suspicion; a suspicion that with Nietzsche has notoriously culminated in a root and branch condemnation of Christian morality, and the adumbration of a new system of ethics.

In the midst of all these contending factions, evolution in the light of natural selection puts forward an olive branch, offers a solution of their various problems, and an explanation of their numerous difficulties.

Before discussing religion more closely, it may be desirable to define more exactly the charges which evolution makes against Christianity.

It need hardly be said that it condemns the old doctrine and offers in its stead one that is claimed to be newer and truer.

But the more practical impeachment is this: Religion teaches righteousness and love ; that is all to the good ; this is gratefully acknowledged ; for this the evolutionist is unfeignedly thankful ; but—religion does not teach patriotism as the first of all the virtues ; it does not teach the fundamental necessity of economic laws ; it does not recognize that patriotism, diligence, and self-denial are the primary virtues, from which alone the sentiments of morality and brotherly love can spring. As a minor charge it will be asserted that there is no true place in Christian philosophy for the recognition of the imperative need for recreation, for physical sports.

Thus evolution, while accepting and endorsing Christian ethics, objects to its doctrines, to its lack of recognition of patriotism, of economics, and of the need for recreation.

To support the above charges it will be necessary to discuss very briefly the essential teachings of religion, paying chief regard to the faith of Christianity.

What is the Bible? 'It is not a book, but the literature of a nation.' It tells a wonderful story 'how a slave people from Egypt—an Egypt of a high civilization but idolatrous—took possession of a tiny strip of land, unique in its physical features even as they were unique, and thus flung themselves across the pathway of the nations, suffered and fought, sinned and rose again, and out of the travail of their sufferings brought forth the One Man who through his servants, called apostles (all Jews), challenged the might of

the idolatrous systems of the great Roman Empire and won.'¹

Indeed Christianity has more than one tremendous victory to its credit, for, as Gibbon says, 'The progress of Christianity has been marked by two glorious and decisive victories, over the learned and luxurious citizens of the Roman empire; and over the warlike barbarians of Scythia and Germany, who subverted the empire, and embraced the religion, of the Romans.'²

A faith that has won such great conquests must needs be respected; and its adherents may well claim that, if a world outlook is taken, 'we are dealing with the greatest fact in human history, the development of the highest moral religion in the life of man.'³

It also is proper to recognize with becoming humility that Europeans are only converts to and not the authors of this system, that 'Europe produced no great world religion; the God of Abraham is, to-day, the God of the Christian, of the Jew, and of the Moslem.'

It is interesting to recognize that Christianity and Mahomedanism are offshoots from the same great stock, branches from the tree of Judaism. And the old faith of the Jews still persists along with its more lusty offspring.

It is curious to observe that Buddhism, which presents so many resemblances to Christianity, is likewise a branch from an older stock, and bears much the same relation to Brahmanism as Christianity does to Judaism.

So do the great religions of the world present resemblances and show relations which cannot be without significance and meaning.

It needs to be considered more particularly in what lay the singular merits of Christianity and Buddhism, for these religions certainly marked the beginning of a new era in the life of mankind. There can be little doubt that the inspiration of both these religions arose from a profound belief in the power and efficacy of

¹ Rev. Dr. Knapp of Oxford University in a letter to the *Daily Mail*.

² *Decline and Fall*, ch. xxxvii.

³ Rev. Dr. Knapp.

love. Love was the secret of life, the sovereign remedy for all ills, the one key to happiness in this world and the next. If men would only love one another they would be sinless, and then all other things would be added unto them.

This belief, it may be remarked, had no necessary connection with the doctrine of reincarnation or the obsession that the end of the world was near at hand, or any other of the cosmic theories with which they were originally associated.

It is not at all difficult to appreciate the grounds for the intensity of this belief. In one fell swoop, it was held, brotherly love would abolish all wrong-doing and all war. But there is one great impediment, one great obstacle—differences of worldly wealth; distinctions of rank and class were fatal to the spread of love between man and man. Hence Mammon was denounced, poverty was preached as a virtue.

It may be desirable to expand the above propositions.

It is obvious that if men love one another, then they cannot injure one another; they cannot seek their own gain when it entails another's deprivation. They cannot pursue their own happiness at the expense of another's misery. Since all social offences necessarily have the effect of injuring or hurting another, love between man and man must have the effect of preventing the commission of such offences. And not only will love abolish wrong-doing, it must inevitably promote well-doing. For love, by virtue of its nature, does not seek to hurt but to help, and the practical advantage of this sentiment is that it conduces to many and various co-operations for the mutual benefit of all participants. Under its influence men will combine for mutual instruction or recreation. Through its influence they mutually insure each other against sickness or distress.

A quotation from a Buddhist work has been given in a previous chapter indicating the intensity of the belief in love as a means to right-doing. But a further illustration may not be out of place here, indicating

how extravagantly the Buddhist sought to extend the application of this sentiment.

Charity or benevolence is said to be the characteristic virtue of Buddhism—‘ a charity boundless in its self-abnegation, and extending to every sentient being. The benevolent actions done by the Buddha himself, in the course of his many millions of migrations, were favourite themes with his followers. On one occasion, seeing a tigress starved and unable to feed her cubs, he hesitated not to make his body an oblation to charity, and allowed them to devour him. Benevolence to animals, with that tendency to exaggerate a right principle so characteristic of the East, is carried among the Buddhist monks to the length of avoiding the destruction of fleas and the most noxious vermin, which they remove from their persons with all tenderness.’¹

Thus, in order that the dominion of this sentiment might not be impaired, Buddha gives his body to the starving tigress, and monks remove noxious vermin with the utmost tenderness—instances grotesque enough, though obviously sincere.

The teachings of the Gospels with regard to love are too familiar to need repetition here. The assertion that God is love, and the injunction to love even one’s enemies, indicate that this sentiment is considered the primary attribute of the Creator, and show that its application to men is regarded as unbounded.

With regard to the condemnation of wealth, this fact is not likely to be contested. The injunction to sell all that thou hast and give to the poor, is familiar ; so are the constant denunciations of Mammon ; and the parallel between the prospects of the rich man getting to heaven and the camel passing through the eye of a needle.

It is probable that the early Christians most literally interpreted and practised the teachings of their master, and it is plain that they accepted the teaching that wealth was an evil and an obstacle to salvation. Says

¹ Article ‘Buddhism’ in *Chambers’s Encyclopædia*.

Gibbon : ' The community of goods . . . was adopted for a short time in the primitive church. The fervour of the first proselytes prompted them to sell those worldly possessions which they despised, to lay the price of them at the feet of the apostles, and to content themselves with receiving an equal share out of the general distribution.' ¹

The same contempt for wealth is signally illustrated by the monks, a set of men common both to Christianity and Buddhism. These devout enthusiasts renounced not only wealth but all worldly and bodily gratifications.

The monks vowed themselves to poverty and celibacy, and showed, by fasting and continence, the power of man to inhibit his strongest desires. To these perhaps should be added ' vigils,' since the denial of sleep is also the repression of one of the strongest constitutional needs.

' Pleasure and guilt,' says Gibbon, were ' synonymous terms in the language of the monks ' ; ' they seriously renounced the business and the pleasures of the age, abjured the use of wine, of flesh, and of marriage ; chastised their body, mortified their affections and embraced a life of misery as the price of eternal happiness.' ²

These examples are perhaps sufficient to indicate that Christianity condemned the pursuit of wealth, despised riches, and regarded poverty as a necessary part of piety—an attitude which is naturally consistent with the belief that distinctions of wealth are an impediment to the spread of brotherly love.

As for the abhorrence and condemnation of war, Christianity to-day has compromised with common-sense and the teachings of history, so that the proper teachings of the Founder of the Faith are obscured and contorted to such a degree that any assertion of what those teachings were is tolerably certain to be contradicted. But the truth is plain enough to an unpreju-

¹ *Decline and Fall*, vol. I. ch. xv. p. 291.

² *Ibid.*, vol. II. ch. xxxvii.

diced eye. For unbiassed testimony definite evidence is afforded by the early church.

Thus the overthrow of the Roman Empire affords perhaps the strongest evidence not only of the influence of Christianity, but also of the signal folly of the persuasion that war even in self-defence is wrong, is sinful. Though the influence of Christianity was subsidiary, it certainly contributed to the downfall of western civilization.

Finlay gives what seems a very fair account of their attitude of mind in the following words :—

‘The Roman aristocracy and populace, with all those who identified themselves with Roman prejudices, adopted the opinion that Christianity was one of the causes of the decline of the Roman Empire. Rome was a military state, Christianity was a religion of peace. The opposition of their principles was felt by the Christians themselves, who seem to have considered that the success of Christianity implied the fall of the empire ; and as the duration of the empire and the existence of civilized society appeared inseparable, they inferred that the end of the world was near at hand. Nor is this surprising. The invasion of the barbarians threatened society with ruin ; no political regeneracy seemed practicable by means of any internal reforms ; the empire of Christ was surely approaching, and that empire was not of this world.’¹

Gibbon expresses the same opinion, and asserts that ‘the decline of the Roman Empire was hastened by the conversion of Constantine,’ and remarks that : ‘As the happiness of a *future* life is the great object of religion, we may hear without surprise or scandal that the introduction, or at least the abuse, of Christianity had some influence on the decline and fall of the Roman Empire. The clergy successfully preached the doctrines of patience and pusillanimity—the active virtues of society were discouraged ; and the last remains of military spirit were buried in the cloister : and so the western world was sunk in night.’²

¹ Finlay, *History of Greece*, ch. ii. ² *Decline and Fall*, end of vol. II. p. 482.

The abhorrence felt by the early Christians to the trade of the soldier is well shown to-day by the Society of Friends, who perhaps more than any other sect implicitly follow the literal teachings of Christ. These Quakers 'regard the profession of arms and fighting not only as diametrically opposed to the general spirit of Christ, whose advent was sung by angels in these words, "Glory to God in the Highest, and on earth peace and goodwill towards men," but as positively forbidden by such precepts as, "Love your enemies, bless them that curse you, do good to them that hate you, and pray for them which despitefully use you and persecute you"; also "Resist not evil; but whosoever shall smite thee on thy right cheek turn to him the other also."'¹

There can be no doubt the Friends are right. The Founder condemned war as he condemned wealth; both were obstacles to the spread of love between man and man, both were occasions to sin, and love he regarded as the great secret of human happiness, the means of reconciliation between man and his maker.

Little allusion need be made to recreation. If recreation be regarded as the temporary removal of all constraints and restraints and the free functioning of the muscular and nervous machinery in those ways for which it was originally designed, then there is obviously no place in Christian philosophy for such a phenomenon. The general attitude of the faithful is summed up in the adage, 'What is not a duty is a sin.' In the Gospels life was too solemn, too earnest to admit of trifling with such frivolous matters as play or sport.

On the view of evolution, however, the development of industrial life has rendered the problem of recreation a most urgent and important one, and its due provision increasingly necessary for the maintenance of physical and mental health.

The charges against the fate of Christendom have now been briefly put forward. It is submitted that

¹ Article 'Friends' in *Chambers's Encyclopædia*.

Christian teachings of the nature and origin of man stand condemned, while in condemning patriotism and economic distinctions in order to glorify the sentiment of love, religion fell into very serious error.

If the analysis given in this essay has any validity, it is idle to blink the fact of war, and it is equally folly to refuse to recognize those distinctions of wealth which society seeks always to ensure shall be based on distinctions of worth.

But once the obligations of patriotism are accepted, once a man loyally accepts his place in the economic fabric of society, then there is indeed free and full scope for the development of brotherly love. Here is an ordered society with every degree of worth and rank, but here on the one hand may be admiration and emulation, and on the other compassion and help. Once accept those facts which derive inevitably from human nature and the facts of human progress, and no longer need there be any impediment to the development of love between man and man, of a mutual willingness to aid, help, and promote one another's happiness.

CHAPTER XXII

FORTUITOUS FACTORS IN PROGRESS

AN attempt has now been made to indicate the essential institutions of society and the qualities in human nature which have developed by the action of natural laws in the progress of civilization.

It is on these institutions and sentiments of mankind that natural selection has continuously acted. These are the qualities which, as Darwin says, would be accumulated, would be added up wherever and whenever they occurred, would be naturally increased by the operation of survival of the fittest.

These are the more permanent factors whose importance is clearly to be seen, but there are other factors whose appearance has been casual and unexpected, and it would not be possible to conclude a review of human progress without noticing the remarkable illustrations it affords of accidental discoveries, even of erroneous views, which have forwarded the evolution of the human race.

These fortuitous factors are quite consistent with the theory of natural selection, though on any other hypothesis they seem utterly inexplicable. Darwin asserted that natural selection acted wherever and whenever opportunity offered ; species might remain unchanged for vast periods and then undergo a metamorphosis in a comparatively short time. Natural selection ' trusts to the chapter of accidents for variation.' Though Darwin drew these conclusions from an examination of its operation in the vegetable and animal kingdoms, the same facts seem to be strikingly exemplified in the history of man. On the assumption that natural selection is the great law for *all* life, this

would not be surprising. Illustrations of its operation in one realm of life might then prove valuable in interpreting the phenomena in other realms, and the debt might later be repaid.

Let, then, a brief consideration be given to the chapter of accidents that have aided man on the road to progress.

The stone age was brought to an end by the discovery of metals, and the first useful metal employed must have been copper. Presuming that civilization had its rise in Egypt, how was copper first discovered by the Egyptians? A plausible suggestion is that it was accidentally prepared from the malachite used as a face paint by the women.¹

But a further and more striking instance of the influence of fortuitous circumstances in the development of the human race is exemplified by the great successes of early Christianity. What was a principal cause which inspired the early Christians with such inflexible zeal? What but a persuasion, a false belief, yet one which was largely derived from the Founder of their faith. This was the conviction that the end of the world was near at hand. The strength of this belief can be estimated by the power it still has to sway the passions of men. For such beliefs are even to-day periodically promulgated. Gibbon remarks that the early Christians 'universally believed that the end of the world and the kingdom of heaven were at hand. The near approach of this wonderful event had been predicted by the apostles; the tradition of it was preserved by their earliest disciples, and those who understood in their literal sense the discourses of Christ himself were obliged to expect the second and glorious coming of the Son of Man in the clouds, before that generation was totally extinguished which had beheld his humble condition on earth, . . . this error was productive of the most salutary effects on the faith and practice of Christians, who lived in the awful expectation of that

¹ Scientific Correspondent of the *Times*, 22nd May 1923.

moment when the globe itself, and all the various race of mankind, should tremble at the appearance of their divine judge.'¹

The inception and spread of this great religion must have been greatly assisted by the persuasion of this error. Yet, as Christianity has powerfully contributed to the development of civilization, civilization is itself greatly indebted to this fallacy. And this affords a striking illustration of the *modus operandi* of natural selection which utilizes accidents or error, or whatever proves in practice to be an advantage to the race.

A further example of the dependence of progress on fortuitous circumstances is shown by the industrial revolution brought about not by the foresight and wisdom of man, but by the unforeseen effects which followed when in the smelting of iron recourse had to be had not to charcoal, but to coal or coke. Mr. H. G. Wells gives the following account:—

'The mechanical revolution itself began, we may say, with the exhaustion of the wood supply for the ironworks of England. This led to the use of coal, the coal mine led to the simple pumping engine; the development of the pumping engine by Watts . . . led on to the locomotive and the steamship.'²

He explains that: 'Before the middle of the eighteenth century iron was reduced from its ores by means of wood charcoal, was handled in small pieces, and hammered and wrought into shape . . . the largest masses of iron that could be dealt with under these conditions amounted at most (in the sixteenth century) to two or three tons. The blast furnace arose in the eighteenth century, and developed with the use of *coke*. Not before the eighteenth century do we find rolled sheet iron and rolled rods and bars . . . the steam engine, even the primitive pumping engine, could not develop before sheet iron was available.'³

The recourse to coke thus led not only to the production of iron on a vast scale, but also to the develop-

¹ *Decline and Fall*, vol. I. ch. xv.

² *Outline of History*, ch. xxxix.

³ *Ibid.*

ment of steam power, and so to the development of rapid locomotion, to the production of machinery of all kinds, and so to manufacturing on its present huge scale. Mr. Wells remarks that : ' Here altogether we have such a change in human life as to constitute a fresh phase of history. In a little more than a century this mechanical revolution has been brought about. In that time man made a stride in the material conditions of his life, vaster than he had done during the whole long interval between the Palæolithic stage and the age of cultivation.'¹

It needs to be recognized that this revolution could not have materialized until property was secure. Not until then would men have devoted their energies and sunk their capital in enterprises such as railways, from which they could expect no return for a considerable term of years. But given this antecedent condition, and it appears that the industrial revolution was introduced not by design, but by accident. And so another instance is furnished of progress being dependent on what for want of a better term must be called accident.

Further conspicuous illustrations are furnished by science.

Modern chemistry is based largely on the older alchemy or the efforts made to discover the ' philosophers' stone ' and the ' elixir of life,' or the secrets respectively of transmuting the baser metals into gold, and the means of indefinitely prolonging human life.

Astronomy in the same way is largely indebted to astrology or the study of the stars, because of their supposed influence on human and terrestrial affairs. Kepler, Copernicus, and Galileo were themselves under this persuasion, though their discoveries sapped its foundations.

Much the same story is told by medical science. The defeat of smallpox is attributed to Jenner being struck with the remark of a young country woman who, referring to smallpox, said : ' I cannot take that disease

¹ *Outline of History*, ch. xxxix.

for I have had cow-pox.' It remained for Pasteur to discover that bacteria, the world of the infinitely small forms of life, were responsible for many of the most serious diseases of man. And with the detection of the cause came the discovery of the remedy. Medical science and surgery have been revolutionized by these discoveries; mankind has known no such deliverer. And how did he win this knowledge? not by design, but essentially by sheer accident. He was absorbed in the study of crystals, and observed that in one of its crystalline forms tartaric acid was capable of fermentation, and his thoughts were in consequence directed to this process. He was then led to study alcoholic fermentation, and to discover that this was a 'phenomenon of life.' He disclosed 'the activities of a vast underworld of life'; discovered the causes of decay and putrefaction; detected the cause and means of prevention of anthrax, of hydrophobia, of the dreadful child-bed fevers which followed child-birth.¹ Lister applied his discovery in inventing antiseptic surgery. And the tale of the triumphs unforeseen and unexpected that followed from an accidental discovery is not yet ended.

What a wonderful event this is to follow from a study of the fermentation of beer. Another world of life is unfolded, another great realm in which living things have their day and reproduce their kind. It is life again and life processes that are found to be the accountable cause for a vast series of hitherto inexplicable phenomena. Putrefaction and decay, fermentation, many fevers and diseases, all are essentially due to the multiplication of these infinitely small forms of life. Though invisible and seemingly so insignificant, they are found to be responsible for many of the great troubles that afflict mankind. This realm of life has been so recently disclosed that science as yet is groping in the dark, its interpretation in the light of evolution has yet to be made. For the present

¹ Medical Correspondent in the *Times*, Centenary Tribute, 27th December 1922.

it may be sufficient to note that this great chapter in human knowledge is another chapter in the great volume of biology, is another page in the book of *life*.

The modern philosophy of evolution is itself largely the result of chance. It derives not from those earnest inquirers who sought deliberately for an understanding of man and the universe through the channels of religion and philosophy, but sprang fortuitously from an inquiry made by an eminent naturalist. It was Darwin who converted the modern world to a belief in evolution, and the problem that obsessed Darwin was not a philosophic but a naturalist's problem—the origin of species. And while Darwin established the fact, he also discovered the instrument. It is on the secure foundations he laid that the modern doctrine of evolution is built.

CHAPTER XXIII

SUMMARY

EVOLUTION and progress, so far as the foregoing analysis has any validity, is seen to have two aspects ; on the side of reproduction it is represented by the continual growth of parental love, while on the side of preservation it is seen to be fundamentally an economic process—a story of the continuous conquest of nature, governed always by the arbitrament of force in the contests between nations. There is nothing particularly original in such an economic interpretation of history. Karl Marx, for instance, contended with a large measure of truth that all the phenomena of history were the result of economic motives, and he attempted to explain the growth of movements and institutions entirely in economic terms. But evolution shows clearly the fallacy of the ideal he espoused, the communist maxim, ‘From each according to his powers, to each according to his wants.’ If work were indeed a blessing, this maxim might well have some warrant. But the labours by which men are constrained to earn their living in civilized lands are the reverse of agreeable. The old theology was nearer the truth in asserting that work was a curse imposed on man as the penalty for disobedience. ‘In the sweat of thy face shalt thou eat bread.’ It seems hardly needful to recall that in labour disputes the workers never clamour for more work or less pay, but precisely the reverse. In the light of evolution it is plain enough why an organized being adapted for war and the chase should be remarkably unfitted for the sedentary life and the monotonous labours of

civilization. The communist maxim is plainly an impracticable ideal ; in its stead must be asserted the old truth that men must be rewarded according to their deserts, according to the value of their labour, determined by the natural law of supply and demand. Clearly national wealth can increase only by preserving the natural incentive to industry, that income shall be determined by output, that payment shall be proportioned to service.

The whole process may now be briefly summarized. As all evolution represents a struggle between different species, different types of organized beings to win certain places in the economy of nature, so the progress of man shows a continuous struggle between combinations of men for the inheritance of the earth. Once association proved to be an advantage, individuals leading solitary lives would be eliminated, and the struggle henceforth would be between societies of men. The society and not the man became, and has ever since remained, the essential unit on which natural selection has acted. This fact governs all others. With hunters, owing to the nature of the life, association was limited. Hence survival of the fittest would here favour the most united society with the most skilful hunters and most efficient warriors. The domestication of animals, however, wherever and whenever beginning, would confer a potential advantage, since the limitation in numbers was thus removed. And wherever and whenever a pastoral people expanded so that it exceeded the size of a hunting society, it would be naturally advantaged and tend to be naturally selected. Agricultural societies, wherever and whenever developing, would be both advantaged and handicapped in the contest with pastoral peoples. In aggregation of numbers the herdsman could on occasion equal them. And whereas increased command over natural resources, expanding wealth, conferred a military benefit on the farmers, their settled situation invited attack, their mode of life tended to unfit them for war, while defeat meant

utter ruin. The contests between pastoral and civilized societies thus continued through thousands of years, and only in comparatively recent times has the issue been finally decided in favour of civilization.

In the contests of civilized peoples with nomads, as in their contests with one another, it has been contended that wealth has yielded the decisive advantage, since wealth determined the size and strength of the military forces which the society could put in the field. Consequently attention has subsequently been directed to the development of wealth. Obviously a people must remain in uninterrupted possession of their land for some considerable time before there could be any material development. While territories are liable to invasion, are continually changing hands, there can be no possibility of definite improvement. In this respect the accident of strong natural boundaries has exercised a considerable influence. And so mountains, great rivers, oceans, deserts have largely decided the territories to be occupied by different peoples, and determined the size of the social unit.

In this respect it is not difficult to see why Egypt was peculiarly fitted for the development of civilization, since in addition to a considerable natural fertility, it was also favoured with strong natural boundaries.

But as hunting peoples contended for the best hunting grounds, and pastoral peoples for the best grazing grounds, so settled peoples fought for the most fertile and favoured lands.

Assuming that a nation has achieved some measure of national security, then the continuance and progress of civilized society plainly depends on two great institutions, the institution of marriage and the institution of property.

Those who assert that the only durable source of faction is property are rather apt to overlook the former, or perhaps to regard women as merely a form of property.

Marriage, it was noted, determines the ownership of the females and the paternity of children, while the

laws of property determine the ownership of every form of wealth.

It is scarcely necessary to contend that the rules by which these rights are governed are determined by the interests of society, and necessarily so, since in a world of contending peoples the nation must seek primarily the well-being of the society considered as a unit.

And both these necessary institutions depend on the degree of security which can be provided for person and property. They depend, therefore, on the efficacy of the law and of religion in preventing theft and adultery, in repressing robbery and rape.

The security of property and person are thus vital to the very continuance of society, since when violations are numerous labour is deprived of its proper stimulus, and the whole community must tend to poverty and decay.

But where property and person are tolerably secure, the elemental appetites, the primary needs for food and love, will compel the necessary industry to secure their satisfaction, and the persistence of society is then ensured.

And while the continuance of a community depends on the security afforded by civil government and religion, progress and prosperity pre-eminently require these things and more also.

As the increase of wealth was seen to be due primarily to 'abstinence,' so the motives prompting to betterment were shown to be the desire of the individual not only to improve his own condition, but the condition of his children also. Personal ambition and parental love were designated as the mainspring of progress, as the essential motives that conduced to the increase of personal and national prosperity.

And the increase of national wealth leads to the increase of population, and so directly and indirectly to an increase in national strength and national security. And thus the cycle of benefit is complete.

Though the above chain of argument is complete

in itself, one proviso has to be made, one practical difficulty needs special recognition.

The correlative of progress is a continually declining death-rate, and as the prolific powers of mankind remain at their old level, the power of reproduction becomes increasingly redundant and requires an increasing restraint ; otherwise the frugality of the father may be nullified by the fruitfulness of the mother. If love be an advantage, lust is clearly a disadvantage. To be a child of a large family is to have a small share of the care and the provision which parents can make for children. To be a child of a small family, on the other hand, confers equivalent advantages. It is clear that parental prudence, limitation of families, is a great advantage to the offspring. And what applies to the family applies with equal force to society.

If population increases faster than prosperity, if the expansion of numbers exceeds the expansion of production, the people tend to indigence and misery. It is clear that population must follow prosperity, that it must not press too hardly on increasing wealth. If the individual prosperity is to advance, production must expand at a greater rate than population. The prolific powers, the parental passions may always be trusted to ensure that the national estate shall not suffer from an inadequate supply of labour. The great problem for individuals and the nation is clearly to restrain their prolific powers within due bounds. Only so can civilization truly advance, and poverty and misery be gradually minimized.

With individuals, then, and with nations, natural selection will tend to advantage those who can restrain lust and increase love.

Having recognized this qualification, the argument may be summarized. It may be confidently asserted that all things that strengthen the two motives (personal ambition and parental love), everything that conduces to the two means (industry and abstinence), everything that fortifies the two conditions (national and personal security)—everything that advances these motives,

these means, or these conditions, promotes the security and the prosperity of the society, contributes to its success in the struggle for existence, makes for its fitness to survive, and will, therefore, be acted on and accumulated by natural selection.

The problem was then looked at from an individual standpoint. It was scarcely necessary to point out that poverty was a disadvantage and wealth an advantage to the individual in his struggle to exist and reproduce his kind in the same way as wealth or the lack of it profited or handicapped the society in its struggle with other societies. The profit of wealth is manifest and all men seek it. Reasons were given which indicated why wealth should be sought honestly.

Righteousness, it was found, not merely yielded security for what was gained, but what was more important, led naturally to the development of 'new traits,' of new qualities, and the qualities that are peculiarly profitable in civilized societies. Among these mention was made of the value of sustained mental work, of the acquisition and application of knowledge.

Intelligence controlled by clear ideas of right and wrong, and obtained without impairing the physical vigour; knowledge, character, and health—this trinity of virtues make the most formidable combination, and are the best warrant of the worth of the individual and of his fitness to survive.

As regards the other ethical quality of love, it was contended that, provided patriotism was recognized, provided distinctions of wealth were accepted, then there remained no impediment to the development of love between man and man. Then good-will would lead to every kind of profitable association, and extract the maximum benefit from every form of co-operation. The development of this sentiment would then be practicable and clearly advantageous to every individual who submitted to its dominion. Supervening on righteousness it would tend to the perfecting of the individual as a member of a civilized society.

Though seemingly more trivial, the need for recreation must not be overlooked. Excessive industry, too severe denial, too great ambitions defeat their own ends by undermining the health and deranging the constitution. Man's labours, particularly the labours of industrial life and the labours of mental work, are not natural to man. Human nature must not be too severely strained, or it will break down. Nor, on the other hand, can undue indulgence be accorded to man's native distaste for these unnatural labours. For life is competitive, and success falls to those who by one means or another most successfully adapt themselves to the new conditions. Still, recreation is plainly indicated as a duty of the same rank as industry and thrift, as righteousness and love.

To make the teachings of evolution more clear, they were then compared with the teachings of Christianity. In the first place, it was decided that man was a natural production and not a divine manufacture. Apart from this, the ethical teachings of Christianity were heartily accepted, with the important qualification that to the precepts of Christianity must be added the duty of patriotism and the necessity of recognizing and accepting those distinctions of wealth which are based on distinctions of worth. Once these were accepted, it was submitted there was no further obstacle to that great ideal of the Gospels, the development of love between man and man.

CHAPTER XXIV

CONCLUSION

THE primary contention of this book has been that the evolution of man could be explained as a natural process, that civilized man could be explained as the descendant of savage man by the operation of a natural selection of the fittest. In other words, the writer's task has been to take the inspiration of Spencer and interpret it by the inspiration of Darwin.

An attempt has been made to examine the elemental factors on which natural selection must have acted, and although the interpretation is obviously, and confessedly, a very imperfect one, it is trusted that it may be of some service in justifying the primary proposition.

At the outset the great engine of natural selection had to be closely examined. It was ultimately decided that the struggle for existence did not derive from the competition between individuals for inadequate food supplies, but from the competition between species and species: the contest being for definite places in the economy of nature and dependent on the relative success in contending against enemies and the elements, and in exploiting the food supplies available. The species and not the individual became the unit on which natural selection acted, the struggle being essentially between rival types, in which the fittest for a particular environment was 'selected,' and the less fit eliminated.

When regard was had to the human race it was readily seen that the unit was no longer the species, but the society, and it was decided that progress

eventuated from the competition between combinations of men.

With this revised conception of natural selection an attempt was made to interpret the outstanding features in the history of the human race.

From this standpoint it was submitted that human nature and the institutions of civilized societies became readily intelligible.

As regards human nature, such qualities as the fighting instinct, the gregarious instinct, the love of sport, the undue strength of the instinct for sex, were readily understandable in the light of man's ancestry and heritage. When the institutions of civilized society were considered, the operation of natural selection showed clearly the fundamental necessity for the institutions of property and of marriage. These were seen to be essential factors in the progress of mankind. The inevitableness of the changes to agricultural and industrial life became apparent, and the immense difficulty in reconciling human nature to these changes in the mode of life was seen with equal clearness. Even the phenomenon of insanity was shown to have some relation to the strains to which human nature was subjected in the process of adaptation.

Fortunately an understanding of the process furnished valuable guidance and counsel for the conduct of life. Acceptance and voluntary conformity were plainly the course of wisdom. Physical sports and recreation were indicated as the most valuable antidote and most necessary medicine for the strains of civilized life. Righteousness, love, and recreation were designated as the trinity of virtues most likely to lead to a natural selection of the fittest, to worldly welfare and true happiness.

As regards the general philosophy of evolution, supposing that the analysis given in these pages has any validity, what are the general conclusions that follow?

In the first place, there is established one great law

for the whole of life—a law that in the realm of life can be compared only to the law of gravitation in its interpretation of the universe. The principle of natural selection, a simple principle postulating only unceasing competition, with continual elimination and selection, is seen to be the great law governing all the processes of plant life, animal life, and human life. It offers an explanation of all the different types of living things that exist, or have existed, upon the earth for the hundred million years or so during which this earth has been a theatre of vital phenomena.

It shows their constitution, their relations, and their mode of development. It explains the tremendous process of evolution.

It is one great law that solves a multitude of problems. More particularly does it explain man to himself. It shows him what he is, and why he is what he is. It shows that his organs, his instincts, his moral sentiments and mental faculties are designed to subserve his preservation and the reproduction of his type. It drives to the persuasion that strength and courage, industry and thrift, self-denial and self-sacrifice, love and righteousness, are alike advantages in the struggle for existence.

Evolution in the light of natural selection, then, offers a clear and simple explanation of human nature and human societies. It affords illumination and gives guidance in all the problems of life.

It approaches more closely to the ideal of the philosopher than any previous theory—the desire to see life steadily and to see it whole.

It brings a multitude of isolated facts into relation with one another, and furnishes one simple explanation of them all. The fangs of the tiger, and the venom of the snake ; the beauty of flowers, and the beauty of maidens ; the honour of men, and the love of women, are all seen to have one explanation—they all represent advantages in the struggle for existence ; in each case the development can be explained as the result of natural selection.

Things horrible and hateful, things beautiful and sublime, practically all the phenomena of life are explicable in this view, practically all may be put to the account or to the credit of natural selection.

And what of its practical value to the human race? Of its ultimate value time alone can tell. It can only be postulated that its value must be proportioned to its truth. Christianity has hitherto been the principal guiding force of Western civilization, and its devotees have always demanded, and rightly demanded, of their critics—What can you give us that is better in exchange?

If evolution be true, if the new gospel to be founded on evolution is to supersede Christianity, it must have its warrant in the recognition that it is truer and more worthy of the allegiance of the human race.

It must prove itself not only in theory, but also in the practice of those who profess the new doctrine.

The task may not be so overwhelming as it appears. After all, love and righteousness are the essence of all religions. Metaphysical doctrines, since they all vary, cannot be vital. And let it be remembered, the doctrine of heaven and hell finds little countenance from the old Bible. 'The doctrine of the immortality of the soul,' says Gibbon, 'is omitted in the law of Moses; it is darkly insinuated by the prophets,' and it appears to have been generally accepted by the Jewish people only after a prolonged controversy between the celebrated sects of the Pharisees and Sadducees. Is it then vital to Christianity?

Divested of its adventitious trappings, Christianity seems little more than a persuasion to righteousness and love.

A truer philosophy of life is plainly one of the great needs of the day.

Of the urgency of the need and the impotence of the present creed there can be little doubt. A prince of the Church recently remarked: 'It is a strange—indeed solemnizing—thought, that we have come to a time when sober and responsible men are asking not

so much, "How can the progress of civilization be maintained?" as "How can its collapse be averted?"¹

Knowledge advances and truth must keep pace. What hopes are there for a new gospel to be derived from evolution? It seems manifest that here is the only road of hope. Evolution takes man out of the darkness into the light, it puts a true compass into his hand, gives him his bearings, and points out his course.

But evolution will only come into its kingdom if it persuades to love and righteousness with a power at least equal to that of the old faith.

How far can it succeed in this tremendous enterprise? The verdict is with the future, and must rest with the issue of events. It can only be repeated that its success will be proportioned to its truth. Proved worth alone will give it a title to the allegiance of men.

What can be said of the whole vast process? are any metaphysical conclusions possible? Darwin's words commend themselves to acceptance: evolution truly 'represents a grand sequence of events which our minds refuse to accept as the result of blind chance. The understanding revolts at such a conclusion.'²

And it may be said that life persists, though the vehicles and forms of life change from age to age. Life has persisted on the earth for millions of years. Matter can neither be created nor destroyed; neither can energy. Life is too subtle in its nature for any similar proof of its persistence to be provided. Yet the creation, or annihilation of life, are alike unthinkable. It is impossible to resist the persuasion that in some way or another life persists after death. The death of the individual is not the end of all things. The whole process cannot be utterly in vain.

What of the more practical and elementary results?

¹ Archbishop of York at Church Congress of 1922. Reported in *Times*, 11th October 1922.

² *Descent of Man*, Part II. ch. xxi.

what of the mundane duties of this new doctrine that may be hoped for? It should move to a truer patriotism and a more worthy citizenship. It should inspire to honourable ambition by methods that injure none and benefit all. It should persuade to the belief that the surest way of securing rights is by performing duties, that the best way of winning love is by giving love, that the approbation of his fellows, the esteem and affection of men of good-will are prizes to be won by following righteousness and pursuing love.

Evolution indicates that good-will between man and man is the present goal of civilized societies, and evolution indicates the only way by which this goal can be attained.

In emphasizing the value of love and righteousness, the more apparently trivial call to recreation may be overlooked. But evolution indicates this as equally a duty, as equally necessary in the life of modern man.

Love, righteousness, and recreation may well be the watchwords of the new doctrine, but the greatest of these is unquestionably love.

The words of the great apostle to the Gentiles still enshrine the greatest of truths. They may be quoted without irreverence and be left as a final conclusion:—

‘ If I speak with the tongues of men and of angels, but have not love, I am become sounding brass, or a clanging cymbal. And if I have the gift of prophecy, and know all mysteries and all knowledge; and if I have all faith, so as to remove mountains, but have not love, I am nothing. And if I bestow all my goods to feed the poor, and if I give my body to be burned, but have not love, it profiteth me nothing. Love suffereth long, and is kind; love envieth not; love vaunteth not itself, is not puffed up, doth not behave itself unseemly, seeketh not its own, is not provoked, taketh not account of evil; rejoiceth not in unrighteousness, but rejoiceth with the truth; beareth all things, believeth all things, hopeth all things, endureth all things. Love never faileth: but whether

there be prophecies, they shall be done away ; whether there be tongues, they shall cease ; whether there be knowledge, it shall be done away. . . . For now we see in a mirror, darkly ; but then face to face : now I know in part ; but then shall I know even as also I have been known. But now abideth faith, hope, love, these three ; and the greatest of these is love.'¹

¹ 1 Corinthians, ch. xiii.

