

THE PHILOSOPHY OF AUGUSTE COMTE

LUCIEN LEVY-BRUHL



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BY

L. LÉVY-BRUHL

Maître de Conférences de Philosophie à la Faculté des Lettres de l'Université de Paris, Professeur à l'Ecole libre des Sciences politiques,

AUTHORISED TRANSLATION

TO WHICH IS PREFIXED

AN INTRODUCTION

BY

FREDERIC HARRISON, M.A.

Honorary Fellow of Wadham College, Oxford



London

SWAN SONNENSCHEIN & CO. LIM.

PATERNOSTER SQUARE

1903

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NOTE

BY

MR. FREDERIC HARRISON

The publication in 1900 of Professor Lévy-Bruhl's volume *The Philosophy of Auguste Comte* was an event in the history of the Positive movement. The eminent position in the University of Paris and in recent philosophical history that is held by Prof. Lévy-Bruhl gave great interest and importance to a systematic judgment from his pen such as the present work. The commemorative festival of Comte held this year, when the statue in the Place de la Sorbonne was unveiled by the Minister of War, in presence of an international gathering of delegates from the civilised world, has called fresh attention to the lifework of the philosopher who died 45 years ago. Accordingly, a translation of Professor Lévy-Bruhl's book was urgently demanded. When I was invited to add to this translation, which I can confidently recommend to students of philosophy, a slight introductory essay, I proposed to use a piece which I wrote on the publication of the French work. It appeared in "The Speaker," (14 April, 1900;) and, as I see no reason to modify my opinion of this masterly book, I leave it nearly as then written. I may add that the learned Professor was a member of the International Committee with many eminent representatives of the government of France and of the Universities of the Old and New World, which in May last raised the monument to Auguste Comte in

Paris.

Professor Lévy-Bruhl followed up his *History of Modern Philosophy in France* by a substantial work on the philosophy of Auguste Comte. It forms a volume of the *Bibliothèque de Philosophie Contemporaine*, which has already devoted four other works to the Positive Philosophy. It is as well to premise that this treatise dealt solely with the *philosophy*, not with the polity, or any part of the religious scheme of Comte. Professor Lévy-Bruhl writes as a student, but not as an adherent of Auguste Comte. His entire work is rather an exposition, not a refutation, or a criticism, or an advocacy of Comte's philosophical system. But it may be said at once that no one abroad or at home, certainly neither Mill, nor Lewes, nor Spencer, nor Caird, has so truly grasped and assimilated Comte's ideas as M. Lévy-Bruhl has done.

In his *Introduction* M. Lévy-Bruhl very clearly states the scope of his work, and his own general attitude. He traces the origin of Comte's philosophy in the mental effervescence of the first generation of the present century towards a reorganisation of society, after the upheaval left by the Revolution and its consequences. He correctly states the relation of St. Simon to Comte as being that of an initial stimulus. The cardinal difference between Comte and all the socialists and founders of social and religious Utopias consisted in this, that Comte saw the necessity of a new system of philosophy as the indispensable preliminary to any reorganisation of society. In 1824, at the age of twenty-six, Comte wrote:—"Discussions about institutions are pure folly until the spiritual reconstitution of society is effected or much advanced." The construction of an intellectual reorganisation, before any social restoration was

possible, occupied twenty or thirty years of Comte's life. And when he opened his *Polity*, or social and religious scheme, the conditions had much changed: the public and its interests were no longer what they had been in 1820-30.

M. Lévy-Bruhl effectively disposes of the objection of Littré, to which Mill gave countenance, that the *Polity*, with the whole of Comte's second or social system, was in contradiction with his first and philosophic system as propounded in the *Philosophy*. As M. Lévy-Bruhl proves, the six *Opuscules* dating from 1819 to 1826, some years before the *Cours*, which only began in 1830 and occupied twelve years, contain in germ the scheme ultimately elaborated in the *Politique*, from 1851 to 1854. Besides this, the *Letters to Mill*, which M. Lévy-Bruhl edited in 1899, and the *Letters to Valat*, which are long antecedent to the *Politique*, show the same governing design. To the unity of Comte's doctrine M. Lévy-Bruhl bears emphatic testimony:—

> "His whole life was the methodical execution of his programme.... He had but one system, not two. From the *Opuscules* of his twentieth year, to the *Synthèse* of his last year, it is the development of one and the same conception."

M. Lévy-Bruhl then explains that, whilst recognising the entire coherence of Comte's collective labours, he proposes to confine his present study to the earlier and principal work, the *Philosophy*, which in M. Lévy-Bruhl's opinion is the dominant and more fruitful composition.

This he regards as the representative work of the nineteenth century, as shown by the intellectual history of the period. He points to its influence on thought in England, in Europe, and in America. It will surprise many persons to learn that in M. Lévy-Bruhl's opinion two eminent French writers, who assuredly neither were, nor were supposed to be, Positivists, "have done more for the diffusion of the ideas and method of Comte than Littré and all the other Positivists together." These two are Taine and Renan, much as they differed from Comte's actual scheme and doctrines. Renan indeed spoke of Comte as destined to prove one of the typical names of the century. The present writer remembers Renan saying to him with a most genial welcome, "I too am a believer in the religion of humanity." History, romance, poetry, says M. Lévy-Bruhl, have all reflected the positive spirit:—

> "Contemporary sociology is the creation of Comte; scientific psychology, in a certain degree has sprung from him. It is not rash to conclude that the Positivist Philosophy expresses some of the most characteristic tendencies of the age."

It is clear that, if M. Lévy-Bruhl is in no sense an adherent of Comte, he is a most sympathetic and discerning master of the positive system.

M. Lévy-Bruhl opens his analysis of Comte's philosophy by examining his main conceptions:—(1) The law of the three states, theological, metaphysical, and positive, through which all human ideas pass; (2) the Classification of the Sciences; (3)

the scheme of each science in turn. And he closes with an explanation of the general doctrines of Humanity, as the centre of human thought, feeling, and activity.

The law of the three states announced by Comte in 1822, is thoroughly explained and entirely assimilated by M. Lévy-Bruhl. Its demonstration, he thinks, is complete when we recognise that, although many orders of ideas have not finally reached their positive state, all of them exhibit the tendency to the same evolution, and there is no single instance of a conception of a positive science ever retrograding into unverified figment. Of course the terms *theological* and *metaphysical* have to be understood in the sense adopted by Comte—*i.e.* "anthropomorphic" and "hypothetical," a bare hypothesis wearing a scientific form. M. Lévy-Bruhl himself regards the law as irrefutable and of capital importance, "the corner stone of the positive system."

Our professor is equally conclusive in his estimate of Comte's classification of the sciences. He quite demolishes the objections made to it by Mr. Herbert Spencer in his essay with that title. M. Lévy-Bruhl repeats the criticisms to which Spencer has been exposed in this country and abroad by Littré, Lewes, Mill, and others. And he has no difficulty in showing that Mr. Spencer's objections are due to his very slight acquaintance with Comte's text, and his own superficial study of the English abridgments. In proposing a classification of the *concrete* sciences, Mr. Spencer enters on a task which Comte distinctly repudiates, and which on good grounds he treats as philosophically impracticable for purposes of evolutionary sequence. Comte's strictly *relative* theory excludes such a scale of *concrete* science;

whilst Spencer's *absolute* theory of the universe forces him to attempt it in vain. If it be objected that Comte's ascending scale of the sciences is "anthropocentric," the answer is that, when reasonably understood as a philosophic device for sorting human ideas, not as a statement of *absolute* truth, the "anthropocentric" arrangement of human knowledge is the only one which is at once possible and useful.

It would need a long essay even to sketch M. Lévy-Bruhl's analysis of Comte's conception of *science*, of *law*, and of the six dominant sciences. He has thoroughly assimilated the positive spirit, that *science* implies a co-ordination of *laws*, not an encyclopædia of facts, that it is *relative* to our powers of observation and reasoning and not an *absolute* explanation of the universe in itself. He goes through the sciences, physical, social, and moral, in turn, as treated by Comte, and justly explains that Comte never attempted or conceived a *vade-mecum* or handbook of contemporary scientific knowledge, but a scheme for the co-ordination of general ideas of science. A real "philosophy of the sciences" is something wholly distinct from a compendium of all the sciences—a thing which in 1840 was far less possible than it might be now. Controversialists have reproached Comte with the obvious fact that his concrete science is now sixty years old. In dealing with these shallow criticisms, M. Lévy-Bruhl has shown how little able is any narrow specialist to understand the abstract conceptions of a real philosopher.

One of the most common of these misconceptions is the ignorant charge that Comte repudiated "psychology," in the sense of the laws of man's

intellectual and moral nature. "*Psychologie*," as M. Lévy-Bruhl shows, when Comte wrote, meant Cousin's futile introspection of the *ego*. Comte certainly rejected that as idle, as do all competent psychologists of our time. Psychology, meaning the laws of mind and will, was not only an indispensable basis of Comte's system, but its rational, systematic foundation dates from Comte's suggestions. His signal contribution to psychology lies, not in his doctrine of its physiological basis, but in his referring it to sociology as its guide and inspiration.

M. Lévy-Bruhl concludes his study with a co-ordinate table of twelve contrasted propositions of the metaphysical and of the positive systems respectively. These show how simple and rational a transition is that between Positivism and the older theological and metaphysical hypotheses of the universe and of Man. We welcome a book which all positivists will regard as fair, learned, and instructive, and which all students of philosophy must regard as a masterly study of a comprehensive subject.

45th Anniversary of the death of Comte,
(5th SEPTEMBER, 1902.)

TRANSLATOR'S PREFACE

Fifty years have now elapsed since Auguste Comte's monumental work, the *Cours de Philosophie Positive*, was first introduced to English readers by

Miss Harriet Martineau. But her work was much more than a translation. It was a condensed exposition of Comte's doctrines, done with such mastery that it obtained the emphatic approval of Comte himself who, in such matters, was not very easily satisfied.

In Harriet Martineau's case, both the substance of the book and the English form in which it was offered to the public, were her work. In the case of the present volume, while a woman is once more responsible for the translation, the substance of the book, that is the comprehensive exposition of Comte's system in the light of all his published works, is from the pen of Professor Lévy-Bruhl, and readers who are acquainted with Harriet Martineau's book will be all the more in a position to appreciate the importance of this fresh contribution to the elucidation of the thought of Auguste Comte.

We fear that the clearness of style, the richness of expression, the power of condensed thought which characterise our author will be found to have been often weakened, if not sometimes altogether obliterated, in this translation. The striking simplicity of the text at first deceived me into the belief that I could do justice to it. I was often tempted to sacrifice the literal sense in order to preserve some of the graces of the original. Yet I hope to be forgiven for having uniformly preferred to err through too much faithfulness to the letter. My sole object has been to enable the English reader to get at the meaning of the text.

But, while I have only too much reason to solicit the indulgence of my readers, conscious as I am of the many defects of this translation, I feel that no

apology is needed for bringing that of which it is a translation within the reach of the English-speaking public.

We live in times when the intimate relation between the natural sciences and social questions is increasingly felt. Old landmarks are disappearing, new foundations are being laid, new problems are constantly arising, generating doubts and perplexities for which the solutions of other days supply no adequate answer.

Meanwhile, as the facts of science reveal to us more of the conditions of human life, we give, more or less consciously, a larger place to sociology in our mental preoccupations. Thus renewed interest is being felt in the writings of the Founder of the Science of Sociology. The most conflicting schools of thought study the works of Auguste Comte and many ask: who is that man whose ideas appear to contain a clearer message to our generation than they did to his own? For such inquirers Professor Lévy-Bruhl's book should prove singularly useful and timely. It is a plain, independent account of what Comte really taught, written by one possessed of the fullest qualifications for such a task, and no work of recent date will enable students to understand so clearly the solution given by the French philosopher to the perplexing moral, social, and religious problems of our time.

Here, as elsewhere, "il s'agit de tout comprendre, non de tout admirer," and Professor Lévy-Bruhl is himself too much of a philosopher to forget that golden rule; but, nevertheless, by his free, independent judgment of Comte's teaching, he helps us to realise to what an extent, in these days, Comte

is inspiring many who are not perhaps conscious of following him.

KATHLEEN DE BEAUMONT-KLEIN.

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THE PHILOSOPHY OF AUGUSTE COMTE.

INTRODUCTION.

I.

Every new system of philosophy, however original in appearance, is more or less directly related to the doctrines which have preceded it. But it is also connected with more general conditions in a manner no less close, if not so immediately obvious. It depends upon a whole set of social conditions. The influence of the religious, political, economical, intellectual phenomena, in a word of the contemporary *milieu* upon this system is as indisputable as its own influence upon the *milieu*. It is therefore not enough to study it as a self-sufficient whole. This whole which is in itself but a part, must be restored to its place within the greater whole which alone explains its essential characteristics.

This rule of historical method, which Comte likes to recall, applies very well to his own system. In order to reach as complete an understanding as possible of his doctrine, to appreciate exactly its general orientation, to understand the importance which the author attaches in it to this or that part, the study of the text will not suffice. We must further

take into account the historical circumstances in which the doctrine found its birth, the general movement of contemporary ideas, and the manifold influences which have reacted upon the mind of the philosopher.

Now one great fact, above all others, dominates the period in which the positive philosophy appeared. It is the French Revolution, as Comte expressly states: without it, neither the theory of progress, nor consequently social science, nor consequently again positive philosophy would have been possible. Was it not, moreover, inevitable that this extraordinary social upheaval should by reflex action have determined a vast and prolonged movement in philosophical and political speculation? The effects of this reflex action varied according to the value and the originality of the minds which experienced them. But in the greatest as in the most mediocre we recognise infallibly certain common features. For instance, men and women, in the rising generation at the beginning of the XIX. century, never fail to put the same question to themselves: "What social institutions should be established after the Revolution?" and by this all understand not only the political form of government, but the very principles of social order: a problem which appeared as urgent from the practical point of view, as it was supreme from the theoretical point of view. It is this problem in various forms which preoccupies Chateaubriand as well as Fourier and Saint-Simon, and Joseph de Maistre as well as Cousin and Comte.

All agree upon the first point. We must "reconstruct." An "organic" period must succeed the "critical" period which has just come to an end. According to Saint Simon's striking expression,

humanity is not made to inhabit ruins. The revolutionary storm had been so formidable, the din so deafening, the social back-wash so violent, that no one exactly measured the effect which had been produced. Many institutions which had only been shaken seemed to be overthrown. A good part of the old régime had even gone through the crisis without being too greatly damaged, and had survived. But this fact, which was very well appreciated by the men of 1850, could not yet be discovered by the first generation of the century. It conscientiously believed that the old régime had crumbled altogether, and that the task either of restoring it, or of again laying down the very bases of society belonged to it. In this the first generation remained faithful to the spirit of the Revolution, which had considered itself as an effort to institute an entirely new social and political system, a thought in which the civilised world had shared. Now, in spite of the labours of the revolutionary assemblies, in spite of the power and of the great talent which the Convention had at its command, this ambitious hope had not been realised. The question remained open after the Directoire and after the Empire. When the old régime was supposed to have been destroyed, how was society to be "reorganised"?

Thus, at the opening of the XIX. century, philosophical speculation was at first to be directed towards the religious and social problems. Undoubtedly the influence of the uninterrupted advance of the positive sciences was also felt at the same time. A study of Auguste Comte's system could hardly fail to recognise the fact. But, even with Comte, scientific interest, however active it may be, is subordinated to the social interest. What he asks of philosophy is the rational settlement of the bases of

modern society. Thus, he means to discover the elements of a religion which can be substituted to Catholicism, whose mission he considers as at an end.

"The XIX. century," Ranke has said, "is especially a century of restoration." A deep saying, which exactly expresses one of the leading features in the historical physiognomy of this century. It is precisely thus that it was conceived by those who inaugurated it. Such indeed is the main tendency of the greater number of philosophical doctrines which have expressed its most intimate characteristics. Only, as is generally the case, this restoration absorbs and consolidates a large part of the results acquired during the crisis. At the same time new problems, raised especially by the development of industry in its larger aspects, made clear-sighted men feel that the revolutionary period, however desirable it might be to bring it to a close, was really only beginning.

II.

Like many of his contemporaries Auguste Comte thought himself singled out for the mission of formulating the principle of "social reorganisation." But this is where he differs from them. Each of the reformers begins by proposing his own solution of the social problem, and all his efforts only tend to justify it. As this problem is the most urgent one in their eyes, it is also the only one which they have put directly to themselves. Now this method, according to Comte, is a bad one, and in following it they court certain failure. For a social problem is such that its solution cannot be obtained immediately; other problems, more theoretical in character, must be

solved beforehand. It is therefore these which must first be dealt with, if we seek anything else than the lengthening of the history of political dreams and of social chimeras. “Institutions,” Comte says, “depend on morals, and morals, in their turn, depend on beliefs.” Every scheme of new institutions will therefore be useless so long as morals have not been “reorganised,” and so long as, to reach this end, a general system of opinions has not been founded, which are accepted by all minds as true, as was, for instance, the system of Catholic dogma in Europe in the Middle Ages. Therefore, either the social problem admits of no solution—and Comte does not stop at this pessimistic hypothesis,—or the solution sought for supposes that a new philosophy shall have been previously established. This is why Comte wishes to be at first only a philosopher. In 1824 he writes “I regard all discussions upon institutions as pure nonsense, until the spiritual reorganisation of society has been brought about, or at least is very far advanced.”[1]

Comte’s originality will therefore lie in taking from science and philosophy the principles upon which depends the social reorganisation, which is the real end of his efforts. While having the same aim as the reformers of his time, he will follow a different path. It is indeed a polity which he also claims to found, but this polity is *positive*: it rests upon ethics and philosophy both equally *positive*. Undoubtedly the polity is the *raison d’être* of the system, which Comte has constructed for it. But, without the system, the Polity would remain arbitrary. It would lack authority and that which would make it legitimate. Philosophy is no less indispensable to the foundation of politics, than are politics to the completion and unification of philosophy.

Whence comes it that Comte has put this great problem, which preoccupied all the minds of his time, in a form which belongs to him alone? We cannot here enter into the detailed biographical study which would throw some light upon this question. Let us only recall that Comte was born in a Catholic Royalist family. From the age of thirteen, he tells us, he had broken with the political convictions and the religious beliefs of his own people. Perhaps, however, the trace of these beliefs was less completely effaced than he himself thought. During the whole of his life he professed the liveliest admiration for Catholicism. On his own confession he was especially inspired in this by Joseph de Maistre; but, if he so much appreciated the book *du Pape*, did not his great sympathy partly spring from impressions of childhood indelibly stamped upon a passionate and sensitive nature?

Whatever may be the case, the first subject which seriously occupied his mind was mathematics. Being admitted to the *Ecole polytechnique* a year before the usual age, he began to study the natural sciences. At the same time he “meditates” upon Montesquieu and Condorcet. He approaches philosophy properly so called by reading the Scottish philosophers, Ferguson, Adam Smith, Hume, and he sees very well that the last one is far above the others. Having left the *Ecole polytechnique*, he remains in Paris, and while giving lessons to earn his living, he completes his scientific education with Delambre, de Blainville, and the Baron Thénard. He reads assiduously Fontenelle, d’Alembert, Diderot, and especially Condorcet who has distilled and clarified the philosophy of the XVIII. century. While studying Descartes and the great mathematicians who came after him, he also follows attentively the labours of

naturalists and of biologists, of Lamarck, for instance, of Cuvier, of Gall, of Cabanis, of Bichat, Broussais and of so many others. He understands the philosophical importance of these new sciences, as already pointed out by Diderot. But for all that he does not neglect historical and social studies. He has read the ideologists, among whom he especially esteemed Destutt de Tracy. Without giving up Montesquieu or Condorcet, he studies the traditionalists: M. de Bonald, this "energetic thinker" and, more than the others, Joseph de Maistre who made the deepest and most enduring impression upon his mind.

Before knowing Saint-Simon then—and his correspondence with Valat testifies to the fact—Comte already possessed a large portion of the materials for his future system. Up to this time his labours had borne upon two distinct orders of subjects. The one scientific proper (mathematics, physics and chemistry, natural sciences) the other more properly political (history, politics, and social questions).

In 1818 Comte meets Saint-Simon. He is attracted and surrenders himself almost unreservedly. For four years he works with Saint-Simon. He loves and venerates him as a master. He feeds upon his ideas, and collaborates in his labours and enterprises. He calls himself "pupil of M. Saint-Simon." However, from 1822 he detaches himself from this greatly-admired master, and in 1824 the rupture is complete and final. What can have happened?

The grievances brought forward by Comte are only of secondary importance. As a matter of fact master and pupil were bound to separate sooner or later.

There was a radical incompatibility between those two minds. Saint-Simon, marvellously inventive and original, throws out a multitude of new ideas and views, of which many will be fruitful. But he quickly affirms, and proves little. He has not the patience to continue working long at the same subject, or to probe it to the bottom in an orderly way. Comte, on the contrary, thinks with Descartes, that method is essential to science, and that "logical coherence" is the surest sign of truth. He could not long remain satisfied with Saint-Simon's disconnected essays. He could even, without dishonesty, turn to account the brilliant but disorderly intuition in which his master abounds and believe that his own doctrine alone gave those disconnected essays scientific value, because his doctrine alone was in a position to systematise them and to connect them with their principles.

It would therefore seem that we can admit at the same time that Saint-Simon's influence upon Comte was considerable, and, on the other hand, that Comte's philosophical originality is no less certain. Saint-Simon's influence would chiefly have consisted: 1. in suggesting to Comte a certain number of general ideas and of views of detail, especially for his philosophy of history; 2. in showing him how the two orders of labours which he had been following until then were to blend into a single one, through the creation of a *science* which would be social, and consequently of a *polity* which would be scientific. Would this synthesis of the two orders of studies which Comte had undertaken side by side have been produced in his mind, had he not known Saint-Simon? In any case it would have been produced more slowly. Let us at least leave Saint-Simon the credit which Comte himself granted him, that of

having “started” his disciple upon the line best suited to his genius.

The intellectual intimacy between them could never be perfect. If Comte entered entirely into Saint-Simon’s ideas, (without adopting them all, however), in return there was an aspect in Comte’s thought which Saint-Simon scarcely discerned through the lack of a sufficiently strong scientific education. It is enough to see how he speaks of the law of universal attraction. Comte must have been scandalised by it. So, at the very moment when he submits with most enthusiasm and youthful confidence to Saint-Simon’s influence he does not neglect his special mathematical studies. “My labours,” he writes to Valat on the 28th of September, 1819, “are and will be in two orders, scientific and political. I should set little value upon the scientific studies, did I not continually think of their utility to the human race. As well then amuse myself in deciphering very complicated puzzles. I have a supreme aversion for scientific labours whose utility, either direct or remote, I do not see. But I also confess, in spite of all my philanthropy, that I should put far less eagerness into political labours, if they did not stimulate the intellect, if they did not bring my brain strongly into play, in a word: if they were not difficult.”[2] A year later, in sending a parcel of political tracts to his friend, in which he distinguishes what is in his own manner and what is from Saint-Simon, he says that he is besides very eagerly occupied with mathematical work. He wants to take part in the competition opened by the Institut; and his ambition is soon to enter the *Academie des Sciences*.

From 1822, in the celebrated pamphlet entitled *Plan des travaux scientifiques nécessaires pour*

réorganiser la société, the synthesis between the two orders of labours is accomplished in Comte's mind, thanks to the double discovery of the classification of the sciences and of the great law of social dynamics. We know that this work was, if not the principal reason, at least the occasion of the rupture between Comte and Saint-Simon. It is the moment which Comte himself considers to have been decisive in the history of his mind. The whole of his future doctrine was essentially contained in this pamphlet. The preface added by Saint-Simon shows that he did not understand its full bearings. Comte is henceforth his own master. At length he has found what for several years he had been seeking without being clearly conscious of it; and the rest of his life is now consecrated to the work which he has conceived and of which he has just outlined the plan. Since he has established a philosophical hierarchy of the sciences, whose summit is crowned by social physics, he has no further occasion to ask how he can conciliate his scientific labours with his political studies.

"In the interval of my great philosophical labours," he writes on the 8th September, 1824, "I propose to publish a few more special works upon the fundamental points in mathematics, which I have long conceived, and which I have at last been able to connect with my general ideas of positive philosophy: so that I shall be free to give myself up to them without *breaking through the unity of my thought*, which is the great condition for the life of a thinker."[3] And in a very remarkable letter to de Blainville, on the 27th February, 1826, he explains in the clearest way the generating idea of his system. "My conception of politics as social physics, and the law which I have discovered upon the three successive states of the human mind are but one and

the same thought, considered from the two distinct points of view of method and of science. That being established, I shall show that this single thought directly and completely satisfies the great actual social need, *considered under its two aspects of theoretical need and practical need*. I will therefore show that what on one hand tends to consolidate the future by re-establishing order and discipline among intellects, tends, on the other hand to regulate the present, as far as possible, by furnishing statesmen with *rational* lines to work upon."[4]

Henceforth Comte's life was to be but the methodical execution of his programme. In turn, with perfect regularity, he wrote and published the philosophy of the sciences and of history, the ethics, the positive polity and the positive religion. Does this mean that Comte's thought remained stationary? Most certainly not. It evolved from 1822 to 1857. But this evolution followed a curve which an attentive observer might have sketched beforehand after having read the *Plan des travaux scientifiques nécéssaires pour réorganiser la société*. Comte had but one system, not two. From the *opuscules* of his twentieth year to the *Synthèse subjective* of his last year, it is the development of one and the same conception.

III.

The unity of the doctrine has been disputed. Comte himself distinguished two successive "careers" in his life. In the first, he says, without affected modesty, he was Aristotle: in the second he will be St. Paul. The founder of the philosophy did but pave the way for the organiser of the religion. "I have

systematically devoted my life to draw at last from real science the necessary basis of a sound philosophy, according to which I was afterwards to construct the true religion."[5]

Many of Comte's disciples, even some of the more illustrious, and at first more fervent, such as Littré, refused to follow him in his "second career." Their admiration for the philosopher could not persuade them to submit to the pontiff.

Littré and his friends were undoubtedly free to follow Comte only up to a certain point, and, while accepting his philosophy, to reject his religion. If they had stopped there, Comte could but have blamed their want of logic and himself have disowned "those incomplete positivists, who are not more intelligent because they call themselves intellectual." But it is they, on the contrary, who accused Comte of inconsistency and of self contradiction. Comte, they said, betrayed his own principles. The "subjective method" in his second career ruined the precious results he had obtained in the first by his objective method. In refusing to go beyond the *Cours de philosophic positive* they remained more faithful to Comte's master-thought than Comte himself. In a word, they defended true positivism against its misguided founder.

Comte answered these attacks, which were all the more painful to him because they came from those whom he had long regarded as his faithful disciples and his best friends. In the course of this work it will appear that those attacks were unfounded.[6] Comte's two methods are not opposed to each other. They complete each other, as do also the two "careers" which they characterize.

It is true that during the last two years of his life an increasingly marked tinge of mysticism spread over his thought and his writings. His brief friendship with Mme. de Vaux, and the death of this "holy" friend had stirred very strong emotions within him, and these emotions with him were transformed into ideas which came to be incorporated into his system. At the same time he laboured to organise the Religion of Humanity. He claimed to secure for it an authority over souls at least equal to that which had been enjoyed by Catholicism at the period of its greatest power. The exaltation of his sentiments, the preoccupation of the new religion which was to be established, the ever-present consciousness of his sacerdotal mission, all this was necessarily bound to react upon the doctrine which he had founded in the preceding period.

Thus the philosophy of the sciences and of history is no longer presented to us in the same way in the *Politique positive* as it is in the *Cours de philosophie positive*. But it is designedly so. The difference in tone and the difference of method in the setting forth is explained, according to Comte, by the different object which he has in view in each of these works.[7] Essentially, the philosophical doctrine has not varied. All we can grant to Littré is that by the fact of its being presented from the religious, that is to say from the synthetic, point of view in the *Politique positive*, it undergoes an apparent alteration. If we only knew the doctrine through this work we should not get the perfectly clear view of it given in the *Cours de philosophie positive*. Comte himself often advises the reader of the *Politique* to refer to his "great fundamental treatise."

But, on the other hand, in carefully reading the

Cours, we find numerous indications of the future structure of the Politique positive. Comte might have been content with a reference to the *Cours*, to answer the objections of his dissenting disciples. He did better. He reprinted at the end of the fourth volume of his *Politique positive* six pamphlets written in his youth from 1818 to 1826. In them, not only is his philosophy already sketched in its main outlines with sufficient precision; but the idea that philosophy is a preliminary work, a simple prelude and that the essential work, the supreme end, is the positive religion which shall arise upon this philosophy—this idea is the very soul of these pamphlets. The proof is given. Upon the question of the unity of his doctrine Comte wins the case against Littré.

IV.

In his correspondence with Stuart Mill which takes place between 1841 and 1846, that is to say which embraces the end of his first career and the beginning of the second, Comte has repeatedly explained how the two successive portions of his work are connected together, and in what they are distinct. It may not be useless to quote his own words. “The second half of my philosophical life,” he says, “must differ notably from the first, especially in that feeling must take, if not an obvious, at least a real part in it, one as great as that of the intellect. The great work of systematization which has been reserved for our century, must indeed embrace equally, both feelings and ideas as a whole. Truly it was the ideas which had first to be systematized, under pain of failing to bring about a complete regeneration by falling into a more or less vague mysticism. That is why my fundamental work had to

appeal almost exclusively to the intellect. It was to be a work of research, and accessorily of discussion, destined to discover and to constitute the true universal principles, in rising by hierarchical degrees from the simplest scientific questions to the highest social speculations."[8] But this being done, Comte passed to the systematisation of the feelings, "a necessary sequel to that of the ideas, and an indispensable basis for that of the institutions."

It is, therefore, an entirely new work. Comte can imagine without difficulty that it might have been reserved for another than himself. His personal mission might have been limited to the foundation of the philosophy which puts an end to the "*mental* anarchy." The ethics and the religion which were to be established upon this philosophy, to put an end to *moral and political* anarchy, would, in this case, have been the work of one of his successors. Stubborn labour and good fortune allowed Comte to undertake this work himself. But even in 1845, he says how "under the holy influence of Mdme. de Vaux," he had very clearly seen his two careers as distinct and as one, these two careers of which the second was to transform philosophy into religion, as the first had changed science into philosophy.

The object of the present work is to study Comte's philosophy properly so called, leaving aside the transformation of this philosophy into religion. The choice which we thus make is not an arbitrary one, since, in order to justify it, we have the distinction formally established by Comte himself, when he admits that his philosophy and his religion might have been the work of two different persons.

It will perhaps be asked in what our position

differs from that of Littré, and of the "incomplete positivists." By the difference, we shall answer, which separates the historical from the dogmatic point of view. It is from the latter point of view that Littré and his friends reject the "systematisation of the feelings," the subjective method and the religion of Humanity. It is as positivists that they connect themselves with the first half of the doctrine, and that they exclude the second half. But we are here working from the historical point of view, and the historian, while using his right to define the limits of his work has nothing to exclude from the doctrine which he sets forth. As a matter of fact far from claiming with Littré that the second part of Comte's work weakens and contradicts the first, we have recognised that they both form a whole of which he had drawn out the plan in his early writings, and that he was not wrong in taking as an epigraph for his *Politique positive* the fine words of the poet-philosopher: *What is a great life? A thought of youth fulfilled in riper age.*

But then, why only study the first of the two careers, why not respect the integrity of that whole which, according to us, Littré ought not to have disregarded?—We do respect it, for we do not arbitrarily exclude from the doctrine any of the parts which Comte included in it. If we make the philosophy proper the sole object of this study, in it we shall ever have before our minds the idea of the greater whole in which Comte placed it. On this condition alone, our study will be accurate. But once this condition is fulfilled we do not consider that we exceed our right, in concentrating our effort upon the philosophy.

There are two different ways of conceiving the

history of a doctrine. The historian may place himself exactly in the mental attitude of the philosopher whom he studies, and think again after him his leading ideas, as indeed he should do; but further, he can judge, just as the philosopher himself does, of the respective importance of problems, without allowing himself to distinguish what is secondary from what is essential. The historical work then assumes the shape of a "monography," or of an "intellectual biography;" or else, while endeavouring to penetrate to the heart of the system, in order to grasp it in its principles, the historian may nevertheless place himself outside it and above it, and try to "situate" it in the general evolution of philosophy. Then the system is better understood in its entirety, since we can see its relations with the preceding, contemporary and following doctrines. At the same time it becomes possible to separate what is of enduring philosophical interest, from what was merely of secondary or momentary importance, although the author may have judged otherwise. To borrow from Comte a distinction which he often uses, the former of these methods is better suited to erudition, the latter to history.

Applied to the study of his doctrine, the first method would have us to consider positive philosophy with him as simply preparatory to the Religion of Humanity, which was the first and the last goal of his efforts. The writer should undoubtedly give a large place to this "préambule indispensable," to this great fundamental work, in which Comte lays down the intellectual bases of his political and religious system. But he ought nevertheless to subordinate it to this system and place in the front rank the "social reorganisation," the dogma, the worship and the *régime* of the

Religion of Humanity, the institution of a spiritual power, in fact the whole of that portion of Comte's work in which he takes up again "the Catholic programme of the Middle Ages," confident of fulfilling it better than Catholicism itself ever did.

Now it is not in this part of his work that Comte shows himself most original, and that his thought has been most fruitful. The problem of "social reorganisation" does not belong to him alone. Its presence is felt, so to speak, in the air at the time that Comte's youth was passing away. The common aspirations of the generation which grew up with him were to re-establish order and to fix the conditions of progress, to determine the relations of Ethics to Politics, and to put a new religion in the place apparently left free by Catholicism. The *Politique positive* which claims to satisfy these aspirations, corresponds in Comte's system (all proper allowance being made for the substance of the doctrines) to what the Saint Simon school had already attempted to do before 1830. It comes thirty years later than the previous attempts of the same kind, because Comte wanted to found his "social organisation" upon philosophy and morality, and because this speculative effort occupied the better part of his youth and of his maturity. But it originated in fact in the first third of the century as is proved by the pamphlets reprinted by Comte. When it appears between 1850 and 1857, a new generation brought up in other political and social circumstances gives it only passing attention. Other problems command attention more forcibly, and claim a more urgent solution. The philosophy of history no longer excites the same passionate interest. Men are less anxious to see the birth of a new religion, and Catholicism has proved that its

vitality is still very strong.

Therefore neither Comte's genius, nor the precautions which he thought he had taken to place his "social reorganisation" upon a rational basis, could shield it from the common fate which sooner or later overtakes all attempts similar to his own. Undoubtedly the *Politique positive* and the other works of Comte's second career are full of just and deep views. Whatever may be the subject upon which a great mind has worked it is always interesting and profitable to see what the reflection of that mind has discovered in it. But, in fact, that portion of his work, which to him was the most important, is far from maintaining this position in the eyes of the historian.

By his *Politique positive* Comte only represents his generation. By his philosophy properly so called he is a "representative man" of his entire century. Is it necessary to prove this? The intellectual history of our age witnesses to it at every step. Of all the systems which found birth in France in the XIX. century, this one alone found a hearing beyond the frontiers and left a deep impression upon foreign thinkers. Comte's philosophy was at first received in England and in Holland even with more sympathy than in France. John Stuart Mill, Herbert Spencer, George Lewes, George Elliot and a number of English philosophers and writers drew more or less of their inspiration from it. To this day, it is defended by men of great talent in England. It is true that no German philosopher had the same personal relations with Comte as John Stuart Mill, but as a matter of fact, for thirty years the positive spirit has gradually gained ground in the German Universities. To be convinced of this, it is enough to see how metaphysics are set

aside in them and to observe the lines on which the moral and social sciences are taught. In the Latin countries of the two hemispheres Comte's influence has been exercised with even greater strength, in Spain, in Portugal, in South America; and North America has also its Positivist societies. In his life time, Comte had already found there some of his most devoted disciples. In France the principal "vehicles" of Positivist philosophy have been the works of two writers who, in their time, were those most beloved by the public; Renan and Taine, although they were not positivists, have perhaps done more for the diffusion of the ideas and method of Comte than Littré and all the other positivists together.

It is true that Taine owes a great deal to Spinoza and to Hegel, and more still to Condillac. Among his contemporaries he seems to be especially connected with John Stuart Mill and Spencer. But through them it is from Comte that he proceeds, and there we find the origin of the greater number of his leading ideas. His conception of literary history, of criticism, of the philosophy of art, in a word, his effort to bring into the study of the moral sciences the method used in the natural sciences, all this is chiefly derived from Auguste Comte. The *Histoire de la Litterature anglaise* is, in a sense, an application of the positive theory according to which the evolution of the arts and literatures is governed by necessary laws which constitute its solidarity with that of morals, of institutions and of beliefs. The theory of the "moment" and of the "milieu" which is the chief one in Taine's work was certainly not unknown in the XVIII. century. But it is Comte who generalised it by bringing Lamarck nearer to Montesquieu; it is he who taught Taine the general definition, at once

biological and social, of the idea of the “milieu.”

Renan spoke of Comte with extreme severity, and not without some disdain. He owned, however, that later on Comte’s name would be one of the most representative ones of this century, and he had himself strongly felt his influence. We must certainly take into account all the other French and foreign sources from which this mind at once so supple and so large, drew inspiration. But is it not from Comte, as much as from Hegel, that he learnt to regard history as the “sacred science of humanity,” to expect from it what before was demanded from theology, to transform the ancient dogmas of Providence and of optimism into the belief in the positive idea of progress, and finally to conceive that truth and goodness are not immutable and immoveable realities, but are realised by degrees through the effort of successive generations?

These two examples will suffice to show the point of extreme diffusion which has been reached by the positive spirit.

This spirit is so intimately mingled with the general thought of our time that we scarcely notice it, just as we do not pay attention to the air we breathe. History, romance, and, even poetry have reflected its influence and, being charged with it, have contributed to its diffusion. Contemporary Sociology is the creation of Comte; scientific Psychology, in a certain degree has also sprung from him. From all these signs, it is not rash to conclude that positive philosophy expresses some of the most characteristic tendencies of the age.

We are therefore conforming to historical reality when we attach ourselves, in Comte’s work, to the

philosophy which constitutes its most original, and up to the present time its most fruitful and living part. It matters little that he himself should only have considered it as a preliminary portion of his work. How often has the speculative effort made by a great thinker for the purpose of establishing practical conclusions proved to be of more enduring interest than those conclusions themselves!

BOOK I

CHAPTER I
THE PHILOSOPHICAL PROBLEM

According to Comte, philosophy is destined to serve as a basis for morality, for politics and for religion. It is not an end in itself but a means to reach an end not otherwise attainable. Had Comte thought it possible to reorganise society without first reorganising morals, and to reorganise morals without first reorganising beliefs, he would not perhaps have written the six volumes of the "Cours de Philosophie positive" which occupied him from 1830 to 1842. He would have gone straight to what was of supreme interest.

He early became convinced that the shortest way would not be the best. In his view, all endeavour at religious, moral, or political reorganisation, must be vain so long as *mental* reorganisation has not taken place. It is therefore with a new philosophy that he must begin. Indispensable to the social end which Comte has in view, philosophy becomes, at least provisionally, an end in itself.

Comte is going to endeavour to reorganise beliefs, that is to say, to substitute a demonstrated faith to the revealed faith whose force is now spent. This demonstrated faith will have nothing in common with the natural religion of the XVIII. century, which

was at bottom but a weak and degenerate form of belief in the supernatural. Under the metaphysical garb of Deism we still recognise theological thought. On the contrary the demonstrated faith will have its origin and its justification in positive science. The two words “faith” and “demonstration” appear to clash with each other. But the contradiction lies merely on the surface. For we are still concerned with “faith” since the great majority of men will always have to take on faith the conclusions of positive philosophy.

The number of men with sufficient leisure and enough culture to examine these conclusions and to go into their proofs will always be small. The attitude of the others must be one of submission and respect. But, differing on this point from the religious dogmas which humanity has known until now; the new faith will be “demonstrated.” It will contain nothing which has not been established and controlled by scientific methods, nothing which goes beyond the domain of the relative, nothing which at any moment cannot be proved to a mind capable of following the demonstration.

This form of “faith” already exists in the case of a great number of scientific truths. Thus all men to-day believe in the theory of the solar system which we owe to Copernicus, to Galileo and to Newton. Yet how many are in a position to understand the demonstrations upon which this theory rests? They know, however, that what here is a matter of faith to them, is a matter of science to others, and would be so equally for themselves had they gone through the necessary studies. *Faith* therefore signifies here not indeed a voluntary abdication of the intellect in presence of a mystery which surpasses its power of

comprehension, but a submission to fact, which in no way encroaches upon the rights of reason. Every man is not capable, at any moment, of exercising this right to criticise. In practice, Comte will severely restrict the use of it.[9] But in theory this right belongs to all men, and must ever remain unalterable. In the last place the legitimate existence of the demonstrated faith rests upon this proposition: "If all minds were in a condition to examine the dogmas of that faith, all, without exception, would understand the demonstration, and would agree with it."

The words "belief" and "faith" must not be misunderstood. In the "reorganisation of beliefs" which he undertakes, Comte only concerns himself with beliefs capable of demonstration. He is here faithful to the thought of Saint Simon, who understood "religion" chiefly as a basis of political organisation. At any rate, in the early part of his philosophical career Comte does not bring into "faith" the mystical, sentimental and non-intellectual elements which this word usually implies and which so often oppose it to "reason." The word signifies for Comte that which man believes concerning *what may be for him a subject of knowledge*. Until now these beliefs have set forth a more or less mythical or metaphysical explanation of the universe and of man, taught by priests and philosophers. But this no longer satisfies the human mind. By degrees positive science, which works on a totally different plan, substitutes a knowledge of the laws of phenomena to those "explanations." From this moment the problem thus presents itself to Comte: To establish by rational means a system of universally accepted truths concerning man, society and the world.

Comte thus takes for granted: 1st, that the

"opinions," the "beliefs" and the "conceptions" relating to these matters, are to-day "anarchical": 2nd, that their natural and normal condition is to be "organised."

There is no need to prove the first part; a glance at contemporary society is enough. The confused disturbing movements which fill it with trouble and agitation, and which, unless rational harmony be at last established, threaten its destruction are not due merely to political causes. They proceed from moral disorder. And this in turn proceeds from intellectual disorder, that is to say from a lack of principles common to all minds, and from the absence of universally admitted conceptions and beliefs. For in order that a human society may subsist, a certain harmony of sentiment or even common interests among its members will not suffice. Above all things, intellectual concord which finds expression in a body of common beliefs is necessary.

If, therefore, a society be a prey to chronic disorders, which political remedies appear powerless to cure, one has every right to believe that the deep-rooted evil has its origin in intellectual disorganisation. All other troubles are merely symptoms. This, according to Comte, is precisely the state of contemporary society. It has neither "intellectual" nor "spiritual" government, and does not even feel the want of it. The minds of men recognise no common discipline. Not a principle subsists which negative and "corrosive" criticism has not attacked. The individual erects himself as a judge of all things—philosophy, ethics, politics, religion. The opinion which he adopts most frequently without any special qualification for so doing, and according to his passions, always appears to him to

have as much right to be admitted as those of other men. He claims to be amenable to no one for his thoughts. And this scattering (later on Comte will say insurrection) of intelligences is what he calls a state of *anarchy*.

But, we may say, does not this state represent the ordinary condition of human societies? Perhaps the "organic" state only appears occasionally and as an exception? Such a supposition is groundless. For, if such were the case societies could not subsist, and above all could not develop. We must admit, on the contrary, that periods of intellectual anarchy form the exception, and that in a normal state of society men are united by their unanimous submission to a sufficiently large body of principles and beliefs. History confirms this view. The immobility of civilisation in the Far-East is especially due to the intellectual stability which distinguishes it from our own condition. The societies of Antiquity (Grecian and Roman), rested upon a conception of man, of citizenship and of the world, which, as a matter of fact, scarcely varied during the whole period of their existence. Lastly, in the Middle-ages, Christianity had constituted an admirable spiritual authority. The organisation of Catholicism, "a masterpiece of political sagacity," had established a body of beliefs which all minds accepted with complacent docility. It is the decomposition of this great system which has produced the majority of the evils with which we are now struggling. Mental anarchy is therefore truly an abnormal state, a pathological fact, what Comte will call later on the "western disease," a mortal disease if it is to be prolonged. Either modern society must perish, or minds must regain their stable equilibrium by submission to common principles.

The problem of the organisation of beliefs would seem to come under two heads. In the first place we have the philosophical problem: how to establish a system of principles and beliefs capable of being universally admitted; and, in the second place, a social problem: how to bring all minds into the new faith. But this distinction only appears on the surface. As a matter of fact, the solution of the first problem will necessarily imply that of the second. Does not the principal cause for the lack of common discipline lie in the disorder which troubles the mind of each individual? If intellects are divided among themselves it is because each intellect is divided against itself. Let one of them succeed in establishing a perfect harmony within itself, and by the mere force of logic, this harmony, by gradual diffusion will be communicated to the others—once true philosophy is established, the rest will only be a matter of time. It will therefore suffice to examine the opinions and beliefs which actually exist in *one* mind, and to inquire into the conditions necessary to substitute in it harmony to anarchy, or in a word, to realise within it a *perfect logical coherence*.

As Descartes, in order to test all his knowledge, had only to examine the sources from which it originated, so Comte, in order to verify the logical compatibility of his opinions, will content himself with the consideration of the methods which have furnished him with them. If he discovers methods which mutually tend to exclude each other, he will have found the cause of the mental disorder which gives birth to all the evils we see troubling modern society. At the same time he will have discovered the remedy which will bring about the disappearance of those contradictions. The human mind is so constituted, that the first thing it requires is unity.

Understanding is spontaneously systematic. Opinions merely in juxtaposition in the mind but logically irreconcilable cannot satisfy it. As a matter of fact, the contradiction, even when it is ignored, nevertheless impresses itself. Whether we know it or not, each of our opinions implies a complexus of connected opinions all arrived at by the same method as the one in question; and this complexus is itself part of the more considerable whole which finally completes itself in a comprehensive conception of the world given in experience.

Now Comte saw in himself, as in his contemporaries, two general methods, two "modes of thought" which cannot coexist without contradiction, although neither one nor the other has obtained a full mastery up to the present time. Concerning several categories of phenomena he thinks as a scholar trained in the school of Hobbes, of Galileo, of Descartes and of their successors. He does not seek to explain them by causes. When, by means of observation or deduction, he has arrived at a knowledge of their laws he remains satisfied. For the knowledge of these laws allows him in certain cases to intervene in the phenomena, and to substitute to the natural order an artificial order better suited to his requirements. It is thus that mechanical, astronomical, physical, chemical and even biological phenomena are objects of *relative* and *positive* science for him to-day.

But, as soon as the question is one of facts which originate in the human conscience, or which are connected with social life and with history, an opposite tendency becomes predominant. Instead of solely seeking for the laws of phenomena, our mind desires to explain them. It wants to find the essence

and the cause. It speculates upon the human soul, upon the relation of that soul to the other realities of the universe, upon the end which society should have in view, upon the best possible government, upon the social contract, etc. All these questions arise from the "metaphysical" mode of thought, and this mode is formally incompatible with the preceding one. Yet we see both of them subsisting in our minds to-day.

Social dynamics will show how this condition must have been produced. But whatever the historical reasons may be, the reality is only too evident. The human mind to-day can neither adhere entirely to nor give up entirely one or the other of these two modes of thought. Undoubtedly it feels that the conquests of positive science are "irrevocable." For example, how could it return to a metaphysical or theological explanation of astronomical or physical phenomena? But, on the other hand, metaphysical and theological conceptions seem to it no less indispensable. It does not believe it could do without them. And this is natural. For, to satisfy the desire for unity, which is its supreme requirement, the human mind demands a conception of the whole which embraces all the orders of phenomena, what Kant called a totalizing of experience, in a word a "philosophy."

Now, up to the present time, the positive mode of thought has not shown itself in a position to respond to this demand. It has only produced individual sciences. Positive Science has been "special" and fragmentary, always attached to the investigation of a more or less restricted group of phenomena. With a laudable prudence, which has made her strength, she has applied herself solely to works of analysis and

partial synthesis. She has never ventured upon a synthesis of the whole of the real within our reach. Until now theologies and metaphysics alone have made the effort, and this office is, still to-day, the chief reason of their existence, this office must be fulfilled. The human mind is carried, by a spontaneous and necessary movement, towards the point of view of the universal. Sooner than leave the philosophical problems without an answer, it would remain attached indefinitely to the solutions, chimerical as they are, which the theologies and metaphysics offer him. In short, in the present state of things, the positive mind is “real” but “special.” The theologico-metaphysical mind is “universal” but “fictitious.” We can neither sacrifice the “reality” of science, nor the “universality” of philosophy. Which is the way out of this difficulty?

Three solutions alone are conceivable:

1. To find a reconciliation which will make it possible for the two modes of thought to coexist without contradiction:

2. To re-establish unity by making the theologico-metaphysical method universal:

3. To re-establish unity by making the positive method universal:

II.

The first solution at first sight appears to be the most acceptable. Why should not the positive investigation of the divers orders of natural phenomena be reconciled with a theological or metaphysical conception of the universe? Nothing prevents one from conceiving the phenomena as

governed by invariable laws, and from seeking at the same time, by another method, for the reason which renders nature in general intelligible. Positive science liberated at last from theology and metaphysics, would assure them of the independence which she claims for herself. Thus, with growing precision would be fixed the boundaries on the one hand of the domain proper of positive science, and on the other that of the speculation which goes beyond experience.

This reconciliation, says Comte, has for a long time been considered legitimate, because for a long time it was indispensable. Up to the present time Theology and Metaphysics have been the only comprehensive conceptions of the world which the human mind has formed. They have fulfilled a necessary function. Moreover, without them positive science could neither have originated nor have been developed. But, as she is their heiress, she is also their antagonist. Her progress necessarily involves their downfall. The parallel history of religions and metaphysical dogmas on the one hand and of positive knowledge on the other shows that the conciliation between them has never been a lasting one.

Not that the antagonism between the two modes of thought can be solved by a supreme dialectical struggle in which the theological and metaphysical dogmas would be worsted. It is not thus that dogmas come to an end. They disappear, according to Comte's striking expression, *by desuetude*, as is the case with forsaken methods. As a matter of fact, have they not been as methods for the human mind, which sought within a single point of view to embrace the universality of things before they had

been sufficiently studied? Man demanded from his imagination at first sight an absolute knowledge of the real, which reason could only give him at a later stage, on a very modest scale, entirely relative and after the patient labour of the sciences. But by degrees, as he has advanced in the positive study of phenomena, he has forsaken the theological and metaphysical "explanations." Without relinquishing altogether the search after causes, he has taken the habit of relegating them to more and more remote regions. Already, in what concerns phenomena whose concept has reached a positive stage we can very well do without any assumption of causes. It suffices for us to represent these phenomena to ourselves as subject to laws. When all the phenomena of all orders are habitually conceived in this way, when the idea of their laws, whatever they may be, will have become equally familiar to us, the metaphysical mode of thought will have disappeared.

In a word, as soon as the whole of science shall have become positive, philosophy will necessarily be positive also: For we only have at our disposal *one* point of view concerning things. All our real knowledge bears upon phenomena and their laws. If, therefore, considered one by one, all the orders of phenomena are conceived according to the positive mode of thought, how could it be that considered together, and in their totality, they should be conceived according to a mode of thought completely different, and even inconsistent with the former one?

As a matter of fact, the coexistence of these two modes of thought lasts so long as the positive spirit has not reached its complete expansion, so long as a more or less considerable portion of natural

phenomena is still explained by their essence, their cause, or their end. But this cannot be indefinitely prolonged. The more the positive spirit progresses, the more the theological and metaphysical conception of the world loses ground, and it becomes more evident that we must make our choice. The unity of the understanding the *perfect logical coherence*, are at this price.

The conciliation being set aside, the alternative either to think solely or not at all, according to the positive mode, presents itself. The traditionalists, and especially Joseph de Maistre, saw this aspect of the problem very clearly. Comte gives them very great credit for it. De Maistre admits no salvation for our society except in the complete return to the theological mode of thought. He thus attacks at its very source, or to put it more plainly, in its many sources, the spirit of modern philosophy. He does not spare Locke any more than the philosophers of the XVIII. century who proceed from him, Bacon any more than Locke; the promoters of the Reformation any more than Bacon. He understood that the XVIII. century came as a mighty conclusion of which the XVI. and XVII. centuries were the premisses, and that the great destructive syllogism had originated in a work of decomposition which began as early as the XIV. century. He is therefore perfectly consistent with himself, when he endeavours to combat this diabolical work, and to bring Europe back to the mental and religious condition of the Middle-ages. The re-establishment of the spiritual supremacy of the Pope would put an end to mental and moral anarchy. The catholic doctrine would restore to men's minds that unity which is their supreme need.

This solution fulfils ideally the conditions of the

problem, but, as a matter of fact, the solution is impracticable. The tide of history cannot flow back. In order to bring men's minds once again under the sway of that spiritual power which they freely accepted in the Middle-ages, we should also have to reconstitute the totality of the conditions in which they lived at that time. How can we wipe from the pages of history the discovery of America, the invention of printing, and so many other great social facts? How can we pretend that Copernicus, Kepler, Galileo, Descartes, Newton, and all the heralds of positive Science never existed? And if, presuming what is impossible, we should succeed in restoring the mental and moral unity of Christian society in the Middle-ages, how could we prevent the natural laws which have once brought about its decomposition, from producing again the same result?

We are thus necessarily brought to the third and last solution. Since the conciliation between the positive mode of thought and the other one is impossible; since the exclusive ascendency of the theologico-metaphysical mode of thought is out of the question; since when all is said the human mind needs a philosophy, it follows that that philosophy can only proceed from the positive mode of thought itself. There is nothing, *a priori*, to prevent this solution from being realised. For the last positions of the theologico-metaphysical spirit are surely not impregnable. This spirit, "fictitious" in its essence, never could become "real." The positive spirit is only accidentally "special." It is quite capable of acquiring the universality which it lacks. The new philosophy would then be founded, and the problem of *perfect logical coherence* would be solved.

The whole difficulty thus appears to be in "universalising" the positive mode of thought. To do this it must be extended to those phenomena which are still habitually conceived according to the theologico-metaphysical mode, that is to say, to the moral and social phenomena. This will be Comte's crowning discovery. He will found "social physics." By so doing he will take from theology and metaphysics the last reason of their existence. He will make possible the transition from a positive science to an equally positive philosophy. Thus will be realised "the unity of the understanding," and this mental harmony will carry with it as its consequence the moral and religious harmony of humanity.

CHAPTER II
THE LAW OF THE THREE STATES

In Comte's system the constitution of sociology may be considered at the same time as a terminus and as a starting point. One sees the positive method attaining with it to the order of the highest, the most "noble," the most complicated phenomena: in this sense sociology is the term reached by the positive spirit in its ascent. It thus reaches the summit of the hierarchy of the sciences, and henceforth rules over them all. On the other hand, positive philosophy, possible from this moment, will make this a starting point for establishing the principles of morality and of polity.

"Through the foundation of sociology," says Comte at the beginning of the *Cours*, "positive philosophy will acquire that universal character which it still lacks, and will thus become qualified to take the place of theological and metaphysical philosophy, whose only real property to-day is this universality,"[10] and at the end of the *Cours* he concludes: "The creation of sociology endows with fundamental unity the entire system of modern philosophy."[11]

This creation, upon which everything else depended, dates from the time when Comte discovered *the law of the three states* as it is called. For, once this law is established, "social physics" ceases to be a mere philosophical conception, and becomes a positive science. This law had been anticipated and even already formulated in the XVIII.

century by Turgot, then by Condorcet, and by Dr. Burdin. Comte, nevertheless, takes to himself the merit of the discovery. As he is generally most precise in doing full justice to his "precursors," we must admit that, according to him, none of them had seen the scientific importance of this law. It certainly is one thing to gather the notion of a law out of a number of facts, and another to understand its capital importance, and to discern in it the fundamental law which governs the whole of the evolution of humanity.

This is the way in which Comte enounces it, in the *Plan des travaux scientifiques nécessaires pour réorganiser la société* (1822).

"According to the very nature of the human intellect every branch of our knowledge must necessarily pass successively in the course of its progressive development, through three different theoretical states: the theological or fictitious state, the metaphysical or abstract state, finally the scientific or positive state."[12]

In the first lesson of the *Cours de philosophie positive*, after having reproduced this statement, Comte adds: "In other words the human mind, by its nature, in each one of its researches makes use successively of three methods of philosophising, essentially different and even opposed to each other: firstly, the theological method, next, the metaphysical, and lastly the positive. Hence we find three kinds of philosophies, or general systems of conceptions of the totality of phenomena, which mutually exclude each other. The first is the necessary starting-point of human intelligence, the third, its fixed and final state; the second is solely

destined to serve as a transition."[13]

The words "theological" and "metaphysical" are here taken in a particular sense, strictly defined.

Comte calls "theology" a general system of conceptions concerning the universality of phenomena, which explains the appearance of these phenomena by the will of gods. He has not in his mind theological speculation as one usually understands it, as a rational or sacred science. He does not in the least dream of a study of revealed truth. He only designated by this name an interpretation of natural phenomena by means of supernatural and arbitrary causes. Theological—that is to say—fictitious. Elsewhere Comte calls this mode of explanation "imaginary" or "mythological." It is in this sense that he could ask if each one of us did not remember having been in regard to his most important notions, a theologian in his infancy, a metaphysician in his youth, and a physicist in his manhood?[14] Comte does not allude to the religious traditions which the child receives from his parents, but indeed to the spontaneous tendency which causes him in the first place to explain natural phenomena by wills, and not by laws. Theology is here synonymous with anthropomorphism in the conception of causes.

Similarly Comte does not take the word "metaphysics" in the most usual extension of its meaning. The science of Being as such, the science of Substance or of first Principles, is not here in question, at least directly. He only refers to a certain mode of explaining phenomena given in our experience. For example, in physics, the hypothesis of an ether to explain optical and electrical

phenomena is metaphysical. So it is in physiology with the hypothesis of a vital principle, or, in psychology, with the hypothesis of a soul. "Metaphysical or abstract," says Comte. At bottom this mode of explanation is no other than the preceding one, but more and more pale and colourless, vanishing, so to speak, as natural phenomena, better observed, are referred no longer to capricious wills, but to invariable laws.

Let us then be careful not to give here to the words "metaphysics" and "theology" their full meaning. For instance, to conclude from the law of the three States that the evolution of humanity ever carries it further from theology, to end in a final state wherein religion should have no place is singularly to misapprehend Comte's doctrine. On the contrary the evolution of humanity is leading it to a state which will be pre-eminently religious. In it religion will regulate the whole life of man. Comte perhaps would not refuse to define man, as has often been done, as a religious animal. The history of humanity may be represented, in a sense, as an evolution which proceeds from primitive religion (fetichism) to final religion (positivism). But the object of the law of the three States is not to express the religious evolution of humanity. It is only concerned with the progress of the human intellect. It sets forth the successive philosophies which that intelligence has been obliged by turn to adopt in the interpretation of natural phenomena. It is, in a word, the general law of the evolution of *thought*.

Those who made a mistake about it probably only considered this law in the first lesson of the *Cours*, where it is separately presented. But the error is no longer possible when one refers to the fourth volume

of the *Cours*, where the law is put in its place, in social dynamics, especially in the fifty-eighth lesson, in the sixth volume.

It is not, however, without reason that Comte set forth this law in the first pages of his *Cours de philosophie positive*. In sociology as he conceives it, the law of the intellectual evolution of humanity, that is to say the law of the three States is the essential law of dynamics, and therefore of the whole of social science. For, of all the social factors of which the concomitant and joint evolution constitutes the progress of humanity, the intellectual factor is the most important. It is the dominant one, in the sense that the others depend far more upon it than it does upon them. The history of art, of institutions, of morals, of law, of civilisation in general could not be understood without the history of intellectual evolution, that is to say of science and of philosophy, whereas this one, strictly speaking, would still be intelligible without the others. This evolution is therefore the principal axis around which the other series of social phenomena are arranged. Thus the law which expresses it is the most "fundamental," the most "general," in the precise sense in which Comte understands this word. In enunciating this law he declares legitimate by anticipation the existence of a social science. He proves *ipso facto* not only that it is possible, but that it already exists. Hence the eminent position which he gives to the law of the three states.

II.

The demonstration of this law presents itself under two distinct forms. In the first place Comte supports

his argument by history. This proves indeed that every branch of our knowledge passes in turn through the three states, with never a single retrogression. It is true that much of our knowledge has not yet reached the positive state. But at any rate it is established that up to the present even those sciences which have not yet reached that state have all described the same curve, already described by those that have reached it.

Historical verification would suffice, if necessary, provided it were complete. Comte is not satisfied with it. He claims moreover to deduce the law of the three states from the nature of man. He will thus give a direct demonstration of it. However useful history may appear to him as an instrument of proof, he still wishes to render its verdict intelligible. To reach this end he has recourse to psychology. "We ought," he says, "carefully to characterise the general motives, drawn from an exact knowledge of human nature, which must have rendered partly inevitable, partly indispensable, the necessary succession of social phenomena, considered directly with respect to the intellectual development which dominates essentially their chief advance."[15]

In the first place, the human mind could only begin to interpret nature by a philosophy of the theological type. For it is the only one which is spontaneously produced, the only one which does not presuppose another. Man at first conceives all activity on the same plan as his own. In order to understand phenomena, he likens them to his own actions, whose mode of production he thinks he apprehends, because he has the feelings of his own efforts and the consciousness of his own volitions. This anthropomorphic explanation comes so

naturally to us that we are always ready to give way to it. Even to-day, if we forget positive discipline for a moment, if we venture to ask for the mode of production of some phenomenon, we immediately dimly imagine an activity more or less like our own. And among the metaphysicians who profess to give an idea of God, the most consistent, according to Comte, are those who make a person of Him.

The spontaneity which characterises the theological mode of thought has been extremely useful. Without it, we do not see how man's intelligence could have begun to unfold itself. For, in order to form a scientific theory, however modest and fragmentary, of natural phenomena, the mind needs previous observations, while, on the other hand, in default of a theory, or at any rate of a preexisting hypothesis, no scientific observation is possible. Absolute empiricism, says Comte, is barren, and even, strictly speaking, inconceivable. Simple collections of facts, however numerous we may suppose them to be, do not possess by themselves any scientific significance. Such, for instance, would be the case in the meteorological facts, making interminable lists, and filling volumes. They would only become observations if in collecting them the mind tried to put upon them some interpretation, however vague or precise, real or chimerical.

Caught between the two equally imperative necessities of observing in the first place in order to reach "suitable conceptions", and of conceiving at the same time some theory in order to make coherent observations, the human mind saves itself by the theological mode of thought. For it has no need of previous observations to imagine everywhere in nature activities similar to its own. Once this

hypothesis has arisen, observation comes into play, first to confirm it, but soon to oppose it. From that moment the impulse has been given. The evolution of the sciences and of philosophy will be continued through doctrines which will succeed each other in a necessary order.

In the same way, from the moral point of view, a theological philosophy alone could at first inspire weak and ignorant humanity with sufficient courage and confidence to shake off its primitive torpor. To-day, if man knows that phenomena are subject to invariable laws, he also knows that a knowledge of these laws gives him a certain control over nature. But in the days when man could not foresee the power of science, the idea that phenomena obeyed necessary laws would have filled him with despair. It would probably have paralysed him for all exertion. The theological mode of thought was far more encouraging since the phenomena are imagined to be arbitrarily modifiable. Anything may happen. Nothing is impossible, neither is anything necessary. The will of the gods suffices for a thing to happen or not to happen. Directly, man has no power over nature; indirectly he can do everything, provided only that he can propitiate the divinities whose will is law. In this way, it is at the moment when man's impotence is greatest, that his confidence in his own power is the strongest.

Finally, from a social point of view, theological philosophy was indispensable for human society to subsist and to be developed. For this society does not merely imply sympathy of feeling and union of interests among its members, but first and above all unanimous adhesion to certain beliefs. Without a "certain system of common preliminary opinions"

there can be no human society. But, on the other hand, how can we conceive the appearance of such a system, if social life is not organised? Here is a new vicious circle, out of which the theological philosophy alone can release us. It constitutes at first sight a totality of common beliefs. All the members of the society defend them all the more energetically, because with them are bound up their hopes and their fears, for this world, and for the next, if they already believe in it.

At the same time, this theological philosophy determines the formation, in society, of a special class, consecrated to speculative activity. What an immense progress this division between practice and theory must have been, however roughly outlined! Such a division was established as soon as a sacerdotal class began to be distinguished from the rest of the social body. And how slow this progress must have been, when we see even to-day how hard it is for men to accept any innovation which does not seem to carry with it any immediate practical advantage! The sacerdotal class, invested, by the nature of its functions with an authority which was precious for social progress, at the same time enjoyed that leisure which is indispensable for theoretical research. “Without the spontaneous establishment of such a class,” says Comte, “all our activity, thenceforth exclusively practical, would have confined itself to the improvement, very soon checked, of some processes having reference to military or industrial life.”[16] The subsequent division of labour depended upon this initial step. Our savants, our philosophers, our engineers descend from the first priests, sorcerers and rain conjurors.

Thus, given the nature of Man, the theological

philosophy was bound to appear *spontaneously*. This appearance was at the same time "inevitable and indispensable," in a word, necessary. Immediately begins what one might call the dialectics of the intellectual history of humanity. The theological philosophy has made possible the observation of phenomena. In its turn, this observation introduces the idea of invariable laws into the mind, whereby the theological philosophy begins to be compromised. The time comes when it appears antiquated and pernicious and reason tends to take the place of the imagination in the interpretation of nature. The more evolution advances, the more marked becomes the preference of the human mind for the positive mode of thought, and, in the several orders of the sciences, after a more or less prolonged conflict, this latter ends by obtaining the ascendancy.

As a matter of fact, the theological stage of our knowledge, even when it exercises its greatest dominion, that is to say, at the time nearest to its origin, already contains the germs of its own decomposition. It is never perfectly homogeneous. There are very common phenomena whose regularity man has never failed to recognize, and which he has never conceived as depending upon arbitrary wills. Comte likes to quote a passage from Adam Smith, where that philosopher remarks that in no time and in no country do we find a god of Weight. Moreover, since the existence of society, man must have had some idea of psychological laws since he was obliged to regulate his conduct according to the way in which his fellows thought and acted. Consequently "the elementary germ of positive philosophy is quite as primitive, at bottom, as that of theological philosophy, although it could only be developed very much later."[17] Not being universal, theological

philosophy could only be provisional. The philosophy, that is to say, the method of interpretation of natural phenomena, will alone be final, which will be applicable to all phenomena without exception, from the most simple to the most complicated. For this philosophy alone will realise the unity demanded by the understanding.

The passage from theological to positive philosophy is never suddenly accomplished. Their opposition is too sharply defined, and our intelligence does not lend itself to such an abrupt change. The metaphysical state serves as a transition. This state is distinguished from the two others, in that it has no principle proper which defines it. Theological philosophy is sufficient to itself. It forms a harmonious whole, at least so long as the germ of positiveness which it contains has not yet revealed its activity. In the same way, the positive state will be perfectly homogeneous. On the contrary, the metaphysical state is only described by a mixture of the two others. “The metaphysical conceptions,” wrote Comte in 1825, “proceed at the same time from theology and physics, or rather are only the former modified by the latter.”[18] Under ever varying and progressively attenuated forms, metaphysics procure the indispensable conciliation in order that the theological and positive philosophies may coexist in men’s minds, so long as the latter is not perfectly worked out. Under cover of metaphysical hypotheses, the scientific method has been able to push its conquests, without greatly alarming the defenders of theological philosophy. Thus metaphysical speculation has a very active critical quality. It has not slightly contributed to the decomposition of the ancient system of beliefs. In this sense, Comte regards the French philosophers of

the XVIII. century, for the most part, as excellent representatives of the metaphysical spirit.

Nevertheless, if we must refer this intermediate stage to one of the two extremes, Comte does not hesitate to approximate it to the theological stage. As a matter of fact, metaphysical philosophy substitutes entities to will, and Nature to the Creator, but with a very analogous function. It supplies, at bottom, the same "explanation" of the real, although weakened by a stronger and stronger sense of the need of natural laws. This equivocal method preserves theology, "while destroying its principal mental consistency." It denies the consequences in the name of the principles. Moreover, it offers no guarantee against an offensive return of theological conceptions, so long as they have not been replaced by positive notions. In the final conflict between the theological spirit, and the positive spirit, the metaphysicians will probably be seen, with the Deists, involved in a retrograde concentration."[19] "Positive philosophy," says Comte, "has neither historical nor dogmatic solidarity with this negative philosophy, and can only contemplate it as a final preparatory transformation of theological philosophy."[20]

Thus the metaphysical stage is never other than an unstable compromise. It only lasts on condition that it changes continually. In default of a principle of its own, metaphysical philosophy is purely critical in character. As a fact, there are but two philosophies, that is to say two methods, two organic modes of thought. Only theological philosophy and positive philosophy allow the mind to construct a logical and harmonious system of ideas, the basis of a morality and of a religion. The theological spirit is "ideal in its

advance, absolute in its conception, arbitrary in its application." The positive spirit substitutes the method of observation to that of imagination, relative notions to absolute notions. It does not flatter itself with unlimited dominion over the phenomena of nature; it knows that its power is measured by its knowledge. The intellectual history of humanity shows by what stages it has passed from the former mode of thought to the latter.

III.

Comte regards the law of the three stages as demonstrated. "Seventeen years of continuous meditation on this great subject," he writes in 1839, "discussed under all its aspects, and subjected to all possible tests, authorise me to affirm beforehand, without the slightest scientific hesitation, that we shall always see confirmed this historical proposition, which now seems to me as fully demonstrated as any of the general facts actually admitted in the other parts of natural philosophy."[21] It could only be doubted if we found any branch of our knowledge which had gone back from the metaphysical to the theological state, or from the positive state to either of the two preceding states. But this case has never presented itself. The theoretical demonstration of the law has established that it *could not* present itself.

Indeed this demonstration has shown that the successive advance through the three stages, in invariable order, was the necessary form of progress of the human mind in the knowledge of phenomena. It is founded upon the nature of the mind. In Comte's thought, the law of the three states could therefore

have been equally called psychological or historical.

But we are not here concerned with introspective Psychology, which uses self-consciousness as a means of investigation. Comte does not recognize any scientific value in this method.[22] He even denies its possibility. Moreover the observation of a subject by himself, were it possible, would be of no help in the present case. For it would only reveal to him the present state of his individual intellect, and not the law of the evolution of the human mind. For this law to become manifest, we must consider not the individual, but the species. Giving up a fruitless effort at self-contemplation in its activity, the intellect must grasp the law of its successive phases in the progress of what it has produced. The philosophical history of our beliefs, of our conceptions, and of our systems: such is the consciousness which the human intellect can have of itself. There only, the philosopher sees the faculties of which this intellect contained the germ coming into play by turns, to reach a "durable harmony." Then, once discovered, the law of the three States helps us to understand the intellectual evolution of each individual, and the study of the individual then furnishes us with a supplementary verification of the law. But, by itself, this study of the individual could not have established it. Whatever utility I may have often derived from the consideration of the individual, says Comte, it is evidently to the direct study of the species that I owed, not only the fundamental thought in my theory, but afterwards its specific development.

The law of the three States is then the general formula of the progress of the human intellect, considered not in an individual subject, but in the

universal subject, which is humanity.

It is indeed also the "universal subject" that Kant has studied in his *Critic of Pure Reason*. But Kant's method is altogether abstract and metaphysical, the universal subject of which he seeks the laws is a human mind "in itself," considered in its essence. Comte, on the contrary, represents the universal subject as a concrete unity, which realized itself in time. For him, the study of the mental functions characteristic of man only becomes positive when it is carried out from an historical and sociological point of view. That is why the discovery of the law of the three States is an event of capital importance. It inaugurates the positive science of humanity, which was an indispensable condition for positive philosophy to be established. It marks the time when, all phenomena being henceforth studied after the same method, the "perfect logical coherence" is definitely assured. This law of social dynamics is the corner-stone of the whole positive system.

CHAPTER III
THE CLASSIFICATION OF THE SCIENCES

According to the law of the three States, all our conceptions in the different orders of knowledge, begin by being theological, pass through the metaphysical transition, and end by becoming positive. If this evolution were terminated at the presented time, the philosophy which Comte wishes to found would be *ipso facto* established. But we are far from such a state of things. On the contrary, the three modes of thought theological, metaphysical, and positive, coexist, still to-day, even in the most cultivated minds. In a different measure, all lack the "logical coherence."

Even in those sciences where the positive method has been finally and for a long time established, in physics, and in chemistry, for instance, we observe undoubted traces of the metaphysical spirit. To a still greater degree this spirit is manifested in what are called the moral and social sciences. Nevertheless, this "incoherence" cannot last. Now that the positive spirit has assumed full consciousness of itself, it is possible to proceed with a systematic purification, which will disentangle it from the theological and metaphysical spirit.

But is not this critical review of the whole of human knowledge an enterprise above the powers of a man?—Happily positive philosophy itself furnishes a means of lightening the task. It establishes an order which allows us to determine without too much trouble to what degree of positiveness the conception

of a given category of phenomena has reached up to the present time. Comte calls this order the classification, or, more precisely the "positive hierarchy" of the fundamental sciences. It is "the plan which he will follow in the exposition of positive philosophy."[23]

This plan is not a simple artifice destined to make the entirety of the doctrine clearer, or its exposition easier. It is not external to the work. It is born from the very spirit of positive philosophy; it expresses the spirit of that philosophy in a new form. It is the natural complement of the law of the three States. Comte puts it in plain words: "The different branches of our knowledge have not been able with equal rapidity to pass through the three great phases in their development, nor consequently to reach simultaneously the positive state. There exists, in this respect, an invariable and necessary order, which our different kinds of conceptions have followed and have been obliged to follow in their progress, and of which the exact consideration is the *indispensable complement* to the fundamental law previously enounced."[24]

Comte did not, like his contemporary Ampère, set himself the logical problem of the classification of the sciences in their entirety. He did not seek according to what principle we could arrange them all in an order where the fact of their respective subordination would be maintained. He even doubts how far such a principle exists, and he is so far from thinking of establishing a complete classification of the sciences, that he begins by leaving out the greater number of them. He first sets aside all forms of human knowledge which refer to art, that is to say all the applied sciences, practical and technical.

Similarly he sets aside all the concrete sciences, such as zoology, mineralogy, geography, etc. He only places within his classification the *theoretical and abstract* sciences, that is to say those which have no other object but the knowledge of laws, and which study phenomena, exclusive of the concrete beings in which these phenomena present themselves. Comte calls them "fundamental" because the other sciences suppose their existence, whereas the abstract sciences do not suppose the existence of the others before them.

These sciences are the only ones whose consideration is of consequence to the end which Comte has in view. For why does he need a classification of the sciences? It is in order to study the ascent of the positive spirit through the successive orders of phenomena. For this, he has no occasion to consider the applied or concrete sciences, which receive their principles from the theoretical and abstract sciences. It suffices for him to be concerned with these. It is in the methods and the progress of these sciences that the characteristic efforts of the human mind have been manifested; and it is therefore here that we can grasp the laws of its evolution.

In order to classify the fundamental sciences, Comte will conform to the principles of the positive method. He will be guided by the rational classifications of which the model is to be found in the natural sciences. The classification must spring from the very study of the objects which are to be classified, and must be determined by the real affinities and the series of connected links which they present, in such a way that this classification may itself be the expression of the most general

truth, made manifest by the searching comparison of the objects which it embraces.

Comte will not therefore stop to consider the classifications which have preceded his own. In the first place, when they appeared, the rational method of classification was not established. Further, how could anyone have united the whole of the sciences into an encyclopædic conception, when some had already reached the positive state, while others remained in the theological or metaphysical states? How could anyone rationally arrange heterogenous conceptions in a single system?

Those premature attempts were doomed to failure. In order that the undertaking might succeed, it was necessary that *all* our conceptions, relating to the various orders of phenomena should have reached the positive form. Here again, the creation of sociology has been the decisive event, for it has allowed the series of fundamental sciences to be made complete. The discovery of the law of the three States has founded sociology, and at the same time it has accomplished the homogeneity of human knowledge. In its time, this homogeneity renders possible the rational classification of the sciences.

II.

Henceforth, the fundamental sciences are all conceived as equally positive. They have all given up the pursuit of the absolute for the study of the relative, and the search after causes for the knowledge of laws. All now proceed by means of the same general methods and their differences can therefore only arise from their object, that is to say

from the nature of the phenomena which are studied. Consequently their relations of mutual dependence will solely result from the relations of these phenomena. Now, observation shows us that these phenomena form themselves into a certain number of natural categories, such that the rational study of each category presupposes a knowledge of the laws of the preceding category, and that a knowledge of this one is in turn presupposed for understanding the one that follows. This order is determined by the degree of generality of the phenomena, from which their successive dependence upon each other results, and as a consequence the greater or lesser simplicity of each science results from it also.

Upon this principle, the encyclopædic ladder of the fundamental sciences is easily constructed. After the mathematics, in an order of diminishing generality and of growing complexity, come astronomy, physics, chemistry, physiology or biology, social physics or sociology. The first science considers the most general, the most simple, the most abstract phenomena, and those furthest removed from humanity. They influence all the others, without being influenced by them. The phenomena considered by the last are the most particular, the most complicated, the most concrete, and the most directly interesting for man; they depend more or less upon all the preceding ones. “Between these two extremes, the degrees of specialisation, of complication, and of individualisation, are in an ever-growing quantity.”

This classification is confirmed, in fact, by the general usage of learned men. It reproduces the historic order of the development of the sciences. Thus, for a long time, mathematics was the only

science of a positive type. On the other hand, social science has been the last to reach this point. Nevertheless, Comte does not mean to say that the fundamental sciences came into existence one after the other, nor that, for every one of them, each period is sufficiently explained by the period immediately preceding it. His thought is very different. On the contrary, he represents the development of the several sciences as simultaneous. They act and react one upon another in a thousand ways. Often some progress in a science is the direct effect of a discovery made in an art which has apparently no affinities with it. Such is, to quote an example which Comte could not in the least have foreseen, the progress of astronomical observations due to photography. In fact, the history of a science during a given period is closely allied to that of the other sciences and arts during the same time, or rather, to be more explicit, to the general history of civilisation. But their respective transitions to the positive state is accomplished in the order set forth in the classification. For individually they could not reach this state, if the fundamental science immediately preceding had not attained to it before them. “It is in this order that the progress, although simultaneous, must have taken place.”[25]

III.

Mr. Herbert Spencer has made several objections to Auguste Comte’s classification of the sciences; Littré has lengthily refuted them. It is not in our design to reopen this discussion. But it results from the preceding explanations that the greater number of Mr. Spencer’s criticisms miss the mark, perhaps because he has not read Comte properly. On his own

admission, he only knows the two first lessons in the *Cours de philosophie positive* in the text, further the inorganic Physics and the first chapter of the Biology in Miss Martineau's condensation, and finally the remainder in Lewes's summing up in his *History of Philosophy*.[26] If Mr. Spencer had been able to obtain a knowledge of the *Cours de philosophie positive* in its entirety, and especially of the three last lessons, or at least of the *Discours sur l'Esprit positif* or of the *Discours sur l'ensemble du positivisme* he would probably have appreciated differently the positive classification of the sciences. His own classification, in which he includes the concrete and concrete-abstract sciences, is not really opposed to that of Auguste Comte who only wished to classify the fundamental *abstract* sciences. Comte never sought to do what Mr. Spencer reproaches him with not having done.

Among Mr. Spencer's objections, there is one which, bearing upon the very conception of the classification of the sciences, shows very clearly the misunderstanding which we are pointing out.

Mr. Spencer insists upon the "anthropocentric" character of Comte's classification, which is indeed remarkable; and he is surprised at what appears to him to be a glaring contradiction. Is not the conception of things from man's point of view, one of the essential forms of the theological mode of thought, according to Comte himself? Does not positive philosophy teach that man must not consider himself as a sort of "imperium in imperio," but as a being subordinate to the whole of nature? If therefore we must substitute the objective to the subjective point of view in which man at first spontaneously places himself, how can the

classification of the sciences be at the same time "anthropocentric" and positive?

This objection would perhaps be a strong one against positive philosophy as Littré understood it. Against Auguste Comte it has no force, for he accepts it. He admits that his classification presents these two characters at the same time, and he does not think that in so doing he is contradicting himself. We must only distinguish with him two successive and different periods. So long as positive philosophy is in process of formation, (that is to say so long as the positive spirit remains special) it is quite true that it is orientated from the objective point of view, in other words, that it goes from the world to man. During this period, it is indeed opposed to the naïve belief which makes man the centre and the end of the universe. But, when from special the positive spirit has become universal, when it has risen from science to philosophy, when sociology is at length founded, and when the understanding realises, from the positive point of view the logical unity which is indispensable to it, this unity is only completed when, in its turn, it takes man for its centre.

Considered as an exact reproduction of the real world, says Comte, our science is not capable of being completely systematised; and in this sense we must not seek for any unity save that of method, aspiring only to homogeneity and to the convergence of the different doctrines. It is otherwise in regard to the inner source of human theories contemplated as the results of our individual and collective mental evolution. "Thus referred, not to the universe, but to man, or rather to humanity, our real knowledge tends on the contrary towards an entire systematization. We must then conceive a single

science, the human science, more precisely social, of which our existence constitutes at once the principle and the end. Into this human science the rational study of the external world becomes fused, at once as a necessary element and a fundamental preamble."[27]

Comte would therefore not have repudiated, for his classification of the sciences, the qualification of "anthropocentric" on condition that it were understood. It is no longer the spontaneous subjectivism from which the theological philosophy starts; it is the conscious subjectivism to which the positive philosophy attains. It has the merit of uniting in itself the two methods called objective and subjective. The former has been in the ascendant during the long evolution of the sciences, which were by degrees and successively reaching the positive state. The latter allows us to concentrate the aim of the distinct sciences thus constituted into a supreme science, which subordinates all the others to itself, without absorbing them.

IV.

The classification of the sciences is, at the same time, a plan for the setting forth of the positive philosophy, and a complement of the law of the three States. But, while this law expresses the *progress* of the human intellect in the constitution of science and philosophy, the classification supposes that science and philosophy are already constituted. It expresses their *order*, and enunciates from the static point of view what the law formulates from the dynamic point of view. It shows the relations of the various elements of philosophy among themselves, and to the whole.

So long as this idea of the whole was not defined, that is to say, so long as positive science remained special, these relations could not be rationally established. But, once sociology was created, and with it positive philosophy, it became possible to embrace the whole of the fundamental sciences in a single conception. For, from that time, they can be represented as being various aspects of the development of the human intellect.

Truly, the object of science is single, and the divisions which are introduced into it for our convenience, without being arbitrary, are artificial. All the branches of our knowledge, that is to say all the fundamental sciences, must be considered as issuing from a single trunk. Not that these sciences can ever be reduced one to another. It suffices that they be homogeneous, and their homogeneity results from their subjection to the same method; further, from their tendency towards the same end, and finally, from their subordination to the same law of progress. In respect to the last and highest of these sciences, the others "must only be finally regarded as indispensable preliminaries in a progressive order."[28]

Thus the ladder of the fundamental sciences represents, in Comte's mind, the methodical ascent of the positive spirit towards universality and unity. It is a hierarchy, a *scala intellectus*, according to Bacon's expression. It includes the whole of the "philosophia prima" also foreshadowed by Bacon and vainly sought after by philosophers.

The memory of Bacon does not prevent the preponderating influence in this conception of Comte from being that of Descartes. Comte is far from ignoring it. He calls himself the continuator and by a

dreadful barbarism, the *completer* of Descartes.[29] Undoubtedly Descartes had not like him conceived the series of the fundamental sciences. After having applied a positive method to the study of inorganic nature, and even of living nature, for the rest he had reverted to a metaphysical method. But this "cartesian compromise" could only be provisional. None the less to Descartes belongs the merit of having definitely acquired several orders of phenomena for the positive spirit, and of affirming the unity of science at the same time as the unity of method. He was unable himself to realise this twofold unity, for its time had not come, and the necessary conditions had not yet been brought together. Moreover in the cartesian idea of science metaphysical elements subsist, and Descartes wrongly believed that the universal method was to be obtained by a transformation of the mathematical method.

Comte takes up the leading ideas of Descartes again, and, at the same time, he corrects them, according as the progress of the positive spirit during two centuries enabled him to do. The position of "leading science," if this expression can be allowed, passes from mathematics to sociology. Moreover, the unity of science, as Comte conceives it, no longer prevents the fundamental sciences from being irreducible to one another. This unity is sufficiently secured by the homogeneity of the sciences, which form a continuous series, an "encyclopædic hierarchy," and which are all subordinated to the final science. Lastly the unity of the positive methods does not imply its uniformity everywhere. Each fundamental science, as will be seen further on, has its methods which are special to itself.[30]

The classification of the sciences thus shows how positive philosophy stretches back over the XVIII. cent., whence it springs, to link itself with Bacon and Descartes. Comte has retained Bacon's view on this point, that all scientific knowledge rests upon facts which have been fully observed, and that a system of positive sciences constitutes the indispensable basis for the only philosophy which is within our reach. To Descartes he here owes the idea of the unity of method and of the unity of science. We might almost say that he has received from Bacon his idea of the contents of the sciences and from Descartes his idea of their form. By what means did he invest such matter with such a form? The answer to this question is found in the positive theory of science.

CHAPTER IV
SCIENCE

We may admit, with Aristotle, that curiosity is natural to man, and that we are inclined to inquire into things for the pleasure of knowing them. But it must be admitted, adds Comte, that this inclination is one of the least active and the least imperative in our nature. It must have been still less so in the beginning of mankind's development; and it was, in any case, much weaker than the inclination to laziness, or than the repugnance to accept anything new. It has therefore been necessary, in order that man might emerge from his primitive intellectual torpor, that the activity of his mind should be induced and even compelled to exert itself by pressing circumstances. Such were undoubtedly the necessities of hunting, the dangers of war, and in a general way, the desire to avoid suffering and death.

Moreover, the knowledge which the human mind acquires at first is only very imperfectly real; for theological philosophy furnishes the mind with its first conceptions. Man begins by supposing everywhere wills like his own, and the world which surrounds him is peopled with gods or fetishes. Nevertheless, from this first period, the rudiments of a more positive knowledge already appear. In every order of phenomena some are very simple and of such striking regularity, that evidently no arbitrary will intervenes in their working. Man must very quickly have had a "real" idea of these phenomena. In all the other cases instead of observing the phenomena he imagined the mode of their

production; but here he observed the sequences and concomitances which he could not resist; and he regulated his conduct upon this observation. From this humble beginning science came into being.

In this way, far from opposing scientific thought to common thought, as most of the philosophers do, Comte, without disregarding the special character of one and of the other shows that both spring from the same source, and that they do not present any essential point of difference. However abstract and however elevated science may become, it always remains, according to him, a "simple special prolongation" of good sense, of common sense and of "universal wisdom." The character of "positivity," by which scientific knowledge is distinguished from theological and metaphysical conceptions, belongs also to popular wisdom. Like this wisdom, which the practical necessities of life have formed, science abstains from searching after the causes, the ends, the substances, and whatever is beyond the reach of verification by experience. Its efforts bear exclusively upon the laws of coexistence and of succession which govern the phenomena. And again it is from this wisdom that it has borrowed the spirit of its positive method, which consists in observing facts and in systematising observations to rise to the concept of laws.

It follows from this that science contains within itself neither its starting-point nor its terminus. Both are given it by "common sense" whence it springs. The starting-point is the spontaneous observation of constant relations between the most simple phenomena. The terminus is the knowledge of these same relations among all given phenomena, as complete and as precise as our requirements

demand. Indeed the common sense, or the popular wisdom, is soon baffled by the complexity of phenomena. If we had no other guide we should know very little, and in nearly all cases we should be reduced to a kind of empirical divination. The function of science is to substitute a real knowledge of laws to this divination.

This function would never have been fulfilled if the human mind had not possessed the property of being able to separate theory from practice. Undoubtedly the former proceeds from the latter. As has been said, every science is born from a corresponding art, and from the desire to perfect it. But this perfecting would not have gone very far, if the human mind had never lost sight of it. Happily, man is capable of temporarily forgetting his immediate interests in the pursuit of knowledge. By degrees, from the complexity of concrete cases, he has learnt to disengage the elements common to a whole class of phenomena. He has thus formed the idea of law, or the invariable relation between given phenomena. Beyond the intellectual satisfaction which this knowledge gave him, he found in time applications of it which he would never have imagined beforehand. To quote an example from a civilisation already very advanced, when the Greek geometers patiently applied themselves to the study of conic sections, did they suspect that their labours would one day serve in calculating certain astronomical determinations upon which the safety of mariners would depend?

In this way, science, utilitarian in its origin, since it sprang from the practical needs of man, utilitarian in its end, since it aims at providing for those needs, has nevertheless been unable to develop itself and

will be unable still to do so in the future, except by neglecting this very utility. Better to fulfil its destiny, it must provisionally forget it; and it will be the more useful, in the long run, in proportion as it will have been the more disinterested. We never know, *a priori*, if a discovery which finds no application to-day, combined later with another one, will not be of capital interest for mankind. Therefore it is of the highest importance that theoretical order should remain clearly distinct from the practical order.

That is why Comte regarded the appearance of a sacerdotal class, specially occupied with speculative research, as a decisive moment in history of humanity. It matters little that these researches should have remained chimerical and absurd during long centuries. The essential point was that the human mind should form and keep the habit of disinterested speculation, that it should not rest content with immediately applicable knowledge, and that it should exert itself towards a theoretical conception of nature, however simple at first that conception was bound to be.

Thus, science has, properly speaking, two roots, the one practical, the other theoretical. If it originated in the primitive arts, it is no less closely allied with primitive philosophy. It still bears features which enable us to discern this twofold filiation. On the one hand, it has remained *speculative* as was the theological philosophy which first dominated over the human mind. Only this speculation has gradually abandoned everything except the laws of phenomena, and it has ended by undermining the theological conceptions from which it came. On the other hand, science has remained *real*, like the popular wisdom which gave it birth.

But, while dealing with given phenomena in experience, it has developed in the direction of theory. Instead of only considering scenes of concrete objects, it has resolved them into their elements. A more and more powerful analysis has raised it to the consideration of laws more and more general and abstract. Thus, while the popular wisdom is limited to empirical generalisations, a science such as, for instance, astronomy discovers the law which governs the whole of an immense order of phenomena.

From this general idea of science the following consequences at once follow:

1. Science is the collective work of humanity. It bears upon an object common to all: Reality. It employs the method common to all: the positive method. All intellects work in the same manner on a common ground. It is what Comte calls "the profound mental identity of learned men with the crowd whose destiny fulfils itself in active work.[31]" The progress of the scientific mind is a methodical extension of popular common sense to all subjects accessible to human reason. But here method does almost everything. "The whole superiority of the philosophical mind over the popular common sense results from a special and continuous application to common speculations, in starting prudently from the initial step, after having brought them back to a normal state of judicious abstraction, for the purpose of generalising and coordinating. For, what ordinary intellects chiefly lack, is less the precision and penetration appropriate for discerning partial approximations, than the aptitude for generalising abstract relations, and for establishing a perfect logical coherence among our various notions."[32]

The germ of the highest scientific conceptions is often to be found in common reason. Comte delights in giving as an example one of the discoveries which he most admires, Descartes' invention of analytical Geometry. To determine at every moment the position of a point in space by its distance from fixed axes: is not that what geographers have been doing for so long in order to determine the longitude and latitude of a place upon the terrestrial sphere? And has not this proceeding itself been suggested to the geographer by simple common sense? For he instinctively seeks to mark the inaccessible points which interest him, by means of their distance from given points or lines. From this the idea of the Cartesian co-ordinates only differs by a superior degree of abstraction and of generality.

Thus all men must be regarded as collaborating in the discovery of truth as much as in making use of it. Speaking generally, if the great philosophers and scientific men of genius seem to be the intellectual guides of humanity, it is because they are the first to be affected by each mental revolution. They are the first to pass from a traditional to a new attitude and their example is decisive. But, says Comte, "the changes relating to the method of thinking with originality only become manifest when they are almost accomplished." The great men whose names are justly authors attached to are, however, more the heralds than the of these changes.

2. Science is the work of all: it must therefore be accessible to all. It is a patrimony common to the whole of mankind; and the inheritance must be taken from no one. As a consequence, the State owes scientific instruction to those who are not in a

position to procure it for themselves. Not that all men, all the people ought to acquire a deep knowledge of the several fundamental sciences, like those who make it the particular occupation of their lives. The impossibility of such a thing is too evident for several reasons. Neither is it a question of popularising the great scientific theories, for the use of badly prepared minds. Comte condemns severely this way of "simplifying" science. For instance, he will not allow Newton's laws to be separated from their demonstrations. It will always be the duty of the greater number of men to adopt the majority of scientific truths on the testimony of those who will have discovered, criticised and verified them. But, what it will be the duty of common education to give to every mind, is the habit of conceiving all phenomena, from the most simple to the most complex, as equally governed by invariable laws, and, consequently, of understanding the whole of nature as an order which the positive method alone allows us to discover and to modify. And as this method cannot be studied apart from the sciences in which it is used, it will be necessary for every man to be made acquainted with a summary of each fundamental science, from mathematics to sociology. There is nothing impracticable in this scheme. Comte has drawn out, in the positive Polity, a plan of education conceived on this principle. On this condition alone will philosophy, founded upon positive science, succeed in realising the harmony of minds, and in "reorganising the beliefs."

II.

Auguste Comte often says that the positive spirit consists in keeping oneself equally distant from two

dangers, mysticism and empiricism.[33] By mysticism he understands the recourse to non-verifiable explanations and to transcendent, hypotheses. Men's imagination finds pleasure in these things, but we must be able to bring all "real" knowledge back to a general or particular fact. Positive science therefore abstains from searching after substances, ends, and even causes. It only bears upon phenomena and their relations.

Empiricism, in its turn, is no less than mysticism contrary to the spirit of science, Empiricism signifies for Comte the knowledge which does not go beyond the pure and simple ascertainment of a fact. Now, an accumulation of even precisely noted facts has no theoretical interest. It may, at most, be erudition, but it is not science. To think that by thus gathering facts together one is labouring at the work of science, is "to take a quarry for an edifice."[34] In a word, "science is made up of laws, and not of facts."[35]

Strictly speaking, no scientific observation is even possible without a previous theory, that is to say, without a presupposed law, whose verification is in question. Undoubtedly in science when it has become positive, the imagination no longer constructs "causes" or "essences." It must submit to reason, that is to say, to the methodical investigation of phenomena. Nevertheless, this investigation cannot take place without guiding hypotheses, and thus the imagination plays a part in science, subordinate it is true, but indispensable. Comte here separates himself from Bacon. According to the English philosopher, in the knowledge of nature, the mind must make itself as receptive as possible. In introducing anything of itself it would falsify science, and its whole effort must be to hold itself up to

phenomena as a perfectly plain and unspotted mirror, so as to reflect them as they are. Now this is precisely the idea of science which Comte rejects under the name of empiricism. Without the hypotheses or the theories suggested by the very activity of the mind science would never be constituted, according to him. There would never even be an apprehension of fact, at least an apprehension such that it could be of service to science. In a word "absolute empiricism is impossible." In the simple observation of a phenomenon by the human mind, the entire mind is interested, and in it the subjective conditions of science are already virtually given.

This being granted, science may be defined as a methodical processus of the connection and extension of our knowledge. It consists, in every department "in the exact relations established between observed facts, so as to deduce from the least possible number of fundamental data, the most extensive series of secondary phenomena, in renouncing absolutely the vain search after causes and essences." So long as men seek to "explain" phenomena the theological and metaphysical spirit has not yet disappeared. Positive science abstains from all explanations of this kind. Thus, Newton has placed in the same category universal gravitation and the attraction of bodies. We cannot know what this mutual action of the stars and the attraction of terrestrial bodies are in themselves. But we know with full certainty, the existence and the law of these two orders of phenomena and moreover we know that they are identical. For the geometer weight is explained when he conceives it as a particular case of general gravitation. On the contrary it is weight which makes the physicist proper understand

celestial gravitation. We can never go beyond such juxtapositions "of ideas."[36]

But while science brings together similar phenomena, its chief function is to *connect* them, that is to say to determine them one by another according to the relations which exist between them. All science, says Comte, consists in the co-ordination of facts; and if the several observations remained isolated there would be no science. We may even say generally that science is destined, as far as the various phenomena permit, to dispense with direct observation, in allowing us to deduce the greatest possible number of results from the smallest number of acquired data. If a constant relation is found to subsist between two phenomena, it becomes useless to observe them both; for from the observation of one the variations of the other will be deduced. But the first may in its turn be the function of a third, and so on; until at last we conceive a constant connection between all the phenomena of a given order, which may allow us to deduce them all from a single law. Such for Comte would be the perfect form of science: how near it is to the Cartesian ideal! "The positive spirit," he says, "without failing to recognize the preponderance of reality directly ascertained, tends to enlarge the rational at the expense of the experimental domain, by substituting the prevision of phenomena to their immediate observation." Scientific progress consists in diminishing the number of distinct and independent laws, by continually multiplying their respective connections.[37]

"Prevision" thus becomes the essential characteristic of scientific knowledge, and that independently of any utilitarian mental reservation.

For the eventual applications of science do not determine its theoretical advance. The prevision with which we are here concerned consists solely in the possibility of knowing with certainty without observing. It is knowledge *a priori* in the Aristotelian sense of the word, of which mathematics present the most perfect model. A rectilinear triangle being given, I do not need experience to know with certainty that the sum of the angles in it is equal to two right angles. Thus understood prevision applies to the present, and even to the past, as well as to the future. When Comte writes "All science has prevision for its aim,"[38] we must understand: "All science tends to substitute deduction to experience, rational to empirical knowledge." This prevision, a necessary consequence of the constant relations discovered between phenomena, will allow men never to mistake real science for fruitless erudition, which accumulates facts without deducing them one from another.

Thus the formula cited above enlarges itself: "Science is composed of laws and not of facts." The more deduction is substituted to experience, the better is the extension and connection of our knowledge realised. Consequently, the more also does science draw near to that unity which is imperatively claimed by our understanding, and which is for it the criterion of truth. "Real science," says Comte, "regarded from the highest point of view, has no other general object but to establish or to fortify unceasingly the intellectual order, which is the basis of all other order."[39] The mind which applies itself to the contemplation of the world requires, before everything, to find it intelligible. "Real" science satisfies it, not in imagining wills and causes, as did theology and metaphysics, but in

discovering order in the constant relations between phenomena. When this order is harmonious, that is to say, when the several classes of phenomena are conceived as homogenous, and as similarly governed by laws, “the spontaneous unity of our understanding is consolidated.” It matters little that the various orders of phenomena are given to us as irreducible to one another. The highest object of science is to determine the point of view from which all phenomena appear intelligible, and this point of view is one as the understanding itself is one.

III.

Perhaps it would have been easy to pass from this conception of positive science to a theory of knowledge, and to a metaphysical view of nature, both idealistic. But Comte neither could nor would push his theory in this direction. In this respect nothing is more significant than his way of understanding the relativity of science.

This relativity is usually presented as the conclusion of a criticism of our understanding, of its nature, of its bearings, and of its relations to its objects. But, according to Comte, an inquiry pursued on these lines, has no chance of reaching a conclusion. The only theory of knowledge which is positive and “real,” is drawn from the history of the human mind. The laws of the mind are only revealed in the examination of the successive products of its activity, that is to say in its beliefs and in its science. The relativity of science can therefore only be stated at first, as a fact, leaving it for subsequent inquiry to determine the reason of that fact. The law of the three States suffices for this, for it shows that man

began by seeking for absolute knowledge. The philosophy to which he first turns is, at the same time, the most naïve and the most ambitious. But a necessary evolution causes him to abandon the pursuit of the absolute, first in its theological form and then in the metaphysical form. Having reached the positive state, man knows that his science, necessarily relative, is limited to "the systematic co-ordination of phenomena," and the knowledge of their laws.

The condemnation which thus strikes researches bearing on the absolute is itself, moreover, only relative in character. It prejudges nothing respecting the ultimate solution of questions. Positive philosophy in no way takes sides in respect to these problems. It simply states that science has more and more cut them off from the number of those which it studies. Indeed it is impossible to apply the positive method to questions which concern the absolute. Now, this method being the only one which our mind can henceforth follow, at least if it wishes to maintain the logical unity which is its supreme requirement, it follows that these problems are in fact abandoned. Nothing more and nothing less. "Sound philosophy," says Comte, "sets aside, it is true, insoluble questions"; but "in stating the motive of their rejection, it avoids denying anything respecting them, which would be contradictory to that systematic disuse by which alone uncontrovertible opinions must die out." (Comte means: opinions which do not come within the range of positive discussion.) The problems relating to the essence of the soul or to the "substantia prima" will melt away, as the majority of the metaphysical problems which the scholastics put to themselves have already disappeared.

Even to positive science, we must be careful not to attribute an absolute character—that is to say, in a sense slightly different from the preceding one, but very frequently with Comte—a definite and immutable character. The laws which we can determine are never true except under certain conditions. We have no right to consider them as true *absolutely*. Newton's law is demonstrated for our solar system: but do we know that it is verified in all the systems throughout space? Do not let us confound the world, which we can study with the united resources of observation and calculation with the universe, of which we know scarcely anything, and which outranges all our powers. In spite of the famous principle of the sufficient reason the absence of motives for negation does not constitute the right of affirmation, without any direct proof. Absolute notions, says Comte, seem to me so impossible that I would not even dare, whatever probability I may see in it, to warrant the necessary and unalterable perpetuity of the theory of gravitation restricted to the interior of our world, if one day, (which is moreover very difficult to admit) the precision of our present observations came to be perfected as much as we have done in comparison to Hipparchus.[40]

In the same way, must not attraction have seemed to be an absolute quality (that is to say an immutable one) of bodies, since neither change of shape, nor the passage from one physical constitution to another, nor any chemical metamorphosis, nor even the difference between the state of life and death could modify this quality, so long as the integrity of the substance was maintained? The Newtonian conception came and destroyed entirely at a signal stroke this character which must have appeared so indestructible, by showing that the weight of a body

is a phenomenon purely relative to the position of this body in the world, or, more precisely, to its distance from the centre of the earth.[41]

In order that our positive science of any part of nature should be absolute, that is to say, final, it would have to be complete. But, as all things are caused or causing, helped or helping, according to Pascal's expression, all the phenomena in a reciprocal universal action, all the laws relative one to another, our science will never be complete on any point. It only furnishes more or less imperfect approximations.[42] The discovery of new facts and new laws is always possible.

How many times does not positive science find itself obliged to modify and to readjust a system of long acquired notions, in order to make a place for new elements? This is a work often very laborious, but from which science never dreams of shrinking, knowing that it is made liable to it, so to speak, by definition, that is to say, that it is relative. Examples of this abound, not only in the history of physical and natural science, but even in that of so-called exact sciences. Do we not hear M. Poincaré declaring in accordance with Hertz, that given the system of Galileo and of Newton in mechanics it is impossible to give a satisfactory idea of mass and of force?[43]

Thus the definitions, and even the laws, established by the positive sciences, are at every period approximations corresponding to the knowledge we have of facts. And as this knowledge can always be enriched the approximation may also become stricter, without ever reaching its confines. Leibnitz already said that the analysis of anything real reaches to infinity. This thought is with him,

closely allied to the whole of his metaphysics. We find in Comte an expression in some way equivalent, although positive. He says, although the progress of the science of nature consists in substituting as much as possible the rational method to the experimental method, the limit can never be attained, we can never affirm that experience will not bring new elements which will oblige us to modify the edifice of science. The relativity of science thus serves to maintain an equal balance between the need of unity which comes from the understanding, and the inexhaustible diversity of the world of reality which this understanding studies.

As a fact, then, positive science is always relative. Rightly, it cannot be otherwise, and this for two essential reasons. It depends necessarily upon "our organisation" and "our situation"[44] or, in other words, it is relative "both to the individual and to the species in its advance."

It is relative in the first place to our organisation. Here Comte takes up again an idea which was dear to the philosophers of the XVIII. century and in particular to Diderot. If our organisation were different, the data which our science elaborates would be other that they are. With more organs we might perhaps grasp kinds of problems of which we have no idea. If we suppose our species to be blind, astronomy would not exist for it. And further, a natural law requires that the more complex and the higher phenomena in regard to their conditions of existence, should be subordinated to the more general and the more common phenomena. The intellectual phenomena thus depend, first, upon the biological phenomena, and then upon all those to which the biological phenomena are subordinated. In

this sense, therefore, science is relative to our organisation, which is itself relative in respect to the milieu in which we live. But, reciprocally, the representation of this milieu and of this organisation rests upon intellectual laws which impart to science a need of unity and harmony special to the mind.

Comte concludes, therefore, that to endeavour to apportion what belongs to the object and what to the subject in scientific knowledge is a hopeless attempt. We simply know that science is not the exclusive product either of the subject or the object. Giving too much to the object leads us to "empiricism." Falling to the opposite extreme leads to "mysticism." The efforts of philosophers to construct an abstract theory of knowledge have only ended in miserable results. We have not gone beyond Aristotle's "axiom as corrected by Leibnitz." *Nihil est in intellectu quod non prius fuerit in sensu, nisi ipse intellectus.* We are only certain of one thing: our science, necessarily conditioned by our organisation, is also necessarily relative.

But this is not the most decisive consideration for it only makes us see that our science would be different, if our organisation were to change. Now, as a matter of fact, our organisation does not change. Human nature, according to Comte, remains similar to itself in the whole course of its evolution. It is this evolution which itself becomes a cause, and a decisive one, of relativity for science. For, if our organisation does not vary, the system of our conceptions and of our science necessarily varies, according to our "situation," that is to say, according to the position which we occupy in this evolution, which accomplishes itself according to laws.

Our conceptions, our religions, our philosophies, are not only individual phenomena; they are also and chiefly social phenomena, moments in a collective and continuous life, of which all the phases are interdependent. We only know in a given order of knowledge, what is compatible at that moment with the generally admitted philosophy, with the knowledge already acquired in this and in the other orders of phenomena, with the great hypotheses considered as true, with the methods in force, etc. As soon as the human mind has become conscious of the evolution to which it is subject, as soon as it has grasped its most general law (the law of the three states), in a word, as soon as sociology is founded, science can no longer be conceived as other than relative. For from that moment the various sciences appear as so many great social facts, which vary as so many functions of the rest of civilisation.

Our speculations, "depending on the totality of social progression," can therefore never admit of that absolute fixity which metaphysicians have supposed. The continuous movement of history modifies, in the long run, the beliefs which appear to be the most immutable. Our theories tend to represent more and more faithfully the objects of our investigations, that is to say the laws of phenomena. We are thus brought back to the idea of limit, which is never attained, towards which we are advancing by means of approximations ever more exact.

The time is not yet far distant, when a doctrine of this kind could not have been advanced without at once being rejected as sceptical. The human mind is scarcely beginning to understand that truth cannot be immutable.[45] Men believed that truth must

always be identical with itself, always identical for all minds at all times and at all places. It seems that in losing this character, it must cease to be truth. That is why philosophy has been so persistent in the pursuit of the absolute. It was believed that no truth could be certain, unless it rested, ultimately, upon an immutable foundation.

Science was therefore made to hang on metaphysics. And the defeats, a thousand times repeated, of metaphysics would not have discouraged the human mind had not positive philosophy at last shown that the truth of which we are capable, because it is relative does not cease to be truth. We are not condemned to choose between the pursuit of an inaccessible absolute and the crumbling down of all science. It suffices to understand that human science evolves and that this evolution is subject to laws. It is never ended: it always "becomes." It is not a "state:" it is a "progress."

There are therefore provisional, and, if one may so speak, temporary truths. Does science ever establish any others? The ideas which Hipparchus and the Greek astronomers had of the heavens was not false in all respects. It was the astronomical truth compatible with the conditions of the society in which they lived. After the labours of the observers of the Middle Ages, utilised by Copernicus, this idea faded before another one which became more perfect with Newton and Laplace. Perhaps this one will be modified in its turn, in consequence of new discoveries! Similarly it was thought that the earth was a flat surface, then a round disc. Then it was represented as a sphere and finally as an ellipsoid. To-day we know that this ellipsoid is irregular.

Truth is then at each period "the perfect logical coherence," or the correspondence between our conceptions and our observations. The history of human thought is composed of a progressive series of alternating periods. At a certain moment the mind has placed what it conceives in accordance with what it knows. But, by degrees, new facts are observed, known facts are better interpreted, discoveries burst forth. The harmony between the conceptions and the observations then becomes precarious. Minds find a greater and greater difficulty in fitting all the acquired knowledge into the traditional frame. At last the frame gives way. Then the harmony is re-established in a more comprehensive form, which in its turn is destined to become insufficient. Here positive philosophy recognises a sociological law. It gives up the vain dream of immutable truth. It no longer regards the truth of to-day as absolutely true, nor the truth of yesterday as absolutely false. It ceases to be critical in regard to the past."

To conclude, the theory of science can therefore only be accomplished from the sociological point of view. It remains imperfect so long as "we" has not been substituted to "I," the universal subject which is humanity to the individual subject, and a philosophical history of the sciences to mere reflective analysis. To the logical conditions of science, to define it completely, its biological and social conditions must be joined. Then, but then only, it will be understood, that, at each period, science is at the same time true and relative, without its relativity placing its truth in danger.

CHAPTER V
SCIENCE (CONTINUED)
PHENOMENA AND LAWS

The perfection of the positive system, towards which it unceasingly tends, although very probably it may never reach it, would be to represent all observable phenomena as particular cases of a single general fact, such as, for example, that of gravitation. The fundamental identity of phenomena, the reduction of particular laws to a supreme law; this is an ideal which we are free to entertain. Comte, after d'Alembert and Saint-Simon, has formulated it himself at the beginning of the *Cours de philosophie positive*.[46]

Unfortunately this ideal is not realisable. We apply a very weak intellect to a very complicated world.[47] The unity which, scorning experience, we might establish, would naturally be valueless. For the several categories of phenomena proposed to us seem irreducible. If this[48] be the case, the pursuit after scientific unity is "irrational." Comte ended by treating it as an "absurd utopia."[49]

However, this utopia is forever reappearing; for the human mind is secretly attached to it. It is because, on the one hand, unity pleases it above all things, and on the other hand because there is here an illusion produced and maintained by a philosophy born of mathematical inspiration. Descartes' discovery which allowed questions of geometry to be dealt with by algebra has been the occasion of a grave error. It gave rise to the thought that

differences of quality could be reduced to differences of quantity. Hence the idea of "reducing" the various categories of phenomena to one another. But this was a wrong interpretation of the principle of analytical geometry. Even there, we have a translation, not reduction, "The geometrical ideas of form and of situation," says Comte—and Mr. Renouvier will repeat it after him—"are not naturally more like numerical notions than the other real conceptions. Every phenomenon, even social, would certainly have its equation, as a figure or a motion if its law were known to us with sufficient precision.

Analysis is therefore but an instrument of incomparable power for the study of phenomena. But, from the fact that we can make use of it, it does not in the least follow that the phenomena may be all brought back to an identical type. Quality is in no way by this means reduced to quantity, which is something entirely abstract, and this no more takes place in the case of geometrical quality than in the case of any other. Neither can the geometrical quality be reduced to pure analysis, nor the physical to the geometrical, nor the living to the inorganic, nor the social to the biological. At every stage something qualitatively new appears. Whether or no we can formulate the relations of phenomena in the form of an equation, their heterogeneity subsists always irreducible.

What is true of phenomena is also true of their laws. Each order of phenomena has its special laws over and above those which result from its relations with the less complicated and more general orders. The idea of a supreme law from which all the others would be deduced must therefore be forsaken. Even within the range of each fundamental science, it is

doubtful how far the unity dreamt of could ever be attained. The number of irreducible laws is far more considerable than is imagined by a false appreciation of our mental powers and of scientific difficulties. For instance, in physics, how can optics and acoustics be reduced to one another? Physiological considerations, in default of other reasons, would be opposed to such a confusion of ideas.[50] Likewise in biology, how can the laws of animal life be reduced to those of lower organic life? and in sociology, the laws of human society, implying a course of history, to those of animal societies which do not do so?

Instead, therefore, of conceiving *a priori*, the phenomena and the laws as capable of a "reduction" which is, in fact, impossible, the positive method requires the determination of the general characters of these phenomena and of these laws by observations. It first establishes the following:

1. *The more complex phenomena become, the more also our means of studying them increase in number.*

It is a natural but an insufficient compensation. For the difficulty of establishing the science of phenomena grows much more quickly than the number and the power of our methodical processes. However, without this compensation, scarcely any fundamental science would ever reach the positive state. Thus, to the method of pure mathematics observation in astronomy comes to be added. Experimentation appears in physics, the art of nomenclatures in chemistry, the comparative method in biology, the historical method in social science. With this final science, the positive method is henceforth complete.

2. *The more complex phenomena become, the more*

modifiable they are.

We have no power over astronomical phenomena. Even the perfect knowledge of their laws would only allow us to foresee them. But we can, in a great number of cases, bring about or arrest physical and chemical phenomena. Our intervention is still more efficacious if we are concerned with biological phenomena, as is sufficiently proved by the good and the evil wrought by medicine and surgery. And it finally reaches the height of its power in social and political life. So much so that even cultivated men find it difficult to persuade themselves that social phenomena are governed by invariable laws, and that politics can become the object of a science. Experience seems to tell them, on the contrary, that the activity of man, and especially that of the man of genius, is all-powerful in this domain. Nevertheless it is not so, as sociology, by the mere fact of its existence sufficiently proves. But it remains true that, of all the phenomena of nature, the social and moral phenomena are those in which man's intervention is at once the easiest and the most efficacious.

3. *The more complex the phenomena the more imperfect they are.*

We shall perhaps be surprised to see Comte appealing to the idea of perfection. It seems that he ought to have excluded it as being something metaphysical. Further on we shall consider his theory of finality. At present let us only say that if he considers natural phenomena as imperfect, it is in the sense in which Helmholtz calls the eye a poor optical instrument. He simply states that certain ends, in fact, being realized by a natural arrangement of a group of phenomena, the same end

might be better or more economically reached, by other arrangements that we can easily conceive. In this sense our solar system is imperfect, but less so than many living forms whose organism might present a much higher degree of advantageous adaptation. And yet these living forms are themselves less imperfect than societies subject as they are to all sorts of pathological alterations, as history clearly shows. It is remarkable that the most imperfect phenomena should precisely be the most modifiable, and also those whose study only became positive in the last stage.

II.

More or less complex, modifiable and imperfect, *all* phenomena are subject to laws. It is the supreme principle, the "fundamental dogma" of science and of positive philosophy. Comte thus enunciates it: "All phenomena whatever, inorganic or organic, physical or moral, individual or social, are all subjected in a continuous manner to rigorously invariable laws."[51]

Undoubtedly this principle is not yet extended, by the majority of minds, to all phenomena. This is shown clearly enough by their mode of reasoning in ethics and in politics. But it is, however, implied in their general conception of nature. It thus assumes a universal character, which has caused it to be regarded by many philosophers as an innate, or at least a primitive notion, in the human mind. According to Comte, this is erroneous. Like John Stuart Mill, whom he expressly quotes on this point,[52] he sees in this principle the result of a long, gradual induction, at the same time individual and collective. Except in the case of the most familiar

phenomena, whose regularity is most striking, the human mind does not begin by believing in an invariable order. Even the mind's conceptions, (theological and metaphysical), conceal the existence of laws, long after observation would have made it see them, were it freed from bias. It is true that the "first germs" of this principle exist as soon as human reason begins to be exercised, since the dominion of theological philosophy never could be absolute. But these germs are only developed very slowly, like the positive method and conceptions themselves.

The induction upon which this principle is founded only began to acquire solidity when it was definitely verified for a whole order of important phenomena, that is to say when mathematical astronomy had been founded. Phenomena of the highest importance, from the theoretical as well as from the practical point of view, could then be predicted with perfect certainty. The invariability of their laws had been placed beyond doubt. From that moment, the principle must have been extended by analogy, to the more complex orders of phenomena, even before their own laws could be known. But according to Comte this "vague logical anticipation" remained valueless and fruitless. It is of no use to conceive, in the abstract that a certain order of phenomena *must* be subject to laws. This empty conception cannot outweigh the theological and metaphysical beliefs, which have the force of habit in their favour. In order that the principle of laws should be really established in an order of phenomena, some laws must *in fact* have been discovered and demonstrated in it.

Consequently, while in the *a priori* doctrines the possibility of all science rests upon the principle of

laws, in Comte's doctrine, on the contrary, it is the progress of positive science which by degrees founds the principle, and which finally brings it to the universal form in which we find it to-day. Until the creation of sociology, this principle did not yet possess an effective universality, since the moral and social phenomena were not conceived as subject to invariable laws. But when the last conquest of the positive spirit is once accomplished, "this great principle at once acquires a decisive fulness, and may be formulated as applying universally to all phenomena." Undoubtedly, in each order, we have only established for a few what henceforth we affirm for all phenomena without previous verification. But we think that laws, unknown to us, nevertheless exist. In this we yield to an "irresistible analogy," which has never been proved to be false.

Thus, "the most fundamental dogma of the whole of positive philosophy, that is to say, the subjection of all real phenomena to invariable laws, only results with certainty from an immense induction, without really being deducible from any notion whatever."[53] This immense induction is a progressive sum of inductions which have taken place successively in each category of phenomena. It would not be absurd, strictly speaking, that a certain category should not be submitted, like the others to invariable laws. But, since sociology has been founded, we know that all are in fact so subjected.

The laws are known to us, sometimes by experience, sometimes by reasoning. This diversity of origin in no way influences either the certainty or the philosophical dignity of the laws. Each of the six fundamental sciences gives examples of these two distinct modes of advance which mutually complete

each other. “There is not less genius in the discovery of Kepler than in that of Newton. The initial laws of mechanics and even of geometry rest solely upon observation. The logical perfection consists in confirming by one of these ways what must have been found by the other. But one of the two suffices when all the conditions required by the method are fulfilled.”[54] How should the laws obtained by induction be regarded as less certain than the laws obtained by deduction, since the principle of laws itself rests upon an induction?

III.

In proportion as the several orders of phenomena are conceived as governed by invariable laws, the belief in final causes becomes weaker and tends to disappear. The final causes are imagined by the mind to explain certain combinations of natural phenomena. When the laws of these phenomena are known, this explanation becomes useless, it ceases to have currency. It shares the fate of the whole of theological and metaphysical philosophy, of which it is a part.

The doctrine of final causes is generally regarded as a constituent principle of religious systems. A special argument in favour of the existence of God has even been drawn from it. Comte remarks that it is more probably a consequence of these systems. So long as man believes in the continual action of the gods, or of God, in nature, he does not need the consideration of final causes upon which to found his belief. He does not even dream of it. Later on only, when the religious conception of the world has become weaker, when God has so far withdrawn

from the world as to be no longer anything but a sovereign who reigns, but does not govern, then the need is felt to demonstrate His existence, and the order of nature becomes an argument. The consideration of final causes from this point of view is a symptom of the weakening of the theological spirit; it is thus pre-eminently a metaphysical doctrine.

Whatever may be the case, experience witnesses against it. Positive science does not lay down that the world must be conceived as the work of an all-powerful intelligence. For instance, the scientific knowledge of our solar system has shown in the most obvious manner, and in various ways, that the elements of this system were certainly not disposed in the most advantageous manner, and that science allowed us to conceive of a better arrangement.[55] Astronomers may admire a natural finality in the organisation of animals; but the anatomists who know all its imperfections, fall back upon the arrangements of the stars. In what concerns animals, a blind admiration wonders even at evidently detrimental complications: it is the case with the eye, with the bladder, etc.[56] But "it is an almost universal disposition of physiologists to draw, even from their ignorance, as many motives for the admiration of the profound wisdom of a mechanism which they declare they cannot understand."

In truth, the natural order, so much extolled, is extremely imperfect, and we can without difficulty conceive a better one. The human works, says Comte, from the most simple mechanical appliances to the most sublime political constructions, are generally far superior either in expediency, or in simplicity, to everything that the most perfect

natural economy can offer us.[57] Our geometers and our physicians "sufficiently prepared" would do far better than nature, if they dared "to take the direct conception of a new animal mechanism as the object of an intellectual exercise." This idea of artificial organisms pleases Comte and he often returns to it. He considers that fictions of this kind may be useful in biology to intercalate intermediaries between the several known organisms, in such a manner as to facilitate comparison in making the biological series more homogeneous and continuous.[58] In fact this is what Broca attempted to do, when he endeavoured to connect man with the other primates by hypothetical anthropoids. Quite recently M. Delage has made use of a similar fiction in his *Traité de Zoologie*.

Comte seldom misses an opportunity of smiling at the stupid admiration of those who believe that nature has done everything "for the best," or that everything in it has been ordered by a providential wisdom. But we can surprise him also in the very act of admiration; not doubtless on the subject of astronomical or biological phenomena, but in the chapter which lies nearest to his heart, that of social facts. He writes, "we cannot experience too much respect and admiration when we see this universal natural disposition which is the primary basis of all society...."[59] and elsewhere: "Can one really conceive, in the whole of natural phenomena, a more marvellous spectacle than this regular and continuous convergence of an immensity of individuals...."[60]

However, there is not here a contradiction. In reality, although Comte says that the consideration of final causes must be accepted altogether, or

rejected altogether, he does not himself reject it as entirely as he seems at first to do.

What he formally rejects, is the finality understood in the theological or metaphysical manner: *Cœli enarrant gloriam Dei.* He does not admit that we can "explain" the natural order by a supernatural wisdom. But he in no way contests the finality which Kant called internal. This finality, or better, this reciprocal causality appears in living beings, where the whole and the parts are reciprocally end and means. The tree could not subsist without the leaves any more than the leaves without the tree. Comte expresses this idea in terms which are almost identical with those of Kant, although he did not know them. "We shall," he says, "cease defining a living being by the collection of its organs, as if these could exist isolated.... In biology the general notion of the being, always precedes that of any of its parts whatever. In sociology, where partial interdependence is less intimate although wider, it would be a serious heresy to define humanity by man ... *a fortiori* in biology we ought not to conceive the whole from its parts."[61] As soon as we rise above the inorganic world, the first condition for the study of phenomena is the idea of their consensus, first in biology, and then in sociology. This *consensus* corresponds to Kant's internal finality.

But the distinction between internal finality and external finality cannot be strictly maintained. We will never affirm that some beings were made in view of others. This would be in the highest degree a theological "explanation" of the first order. But from the positive point of view, we observe that, in order to subsist, organisms need not only special intimate structure, but further require a certain equilibrium of

external conditions. At each moment their existence depends at once on their constitution and on the "milieu." This word, which was destined to attain such popularity and the theory of the "milieu" which Taine has rendered no less popular, belong to Comte. Undoubtedly, the idea was suggested to him, on the one hand by Montesquieu and by his successors, and on the other by the labours of Lamarck and of the contemporary biologists. He also drew inspiration from Bichat's celebrated *Recherches sur la vie et la mort*. But Bichat especially insisted upon the antagonism between the living being and the forces of the inorganic world which press upon him from all sides. Comte thinks, on the contrary, that the very existence of living beings is the proof of a sufficient harmony between their organism and the milieu. And what we cannot dispute is his merit in having generalised the idea specially applied by Montesquieu to social facts, and also specially applied by Lamarck and Bichat to the phenomena of life.

"I designate by this word "milieu," says Comte, in excusing himself for the new meaning which he gives it, "not only the fluid in which the organism is immersed, but, in general, the totality of external circumstances of any kind whatever necessary to the existence of each determined organism."[62]

Properly speaking then, Comte does not reject the doctrine of final causes; he only transforms it. He had declared this himself in his *opuscule* in 1822. "The doctrine of final causes has been converted by the physiologists into the principle of the conditions of existence." Positive philosophy appropriates, "with the understanding of a suitable change," the general ideas primitively invented by the theological and

metaphysical philosophies. As the positive notion of the mathematical laws of phenomena arose out of the metaphysical conceptions of the Pythagoricians concerning the properties of numbers, so the scientific principle of the conditions of existence springs from the hypothesis of final causes.[63]

An example will allow us to realise this transformation in the act.

The stability of the solar system renders the existence of living species on the earth possible. A good example of finality it would seem. Nevertheless this stability is simply a necessary consequence, according to the mechanical laws of the world, of some circumstances characteristic of our system: extreme smallness of the planetary masses in comparison to the central mass, small eccentricity of their orbits, slight mutual inclination of their planes, etc. Since, in fact, we exist it must be that the system of which we form a part is arranged so as to allow of this existence." The so-called final cause would then reduce itself here, as on all analogous occasions, to this childish remark: the only stars inhabited are those which are habitable. In a word, we return to the principle of the conditions of existence, which is the true positive transformation of the doctrine of final causes, and whose bearings and fertility are far superior."[64]

In order to give the formula of this principle, we must have recourse to the general distinction established by de Blainville between the static point of view and the dynamic point of view.

Every active being, and in particular every living being, can be analysed from these two points of view. The static analysis considers its elements in

their relations of simultaneous connexions. The dynamic analysis discovers the laws of their joint evolution. The first is the share of the anatomist, the second that of the physiologist. Now it is clear that these two analyses are complementary to one another, and are even separately unintelligible. For instance, the anatomist is constantly guided by physiological considerations. Conversely, without anatomical knowledge there is no positive physiology.

Thus, the statical analysis establishes the laws of coexistence, the dynamic analysis the laws of succession or of movement. The principle of the conditions of existence is nothing else than *the direct and general conception of the necessary harmony of these two analyses, that is to say, of the agreement of these two orders of laws*.[65] If this harmony, in fact, was not realised, no living being, no natural system of phenomena could subsist. From the point of view of the object this principle accounts for the permanence of beings: from the point of view of the subject it expresses the possibility of science.

Why does Comte say that the importance and fertility of this principle are far superior to those of the doctrine of final causes? It is because this latter doctrine claims to "explain." In referring the natural order to the wisdom of a Providence, it dispenses in some measure with scientific research, or at least it does not require it. The principle of the conditions of existence, on the contrary, is closely allied to the positive conception of natural phenomena. It only implies the existence of laws. It only establishes the continuity of the relations between these laws, a continuity verified by experience, since beings subsist and reproduce themselves. In a word, it

allows us to connect the laws of succession with the laws of coexistence everywhere. Now, to connect is the essential function of science. By means of this principle not only the successive moments of any natural evolution whatever are understood as having solidarity with each other but the whole of this evolution becomes intelligible by its relation to the statical conditions to which it corresponds. And, in virtue of the relativity of science, or, if we prefer it, of the universal reciprocal action of all phenomena, the principle of the conditions of existence leads the human mind to a scientific investigation ever more exact and never completed.

This positive transformation of the doctrine of final causes had already been clearly sketched by the philosophers of the XVIII. century whom Comte knew very well, by Diderot, by Hume, by d'Holbach. Hume says, for instance,[66] "It is useless to insist upon the uses of parts in animals or in plants, and on their curious adaptation one to another. I should much like to know how an animal could subsist without this adaptation. Do we not see that if it ceases he perishes at once, and that the matter of which he was composed takes some other shape?" And d'Holbach, "These wholes would not exist in the form which they bear, if their parts ceased to act as they do; that is to say, ceased to be arranged in such a way as to lend themselves to being mutually helpful to each other. To be surprised that the heart, the brain, the eyes, the arteries, etc., of an animal act as they do; or that a tree produces fruit, is to be surprised that a tree or an animal exists. These beings would not exist or would no longer be what they are, if they ceased to act as they do: this is what happens when they die."[67]

Comte makes this criticism of the doctrine of final causes his own. But, faithful to his maxim, "We only destroy what we replace," he claims to substitute a positive principle to this metaphysical doctrine, which preserves the elements in it which are compatible with the scientific method. It is the principle of the conditions of existence. In virtue of this principle, by the very fact that such an organ is part of such a living being, it necessarily co-operates in a determined although perhaps unknown manner, with the totality of the acts which make up its existence: an organ no more exists without a function than a function without an organ. But it in no way follows from this that all the organic functions are performed as perfectly as we could imagine them to be. For instance pathological analysis demonstrates that the disturbing action of each organ upon the whole of the economy is very far from being always compensated for by its utility in the normal state. "If, within certain limits, everything is necessarily arranged in such a way as to be able to exist, we should seek in vain, in the majority of effective arrangements, for proofs of a wisdom superior or even equal to human wisdom."[68]

Extending these considerations to the whole of the phenomena known to us, Comte concludes in almost the same way as Cournot will later on. An order establishes itself in nature, since it subsists, since it is intelligible, since there are laws.[69] Does not the very idea of a law induce at once the corresponding idea of a certain spontaneous order? But "this consequence is not more absolute than the principle from which it is derived."[70] The experience which reveals this order to us also shows us that it is imperfect, of an imperfection which grows with the complexity of phenomena. Every time that the

necessary and sufficient conditions are realised for a natural system to be able to exist, this system exists in fact, however full of imperfections it may be in other respects. “Undoubtedly, an inevitable necessity which links together a series of events, and a premeditated plan which directs them, resemble each other very much so far as the consequences are concerned.”[71] But, if the necessity is established, there is no need to suppose the plan. Now the principle of the conditions of existence, in showing that all that is “indispensable,” is at the same time “inevitable,” renders this supposition superfluous.

A double tendency makes itself felt in this theory. On the one hand Comte, faithful to the spirit of his philosophy, rejects all that claims to go beyond experience, that is to say the transcendental hypothesis of final causes and of optimism. On the other hand, he wishes to account for the order of nature, which is a fact. Now this order, all imperfect as it is, implies not only the existence of laws, but moreover a permanent harmony between these laws. “The present is full of the past, and big with the future.” The principle of the conditions of existence explains this permanence of order, at least as much as it needs to be explained from the positive point of view. For it states that everywhere, in fact, the dynamical laws are in harmony with the statical laws, and that “progress is a development of order.” The principle of the conditions of existence is no more *a priori* than the principle of laws. Like it it is founded upon an “immense induction.” Like it again, it only acquires its full power when social science is created, and positive philosophy established.

Should we not be tempted to see in this doctrine a kind of projection of an idealism such as that of

Leibnitz on the lines of positive thought? Just as Leibnitz makes mechanism rest upon a deeper dynamism, so Comte completes the principle of laws by the principle of the conditions of existence. True, between these two doctrines there lies all the distance which separates the positive from the metaphysical spirit. But none the less both give symmetrical solutions of the same problem which correspond to one another, the one *a priori* the other *a posteriori*.

IV.

All natural laws, must be conceived as rigorously invariable, whether it be a question of mathematical or of sociological laws. If we could conceive, in any case, that under the influence of conditions exactly similar the phenomena should not remain perfectly identical, not only in kind, but also in degree, all scientific theory would at once become impossible.[72] This principle is the very condition of the possibility of prevision, and consequently of positive science. Claude Bernard will call it "the absolute determinism of phenomena." Comte admits no absolute: but he considers nevertheless that the invariability of natural laws does not permit of exception.

In the case of certain laws their invariability can be directly verified, since they come before us in a mathematical form. Such are, for instance, the mechanical, astronomical and physical laws. Others, on the contrary, such as the biological laws, refuse to be dealt with by numbers and cannot be reduced to equations. But this evidently comes from their complexity: "If it were possible rigorously to isolate each one of the simple causes which concur in

producing the same physiological phenomenon, everything tends to show that under well determined circumstances, it would appear to be possessed of a kind of influence and of a quantity of action, as exactly fixed as we see it to be in universal gravitation."[73] Every elementary phenomenon has its curve.

If then in all cases we could go back to the elementary phenomena, we could undoubtedly also formulate their mathematical law. In this sense, mathematical analysis would apply to all the phenomena of the world without exception. But, nearly always, the decomposition of given phenomena into elementary phenomena is impossible to us. At any rate the work of synthesis or of re-composition taken in the reverse order is far beyond our mathematical powers. The only phenomena to which we apply the analysis without too much trouble are the most simple of all, the geometrical and mechanical phenomena. The difficulty grows very rapidly with the complication of astronomical, physical, and especially chemical phenomena. When we reach the realm of living nature, the elementary phenomena escape us altogether. They are given to us in a state of almost infinite complexity, and, in virtue of the biological *consensus*, closely bound up with others of no less complex a character. These phenomena are in themselves syntheses depending upon other syntheses all in a state of mutual influence and of constant instability. Then, although, in principle, it remains true that identical antecedents can only have identical consequents, in fact, because of the very great number of elementary actions which concur in the production of each phenomenon, there have perhaps never been, there perhaps never will be, two

cases rigorously similar.

It follows that we must not confuse "the subordination of any events whatever to invariable laws with their irresistible necessary accomplishment."[74] Relatively single phenomena appear indeed to us to be produced with an irresistible necessity: for instance, the facts of gravitation. But complex phenomena, in virtue of the more and more varied combinations which their several necessary conditions admit of no longer present this character. They are more "modifiable" and less "irresistible." In other words, as one considers more elevated, more complex, more "noble" categories of facts, the laws become removed from the type of mathematical necessity, and admit more of an ever increasing element of "contingency"?

The order of the world can then be conceived as a "modifiable fatality."[75] In the eyes of the greater number of present thinkers, says Comte, this formula will seem contradictory. This comes from old habits of mind which are not easily broken with. In the same way, as we have had a great deal of trouble in representing truth to ourselves otherwise than as immutable, so we are unwilling to conceive order otherwise than as necessary. During a long time the science of mathematics has been the only positive science. The idea of law formed itself in this science, that is to say according to the necessary relations which are demonstrated in it. It came to be afterwards transferred, just as it was, into the other orders of phenomena, as the positive spirit progressed. But orders of phenomena differ qualitatively from one another. All laws ought not to be conceived according to the single type of

geometrical and algebraical laws. In order to obtain a complete idea of a natural law, we must not confine ourselves to the mathematical order, which is an "exception" in this respect. All the orders of phenomena must be considered. We then see that law must be defined "constancy in variety."

In fact, "the normal type is never suited to any but a medium state, more ideal than real, around which effective existence ceaselessly oscillates, so long as the deviation does not go beyond the limits which are compatible with the duration of the system. Order, even isolated, is no more eternal than it is absolute."[76] In this passage, Comte is speaking of astronomical order, but the same consideration applies to all the systems or groups of phenomena. Every law is necessarily something abstract. Being indispensable to the intelligibility of the real, every law allows prevision and science to exist. But it is not an adequate expression of this reality, which never remains identical with itself.

Comte goes so far as to say that our requirement of precision in the study of natural laws must not be pushed too far. For the laws which it has been possible to establish within certain degrees of approximation vanish if this approximation is pushed further. Not that the phenomena cease to be subject to laws; but these laws becoming too complex, escape us. For instance, it has been possible to establish with our thermometers the laws of the variation of temperature of a body under certain conditions. With very much more sensitive thermometers the variations becomes incessant and very complicated. The known laws disappear without our being in a condition to establish others.[77]

The order which positive science shows us in nature is then very far from being absolute. It is, to speak truly, the outcome of the combined activity of our mind and of things. We cannot separate what belongs to each of these two factors, but it appears from what has just been said that the mind plays a great part, that the external relations are far more contingent than suits our blind instinct of universal connection."[78] Nevertheless the phenomena are not irreducible to order, since science and prevision remain possible. But this order, entirely relative in respect to our understanding is only established within certain limits. More powerful minds than ours would probably construct richer and more complex orders for themselves. For us, beyond a certain point of complexity our vision becomes confused and our logical requirements are no longer satisfied. Limits would thus seem to be placed upon scientific investigation, and these in the interest of science itself.

Finally we reach the last consequence of this theory founded upon experience, the principle of laws and the principle of the conditions of existence only insure a provisional order. Comte readily admits that it might not exist. "This order might become so irregular that it might even escape brains superior to ours. There is nothing to prevent us from imagining words outside our solar system, always given over to an inorganic and entirely disordered agitation, which would not even allow of a general law of gravitation."[79] This is the very hypothesis formulated by John Stuart Mill, in almost similar terms, and in which a kind of *reductio ad absurdum* of his own theory was thought to be found. It is, however, compatible with the existence of a science which does not claim to possess an absolute value.

Moreover Comte at once adds, “Still, even if order should be found to be particular to our world, in fact, it would be in no way accidental in it, since it is the first condition for human existence.” In virtue of the principle of the conditions of existence, the presence of a being such as man implies the whole of the laws which govern our world.

V.

The laws which for us constitute the order of the world are of two kinds. Some are established by the positive method in each order of phenomena separately considered; the astronomical laws, physical laws, chemical laws, etc. They belong to the domain of science properly so-called. The others are apprehended when the mind leaves the special point of view of science, and places itself at the universal point of view of philosophy. They are found again in the different orders of phenomena, whose relations they express without compromising their respective independence. They represent them severally connected, or, according to Comte’s expression, as convergent. Comte calls these last *encyclopædic* laws. They tend to realise the unity which the mind claims, not in pursuing the chimerical reduction of all laws to a supreme law, but in showing that the systems of irreducible laws are nevertheless harmonious among themselves.

Generally speaking, these laws have been known for a long time, but only as special laws of such and such an order of phenomena. It belongs to positive philosophy to give them their encyclopædic character, that is to say, to make them universal. For instance, d’Alembert’s principle is known in

mechanics as a law which connects questions of movement with questions of equilibrium. Philosophy finds a similar law in biology: (physiological questions are correlated to anatomical questions); and also in sociology ("progress is the development of order"). It then formulates the encyclopædic law which generalises these three laws, that is, the principle of the conditions of existence.

Similarly the three great laws of mechanics, known under the name of the laws of Kepler, of Galileo and of Newton, must be universalised and become encyclopædic for they are applicable to all the orders of phenomena.[80] The law of Kepler, in the first place, expresses the spontaneous tendency of all natural phenomena to persevere indefinitely in their state, if no disturbing influence supervenes; a tendency whence are derived inertia in mechanics, habit in living bodies, and the conservative instinct in societies. The law of Galileo which reconciles every common movement with the various particular movements, applies to all the organic and inorganic phenomena. For, in any system, we can always ascertain the independence of the several active or passive mutual relations with regard to any action which is exactly common to the various parts, whatever may be their kind and degree. Finally the universal character of Newton's law (reaction is equal to action), is evident at first sight. It is accidentally, not essentially, that these laws have at first been mechanical laws. They could have been equally attained by the study of biological or social phenomena. If the science of mechanics was the first to formulate them it is because it has for its object the less complicated phenomena.

A complete and rational system of encyclopædic laws would realise the "philosophia prima" which Bacon dimly foresaw. In the actual condition of the sciences this would probably be a rash undertaking. Comte attempted it in the fourth volume of the *Politique positive*.[81] One can hardly say that the trial was a decisive one. It is true that at that moment Comte was already entirely taken up with religious preoccupations.

However, the encyclopædic laws are destined to play a part in the positive philosophy of nature, which may be compared, in some respects, with that of the categories in Aristotle's philosophy. They are the most general forms under which the phenomena given in experience become objects of scientific thought for us. As in each class of phenomena we determine laws, principles of order and of harmony, so the encyclopædic laws make the order and the harmony of the different classes among themselves. They are, so to speak, *the laws of laws*. Through them the human mind which has already reached unity of method, may some day reach a certain unity of knowledge. But this unity will always differ by two essential characteristics from that which metaphysicians have pursued up to the present time: it will respect the irreducibleness of the various fundamental sciences, and it will remain relative, both by the conditions of the object and by those of the subject, upon which it equally depends.

Our conception of universal order "results from a necessary concurrence between that which is without us, and that which is within. The laws, that is to say the general facts, are never anything but hypotheses confirmed by observation. If harmony in no way existed outside us our mind would be entirely

incapable of conceiving it, but in no case is it verified so much as we suppose it to be."[82] We neither make order nor perceive it entirely. By long and arduous labour the human intellect gradually disengages the concept of order out of the facts that come crowding within its reach. It is an imperfect, contingent, perishable order, in a word, an order, relative like the mind itself. It is order nevertheless, and a necessary condition for ethics as well as for science.

CHAPTER VI
SCIENCE (CONTINUED)—POSITIVE LOGIC

Logic, says Comte, almost in the terms of Descartes, is the sole portion of ancient philosophy which is capable of still presenting some appearance of utility.[83] And does even this appearance correspond to a very solid reality?

If we distinguish, according to custom, formal logic from applied logic, Comte in his system will find no place for the former, which establishes *a priori* the principles and the mechanism of reasoning. As to the principles, which are the laws of the understanding, positive philosophy has shown that the only way to discover them is to study the products of the human intellect, that is to say, the development of the sciences. And it is again from these sciences that, through observation, the theory of reasoning must be drawn. Formal logic, as metaphysicians have constructed it, especially develops the dialectical faculty, that is to say, an aptitude more harmful than useful, for proving without finding.[84] Descartes said the same, in speaking of the syllogism, that it serves more for explaining to others the things which we know, than to discover those which we ignore.

All the utility which we can attribute to the study of logic properly so-called is found again more extended, more varied, more complete, more luminous, in mathematical studies. The mechanism of reasoning is everywhere the same. Whatever may be the phenomena which are the objects of a science

the nature of deduction and induction never changes in them. Thus in practising these forms of reasoning in the most simple and the most general phenomena, those whose science is most advanced, we learn to know them with the most entire evidence, and in all the generality of which they are capable. Nowhere is reasoning so exact, so rigorous as in mathematics. They accustom the mind not to feed upon false reasons, and it is in that school that men ought to learn the theory and the practice of reasoning.

But, if the old pure logic is thus replaced by mathematics, must we not at least preserve the general study of the processes used in the various sciences, which is called methodology? Has not Comte himself insisted upon the irreducibleness of the several orders of laws to one another, and in particular to the mathematical laws? Is not the legitimate object of logic to define the processes of investigation and of proof particular to each of the fundamental sciences?

Comte does not think so. This applied logic does not appear to him to be more indispensable than formal logic. In the first place, the former, in fact, supposes the latter. It proceeds from the same philosophical conception. In order to determine *a priori*, in a general way, the rules of the application of the mind to its various scientific objects, we should first have to possess a knowledge of the laws of the mind. But, according to Comte, this knowledge can only be obtained by the observation of the methods which the mind has indeed followed. Moreover, no art is taught abstractedly, not even the art of reasoning well, nor that of experimenting, of finding hypotheses, etc. It has never been sufficient to know the rules of versification in order to write

true poetry. A deep knowledge of the rules of method will not lead to scientific discoveries.[85] Whatever we learn of an art, it is practice that has taught us. Nothing here can replace time, natural disposition, and experience.

Methods then cannot be studied apart from the positive researches in which men of learning make use of them. Even supposing that in the far future, when the sciences are advanced, the methods and their applications could be taught by themselves, the study would run a great risk of yielding poor results.[86] Up to the present time all that has been said of the method, considered in the abstract, reduces itself to vague generalities. When, in logic, we have thoroughly established that all our science of nature must be founded upon observation, that we must proceed sometimes from facts to principles, sometimes from principles to facts, and a few other similar aphorisms, we know far less of the method than the man who has studied a single one of the positive sciences somewhat deeply, even without any philosophical purpose. It is thus that Eclectic philosophers have imagined to make their psychology into a science, thinking they could understand and practice the positive method because they had read the *Novum Organum* and the *Discours de la Méthode*. But did not Bacon, Pascal, Descartes, and the other great scientific leaders insist on the uselessness of abstract considerations about method? They never separated the rules they formulated from their application to positive research.

Comte himself, their successor and their heir, uses no other language. In his long study of the fundamental sciences he never fails to distinguish the contents of the science from its method, what he

calls “the scientific point of view and the logical point of view.” But, while distinguishing them, he considers that they are correlated and closely allied among themselves. He no more conceives method as separated from the science which he studies, than science as separated from its method. Both constitute one intellectual reality seen under two aspects closely allied to one another.[87] To conclude, traditional logic is fast disappearing. In its theoretical parts it is superannuated like the metaphysical philosophy whence it proceeds. In its applied parts it is barren if separated from the practice of the sciences.

II.

There is however a positive logic, and in it we can also distinguish a theoretical and a practical part.

The theoretical part deals with logical laws. These laws which, finally, govern the intellectual world, are invariable, and common not only to all time and places, but also to all subjects whatever without any distinction even between those which Comte calls real and chimerical. They are observed, fundamentally, even in dreams.[88] But this universality of logical laws is not understood by him in the sense in which the rationalist philosophers understand it. Comte is only concerned with a permanence and continuity purely historical in character. The mind of man, like the rest of his nature remains identical with itself, through the diversity of epochs and situations. It evolves without changing fundamentally “without other differences than those of gradually developed maturity and experience.”

Ancient philosophy claimed to discover the intellectual laws by reflection, as if the mind could think and at the same time see itself thinking, reason and observe its reasoning Comte rejects this introspective method, which yields no scientific results. If we apply the method of positive investigation to the intellectual phenomena as to all the others, two ways only are open. We can look at it from the static point of view, that is to say, study the conditions upon which these phenomena depend, and refer the phenomena to them as we refer generally the function to its organ. In this sense the study of the intellectual phenomena belongs to biology. Or else, from the dynamic point of view, we can consider these phenomena in their evolution, by observing the successive phases through which they pass. And since the life of the individual is too short for this "progress" to be appreciable, it must be studied in the life of the species. So understood, the science of the intellectual laws comes within the sphere of sociology.

Now, higher biology which deals with moral and intellectual phenomena, has only just been founded by Cabanis and Gall. Comte discovered that it could not be constituted as a science without the help of sociology. It is then to this newly born study that the search after intellectual laws in every way belongs.

Positive logic abstains, as we see, from speculating upon the leading principles of knowledge, principles of identity, of contradiction of causality, etc. These kinds of principles are not objects of examination or of discussion. Comte upon this point is in full accord with the Scottish school. No positive science questions its own principles, for how can we submit the very principles of all reasoning to criticism?

Nothing is less in accordance with the positive spirit than an attempt of this kind. It is simply metaphysical and has no chance of success.

The intellectual laws of which the research is positive are such as the law of the three states (which is the most general of all), or such, for instance, as these: the human mind always makes an effort to place its conceptions in accordance with its observations; in every case the human mind forms the simplest hypothesis, etc. These laws, which are derived from the nature of the human mind, and whose action has always been felt, could only be discovered and formulated quite recently. For biology and sociology, to which they are related, could not be constituted before the more simple fundamental sciences were sufficiently advanced. To reach a scientific knowledge of the intellectual laws, to found a "positive logic," nothing less was needed than the long evolution whose term is marked by Comte's philosophy.

Applied logic, or theory of method, also finds a new meaning in the positive doctrine. Comte does not fall into the mistake which he has criticised. He does not propose to teach an art *ex professo*, and he will not formulate the rules which positive research must follow in order to be productive. Here again Comte will found his doctrine upon the intellectual evolution of humanity.

In the first place, like the sciences, the positive methods are collective works, "the work of the species gradually developed in the long sequence of centuries." Comte considers as impertinent the pretensions of some modern scientists, who pride themselves upon having invented the comparative

method in biology. As if Aristotle had not already practised it! And Aristotle had not been the first to do so. The processes of the positive methods do not reveal themselves all at once, under a perfect and final form. They gradually come to light during a long period of groping. The human mind notices the processes which have succeeded in simple cases. It endeavours to generalize them, and tests them in new and slightly more complex cases. It seeks for the reason why in certain cases the end is reached, in others it is missed. Method is thus insensibly formed by a kind of practical induction. Its essential processes are, like the leading ideas in the sciences, "inspirations from universal wisdom." The office of great men—and this is sufficient for them to earn our gratitude—is to recognise the value and the fecundity of these inspirations, to set them at work, and especially to endow them with an often indefinite extension by separating them from the concrete conditions in which they were at first manifested.

Thus positive philosophy, less ambitious than its predecessors, does not take upon itself to legislate upon method. But neither does it confine itself to the mere duty of making statements, that is to say to simply register the processes made use of in the sciences. Is not its proper function to represent in human knowledge the "universalizing mind" which in Comte's language is synonymous with government? He himself calls the fifty-eighth lesson of the *Cours de philosophie positive* his *Discours de la Méthode*.[89] He rises above the necessarily peculiar position which belongs to specialists, and places himself at the central and universal point of view which is proper to the philosopher. Thence he embraces under one point of view, the entire

hierarchy of the fundamental sciences. Out of this well-ordered whole, he watches as they arise, first the essence of the positive method, and then the relations of the various elements in this method to one another.

In its essence, the positive method is one, as science is one. For it ever tends towards the same end: the establishment of the invariable relations which constitute the effective laws of all observable events, "thus capable of being rationally foreseen from one another." The positive method proceeds to this by means of a threefold abstraction. It first separates the practical requirements from theoretical knowledge, to be only concerned with the latter, it seeks for the laws of phenomena without troubling itself, at least provisionally, with any possible applications. It also puts aside æsthetic considerations, which ought not to intervene in scientific investigation. Finally—and here is the condition for the very existence of science—the positive method always carefully distinguishes between the abstract and the concrete point of view. It studies not beings, but phenomena. Even in the simplest cases, in astronomy for instance, no general law can be established so long as bodies are considered in their concrete existence. The principal phenomenon has had to be detached, so to speak, so as to submit it alone to an abstract study, afterwards allowing us to return successfully to the consideration of more complex realities. This is what the ancients had known how to do in geometry; and this is what Comte himself has done in the most complex of all sciences, in sociology. Instead of stopping at the concrete reality of history, he determined, by a bold abstraction, the law of the essential movement in human society "leaving to

subsequent labours the care of bringing apparent anomalies into line with it."[90]

In the main, these general characteristics of the positive method bring it singularly near to the Cartesian method. Comte's "Threefold gradual abstraction" seems indeed to have for its end, like Descartes' analysis, to go back to what is simplest and easiest to know, and then to come down, by a synthetic and progressive advance, towards the reality which is given to us in experience. The one and the other of these methods witness, here, to an effort towards generalising the spirit of the mathematical method. Let us never forget, writes Comte, that the general spirit of positive philosophy was first formed by the culture of mathematics, and that we must necessarily go back so far, in order to know this spirit in its elementary purity. The mathematical processes and formulæ are rarely capable of being applied to the effective study of natural phenomena, when we wish to go beyond the most extreme simplicity in the real conditions of the problems. But "the true mathematical spirit, so distinct from the algebraical spirit, with which it is too often confounded, is on the contrary, constantly of value."[91]

We must therefore not take too much notice of Comte's urging and bitterness, when he criticises the narrowness of mind and the "imphilosophisme" of geometers.[92] Undoubtedly he never tires of safeguarding the higher sciences against the encroachments of mathematics, and of showing the impossibility of a philosophy founded exclusively upon their principles. But he none the less recognises that this science possesses the double privilege of having furnished historically, the first model of the

positive method, and of presenting still to-day its finest and purest examples.

However, Comte, even more than Descartes, takes care not to transform the mathematical method into a universal method by a simple generalisation. Nothing would be more contrary to the positive spirit. For the development of this spirit the study of mathematics is a necessary introduction. It is, however, but an introduction. The use which mathematics can make of deduction, on account of the extreme simplicity of their subject produces a very false idea of the power of our understanding, and disposes us to reason more than to observe. Far from preparing us for the method which must be followed for the study of the other orders of natural phenomena, the exclusive habit of mathematics tends rather to draw us from it. In a word it is a dangerous error to take this "initial degree of sound logical education for the final degree."[93]

In order to grasp the positive method in its entirety, we must not consider only mathematics, but the whole series of the fundamental sciences. This method, always fundamentally identical, takes particular determinations in adapting itself to each new order of phenomena. Each of these orders introduces, so to speak, the use of some of the principal processes of which the method is composed, and "it is always at their source that these notions of universal logic must be examined. Thus the mathematical science is the one which gives the best knowledge of the elementary conditions of positive science. In it all the artifices of the art of reasoning, from the most spontaneous to the most sublime are continually practised with far more variety and fecundity than anywhere else. Astronomy

then teaches us, in its initial purity, the art of observation accompanied by that of forming hypotheses. It shows in what the rational provision of phenomena consists, and that science always ends in assimilation or in combination. Physics initiate us to the theory of experimenting, chemistry to the general art of nomenclatures, the science of organic bodies to the theory of classifications. Biology specially makes use of the comparative method, and finally with sociology appears the "transcendant" process which Comte calls the historical method.[94]

Positive logic extends to all the fundamental sciences the use of the processes at first peculiar to each one of them. Each great logical artifice, once studied in the portion of natural philosophy which shows its most spontaneous and most complete development, can afterwards be applied, with the necessary modifications, to the perfecting of the other sciences. For instance, the comparative method belongs in the first place to biology. But, when brought back to its principle and generalised, it becomes a precious instrument for sociology, for physics, and even for mathematics. In every science, the method is completed by the auxiliary use of the processes whose power and whose sphere of action have been made known by the other sciences. By these mutual loans, in each one of them, the positive method reaches its maximum of production.

To be cultivated in the most rational manner possible, the sciences must then be subject to the direction of a general system of positive philosophy, "the common basis and the uniform combining element of all truly scientific labours."[95] The scientific man must at the same time be a philosopher, since philosophy alone puts him in

possession of all the resources of positive method. For instance, this philosophy will show the geometer that he must at least have a general knowledge of biology and of sociology. Biology will teach him the comparative method, of which he can make use when occasion offers, and sociology by showing him the history of his science in the general development of the human mind, will help him better to understand it. If the geometers had a more philosophical mind, their science would be better taught. The great conceptions of Descartes, of Leibnitz, of Lagrange, would be more intelligently explained and brought to light.

If it is useful for the geometer to have studied the other fundamental sciences, it is not less indispensable for other learned men to have gone through the study of mathematics. As an "initial" discipline, this science can be neglected by no one. It is the common school of positivity for all minds. It is therefore to be regretted that the scientific education of future physiologists should be mainly made up of literary studies and of a few notions of physics and chemistry. The more complex the phenomena whose laws they will have to seek, the more necessary will it be for them to have become familiarised in mathematics and in astronomy, with the precise idea of scientific truth. And, as a matter of fact, until this century, the study of the exact sciences had always been regarded as a preliminary condition for that of the natural sciences. Buffon and Lamarck in their day had still received this discipline. If it has been so difficult to constitute social science, it comes, among other reasons, from the lack of scientific education among those who, up to the present time, have wished to study social phenomena. Where, for instance, could economists have found the scientific

idea of what constitutes natural laws, ignoring as most of them did not only biology which was being formed beside them, but even the sciences which had already reached a positive state?

The exclusive cultivation of a single science is always a danger for the intellect. Nevertheless, so long as the chief task of the positive spirit was to disorganise the system of beliefs which constituted theological and metaphysical philosophy, the speciality of the works and of the methods was an inconvenience of secondary importance. It mattered little that the discoveries of the astronomers, the physicians, the biologists should be more or less co-ordinated and directed by a universal positive method, so long as they did their work and prepared the future. But, when the positive spirit had to become organic instead of critical, when it had to substitute a new philosophy to the one which it had overthrown, then it was obliged to subordinate the special processes which it had made use of until then to a single universal method. Should the "scientific anarchy" have lasted, the progress of the positive spirit would undoubtedly have led to the discrediting of the metaphysical régime, but without replacing it, and consequently without having done with it. By rejecting any new general discipline, modern scientific men would unknowingly tend to re-establish the system which they seemed to have shattered for ever.

In a word, the triumph of the positive method, to be final, presupposes the acceptance of the positive philosophy by all men of learning. The old logic was bound by the narrowest ties to the metaphysical doctrines which were then dominant. In the same way positive logic is bound up with positive

philosophy. Speaking more precisely, it is an expression of this very philosophy.

III.

Is the general method of positive philosophy objective, or subjective, or both at once? As we know, this question has raised passionate discussion among positivists.[96] Outside the school it has been solved by some historians as if Auguste Comte, at the end of his life, had gone back to a doctrine very different from the one set forth by him in the *Cours de philosophie positive*. It suffices, however, to distinguish, with him, two successive points of view, to see how the two methods, antagonistic in a certain sense, can, in another one, be very well reconciled.

If we only consider the process followed by our mind in the explanation of natural phenomena, that is to say the object of positive philosophy taken in the strict sense of the word, it is true that two opposite methods are found face to face. The subjective method goes from the consideration of man to that of the world, the objective method goes from the knowledge of the world to that of man. The first gives rise to theological and metaphysical philosophy, the latter to positive philosophy. The incompatibility of the two philosophies proceeds from that of the methods, which is irreducible. It allows us to say: “This will kill that.”[97] In this sense, the final establishment of the objective method, which is completed by the foundation of sociology, implies the exclusion, also final, of the subjective method.

But “having reached its full maturity, true

philosophy should inevitably tend to reconcile these two antagonistic methods," wrote Comte in 1838, in the third volume of the *Cours de philosophie positive*, that is to say, long before the time of what has been wrongly called his second philosophy.[98] This reconciliation will be accomplished by means of the distinction between the special point of view of the sciences, and the universal point of view of philosophy. The scientific investigation of the laws of natural phenomena can only be made by means of the objective method: Comte never varies in his thought on this point. But these sciences are but the parts in a greater whole, for which the subjective method alone is suitable.

Two arguments especially prove this, one belonging to the logical, the other to the moral and the religious order.

The supreme requirement of our intellect is unity. Shall we ever reach this unity by using the objective method in the sciences? Evidently not. Even in each order of phenomena separately considered we do not see how to reduce the laws which we know to a single law of a more general character. And what are the laws known to us compared with those which elude our search, and which perhaps may do so for ever? Considered in its object, each one of our sciences reaches, so to speak, to infinity, far beyond our limited horizon. If then, in order to satisfy us, a *single* conception of the world is necessary, we shall never obtain such a conception from the objective point of view. But if we change our point of view, if we refer the whole of the sciences to man, or better, to humanity, as a centre, we shall then be able to realise the unity which we seek. This is precisely what is made possible by sociology, by subordinating

the hierarchy of the positive sciences to the final science of humanity.

To consider the other fundamental sciences as "indispensable preliminaries,"[99] to represent the evolution which has brought them forth in turn as the very history of human progress; to verify the law of the three states in all our beliefs, and in all our knowledge; finally, to control all scientific research from the sociological point of view: this is what Comte understands by the conciliation of the two methods.

The whole development of positive science from mathematics to sociology, lies between the new use which is made of subjective method and that which was spontaneously made of it by theological philosophy. When theological philosophy considered the knowledge of man and that of the world as interdependent, the instinct which animated it was a just one. But it was imagining instead of observing. It represented the world as filled with "causes" analogous to the will of man and equally capricious. The new subjective method rests, on the contrary, upon the very results of the positive sciences, brought to a synthesis in sociology. It takes as established that the intellectual and moral phenomena depend upon the biological laws, and that the biological laws themselves are subordinate to the laws of the inorganic *milieu*. But, since the "final systematisation of all these laws"[100] must always remain impossible from the objective point of view, the new subjective method undertakes it from the point of view of humanity as a centre.

We can thus distinguish two great periods in the intellectual advance of humanity. During the first,

the positive spirit successively applies the scientific, that is to say objective, method, to higher and higher orders of phenomena. The foundation of sociology marks the term of this progress. Then the second period begins. The positive spirit from special has become universal, from analytical synthetical. It reacts upon the particular sciences, and henceforth makes use of the "regenerated" subjective method, to govern the whole of them.

From the moral and religious point of view, once sociology has been constituted, and positive philosophy has been established, the functions proper to religion appear. The intellect recognises that its end does not lie within itself, and that it is incapable of determining its own rule and aim. It submits to a directing authority, which will guide its efforts and fix their object. *To act from affection, and to think in order to act.* But if the mind understands that it is destined to be used in the service of humanity, it sees at the same time that in the complete positive doctrine, which contains religion, the objective method gives precedence to the subjective, or rather that they mutually support each other. If we were pure intellects we should probably always go from the world to man. But in us the intellect is only a means. Love is the principle, action is the end; and it is to man, finally, that our study of the world must be referred.

Towards the end of his life, Comte replaced the logic of the mind, "especially guided by artificial signs," by the logic of the heart "founded upon the direct connection of the feelings."[101] We shall not here insist upon a conception which is closely allied to his religious system. We will only conclude that, from the philosophical point of view the two

methods objective and subjective, in Comte's thought, are easily reconciled, provided that both have been "systematically regenerated." Now, the regeneration is obtained as soon as sociology is founded. On the one hand, as a matter of fact, it furnishes the sciences formed by the objective method with a principle of unity, since henceforth they are all subordinated to the single science of Humanity. And, on the other hand, the subjective method acquires the positivity which it lacked, for sociology has substituted to the arbitrary "individual subject," the "universal subject," that is to say again, Humanity.

BOOK II
THE PHILOSOPHY OF THE SCIENCES

INTRODUCTION

The Philosophy of the Sciences is one of the leading parts of Comte's work. No other brings out more clearly the essential differences which distinguish his doctrine from previous systems.

In Comte's eyes the philosophy of the sciences is inseparable from the philosophy of history and from the theory of progress. For the sciences are great sociological facts and, as such, are subject, in their evolution, to invariable laws. The method of the philosophy of the sciences could therefore only be the positive method, ever like to itself.

Moreover,—and this is an immediate consequence of this first consideration,—the object of the positive philosophy of the sciences is in no way to "explain" what the sciences themselves do not explain. The sciences, as is well known, do not inquire into their data and their principles. They consider them as sufficiently established by the implicit consent of all men, or at least by the universal usage of learned men. The geometer leaves to others the care of speculating upon the essence of space, or upon the *a priori* character of his definitions. The physicist, if he form an idea of matter for himself, unhesitatingly adopts the one which appears to be the most

immediately advantageous, that is to say, the one which is best in accordance with what he knows of its properties and of its laws. He attributes no more value than that of a simple hypothesis to this idea.

Up to the present the business of solving the questions which the scientific man does not examine has belonged to the philosopher—understand by this term the metaphysician. It is for him to seek what matter, time, movement, space, etc., may be "in themselves." Whether he descends from metaphysics to the positive sciences, or ascends from the latter to metaphysics, he always endeavours to show that such and such a transcendental hypothesis is more in accordance than any other with what we know to-day of the laws of nature. In a word; the philosophy of the sciences has been, in general, an effort to interpret scientific knowledge metaphysically. This explanation remains in respect to such a knowledge an "extrinsic denomination." It explains but does not touch it.

Now, according to Comte, there are not two forms of knowledge, the one positive and properly speaking scientific the other metaphysical and properly called philosophical. *The whole* of our real knowledge in the end bears upon special or general facts. There can therefore be no question of a philosophy which should be essentially distinct from positive knowledge. Any attempt to explain by essences, causes, principles or ends, is excluded by the positive method. Metaphysical problems can no longer be set and, in this sense, when they disappear, the philosophy of the sciences disappears with them.

But, on the other hand, as we have already seen, the positive sciences are not self-sufficient. They

need to be crowned and ordered by a philosophy. If then a philosophy is indispensable, and if, at the same time, this philosophy must be positive, relative like the sciences themselves, and *homogeneous* with them, only one solution remains possible. The philosophy of the sciences will consist in substituting the point of view of the whole to that of the parts. It will still be a product of the positive spirit; but in it this spirit from special will have become general; from particular it will have become universal.

This universal character remains common to Comte's philosophy and to that of his predecessors. But Comte did not understand it as they did. For metaphysicians in general, and still for Kant, universality is the distinctive sign of knowledge which does not come from experience, which is therefore necessary and *a priori*. Comte, who does not know of any *a priori* in the Kantian sense, calls that knowledge universal which remains relative, and which is founded upon induction, but which regulates the other forms of knowledge in the order of generality. Thus the principle of laws is universal. The encyclopædic laws of phenomena are universal. The point of view of humanity is universal, because from this point of view a synthesis of the whole of our knowledge is possible. And, as universality is a relative thing, we conceive universalities of different orders.

Henceforth the philosophy of the sciences is easily defined. Are we concerned with a certain science considered by itself? The philosophy of this science consists in embracing at a glance the whole, the object and the method, as opposed to the special point of view of the scientific man who follows the

discovery of more or less special laws in a branch of this science, but such a philosophy necessarily remains imperfect and fragmentary. The philosophy of a science is only really established in the general philosophy of the sciences, that is to say by a view at once synthetic and single of all the sciences, in which are co-ordinated the objects which they study, the laws which they discover, the methods which they make use of, and the ends which they should pursue.

It has been said that this is not a philosophy of the sciences but simply a "synthesis of the most general results of the positive sciences." Comte partly accepts and partly rejects the objection. If he is reproached with not having constructed a philosophy of the sciences according to the old spirit, that is to say an effort at "explanation," which goes beyond the point of view of positive science, he grants the objection. He considers all philosophy of this kind as out of the question. Is it said that there is no difference between his point of view and that of the scientific man properly so called, unless it be that he successively goes through all the fundamental sciences? Comte calls our attention to the fact that it is not enough to place these sciences side by side to obtain their philosophy. A new point of view, truly universal, although always relative, is needed. How could Comte have distinguished otherwise, in each science, what is lasting and in conformity with the positive spirit from what is decaying and still bears the mark of the theological and metaphysical spirit? Could he especially have fixed the relations which the sciences should maintain among themselves, and could he have imposed upon them a discipline whose principle was not to be found in any one of them?

Thus, until Auguste Comte's time, the philosophy

of the sciences had been a metaphysical conception, joined more or less closely to the whole of positive knowledge. Comte endeavoured to form a conception of this whole, which should be philosophical while remaining positive. It is this conception which is especially set forth in the three first volumes of the *Cours de philosophie positive*. From the static point of view it is founded upon the hierarchy of the sciences, the unity of the method, and the homogeneity of knowledge. From the dynamic point of view, it endeavours to show the progressive convergence of all the sciences towards sociology, the final and universal science. With this "guiding thread," Comte will be able to establish in turn the philosophy of each fundamental science, without ever losing sight of the relation which it bears to the whole of the others.

CHAPTER I
MATHEMATICS

In the eyes of philosophers, mathematics has always occupied a privileged place among the sciences. Plato located their object in an intermediate region between the world of sensible phenomena and that of intelligible realities. On the one hand mathematical objects, and in particular the geometrical figures, appeal to the imagination as sensible things; on the other hand, mathematical truths like ideas and the relations between ideas, are characterised by immutable and eternal fixity. This is why the study of mathematics is an excellent preparation for philosophy, which is the science of ideas. While still leaving to the mind the help of direct sensible perception, it accustoms it to permanent truth. During the whole of antiquity the science of mathematics, as the name indicates, was pre-eminently *the* science. The science of physics, less sure of its object and of its method, was hardly distinguished from philosophical speculation, and lent itself with difficulty to the purely scientific form.

For Plato then, and for those who followed him, mathematics has characteristics which distinguish it from the study of phenomena. In a certain measure, it partakes of the nature of science, conceived as bearing upon *what is*, upon the absolute reality which is neither subject to change nor to motion. It is true that they start from definitions and hypotheses. But, once the principles are established, they are developed *a priori* by a succession of necessary demonstrations like the dialectics of ideas.

This conception offers a mixture of metaphysical and positive elements. It implies that the object of science is reality such as it is in itself; but, at the same time, it sees in the demonstration the essential character of science. A long evolution, which culminates in Comte's doctrine, has driven the metaphysical elements out of science while the other elements subsist in it still. Far from saying with Plato or with his successors that there is no science of the phenomenon or of that which passes away, Comte thinks on the contrary, that the only object of science is phenomenal reality so far as it is subject to laws. Science has not to search for causes or substances; it suffices for it to determine invariable relations.

If the mathematical sciences have long been the only sciences properly so called, and if to-day they are still more advanced than any others, it is because the geometrical and mechanical phenomena are indeed the simplest of all, and those which are most naturally connected among themselves. The period during which they could be studied by observation could therefore be very short, so short that it is even not absurd to maintain that it never existed, and that, in this case, rational knowledge was not preceded by the empirical establishment of facts. But the difference between mathematics and the other sciences none the less remains one of degree and not of kind. The Science of Mathematics is in advance of the other sciences; but all work on common ground. In a word, like all other sciences it is a natural science.

This endeavour to present the whole of the sciences as homogeneous, that is to say, to avoid two distinct classes being formed of mathematics on the one hand, and of the sciences of nature on the other,

had already been attempted before Comte. This endeavour imposed itself, so to speak, upon modern philosophers, from the time when Descartes sought for a universal method for science conceived as a whole. Comte, who saw very well the defect in the Cartesian conception, in which the ascendency of mathematics was still too much felt, did not, however, deny that his own conception proceeded from that of Descartes. In another form, the idea of the homogeneity of the sciences is also found in Leibnitz and even in Kant. Does not the *Critique de la raison pure* show that mathematics on the one hand, and physics on the other, equally rest upon principles which are synthetic *a priori*? In the *Prolégomenes à toute métaphysique future* just as the chapter corresponding to *l'esthétique transcendentale* is entitled "How are pure mathematics possible *a priori*?" so the chapter corresponding to the *Logique transcendentale* bears as its title "How are pure physics *possible a priori*?" On another plan Comte's theory is parallel to Kant's. Here as there mathematics as well as physics rests upon synthetic principles—"superior to experience," says Kant—proceeding from experience, says Comte. The latter, it is true, did not know Kant's theory, and, had he known it he would not have accepted it. But the analogy of tendency subsists none the less beneath the diversity of doctrines.

The immediate antecedent of Comte's theory is found in d'Alembert. The author of the *Discours préliminaire* had said, "We will divide the science of nature into physics and mathematics."

II.

Every science has its origin in the art corresponding to it. Mathematics arose out of the art of measuring magnitudes. Indeed this art would be very rudimentary if we only practised direct measurement. Among the magnitudes which interest us there are very few which we can measure thus. Consequently the human mind had to seek some indirect way of determining magnitudes.

In order to know the magnitudes which do not allow of direct measurement, we must evidently connect them with others which are capable of being immediately determined, and according to which we succeed in discovering the former, by means of the relations which exist between them and the latter. "Such is the precise object of mathematical science in its entirety."[102] We see immediately how extremely vast it is. If we must insert a large number of intermediaries between the quantities which we desire to know, and those which we can measure immediately, the operations may become very complicated.

Fundamentally, according to Comte, there is no question, whatever it may be, which cannot be finally conceived as consisting in determining one quantity by another, and consequently which does not depend ultimately upon mathematics. It will be said that we must take into account not only the quantity, but also the quality of the phenomena. This objection, decisive in the eyes of Aristotle, who could not conceive that we could legitimately [Greek: metaballein] [Greek: eis allo genos], no longer holds good for modern thinkers. Since Descartes' time, they have seen analysis applied to geometrical, mechanical and physical phenomena. There is no absurdity in conceiving that what has been done for

these phenomena is possible for the others. We must be able to represent every relation between any phenomena whatever by an equation, allowing for the difficulty of finding this equation and of solving it.[103] As a matter of fact, we are quickly stopped by the complexity of the data. In the present state of the human mind there are only two great categories of phenomena of which we regularly know the equations: these are geometry and mechanics.

This being established, the whole of mathematical science is divided into two parts: abstract and concrete mathematics. The one studies the laws of geometrical and mechanical phenomena. The other is constituted by the *calculus*, which, if we take this word in its largest sense, applies to the most sublime combinations of transcendent analysis, as well as to the simplest numerical operations. It is purely "instrumental." Fundamentally, it is nothing else than an "immense admirable extension of natural logic to a certain order of deductions."

This part of mathematical science is independent of the nature of the objects which it examines, and only bears upon the numerical relations which they present. Consequently, it may happen that the same relations may exist among a great number of different phenomena. Notwithstanding their extreme diversity these phenomena will be considered by the mathematician as presenting a single analytical question, which can be solved once for all. "Thus, for instance, the same law which reigns between space and time when we examine the vertical fall of a body *in vacuo*, is found again for other phenomena which present no analogy with the former nor among themselves; for it also expresses the relation between

the area of a sphere and the length of its diameters; it equally determines the decrease in intensity of light or of heat by reason of the distance of the objects lighted and heated, etc."[104] We have no general method which serves indifferently for establishing the equations of any natural phenomena whatever: we need special methods for the several classes of geometrical, optical, mechanical phenomena, etc. But, whatever may be these phenomena, once the equation is established, the method for solving it is uniform. In this sense, abstract mathematics is really an "*organon*."

Geometry and mechanics, on the contrary, should be regarded as real natural sciences, resting as the others do upon observation. But, adds Comte, these two sciences present this peculiarity, that in the present state of the human mind, they are already used, and will continue to be used as methods far more than as direct doctrine. In this way mathematics is in fact "instrumental," not only in abstract parts, but also in its relatively concrete parts. It is entirely used as a "tool" by the more complicated sciences, such as astronomy and physics. It is truly the real logic of our age.

In the philosophical study of abstract mathematics, Comte proceeds successively from arithmetical to algebraical calculation, and from the latter to the transcendent analysis or differential and integral calculus. After having stated the manner in which this calculus is presented according to Leibnitz and to Newton, he adopts that of Lagrange, which appears to him the most satisfactory. It is true that at the end of his life his admiration for the author of the *Mécanique analytique* had greatly diminished. Without here entering into the detail of questions,

we will limit ourselves to the indication of a consideration upon the bearings of abstract mathematics, which appears to be of capital importance to Comte. Whether it be a question of ordinary analysis, or especially of transcendental analysis, Comte brings out at once the extreme imperfection of our knowledge, and the extraordinary fecundity of their applications. He can only solve a very small part of the questions which come before us in these sciences. However, "in the same way as in ordinary analysis we have succeeded in utilising to an immense degree a very small amount of fundamental knowledge upon the solution of equations, so, however little advanced geometers may be up to the present time in the science of integrations, they have none the less drawn, from these very few abstract notions the solution of a multitude of questions of the first importance, in geometry, in mechanics, in thermology, etc., etc."[105] The reason of this is that the least abstract knowledge naturally corresponds to a quantity of concrete researches. The most powerful extension of intellectual means which man has at his disposal for the knowledge of nature consists in his rising to the conception of more and more abstract ideas, which are nevertheless positive. When our knowledge is abstract without being positive, it is "fictitious" or "metaphysical." When it is positive without being abstract, it lacks generality, and does not become rational. But when, without ceasing to be positive, it can reach to a high degree of abstraction, at the same time it attains the generality, and, along the lines of its furthest extension, the unity which are the end of science.

Hence the importance of Descartes' fine mathematical discovery, and also of the invention of

differential and integral calculus, which may be considered as the complement to Descartes' fundamental idea concerning the general analytical representation of natural phenomena. It is only, says Comte, since the invention of the calculus, that Descartes' discovery has been understood and applied to the whole of its extent. Not only does this calculus procure an "admirable facility" for the search after the natural laws of all the phenomena; but, thanks to their extreme generality, the differential formulæ can express each determined phenomenon in a single equation, however varied the subjects may be in which it is considered. Thus, a single differential equation gives the tangents of all curves, another expresses the mathematical law of every variety in motion, etc.

Infinitesimal analysis, especially in the conception of Leibnitz, has therefore not only furnished a general process for the indirect formation of equations which it would have been impossible to discover directly, but in the eyes of the philosopher it has another and a no less precious advantage. It has allowed us to consider, in the mathematical study of natural phenomena, a new order of more general laws. These laws are constantly the same for each phenomenon, in whatever objects we study it, and only change when passing from one phenomenon to another "where we have been able moreover, in comparing these variations, to rise sometimes, by a still more general view, to a *positive* comparison between several classes of various phenomena, according to the analogies presented by the differential expressions of their mathematical laws."[106] Comte cannot contemplate this immense range of transcendent analysis without enthusiasm. He calls it "the highest thought to which the human

mind has attained up to the present time." The highest, because being the most profoundly abstract among all the positive notions, this thought reduces the most comprehensive range of concrete phenomena to rational unity.

As the consideration of analytical geometry suggested to Descartes the idea of "universal mathematics," which lies at the basis of his method, so we can think that philosophical reflection upon transcendental analysis led Comte to the idea of those "encyclopædic laws," which hold such an important place in his general theory of nature. For these encyclopædic laws, analogous as they are to the differential formulæ spoken of by Comte, are equally verifiable in orders of otherwise irreducible phenomena, and allow us to conceive them as convergent.

III.

Geometry is the first portion of concrete mathematics. Undoubtedly the facts with which it deals are more connected among themselves than the facts studied by the other sciences, and this allows us easily to deduce some of these facts once the others are given. But there is a certain number of primary phenomena which, not being established by any reasoning, can only be founded upon observation, and which stand as the basis of all geometrical deductions.[107] Although very small, this part of observation is indispensable because it is the initial one, and never can quite vanish.

In this way, metaphysical discussions upon the origin of geometrical definitions and space are set aside. Comte here adopts d'Alembert's opinion. The

latter had said: “The true principles of the sciences are simple recognised facts, which do not suppose any others, and which consequently can neither be explained nor questioned: in geometry they are the properties of extension as apprehended by sense. Upon the nature of extension there are notions common to all men, a common point at which all sects are united as it were in spite of themselves, common and simple principles from which unawares they all start. The philosopher will seize upon these common primitive notions to make them the basis of the geometrical truths.”[108]

Extension is a property of bodies. But, instead of considering this extension in the bodies themselves, we consider it in an indefinite milieu which appears to us to contain all the bodies, of the universe and which we call space. Let us think, for instance, of the impression left by a body in a fluid in which it might be immersed. From the geometrical point of view this impression can quite conveniently be substituted to the body itself. Thus, by a very simple abstraction, we divest matter of all its sensible properties, only to contemplate in a certain manner its phantom, according to d’Alembert’s expression. From that moment we can study not only the geometrical forms realised in nature, but also all those which can be imagined. Geometry assumes a “rational” character.

Similarly, it is by a simple abstraction of the mind that geometry regards lines as having no thickness, and surfaces as being without depth. It suffices to conceive the dimension to be diminished as becoming gradually smaller and smaller until it reaches such a degree of thinness that it can no longer fix the attention. It is thus that we naturally acquire the “real idea” of surface, then of the line,

and then of the point. There is therefore no necessity to appeal to the *a priori*.

Thus constituted, the object of geometry is the measurement of extension. But since this measurement can hardly ever be directly taken by superposition, the aim of geometry is to reduce the comparison of all kinds of extensions, volumes, surfaces or lines to simple comparisons of straight lines, the only ones regarded as capable of being immediately established."[109] The object of geometry is of unlimited extent, for the number of different forms subject to exact definitions is unlimited. In regarding curved lines as generated by the movement of a point subject to a certain law, we can conceive as many curves as laws.

The human mind, in order to cover this immense field, the extension of which it was very late in apprehending, may pursue two different methods. Perfect geometry would, indeed, be the one which would demonstrate all the properties of all imaginable forms, and this can be obtained in two ways. Either we can successively conceive each of the forms, the triangles, the circle, the sphere, the ellipse, etc., and seek for the properties of each one of them. Or else we can group together the corresponding properties of various geometrical forms, in such a way as to study them together, and, so to speak, to know beforehand their application to such and such a form which we have not yet examined. "In a word," says Comte, "the whole of geometry can be ordered, either in relation to bodies which are being studied, or in relation to phenomena which are to be considered." The first plan is that of the geometry of the ancients, or *special* geometry; the second is that of the geometry since Descartes, or

general geometry.[110]

At its origin geometry could only be special. The ancients, for instance, studied the circle, the ellipse, the parabola, etc., endeavouring, in the case of each geometrical form, to add to the number of known properties. But, if this line of advance had been the only one which could be followed, the progress of geometry would never have been a very rapid one. The method invented by Descartes has transformed this science, by enabling it to become *general*, and to abandon the individual study of geometrical forms for the common study of their properties. This revolution has not always been well understood. Often in teaching mathematics, its bearings are not sufficiently shown. From the manner in which it is usually presented, this "admirable method" would at first seem to have no other end than the simplification of the study of conic sections or of some other curves, always considered one by one according to the spirit of ancient geometry. This would not be of great importance. The distinctive character of our modern geometry consists in studying in a general way the various questions relating to any lines or surfaces whatever by transforming geometrical considerations and researches into analytical considerations and researches.[111]

All geometrical ideas necessarily relate to the three universal categories; magnitude, form, position. Magnitude already belongs to the domain of quantity. Form can be reduced to position, since every form can be considered as the result of the advance of a point, that is to say of its successive positions. The problem is therefore to bring all ideas of situation whatever back to ideas of magnitude.

How did Descartes solve it? By generalising a process which we may say is natural to the human mind, since it comes spontaneously into being under the stress of necessity. Indeed, if we must indicate the situation of an object without showing it immediately, do we not refer it to others which are known, by stating the magnitude of geometrical elements by which we conceive the object to be connected with them? Geographers act in the same way in their science to determine the longitude and latitude of a place, and astronomers to determine the right ascension and the declination of a star. These geographical and astronomical co-ordinates fulfil the same office as the Cartesian co-ordinates. The only difference, but it is a capital one, consists in the fact that Descartes carried this method to the highest degree of abstract generality thus giving it its maximum of fertility and power.

Although general geometry is infinitely superior to special geometry it cannot, nevertheless, altogether dispense with the latter. As the ancients did, so it will always be necessary to begin with special geometry. For general geometry rests upon the use of calculation. But if, as Comte has said, geometry is truly a science of facts calculation will evidently never be able to supply us with the first knowledge of these facts. In order to lay the foundations of a natural science simple mathematical analysis would never suffice, nor could it give a fresh demonstration of it, when these foundations have already been laid. Before all things a direct study of the subject is necessary, until the precise relations are discovered. “The application of mathematical analysis can never begin any science whatever, since it could never take place except when the science has been sufficiently elaborated to establish, in relation to the phenomena

under consideration, some equations which might serve as a starting-point for analytical work."[112] In a word, the creation of analytical geometry does not prevent geometry from remaining a natural science. Even when it has become as purely rational as possible, it none the less remains rooted in experience.

IV.

The second part of concrete mathematics (mechanics) is also one of the natural sciences which owes its marvellous progress to analysis. Here again we must distinguish the data which are at the basis of science, and which are facts, from the abstract development undergone by this science because of the simplicity of these facts and the precision of the relations which exist between them. The distinction between what is "really physical" and what is "purely logical"[113] is not always an easy one. We must, however, separate facts furnished by experience, from artificial conceptions whose object is to facilitate the establishment of general laws of equilibrium and of motion.

Only to consider inertia in bodies is a fiction of this kind. Physically the force of inertia does not exist. Nature nowhere shows us bodies which are devoid of internal activity. We term those which are not alive inorganic, but not inert. Were gravitation alone common to all molecules, it would suffice to prevent the conception of matter as devoid of force. Nevertheless, mechanics only considers the inertia of bodies. Why? Because this abstraction presents many advantages for the study, "without, moreover, offering disadvantages in the application." Indeed, if

mechanics had to take into account the internal forces of bodies and the variations of these forces, the complications would immediately become such that the facts could never be submitted to calculation. Mechanics would run the risk of losing its character as a mathematical science. And, on the other hand, as it only considers the movements in themselves, regardless of their mode of production, it is always lawful for mechanics to replace, if necessary, the internal forces by an equivalent external force" applied to the body. The inertia of matter is therefore an abstraction, the end of which is to secure the perfect homogeneity of mechanical science, by allowing us to consider all moving bodies as identical in kind, and all forces as of the same nature.

The "physical" character of this science is again evident from the consideration of the three fundamental laws upon which it rests.[114]

The first, called Kepler's law, is thus defined: "All movement is naturally rectilinear and uniform; that is to say, any body subject to the action of a single force which acts upon it instantaneously, moves constantly in a straight line with invariable speed." It has been said that this law is derived from the principle of sufficient reason. The body must continue in a straight line because there is no reason why it should deviate from it more on one side than on the other. But, answers Comte, how do we know that there is no reason for the body to deviate, except precisely because we see that it does not deviate? The reasoning "reduces itself to the repetition in abstract terms of the fact itself, and to saying that bodies have a natural tendency to move in a straight line, which is precisely the proposition

which we have to establish." It is by similar arguments that the philosophers of antiquity, and especially Aristotle, had, on the contrary been led to regard circular motion as natural to the stars, in that it is the most perfect of all, a conception which is only the abstract enunciation of a imperfectly analysed phenomenon. The tendency of bodies to move in a straight line with constant speed is known to us by experience.

The second fundamental law of mechanics, called Newton's law, expresses the constant equality of action and reaction. It is pretty generally agreed to-day to consider this law as resulting from the observation of facts. Newton himself understood it so.

Finally the third law establishes that "every movement exactly possessed in common by all the bodies of any system does not alter the particular movements of those different bodies in respect to each other; but those movements continue to take place as if the whole of the system was motionless." This law "of the independence or of the coexistence of movements" was formulated by Galileo. It is no more *a priori* than the two preceding ones. How could we be sure, if experience did not show it to us, that a common motion communicated to a system of bodies moving in relation to one another, would change nothing in their particular motions? When his law was made known by Galileo, on all hands there arose a cloud of objections, tending to prove *a priori* that this proposition was false and absurd. It was only admitted later when, in order to examine it, the logical point of view was set aside for the physical point of view. It was then seen that experience always confirmed this law, and that, if it ceased to

operate, the whole economy of the universe would be thrown into utter confusion. For instance, the movement of the translation of the earth in no way affects the mechanical phenomena which take place upon the surface or within the globe. As the law of the independence of motions was unknown when the theory of Copernicus appeared, an objection was put to him which was thought to be drawn from experience. He was told that if the earth moved round the sun all the movements which take place upon it or within it would be modified by the action. Later on when Galileo's law became known, the fact was explained and the objection disappeared.

Once these three laws are established, mechanics has sufficient foundation. Henceforth the scientific edifice can be constructed by simple logical operations, and without any further reference to the external world. But this purely rational development no more transforms mechanics into an *a priori* science than the application of analysis deprives geometry of its character as a natural science. What proves this, in one case as in the other, is the possibility of passing from the abstract to the concrete and of applying the results obtained to real cases, merely restoring the elements which science had been compelled to set aside. If it were possible entirely to constitute the science of mechanics according to simple analytical conceptions, we could not imagine how such a science could ever become applicable to the effective study of nature. What guarantees the reality of rational mechanics is precisely its being founded upon some general facts, in a word, upon the data of experience.

Comte could assuredly not foresee the controversies which to-day bear upon the principles

of mechanics and which have been summed up by Mr. Poincaré in an article upon Hertz's mechanical theories.[115] Mr. Poincaré says that the principles of Dynamics have been stated in many ways, but nobody sufficiently distinguished between what is definition, what is experimental truth, and what is mathematical theorem. Mr. Poincaré is satisfied neither with the "classical" conception of mechanics, whose insufficiency has been shown by Hertz, nor with the conception with which Hertz wishes to replace it. In any case it is a high philosophical lesson to see the classical system of analytical mechanics—a system constructed with such admirable accuracy, and made by Laplace to arise altogether, as Comte says, out of a single fundamental law,—to see it after a century labouring under grave difficulties, not unconnected with the progress of physics.

Might not this be an argument in support of the theory of d'Alembert and of Comte on the nature of concrete mathematics? Geometry and mechanics would only differ from the other natural sciences by the precision of the relations between the phenomena of which they treat, by the facility which they have for dealing with these relations by means of calculus and analysis, and, consequently, by assuming an entirely rational and deductive form. For the extraordinary power of the instrument should not hide from us the nature of the sciences which make use of it. These, like the others, bear upon natural phenomena. Only, as these phenomena are the most simple, the most general and the most closely allied of all, these sciences are also those which respond in the best way to the positive definition of science. They have "very easily and very

quickly replaced empirical statement by rational prevision." They are composed of laws and not of facts. But, conforming in this again to the positive definition of science, they are empirical in their origin, and they remain relative in the course of their development.

Thus positive philosophy, having reached the full consciousness of itself, reacts upon the conception of the sciences which have most contributed to its formation. When the philosophy is universally accepted the idea that a science can be *a priori*, that is both absolute and immutable, will have disappeared. Precisely because it is the most perfect type of a positive science, mathematics will no longer claim these characteristics, and its ancient connection with metaphysics will be finally severed.

CHAPTER II
ASTRONOMY

The object of astronomy is the discovery of the laws of the geometrical and mechanical phenomena presented by the celestial bodies; and, by the knowledge of these laws to obtain the precise and rational prevision of the state of our system at any given period whatever. It is in a word, "the application of mathematics to celestial phenomena."[116]

Mr. H. Spencer has taken occasion of this definition to criticise the place assigned by Comte to astronomy in his classification of the sciences. He makes him contradict himself. He says: you term fundamental sciences the abstract sciences which do not study beings in nature, but the laws which govern phenomena in those beings; by what right is astronomy placed among these sciences, between mathematics and physics? Is not the object of astronomy the study of certain beings in nature? In what does the application of mathematics to celestial phenomena differ from their application to other cases? It appears evident that here Comte introduces into the series of abstract sciences a science which is really concrete, or at least, according to Mr. Spencer's expression, abstract-concrete.

Comte had foreseen the objection. The answer which he makes throws a strong light upon the sense in which he understands the words "abstract" and "general" as applied to the sciences. He partly accepts the objection. The true astronomical notions,

he says, only differ from purely mathematical notions by their special restriction to the celestial case; and this, at first sight, must appear contrary to the essentially abstract nature of the speculations which belong to the first philosophy. But on the other hand, these speculations bear upon the phenomena given in experience, and the order of the abstract sciences should reproduce the real order of dependence of the phenomena. Thus the first of these sciences, mathematics, determines the essential laws of the most general phenomena, which are common to all material beings (form, position, movement). Now, are not the most general phenomena after these, those "of which the the continuous ascendency inevitably dominates the course of all the other phenomena?"[117] In other words, before passing to the study of physical, chemical, biological phenomena, etc., it is indispensable to know the general laws of the *milieu* in which these phenomena are manifested. Outside of this *milieu*, they would be impossible, or at any rate, it so conditions them that, were it otherwise, these phenomena would also be different from what they are.

The character of generality which, with that of abstraction, is made use of to institute the hierarchy of phenomena is thus reduced to the idea of dependence. It is the consideration of this dependence which assigns to astronomy its place between mathematics and physics in the encyclopædic ladder of the sciences. Considered singly in themselves, the phenomena studied by astronomy are purely geometrical and mechanical. They would not, therefore, constitute the object of a science distinct from mathematics. But positive philosophy considers everything from the point of view of humanity. Now, for humanity, this "special

case" is of unequalled importance. All the other phenomena given to us by experience (except the mathematical phenomena) depend, in a more or less direct manner, upon astronomical phenomena. The knowledge of astronomical laws is therefore the necessary condition for the knowledge of all the others. Thus, the infringement of the principle of the hierarchy of fundamental sciences is only apparent. An analogous case is found in chemistry. The analysis of air and water is incorporated in abstract chemistry, because air and water constitutes the general *milieu*, "in which all ulterior phenomena occur."[118]

The place given to astronomy is therefore justified. This science, moreover, remains abstract. For it to be a concrete science, all aspects of the existence of celestial bodies would have to be studied and considered in their relations, to each other in it. But, on the contrary, astronomy only studies the geometrical and mechanical phenomena in the celestial bodies, all physical and chemical considerations, etc., being eliminated. Comte concludes that in passing on to the celestial case mathematics does not lose its abstract nature. It only becomes more developed in the case of a special example, whose extreme importance demands such a specialisation.

The abstract character of astronomy belongs to it almost *a priori*. The facts upon which it rests are only revealed to us by one of our senses, the most intellectual of them indeed, but by which we are only informed of the mathematical properties of bodies. Our eyes alone touch the stars. There is no astronomy for a blind race. Dark stars, if such there be, are for ever hidden from us. All that is given to

us, therefore, is the shape, the position and the motion of visible celestial bodies. We can never by any means know how to study their chemical composition, nor their mineral structure, nor *a fortiori* the nature of the organic bodies which may live upon them. Comte might have formulated in less categorical terms affirmations which were soon to be contradicted by spectral analysis and by photography. But he was confirmed in the entirely abstract and mathematical conception which he had of astronomy by his persuasion that no discoveries of so far-reaching a nature were possible.

Thus, astronomy appeared to be an excellent type of a positive science, because it is at once natural and abstract, and in it these two characteristics are equally apparent, which was not the case in mathematics. In this science the share of observation is so limited, so transient, that it becomes inappreciable. In astronomy, on the contrary, determination of certain facts evidently plays a part in the science. But, at the same time, nowhere do we see more clearly that science does not consist in the mere apprehension of facts. Here they are so simple, and moreover so uninteresting, that their connexion and the knowledge of their laws alone deserves the name of science. In general, what is an astronomical fact? None other than this: such a star has been seen at such a precise instant, and under such an angle duly measured. The more or less profound elaboration of these observations is indispensable to science, even in its most imperfect state. Astronomy, says Comte, did not really come into being when the priests of Egypt or Chaldea made a series of more or less exact empirical observations in the heavens; but only when the first Greek philosophers began to reduce the general phenomenon of diurnal motion to

a few geometrical laws.[119]

Of all the natural sciences, after mathematics, astronomy is also the most perfectly free from all theological and metaphysical considerations. From every point of view it is positive. Astronomers no longer have recourse to a Providence, which as the intelligent cause of the order of the celestial world, would in its turn, witness to the existence of this cause. They do not inquire any more into the intimate nature of forces (gravitation, attraction, etc.). Astronomy is content to determine the invariable relations of phenomena with the greatest possible precision. It is here that philosophical minds can study the essential characteristics of a positive science. In it they will also see how disinterested it must be in order to become useful. "Without the highest speculations of geometers upon celestial mechanics, which have so greatly increased the precision of astronomical tables, it would be impossible to determine the longitude of a ship with the degree of accuracy which is now attainable."[120]

Finally no science has exercised a greater influence upon the evolution of the human mind than this one. The great epochs in astronomy are also those in cosmological philosophy. The desperate resistance which was offered by theological dogmatism to Galileo's discovery responded to a just apprehension of the consequences involved in this discovery. To admit that the earth was not the centre of the world was to take a first and a decisive step in the way which leads away from the anthropocentric prejudice. It was like pledging oneself to substitute sooner or later the relative point of view to the absolute one in philosophy. It was introducing the positive spirit, to-day in speculative physics, to-

morrow in speculative ethics.

II.

Although astronomy is an "eminently mathematical" science, the method of working by observation is used in it. The astronomer observes before calculating, and he observes again after having calculated. The art of observation for which there is no use in mathematics appears here then, and, with it, the inductive method.

Indeed there is no "absolute separation" between observing and reasoning.[121] The mind does not first observe facts in a receptive or "passive" manner, in order to work out combinations of these facts afterwards. In reality every observation is a combination, and this is particularly true in astronomical observation. The facts which we observe are really constructed. We can only see simultaneous or successive directions, according to which the mind must construct the form or the movement which the eye could not take in. The necessary and constant association "between prevision and inspection" is more intimate and more evident here than in any other science.

In the same way, hypothesis (which is inseparable from observation) can be studied in astronomy in its most simple form. Here it is presented in its clearest aspect, and, if one may say so, in the one which most reveals its essential nature. Now, hypothesis in astronomy "serves to fill up the necessary gaps in observation." It provisionally supplements the knowledge—not indeed of causes, for positive science seeks nothing of this kind—but of facts and laws which we ignore. For instance, the simple

geometrical sketch of a diurnal motion would remain impossible without an abstract hypothesis which being compared with the concrete spectacle presented by the movement itself enables us to connect together the various celestial positions. Modern astronomy, which has destroyed primitive assumptions regarded as real laws of the world, has maintained their permanent value for conveniently representing phenomena provisionally. And, as we are not deceived as to the reality of such assumptions we can use without scruple any one which seems to us most advantageous.[122]

The use of hypothesis, as it is employed in astronomy, must be carried into the other sciences. This mode of procedure everywhere remains like to itself, although we do not always conceive it so clearly. "Its normal domain coincides with that of observation." An hypothesis completes by anticipation what we know of facts and of their laws. Consequently, it is subject to be modified, corrected, or contradicted by a wider or deeper knowledge of facts. Hypotheses then are only valid during the time when they are advantageous, that is to say, as long as they serve to unite and co-ordinate our observations. As has been said, they labour to render themselves useless. But they are indispensable, and science, without them, could neither advance nor even begin. Far from giving too small a share to hypothesis, like Bacon, Comte would rather incur the reproof of having given it too large a one. He made too much use of it himself at the end of his life. But the theory which he gave of it in the *Cours de philosophie positive* and of which certain features appeal again in Claude Bernard's *Introduction a l'étude de la médecine experiméntale*, was a careful study of its nature and function.

III.

Astronomy, or at least that part of astronomy which bears the name of celestial mechanics, of all the physical sciences is the one which has been carried to the highest degree of perfection. Nowhere else have the phenomena been better reduced to a supreme law which allows us to foresee them with sufficient precision. But this result could only have been obtained by substituting the notion of a solar world to that of a universe.[123] This world is the only one which we can comprehend as a system. If the object of astronomy were the general laws of the universe, this science would be extraordinarily imperfect, not to say impossible. For what do we know about cosmic laws?[124] We do not even know whether Newton's law applies to any or all systems of stars.

We must then distinguish between astronomy as the science of our world and sidereal astronomy. The latter is not absolutely forbidden us, but we know very little on this subject, and we shall probably never know much more. Do the innumerable suns scattered in space form a general system, or do independent systems exist? Is space limitless? Is the number of celestial bodies an infinite one? philosophers ask. In truth the consideration of our world is positive. The consideration of the universe is not.

History helps us to understand the transition which led from one to the other. Ancient philosophy made the earth the centre of the universe. Notwithstanding the diversity of their particular characteristics and of their motions, it was natural

then for all the celestial bodies to be conceived as the parts of a single system. A more or less clearly expressed postulate supported this astronomical conception: the purpose of the universe was the existence of man. There was no occasion to distinguish our world from the whole world. But could this conception stand when the earth was reduced to the condition of a planet revolving round a sun so like a multitude of other suns. Suddenly the stars were carried to distances infinitely more considerable than the greatest planetary intervals. Undoubtedly the human mind could continue to regard the very small groups of which the earth forms a part as a system. But the system (if it exists) which embraces the whole of the celestial bodies ceased henceforth to be within our reach. Since then "the notion of the world has become clear and habitual, and that of the universe has become uncertain and almost unintelligible."[125]

It matters little, moreover, for, according to one of Comte's favourite maxims, what we have no means of knowing, neither have we any need to know; and every thing which it is our interest to learn we can also attain. Nor should we see in this any providential harmony. That which it is our interest to know must always in some way influence the conditions of our existence. By the mere fact that this action makes itself felt, it is inevitable that sooner or later, directly or indirectly, we should come to know of it. This reflection can be well applied to astronomy. The study of the laws of the solar system, of which we form a part, is of supreme interest for us: and we have reached very great precision on this point. On the contrary, the exact notion of the universe is inaccessible to us; but it is unimportant to us leaving out of the question our "insatiable

curiosity." The independence of our world is certain. The phenomena which take place within the solar system do not appear to be affected by the more general phenomena which relate to the mutual action of suns. Our tables of celestial events, drawn up long beforehand and taking into consideration no other world than our own, so far accord strictly with direct observations. Supposing the law of gravitation to extend to the entire universe, the perturbation in our world caused by a mass equal to a million times its own, and which would be situated at the distance of the nearest sun to our own, would be several thousand million times less than that which brings about our tides, that is to say practically nil.

Here, says Comte, is the only exception to the encyclopædic law according to which the more general phenomena control the more particular ones without being influenced by them.[126] From this he simply concludes that the phenomena of our system are the most general to which positive research can extend, and that the study of the universe must henceforth be excluded from natural philosophy. The encyclopædic law then remains true for the whole of positive philosophy.

The delimitation of the object of astronomy is one of the points where we can best follow the successive modifications of Comte's thought. In the second volume of the *Cours de philosophie positive* he gave to astronomy the place which is generally conceded to it by scientific men. He even claims, as a condition for its utility, the most perfect disinterestedness of scientific research in the whole extent of its province. The example which he gives of it (the determination of longitude at sea), is borrowed from Condorcet.

Undoubtedly, Comte already insists upon the distinction between the ideas of world and universe, the former only being positive. Nevertheless, he still admits that we should not give up all hope of obtaining some sidereal knowledge,[127] and that it would be very precious for us to know the relative motions of multiple stars, etc. But already in the sixth volume of the *Cours* he condemns entirely the "so-called sidereal astronomy, which to-day constitutes the only grave scientific aberration peculiar to celestial studies."[128] Ten years later, in the first volume of the *Politique positive*, he "regenerates" astronomy from the synthetic point of view. He is no longer content to limit it to the knowledge of the solar system. He confines the particular study of our world within narrow limits. Astronomy, like the other sciences, from objective must become subjective. Instead of the vague (that is to say indefinite) study of the heavens its end must be the knowledge of the earth, and the consideration of the other celestial bodies only in their relation to the human planet. At this price alone can the unity of this science be secured.[129]

Thus Comte came back to Aristotle's closed world with the earth as its centre. He points it out himself in showing in what way he differs from the ancient conception. "This unity," he says, "existed for the ancients, but was of an absolute character which at that time was legitimate." When the motion of our planet became known, the ancient constitution of celestial science might merely have been modified "by preserving in it, as subjective, the centre which was at first supposed to be objective." That would have sufficed to change astronomy from an absolute science to a relative one. Undoubtedly the ancients were deceived in believing the earth to be the centre

of the world; but, in order to correct their error, it sufficed to say, the centre of *our* world. The subjective synthesis "indeed concentrates the celestial studies round the earth." The other stars only deserve our attention in so far as the knowledge of our planet requires it. Comte ends by saying in the fourth volume of the *Politique positive* that, strictly speaking, the study of the sun and moon would suffice. We may add to them the ancient planets, but not the "little telescopic planets."[130]

This progressive narrowing of the astronomical domain does not indicate a radical change in Comte's philosophical thought. It only results from the growing subordination of the scientific interest to other superior interests. To know for the sake of knowing, appears to Comte to be a wrong use of the human intellect. The Newtons and the Laplaces in the past have fulfilled a necessary function, and humanity owes them eternal gratitude. They struck a decisive blow against theological and metaphysical philosophy; and secured the victory for the positive spirit. In their time scientific speculation which tended to the discovery of the laws of phenomena, and especially of celestial phenomena, was at once the most sublime and the most useful occupation which those men of genius could set themselves. But now that their efforts have culminated in the foundation of positive philosophy, and this philosophy itself in the "final religion," there is no longer any reason to continue researches with which henceforth humanity can dispense. We must even "cut down many idle acquisitions."[131] In a word, from the religious point of view, Comte, in order to remedy the anarchy of science, suppresses its liberty.

These extreme, but logically deduced

consequences, are part of the whole of Comte's religious conceptions, that is to say of a distant ideal. They must not blind us to the profundity of his philosophical considerations on astronomy. His reflections upon the relation between the ideas of the world and of the universe correspond, from the positive point of view, to the first antinomy of the transcendental Dialectics in the *Critique de la raison pure*. Can we ever be more fully conscious of the relativity of our knowledge, that when we see that what we know of celestial phenomena is admirably precise so long as the solar system is concerned, but is reduced to almost nothing if we look beyond it?

Our world will perish, and its disappearance like its existence, will perhaps be an imperceptible incident. By the continued resistance of the general *milieu*, says Comte, in the end our world must be re-united to the solar mass from which it came, until, in the immensity of future ages, a fresh dilatation of this mass shall organise a new world in the same manner, destined to repeat more or less completely the former cycle. Moreover, all these immense alternatives of destruction and of renewal have to be accomplished without influencing in any way the more general phenomena due to solar interaction; so that the great revolutions in our world would only be secondary and, so to speak, local events, in relation to transformations of a really universal character.[132]

This outlook into the "immensity" of space and of duration suffices to show that Comte was not a prisoner in the little solar fatherland in which he seems to seclude himself. It may be that for moral and religious reasons he will not allow himself to go beyond it. But, like Pascal, he well knows that he inhabits "a little out of the way district of nature."

CHAPTER III.
THE SCIENCES OF THE INORGANIC WORLD

If we do not separate chemistry from physics, their common object is the knowledge of the laws of the inorganic world. In this way they are clearly distinguished on one hand from astronomy which we may consider as an "emanation from mathematical science," and on the other hand from biology. The distinction between physics and chemistry presents a greater difficulty. Nevertheless this distinction must be maintained, since the physical phenomena are more "general," and the chemical phenomena more "special," that is to say, the latter depend upon the former, without this dependence being for the most part reciprocal. Even if some day we succeeded in establishing that chemical phenomena are in reality physical, the distinction would none the less subsist, in this sense, that in a fact termed chemical, there is always something more than in a fact which is simply physical, namely, the characteristic alteration which the molecular composition of bodies undergoes, and which consequently affects the totality of their properties.[133]

To speak only of physics in the first place, this science presents different characteristics from those of astronomy. The speculative perfection of a science is measured by two correlative although distinct considerations, by the more or less complete co-ordination of the laws, and by the more or less accurate prevision of facts. Now, under one aspect or the other, even supposing that physics should make very important progress, it will always remain very

much behind astronomy. Indeed, the celestial science presents an almost perfect unity; physics, on the contrary, is composed of several branches which are almost isolated from one another, and each one taken by itself cannot even reduce all its laws to a more general law. And, as to the second point, while a very small number of direct observations allows of rational and exact prevision of the whole of the celestial phenomena, physics only renders possible predictions which are generally founded upon experience at once immediate and within easy reach. Undoubtedly some parts of physics allow of the use of mathematical analysis (we shall see presently under what conditions). Nevertheless, the part played by experience is infinitely greater in physics than in astronomy. So it is in the former science that we first meet with the inductive method, which is afterwards used and developed in the other positive sciences. Although deduction continues to fulfil an important part, it already ceases to predominate here, because, says Comte, in it the institution of true principles begins to become more troublesome than the development of accurate consequences.[134]

The inductive method implies these essential processes; 1◦ observation properly so called, that is to say the direct examination of the phenomenon such as it appears naturally: 2◦ experimenting, which is usually defined as the examination of the phenomenon more or less modified by artificial circumstances instituted by us in order to study it better; 3◦ comparison, that is to say the gradual consideration of a succession of analogous cases, in which the phenomenon becomes more and more simple. Of these three processes astronomy only makes use of the first. Physics cannot use the third which is reserved for biology; but it avails itself of

the first and institutes the second. This is a fresh confirmation of the law established by Comte: to the complexity and increasing difficulty of the sciences, corresponds an increasing development of the processes of the positive method applicable to them.

Research by way of experiment, which is impossible in Astronomy, appears in Physics. It is therefore here where it originates that we must study it. It is also here that it is most successful, and gives the greatest number of results. Indeed, to experiment successfully we must be able to compare two cases "which present no other difference direct or indirect, than that which relates to the course of the phenomenon under analysis."[135] By experimenting, Comte here clearly designates what John Stuart Mill will call the method of difference, that is to say the most powerful of his methods for the investigation of phenomena.

Now, experimenting, so understood, is extremely difficult when very complicated phenomena are concerned. In physiology, for instance, the experiments must be combined in such a way as to maintain the subjects in the living state, and even, as far as possible, in the normal state. But any modification of one part of the organism immediately affects the other parts. The living being reacts instantly, and adapts itself as best it can to the new conditions in which it has been placed by the experimentalist. We can therefore hardly ever establish in physiology what is so easily obtained in physics: two cases exactly similar in all respects, except in the one which we want to analyse. In chemistry, it is true, experimenting would seem to be even easier than in physics, since in it, as a rule, we merely consider facts resulting from circumstances

which are produced by man's intervention. But this is to mistake the nature of the experimental method. The essence of this process does not consist in man's institution of the circumstances surrounding the phenomena; it lies in the "freest possible choice of the case best suited to show the law of the phenomenon," whether this case be, moreover, natural or artificial. Now, this choice is nearly always easier in physics than in chemistry. For the chemical phenomena more complex in themselves, in general can only be brought about by the co-operation of a great number of different influences; for this reason in chemistry, it is more difficult to modify the circumstances under which phenomena are produced, and still more difficult to isolate as completely as in physics the various conditions by which phenomena are determined.

To the use of the experimental method, physics can often join that of mathematical analysis. But in the employment of the latter it must be extremely cautious, and we must only have recourse to this application of mathematics after having "carefully considered the reality of the starting point," which alone can guarantee the solidity of the deductions. In a word, the spirit proper to physical investigation, must constantly direct the use of this powerful instrument. Now, this condition has not always been fulfilled. Too often the preponderance of mathematical analysis has been the cause of the neglect of experimental studies. Not only has mathematical analysis in this way retarded the progress of physics but it has even tended to vitiate the conception of that science, and to bring it back to a state of obscurity and uncertainty which, says Comte, notwithstanding the apparent severity of the forms differs little, at bottom, from its old

metaphysical state.[136]

For this reason, the application of analysis to physics must not be left to geometers who are chiefly concerned with the instrument. It must belong to the physicists who before all things consider the use to be made of it. Mathematicians have often encumbered physics with a quantity of analytical labour founded upon very doubtful hypothesis; they must give way to physicists trained in experimental studies, and, nevertheless, with sufficient knowledge of mathematics to make use of the analysis whenever it is possible. Within these limits mathematical analysis will render the greatest service to the science of physics. Would optics, acoustics, the theories of heat and of electricity have reached the point where we see them to-day without the powerful help of analysis? Yet even here, physical researches are almost always so complex that, in order to assume a mathematical form, they demand the setting aside of a more or less essential portion of the conditions of the problem. Indeed we are here in presence of the general problem of the translation of the concrete into the abstract. This problem, which is admirably solved in mathematics, and sufficiently in astronomy, is only imperfectly solved in physics. The art of closely combining experience and analysis, says Comte, is still almost unknown. It constitutes the final progress of the method proper to the deeper study of physics.[137] We may add, and this is in Comte's mind, that conversely the progress made by this art would be useful to analysis itself.

II.

Astronomy has reached a perfect state of

"positivity." All trace of the metaphysical spirit has disappeared from it. Can we say as much of physics? It would not seem so, when we see the hypotheses which play so great a part in this science, and of which a few are keenly contested by Comte.

How can we distinguish the valuable hypotheses from the useless ones, those which are useful to physics from those which are merely an encumbrance and should be rejected? This is not a question which can be solved by referring to abstract rules. In order to answer it, we must study the use of hypotheses where it is perfect, and decide according to this example. To my mind, says Comte, the deeper study of the art of hypotheses in astronomy can alone establish the rules which are suitable to direct the use of this precious artifice in physics, and more so still in the remainder of natural philosophy.[138] Now of what use is it to astronomers? To anticipate the results of deduction or of induction, "by making a provisional supposition concerning some of the very notions which constitute the final object of the research." It is a process of which the methods of approximation used by geometers originally suggested the general idea. They "supposed" that the circumference was the limit of the perimeters of inscribed and circumscribed polygons the number of whose sides went on increasing. In the same way, hypotheses provisionally fill up the "lacunæ" of our knowledge.

An hypothesis should always be open to a positive verification, "whose degree of precision is in harmony with that of the corresponding phenomena." For it only expresses beforehand what experience and reasoning might have made known immediately, if the circumstances of the problem had

been more favourable. If, therefore, an hypothesis claimed to attain that which in its nature is inaccessible to observation and to reasoning, it would immediately become illegitimate and harmful. In a word, it must bear exclusively upon laws, and never upon causes or the modes of production of phenomena.

In the physics of his own time Comte finds the two kinds of hypotheses, but he also finds more bad hypotheses than good ones. He especially protests against the ethers and the fluids to which the phenomena of heat, light, electricity and magnetism were attributed. These hypotheses, according to him, are destined to disappear from science. It is true that the physicists deny that they attribute an objective reality to their ethers and their fluids. They claim to need them absolutely in order to facilitate the conception and the combination of phenomena. However, in spite of themselves, they are drawn into speaking of their ethers as if they really existed. Moreover, do they not see that astronomy gets on very well without similar hypotheses? In order to conceive the phenomena it is enough to observe and analyse them attentively. And, as to combining them, that depends upon the knowledge which has been obtained of their positive relations.

The corpuscular theory is, on the contrary, an example of a good hypothesis in physics, where it plays a part analogous to that of the inertia of bodies in mechanics.[139] The innermost structure of bodies is unknown to us. But we have a right to introduce all the hypotheses which can help us in our research, and in particular the hypothesis of atoms, so long as we do not understand it as something representing a reality.

The ethers and the fluids tend to “explain” the physical phenomena by the nature of the agent which produces them. It is here that these hypotheses bear the mark of the metaphysical spirit. To understand the appearance and especially the persistence of these hypotheses, it is not enough to consider them in themselves. We must get back to the history of physics, and compare it with that of the other fundamental sciences. Was it possible for physics to pass suddenly from the period in which phenomena are referred to causes and essences, to the positive period where they are conceived as simply subject to laws? A period of transition was necessary. The scholastic entities, before disappearing, became semi-materialised. They were transformed into fluids. What is heat conceived as existing apart from a hot body, light independent of a luminous body, electricity separated from an electric body? They are the old entities in a new garment, more easily grasped, in spite of their “equivocal corporeity.” They gradually lead to the more and more exclusive consideration of phenomena and of laws, until, in their turn, they disappear.

Astronomy went through the same phases before Physics. In it we have also seen hypotheses which cannot be verified come to facilitate the transition from the theological to the positive state. Such was the conception of Descartes who explained the celestial motions by the system of vortices. Those famous vortices introduced the idea of a mechanism where Kepler himself had only dared to conceive the incomprehensible action of souls and genii. Then Newton came, who preserved the idea of mechanism, while giving up the vortices. In vain did the Cartesians fight against his entirely positive

conception. Their arguments in favour of fluids and ethers were as plausible as those of the physicists of our own time. But we have ceased to listen to them. Having become entirely positive, astronomy no longer seeks anything but the laws at work in the phenomena observed. Every accessory hypothesis aiming at anything else has no further interest for us.

The most advanced portions of physics have already reached this point. Take, for instance, the study of gravitation. There was not perhaps a single scientific man of any importance in the XVII. century, even long after Galileo, who did not construct or adopt a system concerning the fall of bodies. At that time any science on this subject seemed impossible without a hypothesis of this kind. Who troubles himself with it to-day? We may be allowed to think that the other parts of physics will follow the same line, and that in turn they will conform to this rule of the positive method: “Every hypothesis must bear exclusively upon the laws of phenomena, and never upon their modes of production.”

III.

In the series of the fundamental sciences Chemistry appears to fill a somewhat secondary and subordinate place. In it the positive method is not enriched by any process of capital importance, but it confines itself to developing the processes already made use of in physics. In spite of appearances, even experimenting is less easy and less fertile in chemistry than in physics. The only new process which we see appearing is the art of nomenclature. Whenever we wish to study this art “at its source”

we shall have to refer to chemistry.[140]

The phenomena which it studies are the most complicated of the inorganic world. If then physics is extremely imperfect, it is not surprising that chemistry should be much more so. In the greater number of its researches "the chemistry of the present day hardly deserves the name of science."[141] But this inferiority of chemistry is not only due to the nature of its object. There are other causes which it would be easier to remedy. The progress of chemistry is retarded: 1, by the wrong direction given to much of its work up to the present time; 2, by the defective education of the majority of the scientific men who give themselves to its study.

Before all things, chemists lack a clear and rational idea of their science, of its relation to the sciences which stand nearest to it and the way in which its problems should be stated. Being intermediate between physics and biology, chemistry has suffered from the vicinity of both. As the more advanced sciences always have a marked tendency to encroach upon those above them, chemistry must in the first place defend itself against the ascendency of physics, as physics itself must fight against that of mathematics. The chemist must undoubtedly have studied physics, in order to make use of the results obtained by this science, and to turn them, if he can, into a method for his own use. The relation of these two sciences is very close, and a knowledge of the laws of calorific and electric phenomena, for instance, is of the highest importance for chemical research. But, for all this, the chemist has his own point of view. He studies, (which the physicist does not do), the laws of the phenomena of composition and decomposition which are the result of the

molecular and specific action of diverse natural or artificial substances upon each other. He must therefore make use of physics, but not subordinate himself to it.

On the other hand physiological research is not within the province of chemistry. What has been called "biological chemistry" belongs, according to Comte, to biology alone. For the physiologist to have gone through the school of chemistry is natural and even indispensable. But his point of view is quite different from that of the chemist. As a matter of fact, chemists have shown themselves unqualified for physiological studies. None of their numerous attempts have succeeded in establishing a single point of general doctrine, in biology. They merely furnished materials. Moreover these cannot be used just as they are by the physiologist, who is obliged to take up the researches again "under the preponderating influence of biological considerations." Comte admires the self-confidence of the chemists who approach physiological questions without having measured or even suspected the special difficulties. It is, however, clear that the most carefully made chemical analyses must be fruitless here so long as they are not directed in the first place by a precise physiological notion of the whole of the phenomenon, and then modified by the knowledge of the limits of the normal variations to which the phenomena may be liable. Now, for proceeding in this manner, the physiologists alone are competent.[142]

Analogous considerations lead Comte to reject even organic chemistry. Although the chemical phenomena present characteristics which in the

inorganic world come nearest to the solidarity which subsists between the elements of living forms, nevertheless chemical phenomena remains irreducible to living phenomena. That which is chemical is not yet organic; and that which is organic is no longer purely chemical. We must do away with this heterogenous and fictitious grouping which is called organic chemistry, to unite the different parts, according to their respective nature, some to chemistry proper, the others to biology.[143]

How can we define the object of this science, so imperfectly determined at the present time? Comte knows that he is about to depart from the methods generally in use among chemists, but he is not afraid of this. For, he says, in order to understand the real nature of a science, we must always suppose it to be perfect.[144] As chemistry, is in an extreme state of imperfection, the "scientific type" which the philosopher conceives respecting it will appear to be very far removed from what exists at present. It matters little so long as this type is perfectly "rational."

What is essential to science is the possibility of foreseeing phenomena. Given the characteristic properties of the simple or complex substances placed in chemical relations with each other under well defined circumstances, the object of chemistry will therefore be to determine exactly in what their action will consist, and what will be the properties of the new substances produced.[145] According to this definition, the fundamental data of chemistry should be ultimately, reducible to the knowledge of the essential properties of the simple elements alone, which would lead to that of the various immediate chemical substances, and consequently to the most

complex and distant combinations. Obviously, the study of simple bodies can only be made by means of experiments, which alone reveal their properties. But, once this basis is laid down, "all the other chemical phenomena, notwithstanding their immense variety, should be capable of rational solutions, according to a small number of invariable laws, established by the science of chemistry for the various classes of combinations."

Thus, Comte sees clearly that the complexity of the chemical phenomena prevents us from expressing their relations in a form which allows of the use of mathematical analysis. But none the less, in this science as in the preceding ones, he persists in making the experimental method a mere starting-point. The experimental method furnishes the data which it alone can supply. But these data are afterwards elaborated without its intervention. The scientific ideal in chemistry, as in physics and in astronomy, is *to substitute as much as possible rational prevision to experimental verification*. Science always seeks to *deduce* the greatest number of consequences from the smallest number of data, and the smallest number of data in this case are the properties of simple bodies. Deduction will establish *a priori* what the properties of a given combination of two simple bodies, or of two complex bodies will be.

In the name of this scientific ideal, Comte reproaches the chemists with the superabundance of their analytical work. In default of a rational conception of chemistry they do not make their work bear upon the necessary points. What is the use of studying such and such a body, placed in such and such conditions, in an arbitrary way and according to the fancy of investigation? The progress of chemistry

should consist far less in the acquisition of new materials than in the systematisation of those which we already possess. Chemistry is to-day as rich in details as it is imperfectly constituted as a science.[146] Its present state in no way gives an idea of what its normal state will be.

Not content with showing to chemists the "scientific type" towards which their science should tend, Comte suggests a contrivance in method which will bring them nearer to it. It is in no way like the hypothesis of affinities, for this appears to him to be even more "ontological" than the hypothesis of imaginary fluids or ethers. As always happens when we are concerned with metaphysical conceptions, the explanations which we draw from affinities consist in the reproduction in abstract terms of the very statement of the phenomenon.[147] To this hypothesis, which is not a scientific one since it bears up the mode of production of facts, Comte substitutes what he calls the "dualist hypothesis." We ignore, he says, and it is not for us to seek the real manner in which the elements of which bodies are composed come to be grouped together. But, consequently, it is lawful for us, in the very circumscribed sphere of our positive research, to conceive the immediate composition of any substance whatever as merely *binary*, each of the two bodies so separated being able, according as the case may be, to lend itself to a similar analysis, equally binary, and so on, as the occasion arises. We do not affirm that dualism is a real law of nature. It will be a fundamental contrivance in chemistry, like the hypothesis of inertia in mechanics, and that of atoms in physics. It will serve to "simplify our elementary conceptions" in chemistry, and in having recourse to it we do not exceed "the special kind of liberty" of which our

intellect may avail itself, in the institution of science.[148]

The use of this hypothesis would allow us to endow chemistry with a "fine" character of unity and rationality which it lacks to-day. It is true that Comte himself confessed that this hypothesis, proposed by him in 1838, had yet "produced nothing" in 1851. But he explains this sterility to himself by the metaphysical spirit, from which chemists are not sufficiently freed.

IV.

We can now take in at a single glance the relations of the sciences of the inorganic world (including astronomy), with the totality of positive philosophy.[149]

In several ways these sciences have contributed to the progress of the positive spirit. By their constitution, they allowed and prepared the formation of the more complex sciences of Biology and of Sociology. Moreover, their development struck a mortal blow at theological and metaphysical philosophy. Through them minds became familiarised with the idea of natural law. This idea was not so clearly brought to light by mathematics on account of their almost purely abstract character, and of the imperceptible part played in them by observation. It appears, on the contrary, as the mainspring of astronomy, of physics, and of chemistry. The whole effort of these sciences tends to discover invariable relations between phenomena given in experience.

Theological philosophy is the "explanation" of

nature which the human mind first makes for itself. In order that it may give up this "explanation" some contrary evidence must oblige it to do so. It may see for instance, that phenomena can be predicted with a perfect exactness which is always confirmed by experience, or that man, under certain conditions, can modify them with certainty. Astronomy gives us an example of the former case. It studies phenomena which, it is true, are removed from our sphere of action. But, in return, it predicts them with a certainty of which the effect has been practically infallible in the long run. It is astronomy which has done most to discredit the religious and philosophical doctrine of final causes.[150] Not only has it proved that the universe is not disposed with reference to man, but it has shown the imperfections of our solar system. It has helped more than any other science to check the mental habit of seeking the mode of production of phenomena.

Physics is far from allowing of a rational prevision which is comparable to that practised by astronomy. But, as a compensation, it shows how the knowledge of laws gives the power to cause phenomena to vary with certainty. This second way leads us no less surely than the first to the positive conception of nature. For example, Franklin destroyed the religious theory of thunder, even in the least cultivated intellects. The discovery of the means of directing lightning therefore had the same effect, in another way, as the exact prevision of the return of comets.[151]

On the other hand the sciences of the inorganic world furnish the general positive method with some of its most powerful processes. Astronomy introduces observation and hypothesis into this method, Physics

adds experimenting to it, and Chemistry the art of nomenclatures. The inductive method, which virtually consists in simple scientific observation, becomes, however, enriched and is developed, according as the phenomena in question become more complicated.

But, in return, positive philosophy exercises a considerable influence over these sciences. It claims nothing less than to direct and "regenerate" them. Viewing them from above and as a whole, philosophy can bring a remedy to the difficulties which arise from their specialism. It sets an exact limit to each of the sciences. It delivers physics from the "algebraical yoke," and protects the independence of chemists against the encroachments of the physicists. It places the entirety of the positive method at the service of each particular science. For instance, it directs the use of hypothesis in physics by the theory drawn from the use which is made of it in astronomy; for classifications, it extends to chemistry the use of the comparative method which properly belongs to biology. When, later, the integral and final constitution of the philosophy of our age shall have organised the relations between all the sciences, it will be almost impossible, save from the historical point of view, to understand how the study of nature was ever conceived and directed otherwise.[152]

Positive philosophy organises labour within each science, and puts an end to "anarchy." It distinguishes between "idle" researches, and those which should be pursued. It avoids waste of efforts and prevents digressions. We have seen within what limits Comte wishes to enclose astronomy in the name of philosophy. He does not perceive the means by which he can unite the various branches of

physics; but he claims to replace the fragmentary and scattered chemistry of his time by a single systematic science, which will forsake the researches of detail which are without interest for humanity. “Almost the whole of those innumerable compounds will not finally be worthy of any scientific attention. Some well-chosen series may even be able to satisfy the logical requirements of chemistry for the discovery of the abstract laws which belong to each order of composition.”[153]

Finally positive philosophy causes the disappearance of the last remains of the theological and metaphysical spirit from the sciences of inorganic nature. This philosophy has already shown that mathematics is not a more absolute science than the others, and that it originates in experience. In physics and in chemistry it banishes the hypotheses which, more or less avowedly, tend to make us conceive the essence or the mode of production of phenomena. It is thus that it demands a science of physics freed from ethers and fluids, and a wholly rational chemistry which shall give up affinities.

Comte is not therefore possessed of a superstitious respect for the sciences in the state in which they appear before him. On the contrary, he intends that they should be subject to deep modifications, and that they should strive towards an ideal form which is laid down for them by philosophy. He calls this form “positive.” In reality it is Cartesian.

CHAPTER IV
BIOLOGY

The passage from the inorganic world to the world of Life constitutes a critical step in natural philosophy. Astronomy, Physics, and Chemistry represented successive steps in the same series. If each order of phenomena presented in itself something which was irreducible to previous orders, nevertheless all these phenomena, in a certain sense, remained homogeneous. Without rashness, Descartes could conceive that physics, like astronomy, would one day assume the mathematical form. And to-day more than one scientific man considers the distinction between physics and chemistry as provisional.

But as soon as life appears, we enter a new world. At this degree the "enrichment of the real" is suddenly so considerable that we find it difficult to admit the homogeneity of these phenomena with the preceding ones. Comte here reaps the benefit of his prudence. His philosophy has guarded against reducing all science to a single type, and it is content with the unity of method and the homogeneity of doctrine. It only demands that each science should limit itself to the search after the laws of phenomena. As to the way in which this research is to be carried out, it is evidently subordinated to the nature of the phenomena in question. Now, biological phenomena present a number of characteristics which belong to them alone, and the first duty of the positive science which studies them is to respect their originality.

Comte, therefore, here breaks with Descartes who conceived biology as a prolongation of physics. He takes an entirely different view of this science, which, in a sense, is opposed to the whole of the sciences of the inorganic world. From this there arises a double effort. On the one hand, Comte wishes to maintain the continuity of the encyclopædic series of the sciences: he thus shows Biology as immediately following chemistry, and maintaining the closest relations with astronomy and physics. On the other hand he clearly brings out the irreducible character of the vital phenomena, and the modifications which the positive method must undergo when applied to them. Despite the extreme difference between the points of view and the doctrines, he often makes us think of those deep and difficult passages in the *Critique du Jugement* where Kant has shown that without the hypothesis of an inner finality, (although this hypothesis is in itself obscure), the phenomena which take place in living beings remain unintelligible.

With biology, says Comte, necessarily appear the ideas of *consensus*, of hierarchy, of "milieu", of the conditions of existence, of the relation between the static and the dynamic states, between the organ and the function.[154] In a word, a biological phenomenon, considered alone is devoid of meaning. Strictly speaking, it does not even exist. It can only be understood by its relations with the other phenomena which take place in the living being, phenomena which react upon it. At the same time it reacts upon them. Here, in opposition to what takes place in the inorganic world, the parts are only intelligible through the idea of the whole. Undoubtedly a certain solidarity of phenomena exists in the inorganic world, which allows us to consider

united wholes in it. But the solidarity of biological phenomena is far closer, for, without it we could not conceive them, while, as regards the phenomena of the inorganic world, there is nothing impossible in this abstraction.

Henceforth, the positive method must adapt itself to the characteristics which belong to biological phenomena. It does not always demand, as it has been wrongly stated, that we should go from the simple to the complex, but only that we should proceed from the known to the unknown. It is true that in the sciences of the inorganic world we proceed from the least complex to the most complex cases; we begin by the study of phenomena which are as isolated as possible from one another. But, on the contrary, living beings are all the better known to us in proportion as they are more complex. The idea of the animal is in some respects clearer to us than the idea of the vegetable. The idea of the superior animals is clearer to us than that of the inferior ones. Finally man for us is the principal biological unity, and it is from this unity that speculation starts in this science.

Thus, in dealing with Biology the positive method undergoes a veritable inversion. In the preceding sciences, the last degree of composition is forbidden us: we never succeed in uniting the whole of the inorganic world into a single synthesis. In biology, on the contrary, sums of phenomena are given; but it is the last degree of simplicity which escapes us. We have to start from those sums of phenomena, and biology must in this way assume a synthetic character. In it the analysis of phenomena will be as minute as possible; but the analytical operations will always be more or less directly subordinated to the

leading idea of the vital *consensus*.[155]

II.

Like the other fundamental sciences Biology must be abstract, that is to say it must not bear upon individual beings, but upon phenomena. It is thus distinct from zoology and botany which are concrete sciences. In its widest generality it is defined through the constant correspondence between the anatomical and the physiological point of view. Its object is to constantly unite them to one another. In reality these two points of view are the two aspects of a single problem. It is owing to historical reasons that, during a certain time, these two sciences appeared to develop independently of one another. Physiology remained attached to the metaphysical methods, that is to say, to unverifiable hypotheses and to principles which went beyond experience, while anatomists already made use of the positive method. But to-day, the two sciences being equally positive, "their opposition is reduced to that which subsists between the static and the dynamic points of view."[156]

Another element which should enter into the more general definition of biology, although it has sometimes been neglected, is the consideration of the *milieu*. The relation between the organism and its *milieu* is no less essential to life than the relation of the organ to the function. Life supposes not only that the being should be organised in a certain way, but also that a certain number of external circumstances should sustain this organisation, and should be compatible with its activity. Living beings are thus dependent upon their *milieu*, and this dependence grows as we rise in the organic series. The system of

the conditions of existence becomes all the more complex as the functions develop and become more varied. Inferior organisms are subject to less numerous external conditions; but, says Comte, a little variation in one of these conditions suffices to make them perish. The superior organisms stand a variation of this kind better. But, in return, the number of conditions upon which they depend is far greater. The study of *milieux* in their relations to organisms, a study which is hardly outlined, undoubtedly has many discoveries in store for the future.[157] Here is an order of problems of which Lamarck probably suggested the idea to Comte, and upon which Darwin's genius will work.

Bichat then was wrong in saying in his celebrated definition of life that it is "the sum of the forces which resist death." The radical antagonism between inorganic and living nature is an incomplete and consequently a false idea. Indeed if, as Bichat supposed, everything which surrounds living bodies tended to destroy them, their existence would become unintelligible.[158] Where could they find strength to resist such formidable pressure, even for a short time? On the contrary, the fundamental condition for life is a certain "harmony" between the organism and the *milieu* in which it is placed. The proof of this is furnished at every turn by experience.

This being established, what will be the most general problem of the science of life? From the anatomical point of view, says Comte, all possible organisms, all parts whatever of each organism, and all the various states of each necessarily present a common basis of structure and of composition, from which the tissues, organs and apparatus have emerged by means of a progressive differentiation. In

the same way, from the physiological point of view, all living beings, from the vegetable kingdom up to man, considered in all their actions and all the periods of their existence, necessarily possess a common basis of vital activity, whence the innumerable phenomena of nutrition, secretion, etc., proceed, by means of progressive differentiation. Now, from both these points of view, that which is similar in these cases, is more important than that which distinguishes them, since the more general phenomena govern those which are less so. We must therefore disengage the elementary physiological phenomenon and the anatomical structure which corresponds to it, we must determine their relation, and, with the help and confirmation of experience, we must deduce the increasingly more complex, physiological and anatomical, phenomena from it.[159]

This conception which, despite Comte's reservation, still appears to be entirely saturated with the Cartesian spirit, leads him to the "most mathematical statement possible" of the biological problem. "Given the organ, or the organic modification, to find the function or the act, and vice versa."[160] There is nothing more in conformity with the general definition of science, which consists in substituting the knowledge of laws to that of facts, and rational prevision to empirical observation. Here, it is true, we have an "ideal scientific type," from which biology, which has scarcely reached the positive state, is very far removed. But there is no science which does not fall short of its definition more or less. The use of this definition is already a help for a science, and provides a means for measuring its progress.

III.

In part, or even entirely, biology is deprived of certain methodical processes which are utilised by the sciences which precede it. It cannot avail itself of calculation. Undoubtedly each of the elements which go to make up a physiological phenomenon varies according to a definite law. But the sum of these elements forms such a complex whole, that we shall never be able to express their relations in the terms of an equation. Further, the numbers which are relative to the phenomena of living bodies present continual and irregular variations, which do not allow us to establish the data of a mathematical calculation.[161] Each living being has its individuality, its personal formula, its characteristic reactions, which prevent us from treating it as identical with the other beings of the same species. Each physiological or pathological "case" is distinct from any other case. That is why Comte distrusts statistics. In his judgment they are misleading in physiology, and fatal in medicine. In the same way, Claude Bernard will protest vigorously against averages.

Is the inductive method at least a convenient one to make use of in biology? Simple observation cannot lead us far in the study of such complex phenomena, of which many are not directly accessible to our senses or to our instruments. Experimenting is very difficult in biology, for nothing is easier than to disturb, to suspend, or even to bring about the entire cessation of the phenomena of life. But it is almost impossible to introduce an exactly determined perturbation, whether of kind, or, *a fortiori*, of degree. Indeed a modification of a single condition of

the phenomenon almost at once affects the greater number of the other phenomena, by reason of their *consensus*. In principle, experimenting is not forbidden in biology. On the contrary it is of remarkable efficacy, but it is often impracticable.

Nevertheless, as we know, it is not man's intervention in phenomena which constitutes experimenting properly so called. It consists, before all things, in the rational selection of cases, (natural or artificial, it matters little), which are most appropriate for bringing out the law of variation of the phenomenon under observation. Nature gives us such, for illnesses resemble experiments which we can follow through their entire course and to their termination. They are often difficult to interpret, on account of their extreme complexity, but less so, however, than the majority of the experiments which we bring about ourselves. For are they not more or less violent diseases, suddenly produced by our intervention, without our being able to foresee all their indirect and future consequences? It is pathological anatomy which led Bichat to his fine discoveries in histology and in physiology. And to pathology we must join teratology which is, as it were, its prolongation. Here again, nature supplies experiments which we should not know how to institute.[162]

Whatever may be the help which biology derives from these natural ways of experimenting, its progress could only be a very slow one, if it did not possess besides a powerful method for proceeding which is peculiar to it: *comparison*. It is true that every inductive operation implies comparison. We compare what we observe with other real and possible cases. Again we compare when we are

experimenting. But, in the comparative method, properly so called, we do not limit ourselves to bringing two cases together. Comparison bears upon a long sequence of analogous cases, in which the subject is modified by a continual succession of almost insensible gradations.[163]

How would the general problems of biology receive a solution without this method? If we consider an organism by itself, the complication of functions and organs is inextricable in it. But, if we compare this organism with those which come nearest to it, and then with others which are near to them and so on, disengaging what they have in common, a simplification is produced. The accessory characteristics disappear by degrees, as we descend in the biological series, and, if we have set ourselves to study a certain function, we can finally determine its relation to its organ.

Although it belongs to biology, this method has its analogy in other sciences, and especially in mathematics. It appears to me, says Comte, to present a character similar to that of mathematical analysis, which brings forward, in each sequence of analogous cases "the fundamental portion which is common to all, which portion, before this abstract generalisation, was concealed beneath the secondary specialities of each isolated case." The comparative method, in a word, is a method for analysing biological continuity. Whether it be a question of an anatomical disposition or of a physiological phenomenon "*the methodical comparison of the regular sequence of the growing differences* which relate to them will always present the surest and most efficacious means of throwing light upon even the ultimate elements of the proposed question." We see

that Comte had here his conception of the infinitesimal calculus in his mind. Better still, where terms are lacking in the organic series he does not hesitate to suppose them to re-establish continuity. He introduces intermediary "fictitious organisms" hypotheses which some day perhaps palæontology will turn into realities.

By means of this method, not only we shall know a far greater number of cases, but, what is of more importance, we shall know each one among them better, "as an inevitable consequence of their being drawn nearer together." We assume, it is true, that all these various cases present a fundamental similarity accompanied by gradual modifications, which always follow a regular course. But this hypothesis as we have seen, is implied in the very definition of general biology.

The comparative method will then apply successively to the different parts of an organism, to the different ages of the same organism, and to the different organisms in the animal and vegetable series. It will even apply to embryonic life, Comte clearly formulates von Baer's law, while making indispensable reservations. The primitive state of the highest organism, he says, must represent, from the anatomical and physiological point of view, the essential characteristics of the complete state which belongs to the more inferior organism, and so on successively "without our being able to find again the exact analogy of each of the principal terms of the inferior organic series in the sole analysis of the various phases of development of each superior organism." This comparison, so to speak, allows us to realise in the same individual the growing complication of organs and of functions which

characterises the whole biological hierarchy. Thus it is particularly "luminous."[164] Von Baer's book had appeared in German in 1827. Had Comte known it, it is most probable that, according to his habit, he would have quoted it.

IV.

In order to consider organisms in the regular sequence which allows of comparison, we must first have established the order in which they should be arranged. But, conversely, to establish this order, a knowledge of anatomy and physiology is indispensable. So between these two sciences on the one hand and "biotaxy" on the other there is a strict solidarity. The problem of classification is thus an essential part of general biology. In the natural classification sought after by science, the position assigned to each organism would suffice to define at once the whole of its anatomical and physiological nature, in relation to the organisms which precede and to those which follow.[165] Any natural classification cannot, however, be anything but imperfect. Accustomed as we are to artificial classifications, which admit of absolute and immediate perfection, we are surprised that the same should not be the case in natural classification. But, if the latter is a real science, we must own that, here as elsewhere, we can only reach more or less distant approximations. The co-ordination of living species is a problem like the static or dynamic analysis of a determined organism. Like this analysis, it only allows of solutions which are approached rather than realised.[166]

How, in the first place, must we understand

species? Between Cuvier and Lamarck, Comte sides with Cuvier, with this reservation, however, that "our ideas upon this question of capital importance are not yet properly fixed." Two reasons especially incline him to admit the fixity of of species. Lamarck's theory is not sufficiently proved: we nowhere see that the *milieu* exercises the almost boundless influence upon organisms which is attributed to it by Lamarck. Undoubtedly, within certain limits, the exercise induced by external circumstances tends to modify the primitive organisation. But this action of the *milieu* and this aptitude of the organism are certainly very limited. On the other hand, if we have a choice between the two hypotheses, the interest of science would prompt us to use this liberty in favour of Cuvier. The fixity of species guarantees that the series of organisms will always be composed of terms which are clearly distinct, separated by insuperable intervals. This "increases the degree of rational perfection of which the final establishment of this hierarchy is capable."[167] It is then under the influence of a purely formal motive that Comte's preference is here decided. For he felt the strength and the import of Lamarck's labours. Of the two celebrated antagonists, he said, Lamarck was unquestionably the one "who manifested the clearest and deepest sense of the true organic hierarchy."[168]

Comte has even dealt with certain objections which do not go against Lamarck. Thus, we might think at first that, in his hypothesis, there is no real zoological series, since animal organisms would be essentially identical, their differences being henceforth attributed to the diverse and unequally prolonged influence of the external conditions. But, on looking into it more closely, we see, on the

contrary, that this hypothesis only presents the series in a new aspect which would even render its existence still more evident. For the whole of the zoological series would then become, in fact as well as ideally, altogether analogous to the whole of the individual development, confined at least to its ascending period. It would then be conceived as continuous. "The progressive advance of the animal organism, which for us is only a convenient abstraction, would be converted into a natural law."[169]

For the logical perfection of science, Comte prefers to regard species as fixed in the absence of contrary proofs. None the less Lamarck has stated a problem of the highest interest. Comte points out its importance. "The rational theory of the necessary action of the various *milieux* on the different organisms has still almost entirely to be formulated. Such an order of research, although greatly neglected, constitutes one of the finest subjects which the present condition of biology can present." By this means, he adds, we might obtain a theory for the perfecting of living species even including mankind.[170]

V.

Comte's anatomical and physiological philosophy is naturally allied to the science of his time. It is especially connected with the labours of Bichat and of de Blainville. Here again he endeavours to state the problems in the most general form possible. Anatomy should begin by the study of the tissues, to ascend afterwards to the association of several tissues, that is to say, to the organs, and to the

associations of several organs, that is to say, to systems. But analysis must not be concerned with the tissue itself. To attempt the passage from this notion to that of the molecule, is to allow the organic to enter into the inorganic philosophy. In biology, the tissue corresponds to what the molecule is in physics. Such, at least, is the doctrine of the *Cours de philosophie positive*. Later on, instructed by Schwann's works, Comte admits in the *Politique positive* that the anatomical element is the cell.

Be it tissue or cell, there must be a fundamental anatomical element. The simultaneous existence of several elements independent of one another would greatly mar "the admirable unity of the organic world," and consequently the perfection of biological science. Life is always essentially the same. To this dynamic consideration, there must correspond, in the static order, that of a common basis invariable in its primordial organisation, successively producing, by deeper and deeper modifications, the various special anatomical elements.

Similarly, physiology will not be entirely organised until it studies functions (at least the organic functions), throughout the whole chain of living beings, from the vegetable kingdom up to man. This conception of a general physiology leads Comte to dwell, as Claude Bernard will later on, upon the phenomena of life which are common to plants and to animals. Some are better studied in plants and others in animals. But, whether it be animal or vegetable every organism always presents two fundamental functions: 1. the absorption of nutritious materials borrowed from the *milieu* (the assimilation of these materials and finally nutrition); 2. the rejection of unassimilated materials. However,

plants are the only organised beings which live directly upon the inorganic *milieu*.[171] Comte was ignorant of the physiology of fungi.

Comte unreservedly adopts the distinction established by Bichat between the functions of organic life and those of animal life. In the first place he concludes from this, in virtue of the correlation of the dynamic to the static point of view, that distinct tissues correspond to these distinct functions. Then, he goes more deeply into the difference between the two kinds of functions. Strictly speaking, the phenomena of organic life only constitute a special order of composition and of decomposition. They come very near to chemistry, and may serve as a transition between the inorganic world and the world of life.[172] On the contrary, the phenomena of animal life (irritability, sensibility), offer no analogy with the phenomena of the inorganic world. We might almost believe, according to Comte, that the separation is established not between the chemical and biological phenomena, but between organic and animal life, the phenomena of the former reducing themselves to physico-chemical phenomena, and those of the latter presenting entirely different characteristics. Such is not, however, Comte's thought. Undoubtedly, considered one by one, the phenomena of organic life (absorption, circulation, exhalation, etc.) are indeed physico-chemical phenomena. But what renders their biological character irreducible is that it is impossible to consider them separately: in order to understand them we must first look at them from the point of view of the whole, and appeal to the organic *consensus*, in a word, to what Claude Bernard, will call *l'idée directrice*.

In the study of organic functions we shall begin by the lower extremity in the series of living beings, that is to say by the most rudimentary forms of the vegetable kingdom, for it is here that we shall grasp the phenomena in their simplest form. Then we shall follow their growing complexity. For the animal functions, on the contrary, it is expedient to begin by man, "the only being in which such an order of phenomena is ever immediately intelligible." From this point of view man is pre-eminently the biological unity. As soon as it is a question of the characteristics of animality, we must begin with man and see how they descend by degrees, rather than start from the sponge, and look for their mode of development. Man's animal life helps us to understand that of the sponge; but the reverse is not true.[173] Moreover, the phenomena of organic life, being the most general, are also the most fundamental. The functions of animal life are first useful for the needs of organic life, by perfecting it. It is in man alone that the vegetative life is subordinate to the life of relation: and even for that he must have reached a high degree of civilisation.[174]

VI.

It is not surprising that biology, even more than physics and chemistry, preserves the metaphysical spirit. Such, for instance, is the hypothesis of spontaneous generation. Positive philosophy recognizes that each living being always emanates from another similar being. This is not established *a priori*, but is the result of an "immense induction."[175] *Omne vivum ex vivo.* Efforts to explain how the generating tissue should itself be formed by kinds of organic monads, (an allusion to certain theories

arising out of Schelling's philosophy) can only fail. We should never know how to connect the organic with the inorganic world except through the fundamental laws belonging to the general phenomena which are common to them both. Positive speculations in anatomy and in physiology form a limited system, within which we must establish the most perfect unity, but which must ever remain separated from the whole of inorganic theories.[176] We see clearly, it is true, that there is no matter which is of itself living. Life is not peculiar to certain substances which are organised in a certain manner. It never belongs to them for more than a time: every organism of which the molecules are not renewed is dissolved. But "we can no more explain this instability than this speciality."[177]

In the same way we see that in living bodies the nutritive functions are the basis of the others; but there is no contradiction in "dreaming" of thought and sociability in beings whose substance would remain unalterable. From this point of view spiritualism is not less admissible than materialism, in so much as death does not seem to be a necessary consequence of life. This again is an idea which is common to Descartes and to Comte. They both conceive an organism in which the play of functions should not cease of itself. The theory of death, says Comte, although it is founded upon that of life, is entirely distinct from it.[178]

If biology still often hesitates in the statement of its problems and in the choice of its hypotheses, it is in a great measure due to the two opposite tendencies between which it oscillated in the last century. On the one hand, Boerhaave, and the school of physiology which is more or less directly

connected with Descartes, sought a mechanical explanation of biological phenomena, and tended to reduce biology to physics and chemistry. On the other hand, Stahl in Germany, and the vitalist school of Montpellier in France, appealed to metaphysical principles and to unverifiable hypotheses. Being thus swayed from one extremity to another, biology only escaped the "oppression" of the inorganic sciences to involve itself in conceptions which were scarcely scientific.[179] It is only at the end of the XVIII. Century, with Haller, Gall and Bichat, that it finds its equilibrium, takes possession of its method, and at last enters into its positive phase.

By its lower extremity it is contiguous to inorganic science (the physico-chemical phenomena of vegetative life). By its higher extremity, (intellectual functions), it reaches to the final science, or sociology. But the adherence is far from being as close in one case as in the other. At the moment when we pass from the inorganic world to the world of living beings, according to positive philosophy, there is a sudden "enrichment of the real." The transition is very marked. The domain of biology is not so sharply separated from that of sociology. For the higher biological functions, the intellectual functions, cannot be analysed from the point of view of the individual, at least in man, but only from the point of view of the species. We must then, while preserving the distinction between the two sciences, admit a kind of inter-relation between them. Undoubtedly sociology could not be founded so long as biology had not made decisive progress. But, conversely, sociology once founded alone completes the positive study of the highest biological functions.

Certainly, biology has not been less transformed

than chemistry during the last sixty years, and the state in which we see it to-day differs singularly from that in which Comte knew it. It has been developed and differentiated far beyond what he could foresee. None the less he conceived some of its principles with remarkable power. He had a precise idea of that which could constitute a general biology that is, a single physiology and anatomy for the whole of living beings. He knew the fecundity of the comparative method, and he pointed out its analogy with the method of analysis in mathematics. Finally, although he refused to adopt the transformist hypothesis, he had understood the importance of Lamarck's work.

CHAPTER V
PSYCHOLOGY

Psychology has no place in the classification of the fundamental sciences. In it Sociology immediately succeeds Biology. Use has been made of this fact in order to reproach Comte with having neglected an order of most important phenomena. A grave objection has been raised against his doctrine in general. What are we to think of a philosophy which, deliberately, omits a part, and, according to many philosophers, the chief part of reality, the world of consciousness, the spiritual nature of man?

Presented in this way, the objection rests upon many confused notions about words and ideas. What do we understand by psychology? If the word means: "the science of the soul reached through the introspective method," we must own that Comte does not admit the possibility of such a science. But the same objection will also hold good against the majority of the psychologists of our time. For they do not admit this possibility any more than Comte, and they have endeavoured to constitute the science of psychical facts by a different method than that of introspection, pure and simple. Is psychology defined as "the science which investigates the laws of feeling, of the intellect and of moral phenomena in man and in animals?" Then it is inaccurate to say that there is no psychology for Comte. On the contrary, he thinks that positive psychology has just been founded by contemporary science of whose methods he approves. If he did not use the word "psychology," he did so in order to avoid confusion. At that

moment the word was, so to speak, the property of the eclectic school. By the "psychological" method, everyone then understood that of Jouffroy. "Psychology" was the science founded by Cousin on the analysis of the *ego*. Comte who opposes these philosophers, did not wish his theory of psychical phenomena, which differs from theirs, to be called by the same name. It is this very precaution which has come to be no longer understood, now that "psychology" does not designate the eclectic doctrine alone, but any theory whatsoever concerning mental facts.

I.

Comte finds the field occupied by three psychological schools, and he combats all three, for reasons of method and also of doctrine. He looks to them to refute each other mutually, and he will only attack what is common to them all.[180]

The representatives of these three schools are the Ideologists, with Condillac, from whom they proceed, then the Eclectics, and finally the philosophers of the Scottish school. Comte sometimes calls the eclectics the German school, in opposition to the ideologists, who are the French school, and to the Scottish school, the first of the three in point of time. But he always speaks sympathetically of the Scottish school, remembering that, in part, he owes to it his philosophical education. He also esteems the sincerity and logical vigour of the ideologist Destutt de Tracy. But, after all, we have here metaphysicians, as are also the eclectics upon whom he passes a more severe judgment. By "metaphysicians," he understands all those who

study phenomena, (in this case psychical phenomena), by means of a method which is no longer theological, but which has not yet become positive. In this sense, Locke is a metaphysician, as well as Condillac and his other successors in the XVIII. century, Hume alone excepted.

Comte showers derision upon the method of internal observation which is practised by the "psychologists." The sharpness of his language is at least partially explained by the indignation with which Cousin's "charlatanisme" inspired him. This "famous sophist," in whom he recognises some of the gifts of an orator, and in particular that of a mimic, according to him, exercises most unfavourable influence over the minds of men.[181] He turns them aside from the positive path, which they are about to enter, to bring them back to metaphysical dialectics, or to hollow and sonorous rhetoric. And, to crown all, this "psychology" claims to follow a scientific method! the very method which has succeeded so well in the natural sciences! It conceives the idea of practising internal observation, as physics makes use of external observation. But what is this internal observation? How can the function of the same organ be to think, and at the same time to observe that it thinks? We conceive that man should be able to observe himself if it is a question of the passions which animate him. No anatomical reason is opposed to this since the organs which are the seat of the passions, are distinct from those which are used for the observing functions. But as to observing the intellectual phenomena in the same way, it is manifestly impossible. In this case, the organ which is observed being one with the observing organ, how could the observation take place?

This objection does not only hold against the eclectics, but also against the Scottish school and the ideologists. We already find it set forth in a letter from Comte to Valat on the 24th, of September, 1819, when he was perhaps not yet acquainted with Cousin. “With what should we observe the mind itself, its operations, its activity? We cannot divide our mind, that is to say, our brain, into two parts, of which one acts while the other looks on, to see how it goes to work. The so-called observations made on the human mind, considered in itself and *a priori*, are pure illusions. All that we call *logic*, *metaphysics*, *ideology*, is an idle fancy and a dream, when it is not an absurdity.”[182]

This text, to which we could add many similar ones, allows us to rectify an erroneous, although a frequent interpretation of Comte’s thought. He does not deny that we are informed by consciousness of the existence of psychical phenomena. On the contrary, he expressly recognises the fact. What he regards as impossible is to study the activity of thought by means of reflection, that is to discover the “intellectual laws” by a method of internal observation. In a word, it is such works as those of Condillac, of the ideologists, of Reid, etc., which he condemns in their principle. In these works the subject matter is the theory of knowledge, and not that which is called to-day *psychology* proper.

If, instead of seeking specially for the intellectual laws, we wish to study psychical phenomena in general, internal observation will become possible in a certain number of cases. But it will not lead to the end which we wish to reach. It excludes the use of the comparative method, so fertile and so indispensable in the whole domain of biology. It only

studies man, and even adult and healthy man. What will it tell us of the child, of the mentally deranged, of the animal?[183] Will it, like Descartes, go so far as to deny the existence of a psychical life in animals? Still this life cannot be studied by internal observation. We must then have recourse to another method.

Strictly speaking, there are only two methods which are suitable for the science of those phenomena. Either we determine with all possible precision the various organic conditions on which they depend: this is the object of what Comte calls phrenological psychology. Or else we observe directly the products of the intellectual and moral activity, and this study then belongs to sociology. But, if by this supposed psychological, method we set aside the consideration of the agent, that is to say of the organ, and that of the action, that is to say of the productions of the human faculties, what can remain "unless an unintelligible logomachy," or verbal entities which are substituted to real phenomena? Here then is the study of the most difficult and most complex functions suspended, as it were, in the air, without any point at which it touches the simpler and more perfect sciences, "over which, on the contrary, it is claimed that it should reign majestically."

Nothing is more opposed to the general order of nature, in which we always see the more complex and higher phenomena subordinated, so far as the conditions of their existence are concerned, to the more simple and commoner ones. As the biological depend upon the inorganic phenomena, just as, within biology, the phenomena of animal life are subordinated to those of organic life, so the

intellectual and moral phenomena depend upon the other biological functions. Beyond their own particular laws, the laws of all the subjacent orders of phenomena also govern them. Can we study them as if all these laws did not exist? Let the metaphysician be free to do so. The scientific man who follows the positive method will proceed on other lines.

A defective method could lead but to false results. Notwithstanding the differences in their doctrines, ideologists and psychologists have agreed to place the intellectual functions in the front rank, and to thrust the affective functions further back. *The mind* has become the almost exclusive subject of their speculations. Look at the titles of their great works since Locke's "*Essay on the Human Understanding—Principles of Human Knowledge—On the origin of our Ideas—On Sensations—Ideology, etc.*" The various affective faculties have been left comparatively in the shade. Now, it is the contrary which should have been done. Experience shows that the affections, the passions, the inclinations, play by far the most important part in the life of animals and even of man. Far from being the result of intelligence their "spontaneous and independent" impulse is indispensable for the first awakening, and afterwards for the development, of the various intellectual faculties. "Against all evidence man has been represented as essentially reasoning, as being continually performing unaware a multitude of imperceptible calculations with scarcely any spontaneity, even from tenderest childhood."[184]

Had the study of the psychical functions been made upon animals at the same time as upon man, this error would not have lasted long. But

philosophers were maintained in it, on the contrary, by metaphysical and even theological preoccupations. The science of mental functions had to establish a difference, not only of degree but of kind between man and animals. It was further required, by reason of another necessity closely allied to the former, that the soul should be considered as being immortal. And it was consequently necessary that the "ego" should present metaphysical characteristics of unity, of simplicity and of identity. Now, it is by thought that man is most distinguished from animals. It is therefore from thought that the characteristics attributed to the soul or to the "ego" have been borrowed.

But in fact the "ego" is not the absolute unity which the eclectic psychologists say that it is. It represents the feeling which the superior living being has, at every moment of the "sympathies" and the "synergies" which take place within the organism. It is the conscious expression of what the French call to-day "cénesthésie." Far from being directly perceived as Cousin asserts, it is the indirect product of a quantity of sensations and sentiments, of which the majority are not perceived in the normal state.[185] It is especially by pathological facts, (diseases of the personality, double consciousness, lunacy, etc.), that the attention of the scientific man is drawn to this very complex phenomenon. It is, moreover, impossible to regard the sentiment of the "ego" as belonging exclusively to man. Everything leads us to believe that it also exists in the other higher animals. In any case there is no metaphysical doctrine to be founded upon this exceedingly complex and very unstable sentiment. Comte is here speaking as the successor of Hume and of Cabanis. In the clearest manner he defines his opposition to Cousin's

doctrine. The latter draws the whole of philosophy from the analysis of the "*ego*," Comte draws nothing from it.

He does not, however, stop to show the superiority of the positive method over theological or metaphysical method in this matter. Of what use would it be? The progress of science, in the end, gets the better of methods which have become antiquated and barren. Metaphysicians have already passed from the state of "domination" to that of "protestation."[186] And when the positive method gets a footing in an order of phenomena, there is no instance in which, sooner or later, it has not asserted its mastery over it.

II.

The psychology of Comte is connected with that of Cabanis and of Gall, without, however, any actual confusion with them. He praises Cabanis for having been one of the first to form a positive conception of intellectual and moral phenomena.[187] Cabanis set himself to show that the phenomena so numerous and so varied which take place in the being who lives and feels, constantly act and react upon each other. The psychical phenomena do not escape this law. At every moment, through the medium of the nervous system, they are subject to the influence of the state of the whole body, and they make the body feel their own influence. Cabanis gives a great number of proofs of this, borrowed from the action of sex, of age, of temperament, of illness, etc. Moreover, the relation of psychical phenomena to the brain is identical with that which exists between any function whatever and its organ, for instance,

between digestion and the stomach. According to Cabanis we are not necessarily materialists because we refuse to explain the functions of feeling, and the intellectual functions by means of a special principle. First causes always escape us. Here, as elsewhere, the scientific man confines himself to the observation of phenomena and to the search after their laws. On the other hand, if psychology claimed to start from the analysis of the "ego," it would leave aside many phenomena with which our consciousness does not acquaint us, and which are psychical nevertheless. This is a fruitful remark, which will be taken up again by Maine de Biran, and which psychologists in our own time have turned to great account.

Cabanis conceived psychical facts in a positive manner, but he did not attempt to construct their science. In Comte's opinion it is Gall who is the real founder of positive psychology. Whatever may be the value of his localisations—Comte does not think it an enduring one,—to Gall at least belongs the merit of having set the problem as it should be set, and of presenting a precise solution of it. Moreover Gall did not confine himself to localising the different faculties in different parts of the brain. His doctrine proper is preceded by an excellent criticism directed against the psychology usually received in the XVIII. century.

In order to combat Condillac, Helvetius and the ideologists, Gall takes his stand upon experience, that is to say upon mental physiology and pathology, and also upon the observation of animals. As a fact, each individual comes into the world with tendencies, with predispositions, with innate faculties. The supposed natural equality of all men is an ill-founded abstraction, since their propensities

and their qualities often differ very greatly. The paradox of Helvetius who attributes the moral and intellectual inequality of men to the all powerful influence of education and of circumstances, cannot be upheld. We cannot, as we will, make just minds and upright souls. Variety of organs entails diversity of functions; the difference between men and animals, as that of men among themselves, is therefore due to anatomical and and physiological differences. Condillac's absolute sensualism is thus refuted by facts. Moreover, if the science of psychology does not advance it is because distinctions between the faculties of the soul, (memory, imagination, judgment, etc.) have been arbitrarily established, from a metaphysical and logical point of view, which does not correspond to the real speciality of the functions.

Gall lays down the following principle as the ultimate conclusion of experience, and the fundamental basis of his doctrine of the functions of the brain:[188] *The dispositions of the individual soul and mind are innate and their manifestation depends upon the organisation*. We must not see in this a return to the *a priori* method. Gall guards against reverting to the innateness of Descartes and Leibnitz. He means to speak simply of dispositions, or tendencies, or "faculties," for instance, the faculty of love, the feeling of the just and of the unjust, ambition, the faculty of learning languages, that of comparing several judgments or ideas, of deducing consequences from them, etc. "We confine ourselves," says Gall, "to observation." We only consider the faculties of the soul in so far as they become phenomena for us by means of the material organs. We deny and affirm nothing except that which can be brought under judgment by experience.

Comte assents to all this. With Gall he condemns the "childish dreams" of Condillac and of his successors about transformed sensations[189]; with him he admits the speciality of the psychical functions, corresponding to the speciality of the cerebral organs. But he only borrows Gall's principle. He has the strongest objections even to Gall's psychology. Undoubtedly at the time when Gall lived, no one could have done better, and his effort deserves to be admired. But his errors, although they were inevitable, are errors none the less.

In the first place Gall was wrong in isolating the nervous system too much from the brain, which is in fact a prolongation of this system, as is proved by comparative anatomy.[190] Gall considered the systems of automatic life, of voluntary motion, and of the senses, as entirely distinct from one another. He only included in the brain those nervous organs, which, at any rate in the most perfect animals, are the special organs of consciousness, of the instinctive aptitudes, of the inclinations, and of the faculties of the mind and soul. To this thesis Comte opposes the facts assembled by Cabanis, and the solidarity of all the elements in the living being. The brain can neither be isolated from the rest of the nervous system, nor the nervous system from the rest of the organism.

Again, Gall multiplies the faculties in an arbitrary manner. He had established 27 of them. Spurzheim carried this number to 35, and others have further increased it. Every phrenologist will soon create a function, and its organ, whenever it may seem opportune to him, with as much facility as ideologists and psychologists construct entities.[191] These creations are nearly always extremely clumsy.

Thus an innate "mathematical aptitude" has been established. Why not also a chemical, an anatomical aptitude, etc.? And this mathematical aptitude is manifested by the facility for executing calculations. But the mathematical mind, far from being an isolated and special aptitude, presents all the varieties which the human mind can offer by the different combinations of really elementary faculties. For instance, some great geometers have especially excelled by the sagacity of their inventions, others by the extent of their combinations, others again by the genius of language and the institution of signs and so on. From this point of view, well drawn up monographies of great scientific men and great artists would be extremely precious for the progress of psychology.

In conclusion, "fundamental phrenological analysis" must be reconstructed. From Gall, Comte only preserves "the impulsion." The greater part of the localisations which Gall thought right to establish must be abandoned. But he was right in searching for them, for thus he showed science the path to be followed. Even an erroneous hypothesis on positive lines is always a service rendered in the beginnings of a science. But of Gall's doctrine only two principles henceforth indisputable subsist. 1st, the innateness of the various fundamental dispositions, be they affective or intellectual; 2nd, the plurality of faculties distinct and independent of one another, "although effective actions usually demand their more or less complex co-operation." These two principles are moreover the two correlative and interdependent aspects of the same conception, which is in accordance with what "common sense" has always thought of human nature. It corresponds to the division of the brain, from the anatomical

point of view into a certain number of partial organs, at once independent and depending upon one another. To establish and to demonstrate the detail of this correspondence is the object of “phrenological physiology.”

III.

Comte took up the attempt where Gall had failed. But his doctrine passed through two successive forms. He himself calls attention to the importance and to the causes of this change.

In 1837, when he was writing the third volume of the *Cours de philosophie positive*, he still closely followed not only Gall’s general conception, but also his anatomical and physiological hypotheses. He then thought that “the doctrine deduced by Gall from the method represents the true moral and intellectual nature of man and animals with admirable fidelity.” He approved of the division of the faculties into the affective and the intellectual, the organs of the former occupying the whole of the posterior and middle regions of the brain, and the organs of the others occupying only the anterior region of the brain, that is to say, a quarter or a sixth of the cephalic mass, “which at once re-establishes the pre-eminence of the affective faculties upon a scientific basis.” He even accepted the sub-division of these faculties into inclinations and feelings, and that of the intellectual faculties into perceptive faculties and reflective faculties.

At this moment, his objections were especially directed against the excessive multiplication of the faculties, and upon the insufficiency of the anatomy of the brain which accompanied the distinction of so

many faculties. He thought the anatomists were right in protesting against this method of the phrenologists who, from the supposed existence of an irreducible faculty, assume the existence of a corresponding organ in the brain. But anatomy cannot thus be treated *a priori*. As the aim of every biological theory is to establish an exact harmony between anatomical analysis and physiological analysis, this evidently supposes that they are not exactly modelled upon one another, and that each one of them has been worked out in a distinct manner. We must then take up the analysis of the cerebral apparatus again, provisionally setting aside all idea of function, or at least only making use of it as an auxiliary in anatomical research.[192]

In 1851, in the first volume of the *Politique positive*, Comte's attitude is quite different. In Gall's psychology he no longer recognises anything but what is of historical interest. His own conception of psychology is completely altered. This great change has been determined by the foundation of sociology.

Undoubtedly Gall's merit remains very great, for he rendered a service of the first order in daring to construct a positive theory of the intellectual and moral functions. Without this theory, which at first he considered to be exact in its general lines, Comte could not have undertaken to apply the positive method to social facts, nor consequently to found his philosophy. So his gratitude to Gall is almost as great as to Condorcet, "his spiritual father." But once sociology is founded, in looking back, Comte understands that Gall's "cerebral theory" cannot be maintained. It resembles a provisional bridge by means of which positive philosophy passed over the interval which separates biology proper from

sociology. Hardly has it reached the other side when the bridge collapses. It matters little: it suffices that, thanks to the bridge, Comte should have set foot upon the sociological ground. He can now return in all security to the study of the mental functions. "When I had founded sociology," he says, "I understood at last that Gall's genius had been unable to construct a real physiology of the brain, owing to the lack of a knowledge of the laws of collective evolution, which alone must furnish at once its principle and its end. From that time I felt that this task, which before I expected biologists to accomplish, belonged to the second part of my own philosophical career."[193]

The psychology, which, in the *Cours de philosophie positive*, was essentially biological, and ended simply in sociology, becomes, in the *Politique positive* essentially sociological, and is only secondarily biological. From 1846 Comte became conscious of this new orientation of his thought, and, during the five years which follow, he never ceases working at his "cerebral table."

At first, he no longer demands an anatomical study parallel to the analysis of the mental functions, and independent of it. He intends, henceforth, to determine these functions outside all anatomical research. "The logical principle of this construction consists, for me, in its subjective institution." He systematically subordinates anatomy to physiology, and he henceforth conceives the determination of the cerebral organs as the complement, and even as the result, of the positive study of the intellectual and moral functions. At bottom, "this subject has never allowed of any other method but the subjective, well or ill employed." It has been equally used by the

disciples of Gall and by his adversaries. What psychology has lacked up to the present is, not exact localisations but a sufficiently deep analysis of intellectual and moral phenomena. And as a matter of fact it was impossible to treat this problem well, so long as we ignored the laws of sociology, "which alone is capable of dealing with these noble functions."[194]

Thus, in order to determine the elementary faculties, those which are irreducible, and which by their co-operation produce the complex phenomena which are apprehended by consciousness, the method must be at once subjective and sociological. For the subject which we must analyse is not the individual consciousness, of which the study is too inaccessible, and whose life is too short: it is the universal subject, *humanity*, "the case of the species being alone sufficiently developed to characterise the various functions." To this analysis, as a system of control, will be joined the observation of animals. Indeed, all our innate dispositions belong also to the other superior animals. If then the study of man should seem to establish elementary, moral, or even intellectual functions, of which we see no trace in these animals, by this alone we should consider that the analysis has been imperfect, and that complex results have been considered as irreducible. "*Sociological inspiration controlled by zoological appreciation*: such is the general principle of the positive theory of the soul."[195]

By this method Comte obtains 18 irreducible faculties, of which 10 are representative of the heart, 5 of the mind, and 3 of the character. To each of these he assigns a special organ. He places the organ

of the heart in the posterior portion of the brain and in the cerebellum, the organs of the mind in the anterior portion of the brain, and those of character in the intermediary region. Anatomists are free to verify *a posteriori* the separation of the 18 elements which Comte distinguished *a priori* in the cerebral apparatus. The existence of these organs, in any case, appears to him to be sufficiently demonstrated, and anatomical determination is not very important. We might confine ourselves to the specification of the number and the situation of the organs, which we have deduced from the number and relations of the elementary functions. It would not be necessary for us to know their shape or their size. The utility of cerebral localisations resembles that which geometers draw from curves for the better consideration of equations.[196] The organ is simply the static equivalent of the function of the soul. It suffices for us to know its existence and its position so as to situate in it all the relations of the function itself, so to speak. It plays the part of a schematic drawing.

So, the theory of the brain and of the soul is no longer "simultaneous." In fact, the theory of the soul is first constructed by a subjective and independent method and without any consideration of the disposition of the cerebral apparatus. This disposition is deduced, afterwards, from the theory of the soul, once it is established.

Returning then to Gall's psychology, Comte can explain its defects to himself. Gall had "oscillated between subjective inspiration and objective tendencies," without adopting a systematic plan. There has not been any very great disadvantage in this empirical fluctuation in what concerns the

theory of the affective functions. Without a doubt, Gall had established an ill-founded distinction between the inclinations and the feelings. But he could not be mistaken concerning the fundamental inclinations of human nature. In default of the true method, he was supported on this point by common wisdom, and by the observation of animals. It is on the subject of the intellectual functions that he is entirely wrong, because here this twofold help failed him, and nothing, in this case, filled the place of the true method which was then unknown. In order to discover the static and dynamic laws of the intellect, it was necessary to abandon the biological point of view. To Gall's theory Comte then substitutes a new classification of the intellectual functions. He distinguishes between the faculties of conception and the faculties of expression. He indicates the relations of the intellectual functions proper with the affective functions and the functions of motion. He makes us apprehend the very intimate relations which connect desire and will. Finally, to determine the fundamental intellectual functions, he takes into account the historical evolution of the human species.

It does not enter into the purpose of this work to set forth Comte's theory in detail, and to examine the eighteen irreducible faculties of the cerebral table one by one. But the systematic character of the doctrine does not prevent us from taking up a certain number of interesting and deep psychological views in it. To limit ourselves to a few examples, Comte drew imitation near to habit, and he brought habit itself back "to the great cosmological law of persistence," which, in the vital order is modified by the intermittance of phenomena.[197] He remarked that attention is never produced without an affective

phenomenon upon which it depends.[198] He also indicated the distinction between strong states and weak states, and the "reduction" of images by actual perceptions. "If our images could offer as much intensity, he says, as our external sensations, our mental state would not allow of any consistency. The appreciation of what is without would be troubled by this conflict with what is within...." Hence a theory of hallucination and insanity.[199]

The theory of perception which Comte opposes to the abstract sensualism of the ideologists is allied to his general conception of the relations between the subject and the object. Our internal operations are never anything but the direct or indirect prolongation of our external impressions. But "reciprocally, the latter are always complicated by the others, even in the most elementary cases." The sensation, which appears simple, is already the result of a very complex combination.[200] For no sensations are really perceived except after reiterated impressions. If the mind is ever passive, it can only be the first time. For the second, it is already prepared by the preceding one, combined with the whole of previous acquisitions. And Comte insists upon "the habitual participation of reasoning in the operations which are attributed to sensation alone." The activity belonging to the mind enters into all its actions, even the smallest of them.

Mental pathology scarcely exists, owing to the lack of the scientific spirit among specialists for the diseases of the mind. Still if Broussais' principle be true, that is to say, if morbid phenomena are produced according to the same laws which govern normal phenomena, what advantage might not scientific men derive from the observation of mental

diseases? They are privileged cases which nature supplies for them, real experiments, where that which is inseparable in the normal state appears disassociated. What light might be thrown by this means upon many physiological and even anatomical questions, in particular in what concerns the sentiment of the *ego* (diseases of personality, aboulia, etc.), and the faculties of expression, isolated from the faculties of conception (diseases of speech).

Animal psychology would not be less instructive. All the affective and intellectual faculties are common to men and higher animals, save perhaps the highest intellectual aptitudes. Even this exception is a doubtful one, if without prejudice we compare the actions of the highest animals with those of the least developed savages. We should study the habits and the mind of wild animals. We should observe the changes which are produced in them by domestication. Here again almost everything has to be done afresh.[201]

IV.

In spite of whatever may have been said, Comte then has a psychology. And, what is more, this psychology is in a sense not far removed from that of the Scottish school and of the Eclectics although he so much fought against their methods. The points of contact are numerous and important. In both doctrines the psychical phenomena are referred to faculties and these are represented as “dispositions,” innate “properties.” In both, the essential psychological problem appears to be the determination of the number and the relations of these faculties, whose action variously combined

produces psychical phenomena: before everything, it is a question of not considering as an elementary faculty that which as a matter of fact results from the combination of several faculties, or inversely. Finally in both, it is claimed to establish this doctrine of the innate faculties upon the observation of human nature.

Comte himself had seen that, at any rate in the case of Condillac's criticism, he was in accordance with the eclectics. On this point he only refused to grant them originality. According to him they merely popularised, in obscure and emphatic declamations, what physiologists like Charles Bonnet, Cabanis, and chiefly Gall and Spurzheim had long before stated on this subject in a far clearer and especially in a far more exact manner. For his part Garnier, the author of the *Traité des Facultés de l'âme* had clearly seen the relations of eclecticism to Gall's doctrine, and had studied them in a work entitled *De la Phrénologie et de la Psychologie comparées* which appeared in 1839.

Why then does Comte attack the eclectics with such persistence and such violence, if, indeed, the results of his psychology are not very far removed from what they say?—It is because in reality, beneath the apparent resemblance of doctrine, a difference of method as serious as can be conceived is concealed. For Cousin, and especially for the Cousin we know before 1830, psychology is not an end in itself. It is a means which he uses to rise to the study of being in itself and of the Absolute. The "ego" which he analyses is independent of the organism. This is what Comte condemns as a retrogression. "Some men, not recognizing the present and irrevocable direction of the human mind, have endeavoured for ten years to transplant German

metaphysics into our midst, and to constitute, *under the name of psychology*, a so-called science entirely independent of physiology, superior to it, and to which should exclusively belong the study of moral phenomena."[202] And this attempt at reaction takes place at the very moment when the works of Cabanis and of Gall have brought this study upon the positive path!

It is needless to say that, in Comte's system, psychical phenomena are subordinated, as far as their conditions of existence are concerned, to all the orders of more general natural phenomena. Comte should then have followed Cabanis and Gall, as a matter of course. But he thought that to establish the science of the "transcendent functions," the biological point of view was insufficient. In this case anatomical considerations are only a kind of reduplication and transcription of physiological considerations. As Maine de Biran said, in terms curiously like Comte's, "a distinction of places assigned to the exercise of each faculty must necessarily be itself referred to another pre-established division of the faculties.... Hypothesis thus grafted upon hypothesis of a different order would not much contribute to throw light upon the analysis of our intellectual functions."[203] Only, instead of appealing, like Maine de Biran, to reflection, Comte rises from the biological to the sociological point of view He recognises that the subjective method alone is suitable for the science of psychical phenomena, but, in place of the *metaphysical subjective method*, by means of which the "*ego*" is deluded into the belief that it analyses its operations, and grasps its own activity, he will make use of the *positive subjective method*. The subject which he will analyse will be the human mind, or

better, the human soul considered in its continuous evolution, that is to say in its religions, in its sciences, in its philosophy, in its language and in its art. Here is matter for a psychology which will no longer be chimerical, but real, which will be positive, in a word, like the biology upon which it depends and of which it is the fulfilment.

If we leave aside the conception of the "faculties" which Comte accepted rather hastily at the hands of the Scottish school and of Gall, and the "cerebral table" which he believed to be once for all constructed, his psychology contained more than one important and fertile seed. To the eclectic psychology, which is not positive, Comte substituted two sciences which are such. In the first place, an experimental science of the psychical phenomena studied in their relation to their organic conditions: it is the physiological psychology of which no one to-day questions the legitimacy. Then, by the introduction of the sociological point of view, Comte opened the way to a whole series of studies which begin to be developed, (social psychology, ethnical psychology, psychology of the masses, etc). It is often said that sociological laws have their foundation in psychological laws. But the reverse is no less true. The psychological laws, at least the mental and moral laws, are, at the same time, sociological laws, since they are only revealed in the study of the intellectual history of the human species. "We must not explain humanity by man, but man by humanity." To the "Γνῶθι σεαυτόν" of ancient psychology, the positive method substitutes this precept: "To know yourself, know history." Man only becomes conscious of himself, when he becomes aware of his place in the evolution of Humanity.

BOOK III

CHAPTER I
THE TRANSITION FROM ANIMALITY TO HUMANITY. ART AND LANGUAGE

Of the philosophers who flourished before the rise of the positive doctrine, the greater number assumed as a postulate in the comparative study of man and animals, that there was between them a difference of nature, and not merely one of degree. Whatever fundamental difference be attributed to reason, language, moral sense, religion, etc., the "human kingdom" is conceived for the most part as superior to the animal kingdom and as clearly separated from it. Taking their stand upon an analysis of the present state of the human conscience, those philosophers recognise an order of "moral realities," to which animals have no access. Thus they give to the science of Man a privileged object which separates it from the group of the natural sciences.

The positive method admits neither this postulate, nor the consequences which are drawn from it. In general this method is characterised by the substitution of the objective to the anthropocentric point of view, and also by the substitution of observation to imagination. It does not suddenly change its orientation when it comes to the study of man. The positive method is not therefore concerned

with knowing what idea man forms of himself to-day and of his relations with other living beings. Into this idea enter elements of religious and metaphysical origin, whose presence is explained by historical reasons. The question is to observe the nature of man in his *real* relations with other beings. Man, so considered, at once takes his place again at the top of the zoological scale.

The problem will then be set in the following terms: Given that man is included in the animal series, of which he is the highest term, but still a term, to account for the differences which to-day place him so high above the term immediately below him. This is taking the very reverse attitude of nearly all the philosophers, whose main difficulty is to give an account of the likenesses which exist between man and animals. It is the position which Darwin will take in his *Descent of Man*.

Comte takes his stand upon two postulates. The first affirms the fundamental identity of the essential functions in man and animals. Since the whole of the moral and intellectual functions constitutes the necessary complement of animal life properly so-called, it would be difficult to conceive that all those functions which are fundamental should not, by this very fact be "common, at various degrees, to all the higher animals, and perhaps even to the entire group of the vertebrata."[204] The animal functions are as a blossoming out of organic life, destined in the first place to make this life more perfect and more complex: in the same way, the intellectual and moral functions are, originally, as it were, another blossoming out of animal life, and must consequently be found, at least as a possibility, wherever animal life has reached a certain degree of development.

This postulate, according to Comte, is sufficiently established by biology, by means of the comparative method. All the principal characteristics which pride and ignorance set up as absolute privileges of our species, also appear, more or less rudimentary, in the majority of the higher animals.[205] The mistake was made because metaphysical ideology and psychology place intelligence foremost in the study of psychical functions. Intelligence indeed puts to-day an immense distance between man and animals. But a more accurate psychology recognises that the most energetic, the most "fundamental" of mental functions are the affective functions, since, in default of the impulse given by them, intelligence itself would not be developed. The analogy between man and the animals at once appears: for the affective functions are common to them both. It is the same with the intellectual functions, when allowance is made for the development they have assumed in man. In a word, if the dynamical superiority of the human species over the other species is strong, its statical superiority is weak. The problem consists in finding how, to such an apparently unimportant difference in the organs, such a considerable difference in the functions corresponds.[206]

Here comes in the second postulate: "The fundamental constitution of man is invariable." *Evolution but not transformation*: this great principle, transmitted by biology to sociology, dominates the latter science entirely. In the course of the long history which leads humanity from savage animality to positive civilisation,[207] nothing absolutely new appears. Everything which manifests itself little by little, pre-existed in the nature of man—in a potential state it is true; and this state would perhaps never have ceased if a number of favourable

conditions had not occurred together.

The mental functions, which are indispensable to organic and to animal life properly so called, quickly attained the degree of development without which the species would have disappeared. On the contrary, the highest "fundamental dispositions" of our nature remained latent for a long time, and only manifested themselves by degrees. But if their development has been slow, it is, in return, continuous and indefinite. And these dispositions tend to preponderate, although the "inversion" of the primitive economy can never become complete. Humanity emerges progressively from animality. The highest civilization is then, at bottom, entirely in conformity with nature: for it is only the manifestation more and more marked of the most characteristic properties of our species. In this sense, our social solution must be understood "as the extreme term of a progression continued uninterruptedly throughout the whole living kingdom from the most simple forms of vegetable life, the predominance of the organic functions becoming less and less exclusive, in order in the first place to make room for the predominance of the animal functions properly so called, and finally for that of the intellectual and moral functions, whose development is the very definition of humanity."[208]

Thus, the chain of being is uninterrupted. But Comte, as we know, did not accept Lamarck's hypothesis. He believed in the fixity of species. Undoubtedly he admits in a measure which science will some day fix, acquisitions slowly incorporated into organisms by heredity. But he does not think that they will go so far as to transform species. The whole evolution of man must then be explained by

its original constitution. Indeed, Comte here maintains, as everywhere in nature, the perfect correspondence between the statical and the dynamical point of view. The case of man cannot be an exception to this encyclopædic law, which is verified in all the orders of phenomena from the most simple to the most complex. As the whole line of the curve corresponds to the equation, so the whole development of humanity must correspond to the "fundamental nature" of man. On this condition alone is sociology possible as a science. Now positive sociology exists: therefore the postulate is justified.

II.

The theory of the relation between man and animals thus finds itself deduced from the general principles of positive philosophy. But it can also be verified *a posteriori*, through the criticism of the arguments of the adverse theory by means of observation and experience.

The first of these arguments and the one which in general makes the greatest impression, contrasts the instinct of animals with the intelligence of man. It represents instinct as blind and fatal, and intelligence as free and progressive. But this antithesis cannot withstand the examination of facts. Instinct is called too hastily a "fatal tendency of animals to the mechanical execution of actions which are uniformly determined by corresponding circumstances, and not requiring nor even admitting of any education properly so-called." This fatal tendency does not exist. It is a gratuitous supposition, perhaps a remnant of the Cartesian theory concerning the automatism of animals. Georges Leroy, in his

charming *Lettres sur les animaux*, has shown that in the mammals and in the birds of our districts, the fixity in the construction of habitations, in the habits of hunting, in the mode of migration, etc., only existed for naturalists who never left their study, or for inattentive observers.[209]

Undoubtedly, habits may become hereditary. But here we only have a phenomenon common to men and animals, and those habits are modified if the circumstances which have produced them come to change. It is in this sense alone that we can admit M. de Blainville's formula: "L'instinct est la raison fixée, la raison est l'instinct mobile." We must especially understand that instinct is not opposed to intelligence. What ought we really to indicate by instinct? A spontaneous impulse in a direction determined, independently of any foreign influence." But in this sense, the word applies to the activity of any faculty whatever, to the intellectual faculties as well as to the others. There is no contrast between instinct and intelligence. We say of a child that he has the "instinct" of music, of drawing, of calculation, etc. In this sense man has certainly as many and more instincts than animals. If, on the other hand, we call intelligence the faculty of modifying our conduct according to the circumstances of each case, animals are, like man, more or less intelligent and reasonable. Otherwise they would be doomed to disappear very quickly.

But animals have no language! Another error in observation. The higher animals have a certain degree of language corresponding to the nature and to the extent of their relations. This language is no more fixed than the so-called instincts. The language of each social species is characterised by an arrest of

development precisely like the society which this species tended to found. The limits of its progress, beyond which indeed it does not go, result from the whole of the obstacles which it encounters, in consequence of the competition with the other species, and particularly with the human species, without naming those limits which the imperfection of organs may create.[210]

Many animals are capable of experiencing needs without regard to a useful purpose. For instance, they like to exercise their animal functions for the pleasure of doing so, that is to say, to play. Some among them experience æsthetic impressions. They are also, without the slightest doubt, capable of altruistic feelings. Sometimes these feelings show themselves in the shape of domestic affection, and tend to make a solitary life unbearable to the individual. Family life then becomes permanent. Sometimes an animal devotes itself to the service of a superior race. Do we know to what lengths the progress of altruism would go in certain animal species, if their intelligence could have been more developed, and if their surroundings had allowed of their more extensive social progress?[211]

Finally, animals even possess a rudiment of religion, if by this we understand an endeavour to interpret the phenomena which strike them. When sufficiently developed to manifest, where there is sufficient leisure, a certain speculative activity, they reach spontaneously, in the same way as we do ourselves, a kind of low fetichism, which consists in supposing that external bodies are animated by will and by passions.[212] "A child, a savage, a dog, a monkey, seeing a watch for the first time, will see in it a kind of animal." But Comte at once adds that the

chief difference between man and animals lies in the impossibility for the latter to emerge from the lowest degree of fetichism, and to rise to a real religion. No animal society "combines sociability with intelligence sufficiently ever to constitute a religious association."[213] Comte would probably have approved of M. de. Quatrefages' definition in which he calls man a religious animal. The decisive step was taken on the day when man's intellect passed from fetichism to astrolatry.[214] That "great creation of the gods" was the first trial in purely speculative activity made by his mind. The whole subsequent development of humanity arose from this.

Thus, the arguments which claim to establish an insuperable distance between man and animals, generally rest upon imperfectly observed facts. On the contrary, in animals, we find the more or less visible rudiments of everything which has evolved so magnificently in humanity. We cannot describe in detail how and why this species has become, so to speak, incomparable and incommensurable with the others. It must have got the upperhand, not in virtue of this and that particular advantage, (although an important one), such as the upright position or the possession of a hand, but on account of the co-operation of many favourable conditions, of which the totality allowed, so to speak, of an almost indefinite development. From a certain moment, there was a definite stoppage in the social evolution of the other species, and the progress of the human species was decisive. We cannot estimate the initial influence of the various conditions according to the present development of the several human faculties, for this development is especially due to the social life of which those conditions allowed. Each superiority of man may have been very little defined

originally. Time, the action of the other higher functions, exercise, heredity have played their part here. The "human attributes" must then have grown constantly, ever consolidating the "ascendency" which they had determined. At the same time the corresponding attributes must have diminished in the rival species, as they were brought to a standstill in their development. Undoubtedly, by degrees, the interval has widened until it has become a gap so broad and so deep as to make it impossible to imagine how it could ever have been crossed. But biology and sociology help us to judge better. We must see this, in some detail, in connection with the important question of language.

III.

The theory of language, during the eighteenth century, had been one of the favourite subjects of philosophical speculation; in general, it had proceeded in this matter, by way of abstract and logical analysis. It chiefly saw in language a product of the intellectual faculties of man. But, already, from the second half of the century, this conception had been attacked in Germany by the school which began the reaction against the "philosophers," and in which the most illustrious name is that of Herder. In France the traditionalist school felt that here one of the weak points of the philosophy of the eighteenth century was being touched. It insisted upon the characters of language which this philosophy did not explain. Comte knew the works of this school, and, in particular, those of M. de Bonald, whom he calls an "energetic thinker."[215] But his method differs from theirs, and he only agrees with them in the critical part of their doctrine.

If the theory of language, says Comte, is encumbered with insoluble questions, the fault lies in the method made use of by the metaphysicians. They have only considered man's language, in its state of highest complication. They have attributed excessive importance to the signs of articulate human language, they have exaggerated the part played by reflection, and misunderstood that of spontaneity. Condillac especially and his school attributed far too much importance to the "disponibilité" of signs.[216] The scientific method will not isolate humanity from the other species which it dominates. It will connect the positive study of language with biology and with sociology: with biology more particularly for the question of origin; with sociology in so far as the development of language depends upon the reaction of social life upon domestic life.

The starting-point of the theory is a fact of experience. Every strong emotion is accompanied by the impulse to manifest it, and this expression reacts upon the emotion itself. Many species exhibit this.[217] Singing and mimicking, or rather cries and gestures, are often used by them, as by man, not only to relieve the passions, but to excite them more. For instance, anger in carnivorous animals grows to exasperation, through the external signs which the animal gives of it. Comte is in accordance with the observations of Bell and of Gratiolet. The movements which co-operate in expression, he says, coincide in general with those which are made use of in action. Moreover, in the human species, for the most part, the individual expresses his affections in order to satisfy them better, by inducing his fellow-creatures to second him. It is an appeal to sympathy. If then the expression results from the feeling, it tends, conversely to develop and to consolidate it. The

origin of language is thus affective, that is to say *æsthetic*, since "we only express ourselves after having felt strongly." Language therefore translates feelings before thoughts, and this is what the followers of the ideologist theory did not see. Even to-day, in our most developed language, we can still trace this origin. It reveals itself by the musical accent of the slightest speech. Expression is always inspired and maintained by some affection, even in cases where it is apparently limited to a simple scientific or technical exposition. The affective source of language, dissimulated as it is by the intellectual operations of which it is the instrument, reveals itself in the inflexions of the voice.

Language is made up of signs. According to what has just been said, natural signs are spontaneously produced by the play of the emotions. As a voluntary manifestation language is always artificial. The involuntary signs have been gradually divided into their component parts and simplified, while remaining intelligible. All artificial signs, says Comte, even in our species, spring from a voluntary "imitation" of the natural signs which are spontaneously produced. In this way both the formation and the interpretation of these signs are explained.[218]

Hobbes used to define a sign as a constant relation between two phenomena, seen by the subject. The two phenomena are here a state of consciousness and a motion. Sometimes the state of consciousness determines the motion, sometimes the motion causes the reappearance of the state of consciousness. The institution of a system of signs is a means of "connecting the within with the without." Language is thus for man a means of making the series of his

intellectual states participate in the regularity which characterises external order. The logical function of language therefore springs from its very essence in which the phenomena of the objective world and the phenomena which belong to the feeling and thinking subject are joined. It is equivalent to a system for rendering the mental life objective.[219] Being thus made objective, these phenomena can henceforth be preserved and communicated, without man or the animals having had each an end in view, since the institution of the first signs is involuntary, and arises from "the combination between the muscular and nervous systems." External order here acts as a regulator, even before thought has grasped it.

The signs which are spontaneously produced are not all transformed into voluntary signs. Those which appeal to sight or to hearing present special advantages for this use, and as a matter of fact, the two classes of signs are concurrently used by the higher animals. Gestures and cries are the origin of what later becomes the system of artificial signs. By degrees, the communication of emotions gives way to the expression of thoughts. Among very civilised populations it even came to be believed that song had come from speech. But, on the contrary, speech came from song. To be convinced of this a glance at the animal world is sufficient.

Up to this point the theory of language has been biological, and the acquired facts can thus be summed up: 1, Man does not express his thought in order to communicate it, but he communicates because he expresses it. 2, What is first expressed is emotion, not thought. By degrees language becomes intellectualized, as the mental life itself. 3, Expression is spontaneous and primary. It arises from

the relation between the nervous and muscular systems. In the progressive transformation where, from being involuntary, the signs gradually become voluntary, they are at once causes and effects.

The essential condition for this transformation to take place is social life. Undoubtedly, language appears very quickly, as soon as individuals of the same species find themselves in constant relations with one another. Each one learns to attribute the character of signs to the movements which accompany his emotions. Similar beings in whom the same phenomena take place, become equally capable of interpreting those signs. From this moment a language is born; and this is true for the animal species as for man. But human evolution follows an evolution which is peculiar to itself, and which determines that of language. Our language would not have far exceeded the period in which it especially expresses emotions, if human societies had remained purely domestic groupings, without any other organisation than that of the family. “The institution of human language,” says Comte, “appears, in sociology, as the chief continuous instrument of the necessary reaction of political upon domestic life.”[220]

Henceforth we can picture to ourselves, in its broad outlines, the prehistoric evolution of language. Originally it comprised gestures and cries. Gestures predominated in the first place as being more immediately expressive. By degrees they took a second place. As the natural signs became divided up so as to become artificial, the superiority of vocal signs appeared. Among other reasons it was due to the “spontaneous correspondence” between the voice and hearing which allows everyone to develop his

own education. We hear young children practising for long hours, playing with the articulate sounds which they begin to emit. From this more or less organised singing, still a melody of vocal signs, poetry was born. Finally from poetry, much later, springs, what is commonly called prose, that is, the use of non-rhythmic phrases. Three great evolutions in the history of humanity: how many centuries have not been required for their accomplishment!

Writing is to drawing what speaking is to singing. Originally it was not an artifice invented to help vocal language. Here again the ideological theory aggravates the part played by reflection. Man was obeying an instinct when by drawing he reproduced the familiar objects which met his gaze, occupied his imagination, and caused his strongest and most frequent emotions. Gradually, these spontaneous endeavours at imitation assumed the character of signs, became divided up and simplified, and finally were co-ordinated with vocal sounds which themselves had gone through a separate evolution.

Thus language and art have a common origin, which is the *æsthetic*, that is to say, the affective expression. Comte does not separate these two terms. He takes the word “æsthetic” at once in its etymological and in its modern sense. Our movements, at first involuntary, then voluntary, translate our impressions and react upon them, because they spring from them; that is the humble source from which everything else is derived. With animals it only gives rise to inarticulate vocal sounds, and to a more or less expressive mimicry. In man, it is the principle of language and of art. The latter begins by being a simple imitation. Then the reproduction of objects is perfected. It becomes more

faithful "by bringing out better the chief features which were at first obscured by an empirical mixture." "Idealisation" consists in this. Finally "expression" properly so called is developed, and "style."[221]

Thus, if we call language the whole of the means suitable for the transmission beyond ourselves of our various impressions, this whole forms a system in which the most customary and least expressive portion, language, was at first mingled with the portion which bears the name of art, taking art in its most primitive elements: song and drawing. These two parts became differentiated in evolution. Our social requirements have continually increased the use and extension of the vocal and visual signs which are made use of in active life and in speculative thought. These signs have become simpler and simpler and even abstract: to such an extent that their origin ended by being considered the result of a convention.[222]

The primitive parentage of language and of art accounts for many facts which current theories do not explain. For instance, language is not only created but preserved by the people. Grammarians, "even more absurd than logicians,"[223] in general have understood nothing about it. Their claim to authority is amusing. But it is to popular spontaneity, at once conservative and progressive, that our languages owe their admirable rectitude. The basis of each language collects what is essential and universal in the æsthetic evolution of humanity. Hence the magic charm of poetry, the most ancient of all the arts. Words possess a power of evoking images from which the artist draws inexhaustible effects. Often

during the long childhood of human reason even the power of words must have seemed to be supernatural: *Nomina Numina*. By dint of considering language as ideologists and logicians, we have forgotten that its nature is emotional and æsthetic. However, even to-day the mysterious power of words has not disappeared. How great is the action of forms of prayer on tender souls, even when faith has deserted them! Next to action itself, language is the most powerful of the exciting causes of feeling, and religions are well aware of this fact. They know how to make use of it to conquer or to retain souls.

IV.

The logical function of language is the only one which has been studied by philosophers; that is, by the "ontologists" and the "metaphysicians." But even their study has remained incomplete. Condillac and his school have solely considered the language which lends itself to logical analysis. Consequently, they only saw a single kind of combination which may be called the logic of signs. But, in reality, the logic of signs rests upon the logic of images, and this one on the logic of feelings. The so-called logicians thus conceive a narrow and false idea of our intellectual mechanism, when they concentrate all their attention "upon the most voluntary, but the least powerful of the three essential modes of which the mental combination admits."[224]

The logic of feelings is the art "of facilitating the combination of notions according to the connection between the corresponding emotions." It is the most instinctive: it is the source of all the great inspirations of our intelligence. We can think nothing

which contradicts it, or even which is not implied in it. But it has two grave defects. Its elements are not precise enough, and it is not at our disposal. It only operates under certain given conditions, and the appearance of these conditions does not rest with us. We see it at work, for instance, among animals, who occasionally provoke our admiration for the marvels suggested to them by this logic which is so closely bound up with the emotions. The logic of images, though less strong, is more free and precise than the logic of feelings. Nevertheless if we only had these two we should still be incapable of realising combinations conceived and prepared by us. This office belongs to the logic of signs. For to us almost entirely belongs the disposal of these signs, and it is this which has allowed of the development of abstract language and of the sciences.

But we must not separate this last logic from the two others. The laws of our nature always cause the logical use of feelings and images to prevail over that of signs. Undoubtedly, the union between signs and thoughts may become direct, and moreover in the case of abstract notions, it could not be otherwise. Thus our inner world is artificially united to the outer world. We have an abstract and symbolical representation of it, without going through the feelings, or even, strictly speaking, through the images. But this relation has far less consistency than the one which is established by the involuntary intervention of images and of feelings. As the abstract sign has its origin in the sign appreciated by the senses, which itself proceeds from the relation of the muscular system with the nervous system; so, the relations between signs have their origin in the relations between images, and these, in their turn, proceed from the relations between feelings.

The facility with which we manipulate signs hides this truth from us: it is none the less certain that these signs are united to our thoughts in a far less intimate and less spontaneous manner than the feelings and even the images.

The positive theory further allows us, not indeed to solve, but to adjourn the question of a universal language. Indeed are we concerned with a purely scientific language? Mathematical analysis in part fulfils this *desideratum*. It allows us to express the laws of the simplest phenomena by symbols which are at everyone's disposal. But if it is a question of a complete language, destined to be in common use among all men, who does not see that this conception is incompatible with the present state of humanity? How could we establish a universal language, while allowing the prevalence of "divergent beliefs and of hostile customs."[225] The unification of tongues will arise from the unification of peoples. When the latter has been realised, under the action of positive philosophy, the other will follow as a necessary consequence.

Moreover, from the present time, a universal language exists! It is Art, "the only form of language which is universally understood at once in the whole of our species."[226] Truly this universal language has its dialects. Comte's remark is none the less strikingly accurate. The masterpieces of Greek sculpture, Rembrandt's paintings, Beethoven's symphonies are accessible to millions of human beings who have never known a word of Greek, of Dutch, or of German. To teach all children music and drawing, as Comte requires in his positivist plan of education, is not to make them participate in the luxury of "accomplishments." It is placing within their reach

works which appeal to the whole of humanity; it is giving them a stronger sense of the solidarity which is the essential characteristic of human society; finally it is teaching them the universal language of which they possess the instinctive rudiments, and whence have sprung the very languages which to-day appear as frigid systems of symbols and graphic representations. Is it not fair to allow them the enjoyment of a patrimony as ancient perhaps as humanity herself? Somewhere, Comte compares language to property.[227] Like it, language has facilitated acquisitions and preserved social wealth. But it has an advantage over property, that of admitting of equal possession by all at the same time. Art presents this advantage no less than language. Works of art are the common property of the whole of humanity and no one should be deprived of that inheritance.

CHAPTER II
GENERAL CONSIDERATIONS ON SOCIAL SCIENCE

Social science had at first been called social physics by Comte. Later on he invented the name of "sociology"[228] for it. It stands at the summit of the encyclopædic ladder of the sciences. Accordingly, it offers certain characteristics which the other sciences do not present.

Undoubtedly, by the definition of its object and by its method, it is perfectly homogeneous with the rest of positive knowledge. Sociology studies the laws of social phenomena as mathematics inquires into the laws of geometrical phenomena. In this sense, between these extreme sciences there are no other differences than those which arise from the diversity of the phenomena which are studied. But mathematics, and the other fundamental sciences, excepting sociology, are distinctly preliminary. Sociology is final. Each of the preliminary sciences should be cultivated only in the measure necessary in order that the following one may in turn assume the positive form. Social science, which is not preparatory to any other, establishes the principles of morals and of politics. It is, as has been seen, the key-stone of positive philosophy. It is in it, and through it, that positive philosophy acquires the universality which hitherto it had lacked.

Finally, there is a last difference which Comte likes to think he is successfully removing; the other sciences are more or less formed; everything has to be done for social science. Not that many trials have

not been attempted. Comte does not ignore them, and he prides himself upon doing justice to his precursors. He goes back to Aristotle, in whom he admires an incomparable scientific and philosophical genius. In him he sees the inventor of social statics. His *Politics* are still read with profit.[229] But Aristotle could have no idea of a sociology, and in particular of positive social dynamics. For that he lacked (without speaking of the fundamental sciences which excepting mathematics were yet to be born), a sufficiently wide and varied knowledge of history and the idea of progress.

Montesquieu was in advance of his time, when, by the insight of his genius, he generalised the idea of natural law so as to bring under it the political, judicial, economical, and, generally speaking, all social phenomena. He really conceives the idea of social science. But the execution did not respond to the conception. How could Montesquieu have succeeded, since he was still without two indispensable elements: in the first place, the positive science of man from the biological point of view, and then the idea of progress, a vital necessity for every positive philosophy of history? Having failed to apprehend the fundamental laws of social dynamics, Montesquieu made too much use of the comparative method. Consequently, he took secondary laws for essential laws, such as the laws relating to the influence of climate. In the same way he has exaggerated the importance of various forms of political constitution.[230]

Condorcet came after Montesquieu and Turgot, and had been formed in the school of d'Alembert. He came nearer than anyone to the social science which was to be founded. He understood admirably that the

evolution of the human race, considered as a single being, is subject to laws. He brought the idea of progress into full daylight. But, nevertheless, positive sociology does not owe to him its origin. He shared the prejudice of his time on the subject of the indefinite perfectibility of man; this prejudice was only to disappear before the positive science of intellectual and moral man. Moreover, in the heat of the revolutionary conflict, he misunderstood the concrete reality of the progress, whose abstract necessity he had so well realised. By painting the centuries preceding the XVIII. century, in the darkest colours, he made the progressive evolution of humanity a kind of miracle, "doubly inadmissible in a doctrine which does not imply a Providence."[231]

But soon Cabanis and Gall bring forward the positive theory of the moral and intellectual faculties of man. The French revolution throws a vivid light upon the period which separates us from the Middle Ages. At last, the theorists of the counter-Revolution show that the philosophy of the XVIII. century, if it excelled in the power of demolishing, was incapable of reconstructing, and they also show that order must be inseparable from progress. Comte regards himself as a Condorcet who has profited by these lessons of experience. He has worked with Saint-Simon, he has read De Maistre. In short, he is possessed of all the necessary elements for the foundation of sociology.

At the moment when he undertakes it, theological and metaphysical philosophy is still dominant over the contemporary conception of social facts. In it imagination is not subordinated to observation. Men do not apply themselves to the analysis of facts in order to discover their relations and their laws; they prefer to construct philosophies of history, which

appear as non-scientific hypotheses, that is to say, which are not verifiable. Absolute results are sought for, as if in this order of facts, as in all the others, the absolute was not inaccessible. From the practical point of view, nobody doubts that man can modify social facts as he pleases, and that his action can be exercised there without any definite limits being placed upon it. It is supposed, in a word, that political society has no laws which regulate its natural development.

The same prejudices and the same false ideas have already predominated in the past on the subject of the more simple phenomena, which afterwards became objects of positive science. Should not this analogy cause philosophers to conceive "the rational hope of also succeeding in the dissipation of those errors of conception and of method in the system of political ideas."[232] Nothing is more natural than that the science of the most complex phenomena should be the last to reach the positive stage. It would even have been impossible for it to have been otherwise. Finally, beyond the difficulties which belong to the complexity of its object, sociology had to overcome others, which arise from political passions. Problems of this kind are indifferent to no one. In them the interests of each one are involved, and they influence even without our knowledge, the direction taken by our thoughts. Political parties excel in framing plausible theories adapted to their requirements. Thus a constant effort at disinterestedness is necessary on the part of any one who purposes to take up the science of abstract politics.

At any rate, if these reasons make us understand that sociology should make its appearance last among the fundamental sciences, none of them imply

that it would not have arisen in its turn. On the contrary, beside "vital physics" and "inorganic physics," "social physics" was one day to take its place. From 1824, Comte had a very clear idea of this. We do not see, he says, why the phenomena which the development of a social species presents should not have laws like the others, why these laws should not be capable of being discovered by observation, like those of the other phenomena, with this reservation only that the nature of this section of philosophy makes its study more difficult. "I will make it felt by the very fact that there are laws as determined for the development of the human species as for the falling of a stone."[233] Comte later on attenuated the rigidity of these expressions. He recognised that the social phenomena were of all others the most "modifiable." But he none the less maintained that they were ruled by laws.

II.

Sociology, an abstract and wholly theoretical science, only sets itself the task of discovering the laws of phenomena, without first taking into account any possible applications. I shall not have, says Comte, to concern myself directly with political anarchy.[234] Here, more than anywhere else, science must be separated from the corresponding art. The same reasons which led to physiology being constituted apart from medicine, with which it had for so long been confused, also require that social science should be distinguished from politics, of which, up to the present time, it has only been a more or less empirical or arbitrary interpretation.

Comte who took such pains to define the physical

fact, the chemical fact, the biological fact, has not given a definition of the sociological fact. The reasons for this are not difficult to see. In the first place, this fact defines itself so to speak, by elimination. As there are no phenomena accessible to us more complicated than those of the social life, all the phenomena which are not studied by the preceding sciences are of course the subject of sociology. Moreover, there might be a reason to seek for a definition of the sociological fact, if we started from the consideration of the individual to rise to that of society. But Comte's conception is radically different. For him it is the individual who is an abstraction; and society is the true reality. He must not explain humanity by man, but on the contrary, man by humanity. From this moment, all the human phenomena properly so-called are *ipso facto* sociological. It is an essential characteristic of Comte's system that man, considered individually, is not an object of science. The science of man belongs for one part to biology, for the other to sociology. To define the sociological fact amounts then to establishing the relations between biology and sociology.

We have already seen that these relations are extremely close. On the one hand, sociology could not be constituted so long as higher biology had not reached a certain degree of development. History has furnished us with a proof of this: the state of infancy of biology contributed largely to the failure of Montesquieu's and Condorcet's sociological attempts. But, on the other hand, the study of the intellectual and moral functions, that is to say, the highest part of biology, can only be made from the sociological point of view. Here we have a kind of mixed domain, which properly belongs neither to the one nor to the

other of the sciences.

Could we not then consider sociology as a simple extension of biology, an extension which would be far more important in the case of the human species than in any of the others? Do we not do this implicitly when we attribute the study of the intellectual and moral functions to biology, since everything which bears the name of "moral science," history, law, political economy, etc., finally rests upon these functions? What is the use of a new fundamental science for the study of phenomena which at bottom reduce themselves to biological phenomena?

Comte protested against this interpretation of his doctrine.[235] According to him, sociology is no less irreducible to biology, than the latter is to chemistry. The sociological phenomena, independently of the more general laws which are common to them with the subjacent orders, have laws of their own which regulate them. If animal societies only existed as we see them to-day, it would perhaps not be impossible to consider sociology as an appendix of biology. But human society excludes any attempt of this kind. For it is social life which has made the extraordinary development of the intellectual and moral functions possible in man, and this development is the very definition of humanity. Now, the first consequence of this development is that biology properly so-called, no longer suffices for studying it. We need a new method in it, the method of historical observation. Already, were it for this reason alone, there can be no question of reducing sociology to biology.

In the second place, when we pass from the individual to the collective organism, "the continued

expansion and the almost indefinite perpetuity" of the latter makes it almost impossible not to separate it from the former in a scientific study.[236] Comte is not deceived by the analogy between the two kinds of organism. To speak accurately, sociology with him, hardly ever considers anything except a single organism. Let us leave aside the little that it says of animal societies. It represents the human race as constituting, in time and in space, "an immense and eternal social unity, whose various organs, individuals and nations, united by universal solidarity, each, according to a determined manner and degree concur in the evolution of Humanity."

One of the ideas which Comte most admires in Condorcet, and which he regards as indispensable to social science, is that which makes a single being in process of evolution of the totality of the human species.[237] Henceforth, the parallelism between this immense "social unity," and the organisms studied by biology could not be a strict one. "The complex nature of the former," says Comte himself, "deeply differs from the indivisible constitution of living beings." We must then know how to restrain comparison wisely, "in order that it should not give rise to faulty approximations, instead of precious indications." Comte has sometimes failed in carrying out this prudent precept, for instance, when in the social organism he looks for what is analogous to tissues, organs, and systems studied by the anatomists. But he has, none the less, traced very firmly the limits beyond which the use of analogy here becomes an abuse.

These limits are determined by the specific character of the social reality, which escapes the

grasp of the biological method. For the principal phenomenon in sociology, the one which establishes most evidently its scientific originality, is the gradual and continuous influence of human generations upon one another. Now our intelligence cannot "guess the principal decisive phases of such a complex evolution without an historical analysis properly so-called."[238] Here is the final word: no history, no sociology. Comte had already written in 1822: To reduce sociology to biology is to annul the direct observation of the social past. Undoubtedly the reason for man's superiority over the other animals lies in the relative perfection of his organisation. In this sense, social physics, that is to say, the study of collective development of the human species, is really a branch of physiology. In this sense, the history of civilisation is but the sequel and the indispensable complement of the natural history of man. But, important as it is to form a proper conception, and never to lose sight of this relation, yet it would be a mistake to conclude from it that no clear division should be established between social physics and physiology properly so-called. For, in the case of the human race, there is history *which cannot be reached by a process of deduction*.[239]

III.

Already, in biology the nature of the object had compelled scientific men to start from the consideration of the whole to reach that of the parts, to proceed from the complex to the simple. With still greater reason, the same inversion of method imposes itself in sociology. For, although the individual elements of society appear to be more separable than those of the living being, the social

consensus is still closer than the vital *consensus*.[240]

The spirit of the sociological method will then be always to consider simultaneously the various social aspects, whether in statics, or in dynamics. Undoubtedly each of them can be the object of a special study, by the way of "preliminary elaboration." But, as soon as the science is sufficiently advanced, the correlation of phenomena will serve as a guide for their analysis. Political economy has proved by facts that the isolated study of a series of social phenomena is condemned to remain irrational and barren. Those then who, in the system of social studies, wish to imitate "the methodical parcelling out, which belongs to the inorganic sciences," misunderstand what the essential conditions of their subject require. Here the most general laws must be known first. It is from them that science must then descend to the more particular laws.

The more complex the phenomena, the more numerous are the processes of method at our disposal for studying them. This law of compensation is verified again in the present case. Sociology, over and above the processes made use of by the preceding sciences possesses some which are peculiarly its own. To put it more plainly, in its capacity of final science, the whole positive method belongs to it. As method is only learnt by practice, the sociologist will therefore have to be formed by a complete scientific education from mathematics, which will give him the feeling of positivity, to biology which will teach him the comparative method. The *Cours de philosophie positive* precisely retraces this methodical ascent, which leads the human mind, by successive degrees, up to social

science. And, since the intellectual evolution of the individual reproduces that of the species, the sociologist will cover the same ground to reach the same end.

At any rate, if a mathematical education is indispensable so as to accustom him to the positive mode of thought, he will, however, acknowledge that social phenomena do not allow of the use of numbers or of mathematical analysis, nor more especially of the calculation of probabilities. Comte treats Laplace's attempt upon this point as absurd, an attempt which has been taken up again by other mathematicians. He likes to quote it as a proof of the lack of the philosophical spirit among geometers. Indeed, according to him, to apply the calculation of probabilities to historical events, implies a failure to understand that these phenomena are subject to invariable laws like all other phenomena.

In default of the powerful instrument furnished by mathematics, sociology makes use of the methods employed in the physical and natural sciences. Of these observation is the first. Social phenomena seem easy to observe, because they are very common, and the observer takes part in them more or less. But, on the contrary, these two circumstances render sociological observation very difficult. We only observe well on condition that we place ourselves outside what we observe.[241] Sociological facts ought then to appear objective to us, detached from us, independent of the state of our individual consciousness. Nothing is more difficult to realise. In order to obtain, and more especially to maintain, "such an inversion of the spontaneous point of view," the mind must already have partly constructed what it wishes to see. Were it not already provided with a

preliminary theory, for the most part the observer would not know what he must look for in the fact which is taking place under his eyes. It is therefore by the preceding facts that we learn to see the following ones. There lies "the immense difficulty" of sociology, in which we are thus obliged, in a certain measure, to determine simultaneously the facts and the laws. If we are not already possessed of the necessary speculative indications to grasp them, the facts remain barren and even unseen, although we are, so to speak, immersed in them.

Consequently, a social fact can have no scientific significance if it is not brought into relation with another fact. In an isolated condition, it remains in the state of a simple anecdote, capable at most of satisfying "idle curiosity," but unfit for any rational use. An infinite number of facts may be useful to sociology, apparently very insignificant customs, all kinds of monuments, the analysis and the comparison of languages; but the mind must be provided for their observation with general points of view. Only on this condition will a mind, well prepared by rational education, be able to transform the actions which take place beneath its eyes into sociological indications, "according to the more or less direct points of contact, which he will be able to discern in these actions with the highest notions of science, in virtue of the connexion of the various social aspects."

There can be no question of experimenting in sociology.[242] Not that we cannot act upon the social phenomena: they are, on the contrary, the most modifiable of all. But an experiment properly so-called consists in comparing two cases which differ

from each other by a certain definite circumstance, and by that one alone. We have no means of determining two cases of this kind in sociology. It is true that in the absence of direct experiments nature presents indirect ones. They are the pathological cases, unfortunately too frequent in the life of societies, the more or less serious perturbations which they undergo through accidental or passing causes. Such are the revolutionary periods which correspond to diseases in living bodies. If we properly extend Broussais' principle to sociology, that is to say, if we admit that morbid phenomena are produced by the effect of the same laws as normal phenomena, then social pathology will in some measure replace experiments. It will be said that this study has been fruitless up to the present time. But the reason of this is, according to Comte, that direct or indirect experimenting ought, like simple observation, to be subject to rational conceptions. Both are only productive in a sociology already possessed of its essential laws.

The comparative method, so useful to the biologist, is also precious for the sociologist. It draws together the various states of human society which coexist on the different parts of the earth's surface, and among peoples independent of one another. Undoubtedly, if the total development only is considered, the evolution of Humanity is one. It nevertheless remains true that very considerable and very varied populations have as yet only reached the more or less inferior degrees of this evolution. We can thus observe them simultaneously and compare their successive phases. From the Fuegians to the most civilised nations in Europe, we can imagine no "social shade" which is not at present realised on some portion of the globe. Frequently, within the

same nation, the social condition of the various classes represents states of civilisation which are very far removed from one another. Paris to-day contains more or less faithful "survivors" of nearly all the anterior degrees of social evolution, especially from the intellectual point of view.[243] This comparative process holds good for social statics as for social dynamics. Even in statics a comparison can be established between animal societies and human society.

However, this type of method is not devoid of inconvenience in sociology. It does not consider the necessary succession of the various phases in the social evolution: it seems on the contrary to consider them all as simultaneous. Consequently, it prevents us from seeing the filiation of social forms. It also runs the risk of falsifying the analysis of the cases which are observed, and of causing simple secondary factors to be taken for main causes. This is what happened to Montesquieu who compared indifferently the cities of antiquity, the France of the Middle Ages, the England of the XVIII. century, the republic of Venice, the government of Byzantium, the Empire of the Sultan, and that of the Shah of Persia.

So the comparative method is only an auxiliary process in sociology. Like observation and experiment, it has to be made subordinate to a rational conception of the evolution of humanity. The latter in turn depends upon the use of an original method of observation, belonging to social phenomena, and free from the dangers presented by the preceding ones. This specific sociological method, this "transcendent" process, by which the positive method is completed, is, says Comte, the

historical method.[244]

IV.

Sociology is an abstract science: history, which is its essential method, cannot therefore be history merely considered as a narrative. There are two ways of conceiving history, the one abstract and the other concrete. The latter dominates in the historical works written up to the present time. Their end is to relate and to array in chronological order a certain sequence of events. Undoubtedly in the XVIII. century efforts were made to co-ordinate political phenomena and to determine their filiation. But for all that this kind of work has not ceased to be descriptive and literary. The other form of history, which does not exist up to the present, has for its end the research of the laws which regulate the social development of the human species.[245]

Difference of object leads to difference of method. If an historian proposes to himself to compose exact "annals," to relate things as they took place, he will begin by the special history of the various peoples, which, in its turn, is founded upon the chronicles of the provinces and the towns. It will be necessary for him to investigate documents in detail, and to neglect no source: the work of combination will only come subsequently. But if our end is the abstract science of history, that is to say the linking together of social phenomena, quite a different course will have to be followed. Indeed all the classes of these phenomena are simultaneously developed, and under the mutual influence of one another. We cannot explain the line of advance followed by anyone among them, without having first conceived in a

general way "the progression of the whole." Before all things then we must set ourselves to conceive the development of the human species in its widest generality, that is to say, to observe and to link together among themselves the most important steps towards progress which it has successively taken in the various fundamental directions. Then we shall subdivide the periods and the classes of the phenomena to be observed.[246]

These "various fundamental directions" correspond to what Comte called later the "social series." By this he indicates the groups of social phenomena arranged for a scientific study. Once these groups are formed, then, according to the totality of historical facts, the sociologist seeks to determine the continuous growth of each, physical, moral, intellectual or political disposition or faculty, combined with the indefinite decrease of the opposite disposition or faculty: for instance, the tendency of human society to pass from the warlike form to the industrial form, from revealed religion to demonstrated religion, etc. From this will be drawn the scientific forecast of the triumph of the one and the fall of the other, provided that this conclusion is also in conformity with the general laws of the evolution of Humanity.

Such a forecast could never be founded upon the knowledge of the present alone. For the present exposes us to the danger of confusing the principal with the secondary facts, of "placing noisy passing demonstrations above deep-seated tendencies," and of regarding institutions or doctrines as growing which are really on the decline. Our statesmen scarcely look back beyond the XVIII. century, our philosophers beyond the XVI. This is too little. It

does not even suffice to make us understand the French revolution. The study of the "historical series" alone allows the understanding of the present and the prevision of the future. The sociologist will even exercise himself in predicting the past, that is to say, in acquiring a rational knowledge of it, and in deducing each historical situation from the whole of its antecedents. He will thus become familiar with the spirit of the historical method.

However, if this abstract historical method were used by the sociologist to the exclusion of every other, he would sometimes come to a wrong conclusion, and take the continuous decrease in a natural faculty for a tendency to total extinction. For instance, as civilisation becomes more refined, man eats less than formerly. Nobody concludes from this that he tends not to eat at all. But the absurdity which is palpable here, might, in other cases pass unperceived. That is why the historical method in sociology requires to be controlled by the positive theory of human nature. All the inductions which might contradict this theory are to be rejected. Indeed, the whole social evolution is at bottom but a simple development of humanity, without the creation of new faculties. The germ, at any rate, of all the dispositions or effective faculties which sociological observation, (and in particular, history), may make known, must then be found in the primordial type which biology has constructed beforehand for sociology. Accordance between the conclusions of historical analysis and the preliminary notions of the biological theory is the indispensable guarantee of sociological demonstrations.[247]

V.

Thus conceived the historical method rests upon the postulate given by Comte, as we have seen, as a basis to his sociology. This postulate is thus enunciated: *The nature of man evolves without being transformed.* The various physical, moral and intellectual faculties, must be found the same at all the degrees of historical evolution, and always similarly co-ordinated among themselves. The development which they receive in the social state can never change their nature, nor consequently destroy or create any one of them, nor even intervene in the order of their importance.

In a word, the chief regulator of sociology is the science of human nature. It can even be said, without forcing the meaning of Comte's thought, that sociology is really a psychology:[248] not indeed, it is true, a psychology founded upon the introspective analysis of the individual subject, but a psychology whose object is the analysis by history, of the universal subject, that is to say, of Humanity.

Comte endeavours to bring the complexity and the extreme variety of social phenomena into an intelligible unity. This complexity is such that we could not determine the laws by starting from the observation of the simplest phenomena to reach the more complex ones afterwards. Moreover, these facts only possess sociological significance if the observer is already provided with a general theory before he ascertains them. But, on the other hand, history cannot be deduced. Given an already positive knowledge of human nature and of the "*milieu*" in which it evolves, we could not say *a priori* how it will evolve. History must then teach us how, as a matter of fact, social life has developed Humanity.

Nevertheless, once this concession has been made to observation the method becomes again deductive. Since sociology is a science it ought, like the other sciences, to be able to substitute rational prevision to the empirical establishment of facts.

To complete the characterising of this final science, it must be at once positive, like the subjacent fundamental sciences, and universal like philosophy, which alone up to the present time has looked at things from "the point of view of the whole." Henceforth these two conditions are fulfilled. In the first place, the positivity of sociology cannot be doubted. In it social facts are conceived as subject to laws, and Comte abstains from any research as to their mode of production. Then, sociology, in spite of the extreme difficulties of its object, has assumed the deductive form, and has brought secondary laws under more general laws. Comte is even convinced that his sociology comes nearer to the perfect scientific form than physics or chemistry. By his discovery of the great dynamic law of the three states, has he not given it a unity which is to be found as complete nowhere else but in astronomy? But, at the same time, it is truly universal, since it is a philosophy of history, or, in other words, the science of humanity considered in its evolution. As this science presupposes biology, and as biology in turn presupposes the science of the "*milieu*" in which living beings are immersed, sociology becomes at once the summary and the crown of the sciences which precede it.

Thus in replacing man in Humanity, and Humanity in the system of its conditions of existence, Comte constructs a final science which is at the same time the supreme science, the only science, that is to say,

philosophy. “If the laws of sociology could be sufficiently known to us, they alone would suffice to replace all the others, save the difficulties of deduction.”[249] The science of Humanity is the centre around which the others range themselves in order.

Already with Descartes, the anthropological character of philosophy was strongly marked. After him, philosophical speculation took man for its centre more and more. This tendency also predominates in Comte’s doctrine. But in it it assumes a social character. Here the “universal subject” is no longer the intellectual consciousness of Kant, or the absolute “ego” of Fichte; it is Humanity evolving in time, whose unity is displayed through the succession of generations connected in strict solidarity with each other. Henceforth the philosophical problems, no longer present themselves from the point of view of man conceived in the abstract or in himself apart from time. The consideration of history necessarily intervenes. Problems are formulated in social terms. There lies the deep significance of the doctrine systematised by Comte.

CHAPTER III
SOCIAL STATICS

As biology distinguishes the anatomical point of view, “relating to the ideas of organisation,” and the physiological point of view, “relating to the ideas of life,” so sociology separates the study of the conditions of existence of a society (social statics), and that of the laws of its movements (social dynamics).

This distinction has the advantage of corresponding exactly to that of order and progress, from the practical point of view, while it is closely allied to the encyclopædic law called “the principle of the conditions of existence.”

Comte will not admit that he is making two distinct sciences of social statics and social dynamics. Sociology, according to him, is constituted by the constant drawing together of these two corresponding studies. However, they each have their own object, and Comte has treated them separately. Indeed, social statics and dynamics are far from having the same importance in his work.

The essential part, on his own showing, is dynamics.[250] When he makes history the characteristic process of the Sociological method, when he shows that the tradition transmitted from every generation to the following one is pre-eminently the sociological phenomenon, when finally he considers the new science as having been founded from the day when the law of the three states was discovered, is he not placing himself at the dynamic

point of view? After having demonstrated that dynamic laws of social phenomena exist, he concludes that these phenomena are also subject to static laws: there would be a contradiction in admitting the one set of laws without the other. In Comte's mind then dynamics preceded statics. Even from an objective point of view, dynamics seem to be the most important. For, if we knew the dynamic laws it would not be impossible to deduce the static laws from them, while to do the reverse would be impracticable, at any rate for minds constituted like ours.

So, in the *Cours de philosophie positive*, social statics holds a very small place compared with that occupied by dynamics. It is true that it takes up the whole of the second volume of the *Politique positive*. But there Comte brings into it many considerations which arise more from ethics and religion than from sociology properly so called.

I.

The idea of the social *consensus*, more restricted than that of the vital *consensus*, dominates the whole of social statics. The science sets itself to study the continual actions and reactions which the various parts of the social system exercise upon one another. Each of the numerous elements of this system, instead of being observed by itself, must be conceived as in relation with all the others, with which it has constant solidarity. From whatever social element we start, it is always connected, in a more or less direct way, with the whole of the others, even with those which at first sight appear independent.[251]

What are the ultimate "social elements?" In biology, anatomical analysis was to stop at the tissue, or at least at the cell. In sociology, statical analysis will stop at the family. "Human society is made up of families and not of individuals: it is an elementary axiom in statical sociology." In the eyes of social science, the individual is an abstraction. All social strength is the result of a "more or less extended co-operation," that is to say of the combined action of a greater or smaller number of individuals. There is nothing purely individual except physical force. But what is the physical force of a man alone, without arms or tools? (for these already imply a co-operation of social activities). Intellectual power is of value only when others participate in it: so it is with moral power.

On the other hand, if all social force is the result of union, all social force is, nevertheless represented by an individual. The social organism is "collective in its nature, and individual in its functions."[252] In this way the part played by the individual again becomes a very considerable one. If the individual, in so far as he is a social force, always represents some group, he is none the less possessed of his own personality which may precisely have taken a great part in the formation of such or such a group. We know that the social organism must not on all points be compared with the living organism. If the family is the ultimate element for social statics, this element is however itself made up of persons who are naturally independent, and who cannot be compared to cells.

The positive theory of the family is founded upon the biological theory of the physical and moral nature of man. This nature is sociable. The human species belongs to the category of those in which

individuals not only live in more or less permanent bands, but form definite and durable societies. This is a fact in our experience. The social state is, for men, the state of nature. The "contract" theory cannot then be maintained. Comte does not stop to criticise it. The theorists of the counter-Revolution have sufficiently refuted Rousseau. According to Comte, sociability is spontaneous in the human species, in virtue of the instinctive leaning towards common life, "independently of any personal calculation, and often against the most immediate interest of the individual. Society is not then founded upon utility, which could moreover only appear in a state of society already established."[253]

Thus, the family is the ultimate social element. Being preoccupied by this idea, Comte, who had such a deep, clear-sighted feeling of the evolution of societies, does not ask himself whether the family has evolved from something which existed previously. For him it is something natural, that is to say something given, beyond which we should not go back, and of which only the biological conditions can be determined. It is from this point of view that Comte defines the relations of man and woman in the family. He bases himself upon biology (that is to say both upon physiology and psychology), to represent the female sex as living in "a kind of state of continuous childhood." Whence he concludes to the natural subordination of woman. This inferiority does not moreover extend to the whole of her moral nature, for, "in general, women are as superior to men by the natural development of sympathy, and sociability, as they are inferior to them where intellect and reasoning powers are concerned."[254] On this last point, John Stuart Mill held the contrary opinion, and this disagreement contributed not a

little to alienate him from positive philosophy. Later on, in his "second career," Comte, who more and more came to subordinate the intellect to the heart, still more extolled the moral excellence of woman, and ended by considering her as "intermediary between humanity and man." But even then, while proclaiming the sentimental, moral, and æsthetic superiority of woman, he persisted in maintaining that, from the intellectual point of view, by reason of immutable biological conditions, she remains inferior to man.

From analogous motives, Comte regards marriage as a "universal natural disposition, the first necessary basis of all society." Every thing which tends to weaken marriage tends to disorganise the family, and, consequently, to destroy society in its constitutive elements. Comte will thus condemn divorce, of which he himself had the best reasons for appreciating the advantages. Generally, Comte's theory of the family is modelled upon the Christian family. According to his constant practice, he seeks to detach the institutions of Catholicism, which he admires, from its dogmas which he believes to be almost dead. These institutions, excellent in themselves only suffer from being bound up with beliefs which are disappearing. So long, he says, as the family continues to have no other intellectual basis than religious doctrines, it will necessarily participate in their growing discredit. Positive philosophy "can alone henceforth establish the spirit of the family upon an immoveable foundation, with the modifications suitable to the modern character of the social organism."[255] This new intellectual basis is established by positive psychology and social statics. The constitution of the family remains the same. But its foundation is henceforth positive dogma instead

of religious dogma, demonstrated belief instead of revealed faith.

Perhaps we must recognise in the energetic defence made by Comte of the family and of marriage as he found them established by the side of Catholic influence, a desire not to be confused with the followers of Saint Simon, of Fourier, and the other reformers of his time. These did not hesitate to contradict current and traditional customs. In Comte's view, this contradiction is a sign of error. Scientific truth is found in the prolongation of public reason and of common sense. Here Comte sees a new, and not one of the least, important arguments, in support of his own theory.

II.

A society is composed of families: it is not itself a greater family. Neither is it an assemblage of contiguous families living together. The family and society are distinguished from each other by very clear differential characteristics.

The family is a "union" of an essentially moral nature, and secondarily intellectual.[256] The chief constituent of the family is found in the affective functions, (the mutual tenderness of husband and wife, of the parents for the children, etc.). Society is, on the contrary, not a union, but a co-operation" of an essentially intellectual nature, and secondarily moral. Undoubtedly, an association of men cannot be conceived as subsisting without their sympathetic feelings being interested in it. Nevertheless, when we pass from the consideration of the single family to the co-ordination of several families, the principle of co-operation necessarily ends by prevailing. So

Rousseau's theory is not false on all points. Metaphysical philosophy, especially in France, says Comte, has undoubtedly committed an error of capital importance by attributing the very creation of the social state to this principle, for it is evident that co-operation, far from having been able to produce society, presupposes it. But if we confine this assertion to society properly so-called (the family being set aside) it is not so startling. For, if co-operation could not "create" human societies, it alone at least, has been able to "communicate to these spontaneous associations a definite character and a lasting consistency."

This co-operation is called to-day "the division of labour." Comte knew this expression: Adam Smith had already made it famous. If Comte did not make use of it, it is because economists had limited the idea and the term to "merely material usages." He wishes, on the contrary, to consider co-operation in the whole of its rational extension. It then becomes an extremely general principle, dominating the whole of social statics, and finding its application in the greatest as in the most limited social groups. This principle leads us to regard not only individuals and classes, but also, in many respects the different peoples, "as participating together in a suitable way and a determined degree, in an immense common work whose development unites those actually co-operating with the series of their successors and their predecessors." Thus we see the relation between the dynamical and the statical laws of social continuity which binds successive generations, with social solidarity which unites men living in the same period. This solidarity arises especially from the division of labour. The latter is the "primitive cause" of the extension and of the growing complexity of

the social organism, which may be conceived as comprising the whole of our species.

The founder of social statics, Aristotle, had formulated its most general principle: “separation of offices and combination of efforts.”[257] Without the “separation of offices” there would only be an agglomeration of families and not a society. But the indispensable counterpart of the separation of offices is the combination of efforts, that is to say a general thought which directs them, in a word, a government.

Thus, the ideas of society and of government are implied in one another. Indeed, there is no society properly so-called without the division of social labour, a division immediately generating consequences which make government a necessity. Society in developing grows more and more complex. Instead of a small group of a few families, it ends by numbering hundreds, thousands, and even millions of them. At the same time the division of labour often gives rise to individual differences, at once intellectual and moral. Minds are developed, but each one according to its special line, at least according to that of his profession or of his class. The communion of feeling and of thought tends to become weaker. This last is not the least serious inconvenience. Smith had already pointed it out from the economical point of view, and the utopian reformers, Fourier especially, have shown strongly its extent and its dangers.

This is, according to Comte, what it is the mission of a government to remedy. Its social function consists in repressing and in opposing as far as possible the tendency to the scattering of ideas, of

feelings, and of interests. This tendency is the result of the very development of society, and left to itself, it would end by stopping this development. Government may thus be defined in its abstract and elementary function as "the necessary reaction of the whole upon the parts."[258]

Government, at first, appears "spontaneously." As Hobbes clearly saw, it is then in the hands of those to whom force belongs. But it soon becomes regularised and organised into a definite social function. As, in the development of the sciences, the growing differentiation of their object rendered research more and more special, and at last caused the appearance of a particular class of learned men, (the philosophers), whose own function is to attempt the synthesis of human knowledge; so, in the division constantly more ramified of social functions, a new one had to be constituted, "capable of intervening in the accomplishment of all the others, unceasingly to recall in them the thought of the whole, and the feeling of common solidarity."

We are then entirely mistaken, when we want to reduce the function of government to "vulgar attributions of material order." Government is not a simple institution of police, a guarantee of public order, nor, as was said in the XVIII. century, a necessary evil which will reduce itself to a minimum with progress, or even will tend to disappear. On the contrary, the more a society is developed, the more indispensable the function of government becomes in it, the more importance it assumes. Progress in the future will make a more and more considerable place for it in social life. Although it does not itself realise any determined social progress, government necessarily contributes to whatever progress society

can make.

If the idea of the division of labour is not to be understood in a purely material and economical sense, the principle of *social cohesion*, which Comte calls government, cannot any more be founded upon a single conformity of interests. This would not suffice to maintain a human society. For such a society to subsist, there must be a certain "communion" of beliefs, and feelings of sympathy, which themselves depend in a certain measure upon these beliefs. Undoubtedly, society could not resist a deep and durable divergence of interests. But it would still less resist incompatibility of feelings, and especially of beliefs among its members. In a word, the basis of human society is intellectual before all things. And, as the first object of the mind of man is the interpretation of the world which surrounds him, the constitutive basis of human society is religion. The groups which are united in the same general conception of the universe are part of the same society. Hence, in the past, we see endless conflicts between the societies whose religions were different; hence, in the future, the unity of the human species will finally become entirely rallied around positive religion.

If this is the case, government, which is by definition the highest and most general social function which represents the "spirit of the whole," cannot be confined to temporal action. Its object is not only to assure the security of property and of persons. It must at the same time strengthen and preserve that "communion" of beliefs which is the basis of human society. It must guarantee the union of intellects, by establishing and teaching universally accepted principles. It must, in a word, be a

"spiritual power." In this capacity, in positive society, it will exercise an action at least equal to that enjoyed by the catholic clergy in the Christendom of the Middle Ages, as long as the Popes preserved its supreme direction.

These consequences are legitimately drawn from Comte's principles. His philosophy made social reorganisation dependent upon the reorganisation of morals, and the reorganisation of morals upon that of ideas. He was, therefore, in social statics, to seek for the foundation of society in the harmony of intellects and to define government by its spiritual as much as by its temporal function.

III.

Comte's social statics are far from fulfilling the programme which he indicated in a word when he called it "social anatomy." Undoubtedly he is right in not pushing the comparison between living beings and society to dangerous or childish attempts at precision. But, in sociology as in biology, he separates the study of the organs from that of the functions, and we must admit that he insisted very little upon the analysis of the social organs. From the statical point of view he only distinguishes the individual, the family, and society taken as a whole. Moreover the consideration of the individual is only preliminary, since the families represent the real social elements. He therefore sees, or at least he studies nothing intermediary between these elements and the totality of the social body, that is to say the human species. He limits himself to indicating the separation of offices which increases with the extension of the social body. But what is the

structure of this body, what diversity of organs and apparatus does it contain? Social statics tells us nothing of this. The *Politique positive* scarcely gives us a few brief indications on this point. The collective organism would be composed first of families, which constitute its real element, then of the classes or castes which form its tissues, and finally of towns or villages which are its real organs.

This is very vague. Only in the dynamics shall we find views a little more precise on the appearance, the structure, and the functions of the different social forms. Even then Comte does not really take the physiological point of view, any more than in statics he takes the really anatomical point of view. Before all things, his sociology remains a philosophy of history. It analyses the past of humanity, that it may find in it the interpretation of its present and the rational prevision of its future.

This science differs profoundly then from the fundamental sciences which precede it, in that it studies a single being, of which it cannot analyse the phenomena or discover the laws except by considering it in the first place in its totality. Comte hardly ever in social statics (and far less in dynamics) says society, as in biology he said, animals and vegetables. He says the *collective organism*: a simple, immense organism, whose life indefinitely extends into the past and into the future, in a word, Humanity. This conception representing humanity as a single Being which is an hypothesis for science, becomes an ideal for ethics, and an object of love for religion. Insensibly Comte passes from one of these points of view to the other. At the same time the character of social statics changes. From being an abstract science in the *Cours*, in the *Politique* it is

transformed into a picture of future Humanity.

CHAPTER IV
SOCIAL DYNAMICS

For Comte, social dynamics is the chief part of sociology. He tells us that it occupied his attention "in a preponderating and even almost exclusive manner."[259] This preference is easily explained. In the first place the idea which best distinguishes sociology from biology, the idea of the gradual development of humanity belongs to social dynamics. Then, the method which particularly belongs to sociology, the historical method, applies especially to dynamics. Finally, the very conception of a social science became fixed in Comte's mind by the discovery of the law of the three states which is a dynamic law.

Social dynamics is defined as "the science of the necessary and continuous movement of humanity,"[260] or, more briefly, the science of the laws of progress. Here, as in social statics, and even still more exclusively, a single case is studied, namely, the case of the human species, regarded as a single individual, and considered in the whole of its past and future development. Henceforth, without misunderstanding the distinction between biology and sociology, should we not in the first place seek some of the conditions of social progress in the physical and moral nature of the individual man? This question did not escape Comte, and he says that it would be right to begin a methodical treatise on social science with it. However, he did not expressly deal with the question. He contented himself with indicating "this fundamental instinct which is the

complex result of the necessary co-operation between all our natural tendencies, which urges man ceaselessly to ameliorate his condition in all respects, and always to develop the whole of his moral, intellectual, and physical life in every way as much as the system of conditions in which he finds himself placed allows of it."[261] This indication is completed by the study of the conditions which determined the first efforts of man, when he had to overcome his natural laziness, at the dawn of civilisation. It suffices at least to show the close union which exists in Comte's thought between social dynamics and psychology. It is true that the sociological laws cannot be *deduced* from the biological laws. Nothing can replace a direct observation of social phenomena. But the very fact of progress, which is the object of social dynamics, would not exist without the "individual impulses which are its own elements."

I.

Under the name of progress Comte understands a "social advance towards a definite although never attained termination, by a series of necessarily determined stages." This idea was never clearly defined in antiquity.[262] The men of ancient times were more inclined to represent social movements as oscillatory or circular. Upon special points, for instance in morals, they had a foreshadowing of the idea of progress.[263] They conceived an effort towards improvement. But the scientific idea of social progress in its entirety remained foreign to them. For this idea is only formed by observation and by the analysis of history. Their historical outlook was yet too narrow for such a suggestion.

The idea of progress appears with the philosophy of history taught by Christianity; for, this religion gives a rational explanation of universal history considered as a whole. It proclaims the superiority of the Christian world over the pagan world, and of the new law over the old.[264] But, scarcely has the idea of progress thus come into existence when it becomes clouded over and tends to fade away. Catholicism clearly sees progress in the series of events which caused it to succeed a former state, but it denies the progress which continues from that moment. It considers itself as final. It "limits onward progress to the advent of Christianity." It claims to fix an invariable dogma which contains immutable and absolute truth. This is the very negation of the positive idea of progress. In order to find this idea clearly conceived and scientifically formulated, we must come to Condorcet, and even to the XIX. century, that is to say, to the foundation of social science by Comte. He was especially led to it, he says, by the historical study of the development of the sciences. For, of all the social series, this is the one whose evolution is most advanced. No other suggests so clearly the idea of a "progression" whose terms succeed each other by virtue of a necessary filiation. Pascal already gave a very fine formula of it, in his *Préface du Traité du Vide*. Is it not remarkable that, in his sketch of the positive idea of progress, he should have been led at once to the essential hypothesis of social dynamics, that is to say, to consider the whole succession of generations as a single man, always living, continually learning?[265]

Nevertheless, the idea of progress, so well applied to the evolution of the sciences in the XVII. century, could not then be extended to all social facts. It had met with an insurmountable obstacle in the Middle

Ages. Men considered that period as one of retrogression and barbarism, although, as a matter of fact, it was "characterised by the universal perfecting of human sociability." The idea of progress therefore remained a special one. Thus originated the quarrel of the Ancients and the Moderns[266] whose importance has not been sufficiently understood. The "eminent" Fontenelle and the "judicious" Perrault have very clearly shown in respect to intellectual activity generally considered, what Pascal had already established for science properly so-called.[267]

The XVIII. century was full of the idea of progress. But, failing to follow a positive method, it gave a false direction to this idea. It believed in the indefinite perfectibility of man and of society. Now, this notion does not coincide with that of progress. It is even fundamentally opposed to it. Progress signifies "development subject to fixed conditions, and operating in virtue of necessary laws, which determine its advance and its limitations." It is precisely the ignorance of these conditions and of these laws which gives rise to the idea of indefinite perfectibility. If Helvetius and Condorcet had had a positive knowledge of human nature, they would not have entertained so many illusions and unreasonable hopes. Biology, that is to say, scientific psychology, would have taught them that human nature is invariable in its basis, that the preponderance of the selfish over the altruistic instincts is essential to this nature, and that, if progress favours the development of the altruistic feelings, it cannot, however, overturn the natural equilibrium of our inclinations. In a word, indefinite perfectibility is a metaphysical idea. Imagination plays a greater part in it than observation. The philosophers who conceived it did not realise the relations which bind the intellectual

and the moral life of man to the structure of his organism.

In order that the idea of progress should reach its final form it was necessary, in the first place, that positive psychology should have put an end to the dreams of indefinite perfectibility. It was also necessary that the French Revolution should come to render the course of the history of humanity intelligible. Indeed, according to Comte, a "progression" cannot be understood, so long as we do not know at least three of its terms. Two terms do not suffice to define it. Now, up to the time of the French Revolution, several "progressions" or social series undoubtedly offered the required number of terms to scientific reflection; for instance, the evolution of such and such a science or of such and such an art. But, in sociology, the knowledge of secondary laws is subordinated to that of primary laws, and the advance of such and such a social series can only be understood if the development of society in general is known in its fundamental law. To discover this law then, we must possess at least, three terms of the general "progression." Now, before the French Revolution two terms only were given: the *régime* of the societies of antiquity, and the Christian *régime* (that is to say, the one which attained its highest degree of perfection in the Catholic organisation of the Middle Ages.) The French Revolution came to furnish the third term. It brought the idea of a new *régime*. As Kant had said, in terms which were certainly unknown to Comte, it gave men the idea of a social organisation founded upon principles different from those of the existing societies. Henceforth the idea of progress could apply itself to the whole of the historical development of

humanity. “It is to this salutary disturbance,” says Comte, “that we owe the strength and the audacity to conceive a notion upon which rests the whole of social science, and consequently the whole of positive philosophy, of which this final science alone could constitute the unity.”[268]

This social science remained to be constructed. It will be the special work of Auguste Comte. According to him, the French Revolution only brought an imperfect idea of social progress. It helped to bring about the conception of the idea of a different *régime*, but without actually founding it. The functions of the new philosophy will be to realise the positive idea of social progress. In a word, the revolutionary impulse made this philosophy possible. It has not done away with its utility.[269]

II.

Sociology being an abstract and speculative science in the same way as the other fundamental sciences, progress in it is not understood in a utilitarian or moral sense. From 1826 Comte exerted himself to prevent any equivocation on this point. The insufficiency of language, he says, obliges him to make use of the words “improvement” and “development,” of which the former and even the latter, although clearer, recalls ideas of absolute good and of indefinite amelioration, which Comte has no intention of expressing. These words for him have the simple scientific object of indicating, in social physics, a certain succession of states of the human species, “being effected according to determined laws: a usage exactly analogous to the one which physiologists make of them in the study of

the individual organism, to indicate a succession of transformations with which no idea of continuous amelioration or deterioration is connected."[270] It would be easy to treat of the whole of social physics without once using the word improvement, and always replacing it by the scientific term development. For the question is not to appreciate the respective value of successive states referred to an ideal state, but simply to establish the laws of their succession. "The present is full of the past and big with the future." Liebnitz's formula thus expresses the general idea of progress. Comte only makes it positive by discovering the general laws of this progress, and by showing that they are correlated to the laws of social statics.

As a matter of fact, does the development of humanity lead to improvement or progress, in the moral and practical sense of the word? Social science has not to answer this question. However, Comte thinks that this improvement takes place, and that progress, so understood, can be shown at once in our condition and in our nature.[271] As proofs of this, in the first place, he gives the increase in the population, at least in that portion of humanity which he nearly always considers alone, the white race; then he mentions the law—according to which exercise perfects the organs. This progress is fixed by heredity. Comte thus admits this principle laid down by Lamarck, with this reservation, that evolution never transforms "natural dispositions."

As to our condition, it is improved according to the measure in which we can act upon natural phenomena, and this power in turn depends upon the knowledge we have acquired of the laws of phenomena. "Vision brings prevision and thus

facilitates provision." Progress is here manifested by the extension of our scientific knowledge and by the improvement of the arts founded upon this knowledge. If scientific knowledge, which is necessarily abstract, has to be separated from practice in order to seek for the general laws which regulate phenomena, science, once constituted, makes possible a system of reasoned applications which reaches immeasurably farther than empirical art. Like Descartes, Comte founds the most ambitious hopes upon the positive science of nature.

Now, the most "modifiable" phenomena, those in which our intervention is most efficacious, are the human phenomena, be they individual or collective. On the other hand, our action upon the external world especially depends upon the dispositions of the agent. In every way then we must improve these dispositions. The most important improvement will be that of our internal nature. It will consist in bringing about the greater and greater prevalence of the attributes which distinguish man from the animals, that is to say, intelligence and sociability, correlated faculties, which are at once as a means and as an end to one another. We know, moreover, that there are limits to this progress. The perfect preponderance within ourselves of humanity over animality is a *limit*, nearer to which our efforts must ever bring us, without ever actually reaching it.[272]

Whether it be a question of our condition or of our nature the improvement, in both cases, can only be very slow. It is never easy to substitute to natural order an artificial order resting upon the scientific knowledge of the former. Of those different forms of progress, the first, which Comte calls the material progress, because it is the easiest, is the most

advanced. The great attraction which it has for the men of to-day is thus explained, but the importance given to it is quite exaggerated. If our nature could be brought to a higher degree of perfection it would assuredly be preferable. But it is perhaps necessary that our material conditions of existence should first have been ameliorated?

The improvement in our nature may be physical, intellectual, or moral. The first would consist in an addition to the average duration of human life; it depends upon the progress of biology, and, consequently, of medicine and hygiene. Intellectual (scientific and æsthetic) improvement, would be still more desirable. It "means a greater soaring upwards" than is represented by all physical improvements or *a fortiori* by any material improvements: for the intellect is a "universal tool" whose uses have a universal application. But human happiness depends far more upon moral progress "over which we have, also more command, although it is more difficult." No intellectual improvement could be equal in value to an increase in goodness or in courage. If we were wise our whole endeavour therefore would be in this direction. At any rate we ought always to remember that other forms of progress are desirable simply as means, and moral progress alone as an end.[273]

III.

The theory of progress is the "principle" of social dynamics, itself the essential part of sociology, while sociology lies at the heart of positive philosophy. It was therefore to be expected that the adversaries of this philosophy would especially seek to ruin the theory of progress, which supports everything else.

Indeed the objections have been numerous and pressing. Of these objections Comte had foreseen the two most important, and he had endeavoured to answer them beforehand. According to him, the theory of progress implies neither fatalism nor optimism, nor the quietism which has been represented as a consequence of it.[274]

On the first point, Comte draws our attention to the fact that the necessary consequence of his principle of laws is not the absolute determinism of phenomena, whether it be a question of social or other phenomena. Positive philosophy admits nothing absolute. Determinism, like free-will, is a metaphysical thesis, Comte is not compelled to take sides either with one or the other: he leaves them to mutually refute each other. The positive conception of the moral and intellectual faculties of man, as Gall clearly established, does not imply that human actions might not be otherwise than they are. Similarly, if in general natural phenomena are subject to laws, this does not prevent us from conceiving these phenomena as modifiable by man's intervention. Now, of all natural phenomena, social phenomena are precisely the most modifiable; so much so that for a long time it was possible to ignore that they were governed by laws.

There is then no contradiction in affirming the reality of these laws, and in considering at the same time the intervention of human activity in social phenomena as efficacious. As early as 1824 Comte wrote to his friend Valat: "It would be misunderstanding my thought to conclude from it that I forbid all improvement, since, on the contrary, I formally establish that every government must change in consequence of the progress of civilisation,

and that it is in no way a matter of indifference that these changes should take place by the mere force of circumstances, or by calculated planes based upon observation. I do not deny the power of political measures, I limit it."[275]

It belongs to social science to determine the limits of the useful action of man upon social phenomena. These limits are narrow enough. Man can only modify, from the static point of view, the intensity, and from the dynamic point of view, the speed of social phenomena. Indeed, here as elsewhere, modifications can only be produced in conformity with laws. To suppose the contrary would be to deny the very existence of these laws. Now, the fundamental law of statics is the intimate solidarity and the mutual dependence of all social elements, at all the moments of their common evolution. There is, therefore, no disturbing influence, whatever its origin may be, which can "cause unsympathetic opposing elements to coexist in a given society."[276] Rather would it destroy this society. All that is possible is to modify the respective tendencies which indeed coexist in this society, but without causing the appearance or disappearance of any of them. In the same way, from the dynamic point of view, the order of the successive phases of progress is determined by laws. No external influence (nor in particular that of man), could overturn or disturb this order, or "skip" one of the stages. The evolution could only be made more rapid, that is to say, easier. The statesman, infatuated with his power, will perhaps find this a very humble part to play. But, even within these limits, human intervention could still be of capital importance provided that it were directed by science.

History confirms these views. In it we never see social phenomena modified by man otherwise than in their intensity, or in their speed. Where we best know their evolution, that is to say, in the social series, which includes the history of the sciences, of the arts, of morals and institutions, the verification of this law is constant. For instance, among the scientific men at Alexandria astronomy stopped at a certain point, because the further development of this science was not compatible with the general conditions of society at that time. And if Montesquieu's attempt to subject social facts to laws failed, it is because, before sociology, positive biology had first to be founded. Analogous examples abound, and a contrary case has never presented itself.

Three secondary factors, race, climate, and man's political action especially modify progress, in the measure which has just been indicated. In the present state of science it is impossible to arrange them in the order of their importance. Montesquieu, made too much of climates: others have made too much of races.[277] Those elements of social evolution have not yet been studied by the positive method. Until the foundation of social dynamics their part was, of necessity, wrongly conceived. It was not known that the essential law, the law of the three states, is independent of these secondary factors, whilst on the contrary the secondary factors can only act in conformity with this law, without ever suspending it. In order that the modifications which they produce should become intelligible, it was necessary that the normal type of evolution should first be known. To study the influence of climates and of races before first possessing the general laws of social dynamics, was, almost, to pretend to

establish pathology without having first constituted physiology.

As to man's political action, it too has been wrongly understood. In the absence of a positive conception of social phenomena, some denied the efficacy of this action, others exaggerated it. When it was used in the direction of progress, it almost necessarily appeared to be the principal cause of the results which social evolution would have brought about in any case. The illusion was all the more inevitable from the fact that social forces are always personified in individuals. On the other hand, how often have the most vigorous political efforts only been successful for a day, because the general evolution of society was proceeding in the contrary direction!

So long as the theological and metaphysical period lasts, man does not hesitate to ascribe to himself an almost boundless action upon natural phenomena. Having reached the positive period, he knows that phenomena are only, modifiable within certain limits, determined by their laws, and that he can only aspire to relative results. Once positive sociology is established it wholly transforms the familiar idea of political art. But because it entertains less great and less gratifying ambitions, this art will only be all the more effective. Compare what medicine and surgery are able to do to-day for the good of the sick with what they could do before chemistry and biology became positive sciences!

But, it is said, admitting that man can modify social phenomena, what reason has he to interfere with them, since progress takes place of itself? Why not allow the natural evolution which most certainly

realises it to work itself out?

This objection confuses progress understood as a succession of states which unfold according to a law, with progress understood in the sense of indefinite improvement. On this point again the comparison of society with living organisms is instructive. Do not these develop in conformity with invariable laws? Yet, Comte regards them as extremely imperfect, and in what concerns the human body, the intervention of the doctor or the surgeon is often useful and even indispensable. When we reproach the sociological theory of progress with having optimism as its consequence, we take *the scientific notion of spontaneous order for the systematic justification of any existing order*.[278] There is, however, a very long distance from one to the other. Spontaneous order may often be a very rough form of order.

Here, as everywhere else, positive philosophy substitutes the scientific principle of the conditions of existence to the metaphysical principle of final causes. It admits that spontaneously, according to natural laws, a certain necessary order is established; but it acknowledges that this order offers serious and numerous disadvantages, modifiable, in certain degrees, by man's intervention. The more complex these phenomena, the more are the imperfections multiplied and intensified. The biological phenomena are "inferior" in this respect to those of inorganic nature. By reason of their complication, which is *maxima*, social phenomena must be the most "disorderly" of all. In a word if the idea of a natural law implies that of a certain order, the notion of this order must be completed by the "simultaneous consideration of its inevitable imperfection."

The theory of progress is then incompatible neither with the ascertainment of social evil, nor with the effort to remedy it. The most complex of all organisms, the social organism, is also the one most subject to diseases and to crises. Thus, Comte foresees in a near future great internal struggles in our society, in consequence of our mental and moral anarchy.[279] To-day, only that is systematised which is destined to disappear, and what is not yet systematised, that is to say all that lives, will not be organised without violent conflicts. It is enough here to think of the relations between masters and workmen.

Revolutions occur which nothing can prevent. It is an inevitable evil, and Comte gives a striking psychological reason for it. Our mind is too weak and our life too short for us ever to form a positive idea of a social system other than the one in which we were born and in which we live. It is from this one that, willingly or unwillingly, we draw the elements of our political and social ideas. Even men of a utopian turn of mind do not escape this necessity. Their dreams always reflect, at bottom, either the past, or a contemporary social state. In order that a new political system should appear, and especially for it to find access to men's minds, the destruction of the preceeding system must be already very far advanced. Until then "even the most open minds could not perceive the characteristic nature of the new system hidden from all eyes by the spectacle of the old organisation."[280] Hence, the lengthy processes of decomposition of worn-out *régimes*, the no less lengthy birth of new institutions, and the cruel periods of transition, full of troubles, of wars, and of revolutions.

With this same cause are connected what we may call the phenomena of survival. Institutions, powers, as also doctrines, have a tendency to subsist beyond the function which the general advance of the human mind had assigned to them.[281] Conflicts then take place which it is beyond anybody's power to prevent: happy is he who can make them shorter and less acute! The solution only comes with time when the vanquished ideas fall into "disuse." The combat never ceases except from the lack of combatants.

All this in no way excludes the possibility for man to exercise a beneficent or a detrimental action. To understand is not always to justify. It is true that a comprehensive view of history disposes us to be indulgent, because it brings out the close solidarity of all the social elements of the same period. The responsibilities being shared, and so to speak diffused, appear to be less serious for each individual. Nevertheless this philosophy allows praise and blame for the past, and active intervention in social phenomena for the present.

But this intervention will only produce the desired results if it rests upon social science. The positive polity does not propose to direct the human race towards an arbitrarily selected end. It knows that humanity is moved by its own impulse, "according to a law no less necessary, although more modifiable than that of gravitation."[282] It is only a question for politics to facilitate this advance by throwing light upon it. It is a very difficult thing to undergo the action of a law without understanding it, or to submit to it with a full knowledge of the case. It remains in man's power to soften and to shorten crises, as soon as he grasps their reasons and foresees the issue. He will not pretend to govern the

phenomena, but only to modify their spontaneous development. “This demands that he should know their laws.”[283]

Let us also know how to own that in respect to many of these phenomena, and not the least important of them, we are absolutely powerless. Their conditions escape our grasp. For instance, the duration of human life is far from being as favourable to social evolution as might be conceived.[284] On the contrary, after the extreme imperfection of our organism, the brevity of life is one of the causes of the slowness of social development. How many powerful minds have died before their full maturity had yielded all its fruit! What would not have been expected of their genius if they had been in full possession of their faculties during three or four centuries!

The positive theory of progress therefore entails neither optimism nor quietism. The intervention of man being excluded, the social state, which evolves, according to laws, at each period is just as good and as bad as it can be, “according to the whole of the situation.”[285] More than one pessimist would be satisfied with this formula. It is legitimately drawn from the principle of the conditions of existence. But, truly, from the point of view of this principle, that is to say, from the point of view of positive and relative philosophy, there can be no question either of optimism or of pessimism. Metaphysics alone can offer an absolute judgment upon the whole of the social reality. The positive doctrine, here as elsewhere, only seeks the statical and dynamical laws of phenomena. It is true, that it finds that the social evolution is, as a matter of fact, accompanied by improvement. But this improvement is so slow, so

laborious, interrupted by so many crises, disturbed by so many conflicts, that if humanity aspires to a better condition, it is mainly from her own efforts that she must expect a slightly more rapid progress.

CHAPTER V
THE PHILOSOPHY OF HISTORY

If social dynamics is a science, and if the law of the three states, discovered by Comte, is its fundamental law, this law (and those which proceed from it), must explain the successive phases of humanity, from the first dawn of civilisation, to the present condition of the most advanced nations. They must "introduce unity and continuity into this immense spectacle, where in general we see so much confusion and incoherence."[286] Thus the counterpart of social science is a philosophy of history. In it, social science finds its concrete expression and its verification. In the absence of the prevision of social facts for the future, a prevision which is rendered almost impossible by the extreme complication of these facts, social science at least allows of the "rational co-ordination" of the whole of the past.

In order to establish this philosophy of history, Comte gave himself two postulates. The first is common to him and to all those who endeavoured to set forth the evolution of humanity from its beginnings, especially before the recent progress made by anthropology. Comte "constructs" primitive man and the society in which he lived. The second postulate consists in considering, instead of the history of the whole of humanity, "the most complete and the most characteristic evolution," that is to say, that of the white race; and in this race, only the populations of western Europe.[287] Comte will almost confine himself to the periods dealt with by Bossuet in the *Discours sur l'histoire universelle*, which,

moreover, he greatly esteems. His philosophy of history only embraces Egyptian civilisation, very little known in his time, then Greece and Rome, and finally after the fall of the Roman Empire, the development of some Latin and Germanic peoples in Europe.

We can understand that Bossuet should have so limited universal history as to include in it only a small portion of humanity gathered on the shores of the Mediterranean. He was obliged to do so by the leading idea in his work which makes the appearance of Christianity the culminating point in the human drama. All that precedes it must tend to bring it about, all that comes after it must arise from it. But is Auguste Comte, like Bossuet, justified in leaving out of universal history the great civilisations of the far east, almost the whole of Africa, and the whole of the new world? Since, according to him, there is no chosen people, nor "providential direction," must he not consider the total evolution of humanity? He has no right to isolate a part of it in an arbitrary manner, and to neglect the rest. He has it all the less in that he considers the species in its entirety as an individual, and that this hypothesis of Condorcet has become a principle of social science with him.

But Comte believes his postulate to be as well justified by his definition of sociology, as Bossuet's plan could have been by his theological doctrine. Resembling on this point the other positive sciences, sociology is made of laws not of facts. The pure and simple knowledge of facts is only an end from the point of view of scholarship. Science only seeks for this knowledge in the measure in which it is indispensable for the determination of laws.

Consequently, if the evolution of human society proceeded simultaneously at different points on the globe, as, this evolution takes place, as we suppose, everywhere according to invariable laws, and as climate and race can only modify it within very narrow limits, the sociologist is not bound to study all the societies of the past and of the present. He will only do so in order to make use of the comparative method, in the measure which is judged useful and within the limitations permitted by this method. In the second place, among those historical evolutions, up to the present time independent of one another, to which will he give the preference to seek in it the verification of abstract social dynamics? Evidently to the most complete and the most characteristic: for there he will have least difficulty in disengaging the laws from the extraordinary complexity of facts. Have we not seen that the idea of progress, without which sociology cannot be constituted, has only been definitely formulated since the French Revolution? Comte then thought himself authorised to "limit his historical study to the sole examination of a homogeneous and continuous series, which was nevertheless justly qualified as universal." At every moment in history, the people whose evolution is most advanced represent the whole of humanity since the rest of humanity is destined, sooner or later to pass through the same phase. Hence the idea, which is found equally in Hegel and in Renan, of a "mission" of races and of peoples. A temporary mission which, while it lasts, constitutes their might and their right, but which, too often, they have the misfortune to survive.

I.

The positive philosophy of history takes as its guiding principle the idea of unity. In virtue of a postulate which is an audacious anticipation concerning an uncertain future, the human species, in it, is regarded as an immense social unity. Similarly, in it, the evolution of humanity is regarded as ending in the moral and religious unity of all men. Humanity goes from spontaneous religion where it begins, to demonstrated religion where it becomes finally established. Between the two lies the domain of history. The successive states through which humanity passes in evolving are not homogeneous. The theological and the positive spirit are mingled in them at various degrees. They struggle one against the other. These states then contain within themselves the principle of their own destruction. Each one necessarily prepares the appearance of the following one, until the final state in which the positive spirit alone will predominate.

The spring of these concrete views of history is the logical need of unity. It is this which determined the initial movement. For the primitive religions, unity was never perfect. Even at the period when fetichism rules without question, some rudiments of the positive spirit exist. Human nature, being invariable, the germ of its final state was already contained in a primitive state. From that time it was certain that, if humanity emerged from its primitive state, it would evolve until it found unity in the final religion.

If this be so, how is it that Comte did not regard the succession of religious forms as the supreme dynamic law, as the principle of the philosophy of history? Why did he believe rather that he had found this principle in the law of the evolution of philosophies? It is because, according to him, the

evolution of religious forms is a function of intellectual evolution. It is even subordinate to intellectual evolution, in this sense, that progress in the knowledge of the laws of nature sooner or later brings about a religious revolution. In the second place, if the philosophy of history had chosen the succession of religious forms as its chief axis, it would only have studied the process of decomposition of beliefs, which, up to the present time, has led them from the period when all thought is religious (fetichism), to that when no thought seems to be so any more (philosophical deism). It would not show at the same time the inverse and simultaneous process of the positive spirit, which not only determines this progressive decomposition, but also prepares the elements of a new faith. It would not show how by degrees, by means of science, this spirit establishes a conception of nature which by becoming social will become universal, and which will be the basis of the final religion. This is why Comte, while making religion the chief element in individual and social human life, was nevertheless to take the evolution of the intellect, that is to say, the sciences and the philosophies, as the "guiding thread" of his philosophy of history.

II.

It does not come within the purpose of this work to give even a summary outline of the philosophy of history developed by Comte first in the *Cours de philosophie positive*, and then in the third volume of the *Politique positive*. Neither shall we disengage the ingenious or profound views of detail with which it abounds. It will suffice for us to show how, according to Comte, the laws of social dynamics are always

verified, and how apparent exceptions end by being interpreted in the direction of these laws.

Fetichism, properly so-called, was succeeded by astrology, then by polytheism, which was first conservative (the régime of castes in Egypt), then intellectual (Greece), and social (the Roman empire). With the Christian religion monotheism comes to be substituted to polytheism. But does not the theory of progress soon meet with an insurmountable obstacle? How does it explain the Middle Ages, that long succession of centuries which Voltaire and the philosophers had described as full of darkness, of superstition, and of ignorance, as the disgrace of history? How to reconcile this lamentable "retrogression" with the "continuity" of progress affirmed by social dynamics?

Auguste Comte's answer is presented in two forms.

In the first place the "retrogression" was never complete. At the time when the Middle Ages were at their darkest in Europe, Arab civilisation was going through its most brilliant period. In it many of the sciences were going beyond the extreme point reached by them in antiquity. The continuity of evolution was then not interrupted. It suffices to understand, in conformity with the postulate laid down by Comte at the beginning of social dynamics, that, at this period, the Arabs were the part of humanity whose intellectual evolution was most advanced, and who, consequently, represented the rest.

But, above all, the current opinion concerning the Middle Ages is erroneous. The philosophers of the XVIII. century did not know it. They only saw this period through their prejudices, or rather they did

not deign to look at it. Nevertheless, the whole spiritual movement of modern centuries goes back to those "memorable times, unjustly qualified as dark by metaphysical criticism, of which Protestantism was the first organ."[288]

In the first place—and this is a capital proposition in historical philosophy[289]—the feudal *régime* as a temporal organisation, was the natural result of the situation of the Roman world. In any case it would have been formed, even if the invasions had not taken place. In virtue of the *consensus* which is the fundamental principle of social statics, the other series of phenomena which accompanied the establishment of the feudal *régime* were then also produced as a "natural development," and it is a misunderstanding to see in them an interruption of "progress." The superiority of Antiquity over the Middle Ages, especially in the fine arts, will be raised as an objection. But Comte only recognises this superiority in the plastic arts, and especially in sculpture.[290] According to him, it is explained by certain features in Greek customs which were sure to make the people of antiquity incomparable in the art of expressing the beauty of the human form. For the rest, the æsthetic education of humanity "progressed during the Middle Ages. Architecture produced marvels of which antiquity had no idea. Dante is a unique poet. Modern music has its origin in the old Gregorian. Finally, the art of the Middle Ages presented two characteristics which the art of the aristocratic societies of antiquity did not possess, at least in the same degree. It was spontaneous, that is to say, in full natural harmony with the whole of the surrounding conditions. Consequently, it was popular, it expressed marvellously for the people, the very soul of the people.

If then it be true that “the mainspring of the fine arts is to be found under the sway of polytheism,” none the less has the development of our æsthetic faculties been continuous: and the law of progress has not been reversed. It is true that since antiquity these faculties have not found a combination of such favourable circumstances, such a direct and energetic stimulus; but that proves nothing “against their intrinsic activity, nor against the real merit of their productions.” The æsthetic spirit has become more widespread, more varied, and even more complete than it could ever have been in antiquity.[291] Hence it is that the Renaissance did more harm than good to the fine arts. It inspired an exclusive and servile admiration for the masterpieces of antiquity, which are related to an absolute social system. “In this sense,” says Comte, “the appreciation of the present romantic school only sins in the direction of historical exaggeration; but its recriminations are far from being groundless.”[292]

Similarly, the intellectual activity of the Middle Ages has been very unjustly treated. Certainly, positive philosophy cannot be suspected of partiality in favour of theological dogmas and metaphysical subtleties. But, just as in physics we distinguish the material changes, which are within reach of our senses, and the molecular movements which escape them, so at certain periods the human intellect produces outside itself works which testify to its activity, and at other moments, without being less active its labour remains an internal one. There are periods of secret and silent preparation. Such, for instance, was the first portion of the Middle Ages. Far from the human mind remaining stationary and inactive at that time it did, on the contrary, a very

considerable work: it was creating the modern languages, that is to say, the indispensable instrument for subsequent progress of thought.

We must also be fair to two immense series of labours, (alchemy and astrology), which have contributed so greatly and for so long to the development of human reason. In coming after the astrologers and the alchemists, modern scientific men not only found "science roughly outlined by the perseverance of these bold precursors,"[293] they further received from them the indispensable principle of the invariability of natural laws. Astrology tended to suggest a high view of human wisdom. Alchemy restored the feeling of man's power, which had been lowered by theological beliefs. In speaking of Roger Bacon, Comte goes so far as to say that the greater number of the scientific men of to-day who despise the Middle Ages so much, would be incapable not only of writing but even of reading "the great composition of this admirable monk," on account of the immense variety of views on all orders of phenomena contained in it.[294]

Comte further enlarges with pleasure upon the mutual obligations of feudal tenure, "an admirable combination of the instinct of independence and of the feeling of devotion," upon the appearance of chivalry, upon the raising of the condition of women, upon the enfranchisement of the commons upon the formation of the *tiers état*, etc.[295] Like the romantic school, being preoccupied with the duty of fighting the systematic detractors of the Middle Ages, he goes to the opposite extreme. He no longer sees the famines, the the plagues, the stakes, the interminable wars. He is not content with showing that, in spite of all, the Middle Ages was a period of progress. He

wants it to be a model period, in which we should find the indication, *in all essential aspects*, of the programme which we are to realise to-day.[296]

The secret of Comte's partiality for the Middle Ages is not hard to discover. He never tires of praising the Catholic organisation of this period, the separation of the temporal from the spiritual power,[297] last of all "the miracle of the papal hegemony." Nothing of the kind was known in antiquity. That alone suffices to establish the superiority of the Middle Ages. Positive philosophy will restore this separation of the two powers to-day. It will complete the "admirable sketch" drawn of old by the Catholic Church.

Positivism, says Huxley, is "Catholicism minus Christianity." Comte would not have protested very violently against this definition. Indeed, in the Catholicism of the Middle Ages, he distinguishes between the doctrine and the institutions. The doctrine is on the decline and will disappear. But the institutions were masterpieces of political wisdom, and they have only been ruined by having seemed to be inseparable from this doctrine. They ought to be re-established upon intellectual bases at once broader and more permanent.[298] Positive philosophy furnishes these bases. It will know how to restore the "government of souls," according to the model left by the Catholic Church of the Middle Ages.

It has often been said that the social action of Catholicism was especially due to its moral teaching. Comte reverses this proposition. The moral efficacy of Catholicism principally depended upon the constitution of the Church, and only in an accessory way upon its doctrine.[299] Without the constant

action of an organised spiritual power, a religion, however pure it may be, cannot have much power over the conduct of men. Catholicism had understood this. It had founded a system of common education which was equally received by rich and poor. Morality thus acquired the "ascendency which belongs to it." The feelings were subjected to an admirable discipline, which exerted itself to uproot even the smallest seeds of corruption.[300]

To conclude, "the eternal honour"[301] of Catholicism is to have brought a decisive improvement into the theory of the social organism, by the separation of the two powers. Many causes have contributed to its being misunderstood; the excessive admiration of the modern historians for the city of classical times, the partiality of Protestants for the early Church, and finally the contempt of philosophers for the supposed darkness of the Middle Ages. We judge of it better to-day. Positive philosophy does not confine itself to rehabilitating the Catholic organisation: it takes it up again on its own account. "The more I investigate this immense subject," writes Comte to John Stuart Mill, "the more confirmed I become in the view which I already held twenty years ago, at the time of my work upon the spiritual power, of regarding ourselves, we, systematic positivists, as the real successors of the great men of the Middle Ages, by taking up the social work again at the point to which Catholicism had carried it."[302] Undoubtedly the conditions are not the same to-day, and we must take the differences into account. But as to the extent and the intensity of action, we may say that for each of the social relations on which the Catholic clergy had to pronounce, an analogous attribution exists for the modern spiritual power.[303] In a word, excepting for

the dogma, Comte borrows from the Catholicism of the Middle Ages almost everything, its organisation, its *régime*, its worship, and, if he could, its clergy and its cathedrals. His religion will be a Catholicism raised upon another basis.

III.

The separation between the temporal and spiritual power realised by Catholicism in the Middle Ages marks a decisive progress in the history of humanity. But it was not finally established. The *régime* of which it formed a part was bound to disappear, because of the "mutual antipathy" between the elements included within it. The Catholic organisation of the thirteenth century was first shaken and then destroyed by the advancing ascendancy of the positive spirit, and the resistance of theological dogma. From this "organic" period European society has passed to a "critical" period which has filled centuries, and which positive philosophy alone is able to bring to a close. The whole of modern history, political, religious, scientific, æsthetic, economic, etc., is, at bottom, merely the succession of the necessary stages in this double work; the decomposition of the *régime* of the Middle Ages, and the preparation for the positive period. In a first phase, which occupies the fourteenth and fifteenth centuries, the movement remains a spontaneous one. It ignores the end to which it is tending. In the second, which extends to the end of the eighteenth century, the disorganisation becomes deeper under the influence of an entirely negative philosophy.[304]

The first signs of the decomposition which was

beginning were of an economic order. The phenomena of this order are indeed a factor of the highest importance in the whole of social life. The economic evolution, according to Comte, necessarily precedes the æsthetic and scientific evolution. It is the former, far more than the two latter, which characterises our civilisation in contrast with the societies of antiquity.[305] Through it the organisation of modern societies was to begin. The freeing of the serfs, the foundation of independent urban communes, the transformation of industry which arose from this, are described by Comte almost in the same terms as those used by Augustin Thierry, (who like him had worked by the side of Saint-Simon). It is the ending of an economic organisation, and the heralding of a new *régime*.

When this spontaneous decomposition had reached a certain point, the critical doctrines could appear and push it further. But, to see in these doctrines the original cause of this great movement, is to credit them with an exaggerated influence, and even, strictly speaking, an incomprehensible one. In order that doctrines may arise and prosper they must find favourable ground. The contrary opinion exaggerates "beyond all possibility" the political influence of the intellect, and creates a kind of vicious circle.[306]

The principle of "free examination" was at first, in the XVI century, only a natural result of the new social situation gradually brought about by the two preceding centuries. For this principle corresponds to a state of "non-government" of minds. And this state, in turn, comes from the progressive dissolution of mental discipline. It lasts so long as a spiritual power has not been reconstituted upon new foundations. In a society where spiritual power is normally

exercised, that is to say, where it governs the universality of minds, united by a body of common beliefs, the need of intellectual liberty is not developed in individuals. At any rate it does not challenge unanimously accepted principles. But, when this power is weakened, the principles begin to be discussed. Each one soon claims to be a judge of their value. Everything then depends on the combination of social conditions. We can no more produce than we can stifle this disposition of minds, "outside the conditions which are favourable or unfavourable to it." It is only developed during the periods which are not "organic." "It is through having misunderstood this law of social statics that so many historical errors have been committed, in which the symptom is mistaken for the cause, and the result for the principle."[307]

The first general form of the principle of freedom of examination expressed itself in Protestantism. In it this freedom at first remained confined within the more or less narrow limits of Christian theology. The spirit of criticism at first especially endeavoured, in the very name of Christianity, to ruin the admirable system of the Catholic hierarchy, which was its social realisation. This is the characteristic inconsequence of the metaphysical spirit, which always denies the logical deductions while claiming to maintain the principles, and which, in this particular case, aspired to reform Christianity at the same time that it destroyed the necessary conditions of its existence, that is to say, its organisation.

In the same way, as in the Catholicism of the Middle Ages, Comte chiefly admires "the masterpiece of political wisdom," which knew how to separate the attributes of temporal power from those of

spiritual power; so in Protestantism he especially sees the destructive principle of this masterpiece. He unceasingly reproaches it with having subordinated the spiritual to the temporal power in the whole of Europe. This “chief perturbation” was the origin of all the others. In accordance with the leaders of the traditionalist school, with de Maistre and de Bonald in France, with Haller in Germany, Comte insists upon the close relationship between the Protestant spirit and the revolutionary spirit. Once it has been demanded, the right of examination spreads by a necessity which is at once mental and social and cannot be overcome, to all individuals and all questions. The name of Protestantism should not be restricted to religious reform. It is no less suitable for the whole of the revolutionary philosophy. For this philosophy, from Lutheranism to the Deism of the XVIII. century, “without excluding Atheism which constitutes its extreme phase” is a *protestation*, at first against the principles of the old social order, and then against any organisation, whatever.[308]

The “absolute and indefinite” dogma of free examination sets up each individual judgment as an arbiter upon all social questions. From this dogma gradually emerge absolute liberty in speaking and writing, the political sovereignty of the masses at will creating or destroying institutions, the equality of all men, the isolation of nations: in a word, as Haller has said, “social and political atomism.” These consequences had become inevitable from the day when Protestantism gave the supreme decision in religious questions to every one, without taking into account conditions either of competence, or authority. This first step was a decisive one. If, supposing an impossibility, modern society were replaced in the state in which it was when

Protestantism succeeded in becoming established, the same necessary succession of social and political consequences would again unfold themselves.

After that, it matters little that Protestantism should have fought against the revolutionary spirit, and that it should have disavowed "anarchical" philosophy. It matters little that it should have made repeated efforts to constitute a spiritual authority, and that it should have produced a multitude of sects "of which each pitied the preceding one and abhorred the one which followed it."[309] Whatever it may do, Protestantism remains purely critical, negative and disorganising. Consequently the part it plays can only be transitory. It contains no element which the positive organisation should preserve. It naturally ends in philosophical Deism.

This Deism appears as early as the XVII. century in England, and in Holland with Hobbes, Spinoza and Bayle. The right of examination is henceforth recognised as indefinite in principle, but in fact, it is thought possible to maintain the metaphysical discussion within the more general limits of monotheism.[310] At bottom they continue "to destroy religion in the name of the religious principle." A "rational theology" is constructed; and the natural religion, dear to the XVIII. century, is finally reached.

Now, in Comte's eyes, rational theology is an "incoherent expression,"[311] and natural religion "a monstrous drawing together of terms." As if every religion (with the exception of the positive one), was not necessarily supernatural! The harmony between reason and belief, even when sought for with perfect sincerity, is deadly for faith. For the strength of theological conceptions lies in their spontaneity.

Logical proof, even admitting that it be really demonstrative, never fortifies and can only weaken them. The innumerable proofs of the existence of God which have appeared since the XII. century, not only state the bold doubts of which this existence has been the object: it can also be asserted that they have largely contributed to the propagation of those doubts, "either through the contempt which the weakness of many of these arguments was bound to reflect upon ancient beliefs, or even by consideration of the strongest of these arguments."[312] Popular instinct was not mistaken in calling the metaphysicians who were working at these proofs atheists. Their work was essentially anti-theological. Our century sees it in another light. As the decay of theology still continues, that which formerly was judged by public opinion as impious, may to-day appear to be a pious occupation.

The criticism of religious beliefs has been developed and spread without giving too much offence to temporal power, thanks to the care taken by philosophers in general to reassure it upon the immediate consequences of their labours. Hobbes in the XVII. century, Voltaire in the XVIII. are as conservative from the political point of view as they are revolutionary from the religious point of view. The precaution was a very wise one on their part. But it did not arrest the consequences which arose from their principles. Critical philosophy, urging the dogma of the freedom of examination to the assault of all the principles of the established régime, shook and ruined them one after the other, until the "final explosion" of the French Revolution. This was the conclusion in fact of the long work of decomposition which had been going on during five centuries. The old régime was rotten; the Revolution overturned it,

meaning to clear the ground.

But did it lay down the basis of the régime which was to succeed this one? It did not, replies Comte with Saint-Simon and de Maistre. He admires the energy of the political gifts of the Convention. Nevertheless it was wrong in believing that "critical" principles could take the place and carry out the functions of "organic" principles. So long as the struggle lasted, the critical principles had been all the more effective in that they were credited with an absolute value. Thus the dogma of boundless liberty of conscience had served to destroy the spiritual power of the catholic clergy, the dogma of the sovereignty of the people to upset the temporal government, finally the dogma of natural equality to decompose the system of social classes. But, once the old régime was abolished the error of taking these dogmas as the basis of "reorganisation" was committed.

It was not seen that they were incompatible not only with the régime which they had just destroyed, but *with any social system whatever*. In this way it is moral and political disorder which was upheld as the end of social perfection. For, each of the dogmas of the critical doctrine, when it is taken in an organic sense, "comes exactly to lay down as a principle that in this particular respect society *must not be organised*."[313]

What becomes of government, for instance in this system? "By a direct and total supervision of the most fundamental political notions," government is represented, the necessary enemy of society.[314] The latter must always hold it in a state of suspicion and of supervision, it must more and more restrict its

modes of activity, and finally only leave it functions of general police, without its contributing in any way to the direction of the collective life and social development. In a word, with no action upon ideas, upon beliefs or feelings, the government would only have charge of the protection of interests. But is not this formally denying the very idea of government, which by definition, should on the contrary represent "the spirit of the whole," and the "directing function" of society? Is it not giving up at the same time the great progress realised by the Middle Ages, that is to say a spiritual power independent of the temporal power? Even considering interests alone, this system only maintains order with great difficulty. It is obliged to have recourse to corruption, and it leads to continual increase in public expenditure.

The principles of critical philosophy cannot then be used as a foundation for a new social organisation. The attempt has been made and has been condemned by history. This failure could have been foretold. For, being essentially metaphysical, this philosophy implies a contradiction which necessarily renders it powerless. It tends to preserve the general bases of the old political system, whose chief conditions of existence it has however destroyed.[315] There is a very close relationship between the natural religion of philosophers and the political conceptions of the revolutionists. The latter are still connected by their deepest roots with the old order of beliefs which they have fought against with all their strength. Liberty, equality, the sovereignty of the people, the whole of the "absolute" rights which constitute the basis of the revolutionary doctrine is shielded, in the last place, by a kind of "religious although vague consecration." The French

Revolution was the work of the Deists. Comte has set apart the thinkers of the XVIII century whom he considers as his precursors, that is to say, as the anticipatory representatives of the positive spirit: Fontenelle, Hume, Montesquieu, Diderot, and d'Alembert, Turgot, Condorcet and a few others. He judges the rest of the philosophy of the century more severely. He does not spare the *Encyclopédie*, and in the majority of the philosophical writings of this period he finds little but "a frivolous and feeble sophistic argumentation." Circumstances almost alone have made its success. This philosophy is incomparably inferior to that which the counter-revolution opposed to it. In the logical respect *which finally predominates*, says Comte, the revolutionary criticism cannot to-day resist the system of the "retrograde school." In a regular discussion, the latter would soon have compelled it to admit that it allows the essential principles of the old régime while refusing to accept their most indispensable consequences.[316]

The inmost contradiction from which the revolutionary philosophy suffers will become more and more apparent. A not far distant moment will arrive when the effort to restore the past will include a large number of those who have contributed to its destruction. The partisans of natural religion, and even those of the most advanced Deism will rally to Catholicism as to the real foundation of the social organisation which they defend. The alternative will then be set up between the only two solutions which are logical and organic: either the old régime, with the Catholic organisation, or the new, with the positive organisation. Between these two there is no room for the critical, liberal, metaphysical,

revolutionary system, which, by whatever name it may be called, signifies “no organisation at all.”

IV.

The old régime was bound to perish because in it, the social organisation was connected with a system of beliefs and of dogmas which could not withstand the spirit of investigation. In order that the new régime may escape this cause of death, must it be able without suffering to bear the indefinite exercise of an absolute freedom of examination?——No, replies Comte, there is no system capable of enduring under these conditions. But it suffices that in constituting itself, the new faith, which is the basis of social order, should have undergone the test of free examination as we see it practised in the positive sciences. It suffices that, instead of a revealed faith, we should have a demonstrated faith which will then be immovable, and which will no more have to be called in question.

Comte then admits the preliminary test, but he is opposed to free examination indefinitely renewed. This distinction allows us to reconcile some of his declarations which otherwise would appear contradictory. His language differs according as he speaks of the positive dogma in the process of formation, or of that dogma once it has been formed. When it is in process of formation the dogma is subject to criticism, and if it is not victorious in resisting it it does not become an object of belief. No matter how much we may deplore the ever-dissolving energy of the spirit of analysis and of examination, it remains beneficial none the less, by compelling, for the intellectual and moral

reorganisation, the production of a philosophy capable of sustaining the decisive test of a deep discussion, "freely prolonged until the entire conviction of public reason" has taken place. This is a condition from which nothing henceforth can exempt us.[317] The spiritual reorganisation, says Comte, will be the result of purely intellectual action. It supposes a voluntary and unanimous assent at the end of complete discussion without the intervention of the spiritual powers to hasten the conclusion.

But does it follow that freedom of examination should *remain* indefinitely without limits? Undoubtedly it has been a good thing that men should see in this liberty an indefeasible right which they were all to enjoy. The dissolution of old beliefs in this way was easier and more rapid. The better this "singular phase" in our social development is analysed, the more will the conviction gain ground that without the conquest and use of this unlimited freedom social reorganisation could not have been prepared. But this singular phase was a transitory one. When it has been gone through, when common principles have again become universally accepted, "after sufficient verification," the right of examination will again return within its normal and permanent limits, which consist in discussing the connection of consequences with fundamental and uniformly respected rules, but without again questioning these rules themselves.[318]

The question then reduces itself to knowing when the test may be legitimately considered as at an end. Will the individual approbation of all the members of society be required, and a kind of consecration by universal suffrage? As a matter of fact, such unanimity will perhaps never be realised. In justice it

is not necessary. When we demand it we forget that Politic science is a positive science, the highest and most complicated of all. No one possesses any authority in the sciences if he is not competent. The people has no thought of making its opinion prevail in them; and, in matters of science, all who are not in a condition to understand demonstrations are the people. The convergence of intellects presupposes the voluntary and intentional renunciation on the part of the greater number of their "sovereign right of examination."[319]

In this way the right is taken from no one. The use of it is simply intrusted by those who are incompetent to the competent ones. This intrusting, freely accepted by all, lasts as long as the conditions which made it necessary. No moral order could be compatible with the "wandering liberty of minds at the present time," if it were to persist indefinitely. It is not possible that any man, whether he be competent or not, should every day call into discussion the very bases of society. "Systematic tolerance cannot exist, and has never really existed, except on the subject of opinions which are regarded as indifferent or as doubtful."[320]

Such is the meaning of the celebrated passages on liberty of conscience with which Comte has so often been reproached. He had written it in 1822, and quoted it himself in the fourth volume of the *Cours de philosophie positive*,[321] never suspecting that anything could be said against it. "There is no liberty of conscience in astronomy, in physics, in chemistry, in physiology, in the sense that everyone would deem it absurd not to take on trust the principles established in these sciences by competent men. If it is otherwise in politics, it is because the old

principles have fallen, and, as the new ones are not yet formed, there are, properly speaking, in this interval no established principles." It is then in no way a question of imposing beliefs upon men of which they are not to judge, by a kind of spiritual despotism. Comte merely wishes to extend to politics, *considered as a positive science*, what is admitted in the other sciences by common consent.

V.

Without much trouble, it is easy to see whence originate the essential features of this philosophy of history. In so far as it represents the development of humanity as subject to a law of evolution, which causes it to go through a succession of phases whose order is rationally determined, in a word as *progress*, the leading-idea is due to Comte's "spiritual father," to Condorcet.

For the interpretation of more recent events, and for the judgment passed upon the Middle Ages, Comte draws his inspiration from Joseph de Maistre, from the traditionalist school, and from Saint-Simon. To the latter, among other ideas, Comte owes the distinction between the critical and the organic periods. But, on Comte's own confession, Joseph de Maistre's influence over his mind was especially decisive. Like de Maistre, he thinks that the entirely negative philosophy of the XVIII. century knew very well how to destroy, but showed itself powerless to construct. Like de Maistre again, he is persuaded of the fact that social order requires a spiritual power beside the temporal power, and that the régime of the Middle Ages was a "masterpiece of political wisdom" precisely because at that period the

Catholic Church had brought about the independence of the spiritual power. Finally, like de Maistre, he makes the salvation of humanity in the future depend upon their return to a unity of beliefs.

Comte then equally proceeds from the learned ideologist with whom the philosophical effort of the XVIII. century ends, and from the ardent traditionalist for whom this very century is the abhorred period of error and of moral perversion. He undertakes, not indeed to reconcile them (who can reconcile things which exclude each other?), but to found a more comprehensive doctrine in which he will combine what he has received from the one and the other. As such his own task appears to him, and he does not believe it to be above his power; he feels himself in a position to avoid the mistakes which his predecessors were bound to make. Condorcet had a clear idea of social science; but that did not prevent him from misunderstanding the real onward movement of the human mind, and only to estimate his own century justly at the expense of preceding periods. De Maistre in his turn, no less prejudiced, though in another way, does not understand history any better. To restore society, to re-establish it in the state in which it was in the XIII. century, he goes to absurd lengths. He claims to take no notice of the advance of civilisation, and of the development of the sciences. Condorcet, who brought to light the idea of progress, understood nothing in the Middle Ages. De Maistre, who so clearly saw the excellence of the Middle Ages, denies the glaring fact of progress.

Both are excusable, because they were still too close to the French Revolution to grasp its full meaning. In the heart of the fray they were still

partially blinded. Comte, who sees things from a greater distance, also sees them from a higher standpoint. He especially has at his disposal an instrument which neither Condorcet nor de Maistre possessed: he has completed the positive method, and he applies it to the science of historical phenomena. In a word, he has founded Sociology.

If he did not push social science as far forward as he believed, at any rate he was right in thinking that his originality lay in this attempt. The problem was clearly set: to blend into a new and positive science the social ideas proceeding from the speculation of the XVIII. century with the historical truths brought to light by the adversaries of this philosophy. The solution given by Comte is the very soul of his system. By a twofold and vigorous effort, he created "social physics." On the one hand, he carries to the past the idea of progress which Condorcet could only apply to the future, and this allowed him to institute a positive philosophy of history. At the same time, he projects into the future that spiritual order which de Maistre had only seen in the past, and this furnishes him with the frame for his "social reorganisation".

This philosophy of history, which no longer contains anything metaphysical, is social dynamics; this "reorganisation" of society, by means of a spiritual power, will be the positive polity.

BOOK IV

CHAPTER I
THE PRINCIPLES OF ETHICS

In Comte's system Ethics occupies an intermediate place between theoretical philosophy and politics. Ethics rests upon the philosophy as Politics rests on the principles of Ethics.

Ethics is not an abstract speculative science; it does not therefore belong to the hierarchy of the fundamental sciences. It is true that, at the end of his life, Comte added a seventh to the six sciences of the early list,[322] which precisely was ethics, that is to say the science of the laws which govern the emotions, passions, desires, etc., of man considered as an individual. But here it is more a question of ethical psychology than of ethics understood in the sense usual with philosophers. The latter, in Comte's eyes, never constituted the object of a special science. As a matter of fact, either the laws of moral phenomena are studied, and this research, founded upon the positive knowledge of individual and collective human nature, forms a part of sociology. Or, starting from the knowledge of these laws, we ask ourselves what would be the best use for the power possessed by man of modifying phenomena; in this case it is an art whose rules must be determined. But for these rules to be rationally established, social science itself must be rationally founded. Thus, from the practical

as from the speculative point of view, positive ethics depends upon sociology.

I.

In the XVIII. cent. Comte distinguishes three schools of Ethics: the utilitarian school, especially represented in his view by Helvetius; the Kantian School, which he knows through Cousin; and finally the philosophy of the moral sentiment; that is to say, the Scottish school; by none of the three is he fully satisfied. The Utilitarianism of Helvetius rests upon an inadequate psychology, which distorts human nature by denying against all evidence the existence of altruistic inclinations. He involuntarily tends to "reduce all the social relations to low coalitions of private interests." The ethics of duty, as presented by Cousin, at any rate, organises "a kind of mystification, in which the so-called permanent disposition of each one to direct his conduct according to the abstract idea of duty would end in a small number of clever schemers taking advantage of the human race." These remarks, in Comte's mind address themselves less to the doctrine than to the person of Cousin. Finally the Scottish school was nearer to the truth than the others, since it admitted the existence of the altruistic tendencies beside the selfish ones. But it lacked precision and strength.

These various schools of ethics had a common failing by which they stood condemned as erroneous: they were constituted before the science of human nature had become positive. Thus utilitarian morality is quite deducible from a psychology such as that of Condillac: but this "metaphysical" psychology treated man chiefly as a reasoning and calculating

being, and misunderstood the preponderance of the affective faculties. In the same way, the "german," that is to say Cousin's philosophy, represents the *ego* as being free, of an absolute freedom, and as being subjected to no law whatever: hence a strange and metaphysical system of ethics of duty.

Theological doctrines of ethics hitherto have been very superior to those which have been produced by philosophical speculation. The reason for this is simple. Without any scientific apparatus, religion implies a far more exact psychology than that of philosophers up to the present time. It deals with man "concrete" and real. It was bound not to misunderstand the relative importance of his faculties, and the respective power of his inclinations and his passions. The priest very often has a better knowledge of men than the metaphysician.

Comte especially admires Christian morality or, more precisely, the teaching of this morality as it was given by the Catholic church in the Middle Ages. "All the different branches of this morality have received most important improvements from Catholicism." In saying "Love thy neighbour as thyself," in making charity the supreme virtue, in fighting against selfishness as the source of all vices, Christian morality has taught what above all other things must be engraved upon men's hearts. Positive philosophy will use the same language. "For anyone who has gone deeply into the study of humanity, universal love as Catholicism conceived it is still more important than the intellect itself in the economy of our individual or social existence, because to the gain of each one and of all, love makes use even of the least of our mental faculties, while selfishness disfigures or paralyses even the best

dispositions."[323]

But the greatest merit of Catholicism has been that it considered ethics as "the first of social necessities." Everything is subordinated to it: it is subordinated to nothing. It dominates the entire life of man so as ceaselessly to direct and control all his actions. In ancient society, morals depended upon politics. In Christian society even politics borrows its principles from morals. That was the finest triumph of "Catholic wisdom," which instituted a spiritual power independent of the temporal power.

Unfortunately this pure and lofty morality has linked its destinies with those of Catholicism. Now, Catholicism has been unable to keep pace with the progress of the intellect and of the positive method. At first it gave proof of "admirable liberality." Later it became indifferent, and then hostile, to scientific progress. Finally it showed itself to be "retrograde," when it had to struggle for its own existence. Catholic dogmas underwent a decomposition the necessary stages of which have been already described[324] as it was bound to happen, and as a matter of fact did happen, the morality itself came to be affected by the attacks which were loosening the foundations of dogma. The work of criticism, after having successively ruined all the foundations of the old intellectual system, was subsequently to attack those of ethics. So we see the family, marriage, heredity, "assailed by senseless sects."[325] To be sure, private morality depends upon other conditions than those of unanimous opinions immovably established. Natural feeling speaks in it. Nevertheless it is not beyond the reach of "corrosive discussion," when opinions of this kind are lacking, but public morality

is all the more threatened. Here, without naming them, but clearly pointing them out, Comte attacks the schools of Saint-Simon and Fourier. “While dreaming about reorganisation of society they only developed the most dangerous anarchy.” Saint-Simonism endeavoured to ruin the family which the revolutionary storm, “with a few exceptions,” had respected. Fourierism denies the most general and the commonest principle of individual morality: the subordination of the passion to reason.

Must we then go back, as the retrograde school would have us do, and in order to save morality base it once again upon revealed religion? But the remedy, if it be not worse than the disease, is at least powerless to cure it. How could the religious dogmas be used as a support for morality when they cannot sustain themselves? What, in the future, can we expect from beliefs which have not withstood the progress of reason? Far from being able to furnish a solid basis for morality to-day, religious beliefs tend more and more to become doubly detrimental to it. On the one hand they are opposed to the human mind placing it on a more solid foundation; and, on the other hand, they are not active enough, even among those who believe in them, to exert a marked influence upon conduct. The clearest result of these dogmas is to inspire the greater number of men who are still imbued with them, with an instinctive and insurmountable hatred of those who have shaken them off.

II.

Being founded upon positive science, Comte’s ethics will reproduce its essential characteristics. In

the first place it will be “real,” that is to say it will rest upon observation and not upon imagination. It will consider man as he is and not as he fancies himself to be. It will then rest, not upon the abstract analysis which he may make of his own heart, but upon the proofs given by humanity of its inclinations and of the usual motives for its actions, during the centuries made known to us by history. In a word, through the use of an objective and truly scientific method, it will avoid serious causes for mistakes.

Being positive, this morality will be relative. For the immediate and necessary consequence of the relativity of knowledge is the relativity of morality. Kant, whom Comte himself called “the last of his great precursors,” attempted to preserve an absolute character for ethics: it is because, at bottom, he also preserved metaphysics. The moral law, says Kant, is universally valid for every free and reasonable being. But the only species of beings of this kind which we know, the human species, is developed in time according to the laws of a necessary progress. At every stage in this development it was not possessed of an equal aptitude for understanding a moral law. The most we can say is that, with time, the aptitude becomes greater and greater. Then, the existence of our species depends upon a great number of natural conditions—astronomical, physical, biological, sociological. If these conditions were different, which is not an absurd hypothesis, our morality would be different also. It is then relative at once to our situation and to our organisation.”

The idea of a relative morality is still a source of anxiety to many minds, who take it to be a preliminary step towards the negation of all morality. They think that, either good is absolute or

the distinction between good and evil vanishes; there is no middle course. However, history shows that there is a way out of such deadlocks. Was not a similar dilemma put on the subject of knowledge? Was it not even said: either truth is absolute, or there is not truth at all? The dilemma was a false one. The human mind has become accustomed to relative truths; and an analogous solution will end by being also accepted for ethics. The acknowledgment of its relativity will not be any more fatal for it than it has been for science.

As the distinction between the true and the false subsists, although good is no longer conceived as absolute and immutable, so the distinction between good and evil subsists, although good is no longer conceived as a supreme theological or metaphysical reality, but as a "progress" towards an end indefinitely approached but never reached. The evolution of morality corresponds to that of knowledge. Both go through successive phases, of which each one implies the preceding ones, and preserves while modifying them. There are then "goods" as there are "truths," provisional and temporary. Positive philosophy can thus give a reason for moral ideas, sometimes so poor and even so horrible, upon which humanity formerly lived. It does not judge the ethics of the past as compared with the ideals of to-day. It gives full justice to the theological and philosophical ethics which it replaces, and of which it proclaims itself the legitimate heir.

Finally it claims neither to be moral nor original in morality. Already positive science is "a prolongation of public reason." In its nature it does not differ from simple commonsense, to which it owes its essential

ideas: only in science these ideas assume a more systematic definition, and an abstract character which allows us to make the most thorough use of them. In the same way systematic morality is a prolongation of spontaneous morality.[326] It simply disengages the principles which, as a matter of fact, have directed the moral development of humanity. Does it follow from this that it only has, so to speak, an interest for curiosity, and that moral progress takes place of itself as rapidly and as completely as possible, even if philosophical reflection is not applied to it? But Comte has already replied to this form of inept sophism. What is true of the evolution of humanity in general is true of the moral evolution included in it. This evolution allows of crises, of diseases, of stoppages in development, etc. It is then not at all a matter of indifference that systematic morality should bring out strongly the end towards which man's efforts must tend, according to his nature and to the whole of the conditions in which he is placed. By throwing light upon its advance it helps progress as effectually as it is in man's power to help it.

III.

In its positive form the enunciation of the moral problem is as much as possible to make the sympathetic instincts predominate over the selfish impulses, "sociability over personality."[327]

That human nature admits of sympathetic instincts, or, according to the name given them by Comte, *altruistic* instincts, is not a postulate but a fact. Positive psychology proves it. It is one of the solid portions of Gall's doctrine. To be convinced of

this it is enough to observe men, children, and even animals. Without these instincts, moreover, society would not subsist. Metaphysicians who considered man as a being acting chiefly through reasoning, may have imagined a society founded upon the expressed or tacit consent of the contracting parties. In reality, before all things men obey their inclinations. If they live in society, it is assuredly because their affective faculties lead them to it. Without inborn altruistic tendencies there can be no society and no morality.

But biology has proved that, since organic life preponderates over animal life, the selfish instincts are naturally stronger than the sympathetic ones. How could the latter succeed first in counter-balancing and then in dominating the former? This problem would have no solution if the progressive ascendency of the altruistic instincts, very weak originally, were not favoured by two orders of conditions, the one subjective, the other objective, whose action is unceasingly felt.

The following development of domestic and social affection is, in the first place, the result of the fact that man lives in society, and, consequently, in continual relation with his neighbours and his fellows. For, as we know, habitual exercise favours the development of organs and of functions. Further, the natural inferiority of the altruistic inclinations is compensated for by their aptitude for "indefinite extension." They can grow in all the members of a group at the same time. Far from their being obstacles in each other's way, the stronger altruism in one awakens and encourages nascent altruism in others. On the contrary, forms of selfishness tend to exclude each other. Save in the case of a more or less

durable coalition, their rival claims clash with each other, to the peril of social peace. They are bound to make mutual concessions. They are never altogether repressed; however, social life obliges them to dissimulate and to restrain their most violent outbursts.

Add to this that the benevolent affections find in themselves their own satisfaction, and that this satisfaction is inexhaustible. We tire of acting, said Comte, we even tire of thinking; we never tire of loving. The affections which it is sweetest to experience have also a tendency to occupy a larger and larger place in the heart of man. Moreover the question for them is not to take the place of egoism but to hold it more and more in check. If human nature evolves it is, as we know, without any essential transformation. The preponderance of selfishness in us is connected with organic reasons which are beyond our power and which will never change. To wish to uproot egoism is folly; *qui veut faire l'ange fait la bête*. Whatever efforts we make, we cannot permanently change the relations between our altruistic and egoistic instincts. The latter will always be the strongest. But we can regard this change as an ideal which we shall approach always without ever actually reaching it.[328]

Finally, it is rare that our selfish instincts do not awaken some altruistic feeling as a counter-result. For example, the sexual instinct determines the development of maternal love. The desire to impose one's will generates devotion to the common weal. Once the benevolent affection has arisen it persists and grows, and, after the selfish instinct has ceased to operate, it is sometimes sought after for its own sake. This fact, says Comte, greatly facilitates the

"solution of the great human problem."[329]

This solution would however remain exceedingly uncertain and very precarious if its only guarantee were the whole of the subjective conditions which have just been analysed. For, in order that it may become established and last, this group of conditions itself requires what Comte calls an "objective basis." The moral order within us must be united to the order of the world outside ourselves.

It is true that, including the altruistic ones, our inclinations tend to become spontaneously developed. But it is also true that the external world tends constantly to modify them, through the medium of the impressions which it makes upon us. For the development of these inclinations is necessarily affected by the direction of our conceptions and by the success of our undertakings. Now both are ever becoming more subordinated to external order, since the end of science is to know this order, and that of the useful arts is to modify it. In this way, independently of ourselves, order tends in a twofold manner to regulate our instincts, "either by the excitement resulting from the notions which it procures, or by exercise corresponding to the efforts which it demands."[330] In a word, the laws of the "*milieu*" in which we live act like a regulation upon our inclinations. Although an indirect one, the influence of these laws upon them becomes in the long run irresistible.

And further, in order to be felt, this action does not require that we should have a more or less clear knowledge of it. Even at the time when man knew almost nothing of the laws of nature, his activity was more or less controlled by them. The ends sought

after by man have always depended upon his moral and physical nature: the reason of the failure or the success of his efforts have always been found in the natural laws. Gradually positive knowledge was developed. Man became conscious of the order by which he is himself surrounded, of which he feels himself to be a portion, and in which his intellect collaborates in a measure difficult to determine but yet certain. The external regulator which, whatever our will may be, imposes itself upon our activity is thus revealed to our mind. The last degree to be reached is that it should finally be accepted by our feeling. This is precisely the result obtained by positive philosophy. For it makes us know our individual and social nature. It has shown us that humanity must not be explained by man, but man by humanity. It has explained the growing development of social life and that of altruism, which is at once its condition and its consequence. We now understand that our benevolent affections find themselves "spontaneously in conformity with the natural laws which govern the development of society."[331]

Thus it is the continual pressure of external order which makes our egotistic instincts capable of being trained. They would undoubtedly get the mastery, if our sympathetic inclinations did not find without, in the laws of nature, a constant support which reason ends by understanding.

Moral perfection would be harmony realised among all men, by their mutual goodwill, according to the principle: *Live for others*, and, at the same time, harmony realised in each individual soul, by the subjection of egoism to the altruistic sentiments. But this harmony is not what is produced in the first place. On the contrary, war rages between the social

groups, discord between the members of the same groups, the passions in each individual soul. Sometimes one, sometimes another of our tendencies influences us, according to circumstances whose details vary to infinity. No stable order of subordination is established among our tendencies: human nature, considered by itself, does not contain any principle which could maintain such an order. Left to itself, the human soul would remain in the state called by Spinoza "fluctuation." The moral problem would have no durable solution. Hence the necessity of a "universal brake," to make sure of the development of the altruistic tendencies. This brake is no other than the inevitable and continual pressure of the order of the world upon our conduct, and in the long run, *upon our motives*.

When the human mind wishes to direct its own phenomena, it instinctively seeks, in the general system of intelligible facts which constitutes the world, a group of well combined data, in order to refer its own less stable phenomena to it. We have already seen an example of this kind in the formation of language. Man "consolidates" his thought by coordinating it with a combination of signs which themselves are movements, and, as such, are subject to the general laws of the universe. In ethics we find something analogous. The main artifice in moral perfection, writes Comte, lies in diminishing the inconsistency, indecision and divergency in our purposes, by connecting our moral and practical intellectual habits with external motives. The mutual links between our various tendencies are incapable of securing their stability, until they have found an immovable fulcrum outside themselves. To endure, the harmony of the soul must be realised by itself as founded on reason, that is to say, upon the order of

the world.

IV.

What place must we assign to this positive ethics, in the usual classification of ethical doctrines? It is often considered as a theory of the moral sentiment. And, as a matter of fact, Comte himself characterises his ethics by "the direct preponderance of the social feeling." In its origin also it belongs to this group. Comte makes use of Adam Smith and of Hume, when he affirms the existence of inborn altruistic tendencies within the soul. He indicates these tendencies, in his *Cerebral Table*, under the general name of "sympathy," which comes from the Scottish school. Establish these altruistic feelings, he says, and morality is given, take them away, and morality disappears.

But these philosophers did not push analysis any further. They neglected to inquire how morality is developed in fact, although the altruistic tendencies are less powerful than the others. Comte reproaches the ethics of the Scottish school with its superficial character and its lack of systematic strictness. He praises their psychology which is less incomplete than that of their contemporaries; he is not satisfied with their theory of human activity. If the existence of sympathetic inclinations is a fact, their evolution must none the less be explained. The latter only becomes intelligible through the continued action of the objective order upon the soul of man, an action which becomes all the more decisive as man becomes more conscious of it, by the discovery of the laws of nature.

Thus, in order to give an account of human

morality, Comte adds a rational element to the feeling-elements. Undoubtedly it is not an *a priori* element. But it is that which for Comte is the substitute of the *a priori* in metaphysical doctrines: that is the invariableness of the laws of phenomena, which makes the world intelligible. From the speculative point of view this intelligibility, under the name of "the principle of laws," is the basis of our science. From the practical point of view, the order of the world alone can guarantee the lasting harmony of our inclinations. In this way it becomes the foundation of morality.

In spite of the more than evident differences of all kinds which separate Comte from Malebranche and from Leibnitz, it then appears that in his philosophy as in theirs, the idea of *order* is made use of to pass from the domain of knowledge to that of action. Undoubtedly, with Comte, from theological or metaphysical this idea has become positive. He does not intend to go beyond experience, and affirms nothing which cannot be verified as a fact. But, like the philosophers his predecessors, he is none the less anxious to find the unity of the soul beneath the diversity of its modes of activity, and to show that theoretical reason and practical reason are one and the same. Malebranche solved the problem by appealing to the idea of divine perfection, expressed everywhere by order. Comte explains that the pressure exercised by external order generates order in our mind (which moreover collaborates in it), then, as a consequence, in our feelings and finally in our actions. The stoics had already said something similar on this subject. Briefly, Comte's ethics may be presented as the positive form of the ethics of universal order.

Shall we then say that, being sentimental and rational at once, this morality is not definite in character? Is it merely an eclectic attempt at conciliation?—Eclecticism in a certain sense would not frighten Comte. Positive philosophy flatters itself on being just in regard to its predecessors. It takes pleasure in praising each of them for the portion of truth which it contains. But, in the present case there is no occasion for it to be eclectic. It suffices for it to be relative, and, since it is a question of moral and social things, to appeal to history. Thus we see that the sentimental and the rational principles in no way exclude each other. From the historical point of view, that is to say, if we consider the genesis of morality, the latter finds birth in the sympathetic *feelings* which man, like many other animals, experiences, and which are spontaneously developed in domestic affection and in social life. How is it that subsequently this morality evolves, that friendly relations grow indefinitely in relative importance, in spite of the inborn strength of selfishness, that humanity, in a word, should gradually rise above animality? Without any doubt, that is due to the development of *intelligence*, itself bound up with the efforts which man is obliged to make to adapt himself to the "*milieu*" in which he lives.

Instinctive in its animal origin, morality becomes rational in its human evolution. We can say as much of language, of art, of science, and even of religion. All this was in embryo in the primitive nature of man, since nothing absolutely new ever appears in it. All this only manifested itself under pressure from external order, which, consciously or unconsciously, is always being exercised. Only when we know this order, we can make use of our science to turn the natural forces to our own ends, which in themselves

are rational. It is in this way that systematic morality is substituted to spontaneous morality.

If we were more intelligent, says Comte, it would be equivalent to our being more moral. Understanding better the intimate connection which in a thousand ways, at every moment, binds each one of us to the whole of our fellows, we should more surely observe the precept: “Live for others.” And, if we were more moral, it would be equivalent to our being more intelligent. We would then act precisely as a more open and a deeper intelligence than our own would lead us to act. Now, we cannot become more moral by an immediate modification of our inclinations. Positive psychology has established that we exercise no direct action upon the affective part of our nature. But we can endeavour to become more intelligent: every successful effort that we make to understand the order of nature affords us the means of making fresh attempts.[332] In this indirect manner morality can grow. Finally, it grows still more surely, when the intellect has understood that it does not contain its end within itself, that it must be subordinated to the heart, and that the only happiness compatible with the nature of man is found in devotion and in love.

CHAPTER II
SOCIAL ETHICS

"Live for others": such is the supreme formula of positive ethics. Feeling bears witness to its justice; science discloses its far-reaching importance and its deep consequences. But this formula is not only applied in a general way to the natural society formed by men among themselves, a society in which Comte even includes animals capable of affection and of devotion, whose services deserve our gratitude. The moral law finds a precise application in the definite relations established among men by civic society, that is to say in the rights and in the mutual duties of individuals. If it be true that ethics and politics are distinct from each other, politics is none the less closely subordinated to ethics. The spiritual power does not govern; however it directs those who govern as well as those who are governed. It is this power which gives to all the sum of common beliefs and feelings which enable Society to live. Thus to ethics belongs the task of determining the principles according to which positive politics will regulate the relations between men.

Now, as a matter of fact, these relations are in a very unsettled condition to-day. Public order is unstable, revolutions are frequent, suffering is excessive. Are we to lay the blame upon public institutions? They are rather an effect than a cause. In order to understand the present condition it is necessary to grasp the law of the general evolution of humanity, and in particular that of European Society. It then becomes apparent that the actual

disturbances proceed from the great conflict inaugurated by the French revolution. This conflict is still going on. The old régime has not yet quite disappeared, and the régime which is to take its place is not yet organised. The struggle is prolonged between the theologico-metaphysical spirit and the positive spirit, between revealed belief which is becoming weaker and demonstrated belief which is being formed, and finally between the old economic landmarks and an industrial activity whose laws have not yet been discovered.

The relations between masters and workmen are at the present time "anarchical." The advance of industry, as it grows, oppresses the majority of those whose co-operation in it is indispensable. And the ever more strongly marked division between "brains and hands" is far more due to the political incapacity, the social thoughtlessness, and especially to the blind selfishness of the masters than to the inordinate demands of the workmen.[333] The capitalists have not dreamt of organising a liberal education for the people to defend it against the seductions of the revolutionary propaganda. They seem to fear that the people should receive instruction. As far as they can, they take the place of the ancient chiefs whose social rank they covet. But they do not inherit their generosity. They do not understand that "noblesse oblige." In this way the great masters of industry too often tend to utilise their political influence to the detriment of the public, to appropriate important monopolies and to take the advantage of the power of capital to make the claims of the masters predominate over those of the workers, without any regard for equity, since the right of coalition which is allowed to the former is refused to the latter.

Comte saw the *bourgeoisie* at work during Louis-Philippe's reign, and he passes severe judgment upon it. Its political conceptions, he says, refer not to the aim and exercise of power, but especially to its possession. It regards the revolution as terminated by the establishment of the parliamentary *régime*, whereas this is only an "equivocal halting place." A complete social reorganisation is not less feared by this middle class than by the old upper classes. Although filled with the critical spirit of the XVIII. century, even under a Republican form it would prolong a system of theological hypocrisy, by means of which the respectful submission of the masses is insured, while no strict duty is imposed upon the leaders.[334] This is hard upon the proletariat, whose condition is far from improving. It "establishes dungeons for those who ask for bread."[335] It believes that these millions of men will be able to remain indefinitely "encamped" in modern society without being properly settled in it with definite and respected rights.[336] The capital which it holds in its hands, after having been an instrument of emancipation, has become one of oppression. It is thus that, by a paradox difficult to uphold, the invention of machinery, which *a priori*, one would be led to believe, would soften the condition of the proletariat, has, on the contrary, been a new cause of suffering to them, and has made their lot a doubly hard one.[337]

Here, in brief, we have a formidable indictment against the middle classes, and in particular against the political economy which has nourished them. Comte has in view sometimes the classical economists of the end of the XVIII. century, sometimes their orthodox successors in the XIX. Those of the XVIII. he regards as having collaborated

in the great revolutionary work. They took part in the diffusion of critical doctrines and of negative philosophy. In this capacity they have, no doubt, rendered certain services. They contributed to the decomposition of the old régime. Political economy had succeeded in convincing the governments themselves of their unfitness to direct the commercial and industrial movement.[338]

The affinities between the philosophers and the economists of the XVIII. century are evident enough: is it necessary to recall the spirit of "individualism" of the economists, and their characteristic tendency to restrict the functions of government as much as possible? Despite the efforts of a great number among them, conservatives by temperament or by political tendencies, the logical consequences of their principles were bound to come to light. Thus "the superfluity of all regular moral teaching, the suppression of all official encouragement of science and the fine arts; even the recent attacks against the fundamental institution of property find their origin in economical metaphysics." It was with this doctrine as with the other parts of negative philosophy; after having accomplished its work of destruction, it sought to transform its critical principles into organic ones, without realising that this amounted to repudiating beforehand any positive organisation.

The famous formula, "Laissez faire, laissez passer," is no more a real principle in political economy than liberty itself is one in politics properly so-called. Comte vigorously opposes the dogma of non-intervention. Because in some particular and secondary cases political economy has ascertained "the natural tendencies of societies in the direction of a certain necessary order, it concluded from this that

any special institution is useless." But this order is extremely imperfect. The knowledge of sociological laws will give us the power of improving it, as we already do in the case of medicine and surgery. Merely to admit the degree of order which is spontaneously established in practice is equivalent to "a solemn dismissal in the case of every difficulty which arises." Look at the social crisis brought about by the development of machinery. In reply to the just and urgent claims of the workmen suddenly deprived of their means of livelihood, and unable in a day to find another, our economists can only repeat, "with merciless pedantry," their barren aphorism about absolute industrial liberty. To all complaints they dare to answer that it is a question of time! And this to men who require food to-day! "Such a theory proclaims its own social impotence."[339]

And so neither is political economy a science yet, nor, so far, are economists men of science. Originally being nearly all barristers or men of letters, they were strangers to the idea of scientific observation, to the precise notion of a natural law, and finally to the sense of what constitutes a demonstration. If we make an exception of Adam Smith and of a few others, how could they apply the positive method which they did not know to the most difficult cases of analysis? Destutt de Tracy placed political economy between logic and ethics. And this was not without reason: for it is nearer to metaphysics than to positive science. In it, work preserves its personal character, schools contend with each other, the discussions as to the elementary notions of value, of utility, etc., savour of scholasticism. The very idea of studying economical phenomena separately is not scientific, since the various "social series" are interdependent, and since in sociology more

particular laws depend upon more general laws.[340] There is no scientific study of economical facts unless we first look at them from the sociological point of view. We can no more isolate the laws which regulate the material existence of societies than we can describe man as an essentially calculating being, only actuated by the motive of personal interest.

The same objections naturally hold good against the adversaries of the economists, since, in general, socialists and communists have confined themselves to an analogous conception of their science. However, while criticising them, Comte recognises the fact that they have established some truths. Everything they say is not false. Thus, they justly claim the right for the government to intervene in economical relations. And, if it be absurd to wish to abolish private property, as certain sects demanded, it is very true that property is of a social nature, and that it is necessary to regulate it.[341] To endow it with an absolute character is, says Comte, an "anti-social" theory. No property can be created, nor even transmitted, by its mere possessor without the concurrence of society. Thus always and everywhere the community has intervened in the exercise of the right of property. The tax makes the public a partner in every private fortune.

In discussing the essential problems of property, the communists (whom Comte confuses with the socialists), to-day render an important service. The very dangers called forth by the solution they propose concur in fixing the general attention upon this great subject, "without which the metaphysical empiricism and the aristocratic selfishness of the leading classes would cause it to be set aside or disdained." Merely to state the problem without the

solution with which the communists associate it, would not suffice. Our weak intellect does not fasten upon a question for long, unless a reply to it, be it true or false, which we must accept or reject is forthcoming at the same time. Moreover, are the communist "aberrations" more useless, and at bottom, more dangerous than the current illusion according to which the Revolution is ended by the establishment of the parliamentary *régime*?[342]

But, this being admitted the innovating schools have all fallen into grave mistakes. In general, being devoid of the historic sense, and on the other hand, ignoring the principles of social statics, they do not see that man's action upon social phenomena is only usefully exercised within certain limits. The idea that a revolution can, in a moment, transform the *régime* of property and all the social conditions which depend upon it is destined to disappear, when the "positive mode of thought" shall have extended to the social phenomena in the same way as it has to all others. Then the "extravagant proposals" of the socialists will find no adherents, and the demand for what is recognised as impossible will no longer be made by anyone.[343]

Finally, Comte reproaches communism with its tendency to restrain individuality. This objection, coming from him, is remarkable, for it has very often been made in his own case. As an organiser of despotism, John Stuart Mill has compared him to Ignatius of Loyola. But Comte reminds us that, according to him, the collective organism, or society, differs from the individual organisms, or living beings, by the fact that in it the elements live an independent life. The problem consists in conciliating, as much as possible, this free division

with the convergence of the activities. Neither of the two must be sacrificed to the other. To restrain individualities would tend to destroy the dignity of man by doing away with his responsibility, while the want of independence, and the subjection to a community indifferent to him would make life intolerable. "Such is the immense danger of all utopias which sacrifice real liberty to an anarchical equality, or even to an exaggerated fraternity."[344] On this point, positive philosophy on its own account takes up again the "decisive criticism" of communism made by our economists.

II.

Positive philosophy does not confine itself to refuting the orthodox economists and the socialists by the help of their own arguments. In its turn it takes up all the questions raised by them, and, for their solution, takes its stand upon the results obtained by sociology.

In the first place it states the problem of "social reorganisation" in its most general form. Socialists, in the same way as their adversaries, are only concerned with riches as if they were the only ill-divided and ill-administered social forces. But there are others. The reform of economical conditions depends, in conclusion, upon that of morals. Before all things then we must "reorganise" morals. We must determine the rights and mutual duties of citizens, and inspire everyone with the feeling of his duty and with respect for the rights of others.

The two ideas of right and of duty are not dealt with by Comte in the same manner. He accepts the

idea of duty without subjecting it to a special criticism. Duty is the rule of action prescribed to each one both by feeling and by reason. It is our duty to do what we recognise as most suitable to our individual and social nature. On the contrary, the idea of right "disappears" in the positive state. The word "right" must be removed from political language, in the same way as the word "cause" is from philosophical language. They are two metaphysical notions. Everyone has duties, and towards all. No one has any right properly so-called. "The idea of right is as false as it is immoral, because it presupposes an absolute individuality."[345]

These formulæ called forth strong protests, particularly from M. Renouvier and his disciples. Indeed, in the constitution of civil society, they appear to neglect justice entirely, to establish the relations between men merely upon charity and feeling. However, if we look into it closely, Comte's thought as is often the case, has been forced and warped, by its expression. But the comparison between the ideas of right and of cause suggested by him, satisfactorily throws a light upon his meaning.

Positive science has given up the search after causes, in order to confine itself to establishing the invariable relations between phenomena. But these relations correspond to what was formerly called causal action. They represent what was real in this supposed action. The only difference—but it is important—consists in the fact that the human mind has forsaken the absolute point of view for the relative one, and is henceforth content to establish the connection between phenomena, without imagining "connecting entities" according to Malebranche's strong expression.

The idea of right has gone through an analogous transformation. In the same way as the idea of cause, it was theological for a long time, and then metaphysical. In antiquity it was closely allied to religion. In modern times the rights of peoples, and even the rights of individuals, are conceived according to the ancient standard of the rights of princes and masters. But, having become established by triumphing over the rights of princes, the rights of peoples and individuals ultimately rest, as they did, upon a supernatural and mystical basis. The rights which every citizen claims are the change in small coin of the absolute right formerly possessed by the sovereign who represented the whole nation. Having become metaphysical in the XVIII. century, the idea of absolute, intangible, indefeasible right, which attaches to the human person, has been most useful for the decomposition of the old *régime*. But, once this work has been accomplished, it cannot be made use of in the work of reorganisation any more than the other metaphysical principles. Positive philosophy admits nothing absolute. Everything in society is at once subject to conditions, and places conditions upon all things. Nothing is unconditional; and sociology teaches that we must go not from the individual to society, but from society to the individual.

In consequence, here again we must give up endeavouring to transform a critical principle into an organic one. Undoubtedly rights will remain, as the constant connections between phenomena subsist. But we shall cease to base these rights upon a metaphysical conception of human nature, in the same way as we have ceased to refer the connections between phenomena to metaphysical entities called causes. Instead of making individual duties consist in

the respect of universal rights, we shall conceive inversely the rights of each one as the result of the duties of others towards him. In a word, duty is established before right. This principle is of the highest importance in Comte's eyes. In it he sees an expression and a proof of the predominance of the positive over the metaphysical spirit, and of the subordination of politics to ethics. He likes to say that "the consideration of duty is bound up with the spirit of the whole." On the contrary, the consideration of right, if it be conceived as absolute, leads to a denial of all government and of all social organisation.

The new philosophy will tend more and more to replace "the vague and stormy discussion of rights, by the calm and strict determination of respective duties." Henceforth, the problem raised by the communists assumes a new aspect. That there should be powerful industrial masters is only an evil if they use their power to oppress the men who depend upon them. It is a good thing, on the contrary, if these masters know and fulfil their duties. It is of little consequence to popular interests in whose hands capital is accumulated, so long as the use made of it is beneficial to the social masses.[346] Now this essential condition "depends far more upon moral than upon political measures." The latter can undoubtedly prevent the accumulation of riches in a small number of hands, at the risk of paralysing industrial activity. But these "tyrannical" proceedings would be far less efficacious than the universal reproof inflicted by positive ethics upon a selfish use of the riches possessed. The reproof would be all the more irresistible, because of the fact that the very people who would have to submit to it could not challenge its principle, inculcated in all by

the common moral education." It is thus that in the Middle Ages, excommunication was not less feared by the princes who incurred it than it was by the peoples who witnessed it.

Once common education was established, under the direction of the spiritual power, the tyranny of the capitalist class would be no more to be feared. Rich men would consider themselves as the moral guardians of public capital. It is not here a question of charity. Those who possess will have the "duty" of securing, first, education and then work for all.

These ideas seem perhaps paradoxical and chimerical. But, says Comte, this is because modern society has not yet got its system of morality. Industrial relations which have become immensely developed in it are abandoned to a dangerous empiricism, instead of being systematised according to *moral* laws. War, more or less openly declared, alone regulates the relations between capital and labour. In a normal state of humanity these relations, on the contrary, are "organised." Strength does not generate oppression. Every citizen is a "public functionary," whose well-defined functions determine at once his obligations and his claims (that is to say his rights). Property is a function like any other, and not a privilege. It serves for the formation and administration of capital by means of which each generation prepares the work of the next. Those who hold it must not turn it from its public use to their own individual advantage.[347]

In the same way as the capitalists, the workers are public functionaries, and they perform a no less important service. Independently of their salary, they are deserving social gratitude. Our customs already

admit of this feeling in the case of the liberal professions in which the salary does not dispense with gratitude. This feeling will have to be extended to all work which contributes to the common weal. The service of humanity, says Comte, is a gratuitous one. The salary, whatever it may be, only pays for the material part in every office. It serves to repair the consumption demanded by the organ and the function. As to the essence of service itself it allows of no other reward than the very satisfaction of performing it, and the gratitude which it arouses.[348]

Consequently in a "truly organised" society (note this expression which M. de Bonald often uses), the vulgar distinction between public and private functionaries is destined to disappear. As, in an army, even the private soldier has his own dignity which comes from the close solidarity of the military organisation, and from this fact, that all share the same honour in it; so, when positive education has made evident to all the part played by each one in the social work, professions which are humblest to-day will become ennobled.[349] The industrial *régime* of to-day, which shows us little else than the conflict of rival egoisms, is an anarchical *régime*, or, to put it better, an "absence of *régime*."

Modern society has not yet got its morals. It will form them gradually, in the same way as military society did. Military life, more than any other, is ruled by the predominating selfish inclinations. Nevertheless, as it could only be developed by the spirit of union, this condition alone sufficed for it to determine admirable devotion.[350] Why should it not be the same in industrial life which rests upon the peaceful and constructing instinct? Otherwise, if the present "anarchy" of morals were to last, modern

society would remain below the level of the Middle Ages, which really was organised by its spiritual power. It would even be below the level of military societies. What would be the use of substituting monopoly to conquest, and a despotism based upon the right of the richest to the despotism resting upon the right of the strongest?[351]

Everything then depends upon the common moral education, which itself depends upon the establishment of a spiritual power. The superiority of the positive doctrine lies in the fact that it has restored this power. The innovating schools all wish to secure normal education and regular work for the proletariat. But they want both at once, or work before education. Positivism wishes to organise education *first*.[352]

Naturally, in positive education duties will be presented in their social aspect. Thus the elementary virtues of temperance, of chastity, etc., are recommended by positive morality;—but not from the point of view of their usefulness to the individual. Even if "an exceptionally constituted nature should shield the individual from the consequences of intemperance or debauchery," soberness and continence would be no less strictly required of him as being indispensable for the fulfilment of his social duties.[353] In the same way, the object of domestic morality is not to form "a selfishness shared by several," but to develop the sympathetic affections which, from the family will gradually extend to the social group, and then to humanity. The principle is to get man into the habit of subjecting himself to humanity, even in his smallest actions, and in all his thoughts. Once this point is reached, modern society will spontaneously

become organised and the positive *régime* will of itself be established.

CHAPTER III
THE IDEA OF HUMANITY

In this world there is nothing absolute, everything is relative; Comte wrote this to his friend Valat as early as 1818.[354] But as a matter of fact, there exists a supreme reality to which all others are subordinated, the idea of which is the principle of a rational conception of the world. Comte calls this reality *humanity*. Instead of being the ultimate end of all thought and all action "in itself," it is the ultimate end "for us." But this difference simply signifies that the new philosophy leaves the metaphysical for the positive point of view. With these limitations the idea of humanity "corresponds" to the old idea of the absolute. It takes its place and fulfils its religious part. It is truly, if one dares to say so, a "relative absolute."

In Comte's doctrine, the idea of humanity is presented under several successive aspects, or, to put it better, the development of his system has brought to light, in turns, the various attributes of this "Great Being." In his first career, Comte prefers to consider humanity as an object of science. In his second career, it rather appears to him as an object of adoration and of love. Here we can follow the progress of the mystical and religious feeling which, especially from 1846, filled his thoughts and modified his language, his philosophical doctrine, nevertheless, remaining essentially the same.

I.

We must not, says Comte, define Humanity by man, but on the contrary man by Humanity. In general this formula is understood in a moral and social sense. It is understood as a condemnation of "individualism," and one of the directing principles of the positivist *régime*. This interpretation is not a false one, and consequences of this kind can indeed be drawn from Comte's formula. But they are only consequences. The immediate object of the formula is not to subordinate the individual to the multitude. In the first place it expresses a fact. If we consider a man by himself, positive science only allows us to define him as an animal, in whom as in all others, the end of animal life is to insure organic life. Do we wish to define him by what is essentially human in him, that is to say, by intellect and sociability? One must then pass from the consideration of the individual to that of the species. From the strictly biological point of view M. Bonald's saying must be reversed; we must say that man is an organism served by an intellect. It is only if we leave the biological for the social point of view, if we look upon the human species as a single "immense and eternal" individual (a conception which is justified by the continued development of intelligence and sociability),[355] that we can consider the voluntary and systematic subordination of vegative to animal life as the ideal type towards which civilised humanity is tending. We can then make use of this subordination to refine it. In a word, we are really men only *by our participation of humanity*.

The essential attributes of this "immense and eternal social unity" are solidarity and continuity.[356] These attributes are at once social and moral and it could have no others. The attributes of the theological and metaphysical absolute had reference

to the categories of substance, of cause, of time, of space, etc. It was one, simple, infinite, etc., all often incomprehensible and contradictory expressions of this idea that the supreme principle is "absolute." On the contrary, positive philosophy admits that in the scale of beings, dependence grows with dignity. Humanity, which is the most "complex" and the "noblest" of all beings known to us, is therefore also the most dependent. Its existence will necessarily end with that of the planet which it inhabits. Its unity is one of "collection." It is imperfect and subject to crises of all kinds. Such as it is, however, science and morality show us in it the highest term which our mind can reach, the loftiest ideal which our heart can love, and finally the object most worthy of our devotion.

Human solidarity has been studied by statical sociology. We have seen with what admiration the social *consensus* inspired Comte, a consensus, according to him, even closer and more intimate than the vital *consensus*. Positive education will develop the feeling of solidarity and make it the principle of moral instruction. Every individual in all his ways of thinking and acting, will be imbued with two convictions which imply one another. In the first place he will know that he is only really a man by his participation in humanity, since his intelligence and his morality are essentially social things. He will also know that the life of humanity is in part made up of what he brings to it, and that each of his actions, independently of his will has a social interest and a social counterpart. Once we are thoroughly persuaded that we live in humanity and by humanity, we shall also become convinced that we must live for humanity. Malebranche said that God is the *locus* of intellects: Comte would readily say that

humanity is the *locus* of good wills.

As, in sociology, dynamics is more important than statics, so among the attributes of humanity, continuity is placed above solidarity. Not only are the individuals and the peoples of the same epoch bound by a common solidarity, but the successive generations co-operate in the same work. Each one has its "determined participation" in it: and their combination in time produces "a still nobler and more perfect conception of human unity." This is the conception which Comte admired so much in Condorcet, which he borrowed from him, and which he developed in the positive idea of progress.

Humanity so understood will inspire us with the strongest feelings of gratitude. Do we not owe to her all that is good, precious and human in us? Man will see "co-operators" in the men of all time.[357] Each of us has to reflect only upon his physical, intellectual and moral being to realise what he owes to the whole of his predecessors. The man who would think himself independent of others could not even formulate this error (which in Comte's eyes becomes blasphemy) without contradicting himself; for is not language itself a collective and social work?[358]

History will become the "sacred science" of humanity. To put it more simply, it will be the ever clearer consciousness which humanity will have of itself, through the study of its intellectual and moral activity in the past. Gradually, with the progress of the historical spirit, the idea of an evolution subject to laws, the idea of "order conceived as capable of development," will become substituted to the prejudice which attributes to man boundless power of action upon social facts. It will become apparent

that the part played by each generation in the common work of humanity is necessarily a very small one, as compared with what is transmitted to it by previous generations. To refuse this inheritance would be to refuse to be what we are: it would be an absurd and immoral pretention, and, moreover, entirely fruitless. It is impossible for man to disown humanity without ceasing to exist. He necessarily represents, while he lives, a long past of intellectual and moral efforts. And this is the most essential attribute of human life, although we meet with more or less developed solidarity also among other animal species. But continuity belongs to humanity alone. In a word, according to Comte's fine formula: "Humanity is made up more of the dead than of the living."

However, neither the "yoke" which presses upon the living with all the weight of history and of prehistoric times, nor the *consensus* which makes of humanity a great "collective organism" take from man his liberty of action. The consequence of human solidarity and continuity is not a kind of fatalism. Individuals remain responsible. We must regard them neither as the wheels in a machine, nor as the cells in an organism, nor as the members of an animal colony. Humanity is not a polyp. This comparison, says Comte, "shows a very imperfect philosophical appreciation of our social solidarity, and a great biological ignorance of the kind of existence peculiar to polypi."[359] It likens a voluntary and deliberate association to an involuntary and indissoluble participation. Humanity, as a collective organism, stands out, on the contrary, as distinct by its own characteristics from animal colonies. In these colonies, the individuals are physically bound together and physiologically independent. In

humanity, the individuals are independent physically, and are only bound together in space and in time by their highest functions.

Thus this "immense organism" is especially distinguished from other beings in that it is made up of separable elements, of which each one can feel its own co-operation, can will it, or even withhold it, so long as it remains a direct one.[360] The individual undoubtedly cannot "unhumanise" himself: that is too evident. But he retains a partial independence. As he can collaborate in the collective work by free consent, he is also free to impede it in the measure of his strength. Briefly, although the evolution of the Great Being is subject to laws, every individuality, far from being annulled,[361] plays its part and can have its merit in it. The very knowledge of sociological laws is a rule for human activity and not a tyranny.

II.

In the latter part of his life, Comte drew out precisely the features of what he henceforth called the new Great Being. Although we were not here to undertake to write an account of positive religion, we must nevertheless, in a few words, indicate the form which this supreme idea ended by assuming in Comte's mind.

Firstly, humanity is not conceived simply as the sum of all the individuals or human groups present, past and future. For all men are necessarily born children of humanity; but all do not become her servants. Many remain in the condition of parasites. All those who are not or were not "sufficiently assimilable,"[362] all those who were only a burden to

our species, do not form a part of the Great Being. A selection takes place among men. Some finally enter into humanity never to leave it; others leave it never to return. The selection takes place according to the life they have preferred. Those who have lived in the purely biological sense of the word, that is to say, those in whom the higher faculties have been made to serve the organic function, those whom with brutal energy Comte calls "producteurs de fumier,"[363] will only have been part of humanity in a transitory manner. Death for them, as for their anatomical system, will be an end without further appeal. Those in whom the "sublime inversion" has been accomplished, or at least those who have made an effort to subordinate the organic to the higher functions, those finally who have worked for a pre-eminently human end: to make the intellect predominate over the inclinations, and altruism over egoism; those having lived for humanity will always live in her. human end: to make the intellect predominate over the inclinations, and altruism over egoism; those having lived for humanity will always live in her.

As the conduct of each one can only be finally judged after his death, humanity is essentially made up of the dead and "the admission of the living within her will hardly ever be more than provisional."[364] Each generation, while it lives, furnishes the indispensable physiological substratum for the exercise of the superior human functions. But this privilege which momentarily distinguishes it from the others, soon slips away from it, as it slipped away from the preceding ones, and from the men of which they were composed; they alone who are worthy of it are incorporated into humanity. Moreover, they are only incorporated in it by their

noblest elements. Death causes them to pass through a “purification.”

This theory allows Comte to attain at the same time two results, which he considers equally desirable. In the first place, the religious idea of humanity remains in perfect accordance with the idea given of it by biology and sociology. Humanity conceived as the Great Being, is a kind of hypostasis of the functions by which man tends to become distinguished from the animal. It is the progressive realisation through time, of the intellectual and moral potentialities contained in human nature: it is also its ideal impersonation. In this last sense, it becomes an object of love and adoration. Thus, the positivist religion naturally leads to a “commemoration” of great men, the benefactors of humanity. Here we have one of the ideas which were defined very early in Comte’s mind.

On the other hand, the desire for immortality is very strong in the heart of man. On principle Comte recognised at any rate a provisional value in all that arises spontaneously from human nature. In science he saw a prolongation of “public reason,” in systematic morality a development of spontaneous morality. He was thus led to take into account the almost irresistible tendency which impels man to desire to triumph over death.[365] This tendency, up to the present time, has satisfied itself by means of illusions. But beliefs of this kind have become incompatible with the progress of our mental evolution. Moreover, the social efficacy of hopes and fears concerning the future life has been much exaggerated. As a matter of fact, says Comte (and the science of religions bears him out on this point), the tendency to desire, and consequently to accept the

idea of an ultimate survival, existed for a long time before it was made use of to support religious beliefs or to preserve public order. Here, again, positive philosophy does not deny, does not destroy: it transforms. To the chimerical and vulgar notion of *objective* immortality, it substitutes the notion, which is alone acceptable, of *subjective* immortality. The same doctrine which takes from us the consolations so dear to past generations, gives us an adequate compensation, by allowing each one to hope that he may be united to the Great Being.

"To continue to live in others," is a very real mode of existence.[366] It is the only one which we can hope for after death; but it is also the only one which we ought to desire, if it be true that what most constitutes ourselves in us does not consist in the individual in the biological sense of the word, but truly in intelligence and good will, that is to say, in the social and human element. He who has only lived for himself, who has selfishly sought for life, has lost it: for death takes him away altogether. He who has lived for others, he who has not sought life for himself, has found it: for he survives in others. In the religions of the past, salvation was found in union with God: in the positive religion, salvation is found in union with humanity.

Once incorporated in the Great Being, the individual becomes inseparable from it.[367] Being from that time withdrawn from the influence of all the physical laws, he only remains subjected to the higher laws which regulate directly the evolution of humanity. Being even withdrawn from the influence of the laws of time and space, he can live again at the same time in several organisms. Do we not see that the thought of a poet, of an artist, of a man of

science revives in a great number of living men at the same time on the most distant points of the globe? Subjective immortality, renewed by an uninterrupted sequence of successive resurrections, will last as long as humanity itself. “To live with the dead,” says Comte “constitutes one of our most precious privileges.”[368] But, in the same way, the dead live with us. They live in us, and those who have been most truly men, those who have made humanity by the effort of their intellect and their will, they are within us the best and most lasting part of ourselves. For, when our generation disappears, it is this part of us which will survive. We shall also survive in the measure in which we have contributed to the increase of this inheritance, in the measure in which we shall have deserved well of our contemporaries and our successors. The present life is a trial. The “subjective” life, that is to say, incorporation into humanity, is at once a liberation and a reward for those who have passed victoriously through this trial.[369] We see to what extent the old moral and religious ideal subsists in the positive conception. We are little surprised at this, when we know that, towards the end of his life, Comte made the *Imitation* his daily reading.

It is then towards the idea of humanity as their centre that the scientific, social and religious ideas of Auguste Comte converge. If this convergence be perfect, his work is accomplished. Henceforth mental and moral anarchy is cured; political and religious anarchy is about to disappear. Unity will be everywhere re-established. This is already done in the understanding, since henceforth all our conceptions are homogenous, that is to say positive, since the same method is made use of in all our researches, since finally the whole sum of the

sciences is regulated from the social point of view. Unity is also accomplished in the whole soul, since the intellect, henceforth conscious of its laws and of its essential functions, subjects itself to the heart, to be directed by love. Finally, unity will be brought about in society, since a new spiritual power, possessed of universally admitted principles, will give to all men and women a common education, will teach them all the same morality, and will rally them all within a same religion of love and goodness. The harmony which is realised in the individual soul is the symbol and, as it were, the guarantee of the harmony which will be established in the social body. Undoubtedly, obstacles remain to be overcome. The positive spirit must still struggle to become altogether universal. The old mental *régime* will not disappear without struggles which, Comte foresees, will be both formidable and bloody. But these crises, however acute they may be, cannot prevent the human evolution from taking place in accordance with its law.

CONCLUSION

At the end of the *Cours de philosophie positive* Comte has himself summed up the results which he believed himself to have established. In the first place it is, from the intellectual point of view (which at first takes precedence of all others, although, in the positive state, the mind must be subject to the heart), a "perfect mental coherence which, as yet, has never been able to exist in a like degree," not even in the primitive period when man explained the phenomena of nature by the action of wills. For already, in this period, although imperceptibly, the positive spirit was making itself felt, while, in the positive period, nothing will subsist of the theological and metaphysical mode of thought. From the moral point of view, which comes next, the agreement of minds upon speculative problems, and in particular upon the relations between man and humanity, will allow of a common education, which will bring about ardent moral conviction in all. Powerful "public prejudices" will develop, and with them, such irresistible fulness of conviction, according to Comte, that Humanity will be able to realise what our penal system is incapable of achieving: to prevent instead of punishing, at least in the majority of cases. From the political point of view, the two spiritual and temporal powers will be duly separated, and a lasting organisation will at once insure order and progress. Finally, from the æsthetic point of view, a new art will appear. No longer an aristocratic and learned art like the one

which has been with us since the Renaissance, but an art closely connected with the convictions and the life of all, which will be accessible and familiar to all, as was the case with the art of the Middle Ages. The positive conception of man and of the world, will become an "inexhaustible spring" of poetical beauty.

All these results will be ordered, protected and sanctified by the positive religion, or religion of Humanity, of which Auguste Comte, in his "second career" established the dogma, the worship and the *régime*.

Without entering into the details of this religious construction we see that, like the ethics and the politics, it depends upon the "perfect mental coherence" founded, in the first place, by positive philosophy. In its turn, this perfect mental coherence, reduces itself to the unity of the understanding, whose necessary and sufficient conditions are "homogeneity of doctrine and unity of method." Now, when Comte began to write, this homogeneity and this unity already existed for all the categories of natural phenomena. The moral and social phenomena alone were still an exception. In conclusion everything was reduced to this question: "can moral and social facts be studied in the same way as the other natural phenomena?" If not, we must be resigned to the indefinite duration of the disorder of minds, and consequently of the disorder of customs and institutions. But, if the contrary is true, then the human understanding reaches the unity to which it aspires. Is sociology impossible? then we have no politics and no religion. Is sociology founded? then all the rest is based upon it.

Thus, the creation of social science is the decisive moment in Comte's philosophy. Everything starts from it and comes back to it. As in Platonism, all paths lead to the theory of ideas, so, from all the avenues of positivism we see sociology. Here, as in a common centre, are joined the philosophy of the sciences, the theory of knowledge, the philosophy of history, psychology, ethics, politics and religion. Here, in a word, is realised the unity of system, a unity which, in Comte's eyes, is the best proof of its truth.

If, in sociology, we chiefly consider the end which Comte proposes to attain by its means, it is true that this doctrine is principally a political one, and the very title of Comte's second great work bears this out. But, considered in itself, it is essentially a speculative effort, and the principle of a philosophy in the proper sense of the term. What Kant called a totality of experience is made possible by the creation of social science.

Before Comte, this totality had been attempted many times. But those who attempted it started from this postulate that philosophy is specifically distinct from scientific knowledge proper. Whether philosophy were dogmatic or critical, whether it had bearings upon the essence of things or rather upon the laws of the mind, it none the less presented characteristics of its own, which seemed to separate it from positive science, and even allowed it to dominate over this science, and to "explain" its principles. Comte rejects this postulate. He is going to endeavour to see if, by taking the contrary postulate as his foundation, he will not succeed better than his predecessors.

In order to reject the postulate admitted by philosophers before him, he appeals at the same time to arguments founded on facts and demonstration; but we must notice that, in his doctrine, these two orders of arguments logically reduce themselves to one another. Indeed he says, up to the present time no philosophy which commands acceptance by all minds has been established. Idealisms, materialisms, pantheisms from all sources and in every shape have never done more than ruin the doctrines opposed to them, without becoming finally established themselves. Those systems claimed to give a rational knowledge of that which by nature is beyond the reach of science. They prided themselves upon explaining the essence, the cause, the end and the order of the phenomena of the universe. Thus they could only build up temporary conceptions which were undoubtedly indispensable at the time but which were doomed to die. Metaphysics is never anything but a rationalised theology which is weakened by this very fact, and deprived of what constituted its strength during the period when it was an object of belief.

But in the name of what principle can Comte discern what is and what is not "beyond the reach of science?" In order to justify a distinction of this kind should he not before everything begin by a criticism of the human mind, that is to say by a theory of knowledge similar to that proposed by Kant in his "Criticism of Pure Reason"? M. Renouvier endeavours to show that, through the absence of this preliminary criticism, with which Comte dispensed, his philosophy remains superficial. Mr. Max Muller expressly says that there is no need to take into account a philosophical doctrine which proceeds as if the "Criticism of Pure Reason" had not been written.

On the whole the objection reduces itself to reproaching Comte with not having attempted to do what he considered to be impracticable: namely, not to have determined the intellectual laws by the analysis of the mind reflecting upon itself. But, it is said, by what right does he affirm that this is impossible? Because, like all the others, these laws can only be discovered by means of the observation of facts, and because the only method which is suitable for the discovery of intellectual facts is the sociological method: the nature of these facts being such that, especially from the dynamic point of view, they can only be grasped in the evolution of humanity. The theory of knowledge demanded by M. Renouvier and Mr. Max Muller is not wanted in positive philosophy. It is not seen in this philosophy, because it is not presented in its traditional form. It is there none the less; but, instead of consisting in an analysis *a priori* of thought, as a preliminary to philosophy, it is not separated from the philosophy itself. It is one of the many aspects of sociology.

In the positive doctrine, as in all the others, there are dialectics—dialectics which are no longer abstract and logical, but real and historical. They do not seek to see the laws of the human mind through an effort at reflection in which the mind, beneath the phenomena, apprehends its very essence. They endeavour to discover these laws in the necessary sequence of periods which constitute the progress of the human mind. They, in their turn, study the "universal subject" whose forms, categories and principles have been determined by Kant *a priori*. But this universal subject is no longer reason grasping itself, so to speak, outside and above the conditions of time and of experience: it is the human mind becoming conscious of the laws of its activity

through the study of its own past. Instead of the "absolute ego" of "impersonal reason," or of the "conscience of the understanding," positive philosophy analyses the intellectual history of humanity. It has then neither ignored nor neglected the problem. It has put it in new terms, and has been obliged to deal with it by a new method.

The critic is free to point out the defects of this method and the insufficiency of these terms. But, to reproach positive philosophy with not having dealt with the problem in the usual form in which it is taken by metaphysicians, and, for this reason, to put it aside unexamined, is to commit a kind of "petitio principii." If Comte abstains from attempting an abstract theory of knowledge, he gives philosophical reasons for his refusal to do so. Before condemning him, it is but right to examine them. Had he done what M. Renouvier and Mr. Max Muller reproach him with having omitted, he would have contradicted himself. There would have been no reason for the existence of his system. He claimed to have reformed the very conception of philosophy: can we reproach him with the fact that his conception does not coincide with the view preferred by his adversaries? Briefly that which, according to Comte, characterises positive philosophy, is that it no longer requires for its constitution what in the judgment of M. Renouvier and Mr. Max Muller on the contrary, is indispensable. Are they or is he in the right? The question cannot evidently be solved by the mere affirmation of those interested. The examination of the doctrines themselves is necessary.

II.

The position taken by Comte may be briefly defined in a few words. Seeing that philosophy, such at least as it had been conceived until the XIX. century, could not assume the characteristics of science, he asks himself whether one would not succeed better by endeavouring to give the characteristics of science to philosophy. Like Kant, he might have compared the revolution he was attempting to that accomplished by Copernicus in astronomy, had he not preferred to present it as prepared and gradually brought about by the very "progress" of science and philosophy.

According to his own expression then he endeavours "to transform science into philosophy." But on what conditions will the transformation be effected? If science were to lose in it its characteristics of positiveness, of reality, and of relativity, to assume those of a metaphysical doctrine, this change would be neither desirable nor possible. The transformation will simply consist in giving to science the philosophical character which it does not yet possess, namely universality. While thus acquiring a new property, positive science should lose none of those which it already possesses, and which constitute its value.

Thus, in the "transformation of science into philosophy," what is transformed at bottom is not science which remains itself while becoming general from being special: it is philosophy rather which is transformed. The latter will henceforth undoubtedly be conceived as the highest and most comprehensive form of positive knowledge, but as constituting a part of that knowledge. It has been said that Comte does away with philosophy, by reducing it to being merely the "generalisation of the highest results of

the sciences." This is not a proper interpretation of his thought. Up to the present time the duties performed by the philosophical doctrines have been indispensable. Comte intends that his system shall fulfil them in future. Beside science properly so-called, which is always special, philosophy which represents the "point of view of the whole" must arise. On this condition alone can the government of minds and the "perfect logical coherence" become possible.

Philosophy will then not merely be a "generalisation of the highest results of the sciences." The synthesis of the sciences must be brought about according to a principle to which they will be all related. It must really be a "summing up of experience." But if this philosophy thus coalesces with science it must also be *real* like it, and all real knowledge is necessarily positive and relative. In short, the distinction between science and philosophy implies no specific difference between these two kinds of speculation. On the contrary, there exists between them homogeneity of doctrine and unity of method.

Therein lies the novelty of Comte's system. The question was, without leaving the scientific point of view, to discover a single universal conception of the whole of Reality as we find it in experience. The solution of this problem was found on the day when Comte created social science. For indeed, in the first place, sociology makes the positive method universal by extending it to the highest order of natural phenomena accessible to us. Moreover, once it is established as a special science, *ipso facto* it assumes the character of a universal science, and consequently of a philosophy. Under a certain aspect,

sociology is the sixth and last of the fundamental sciences. Under another aspect it is the only science, since the other sciences may be regarded as great sociological facts, and since the whole of what is given to us is subordinated to the supreme idea of humanity.

Such is the way in which the transformation of science into philosophy takes place. If it dates from the foundation of sociology, it is because, once this last positive science has been created, nothing remains in nature of which we conceive the possibility of obtaining an absolute knowledge. “The relative character of scientific conception is necessarily inseparable from the true notion of natural laws, in the same way as the chimerical tendency to absolute knowledge spontaneously accompanies whatever use we make of the logical fictions or of metaphysical entities.”[370]

Considered as a whole, the object of positive science, according to Comte, necessarily coincides with that of philosophy. For both of them it is the whole of the reality given to us. The human mind cannot exert itself in a vacuum. What it might draw from itself, without the help of experience, (if such a conception be not absurd), is purely fictitious, and has no objective value. If then the human mind remains attached to a metaphysical philosophy, this can only be in so far as the mind still conceives the whole or a part of reality from the absolute point of view, that is to say in so far as it still fails to understand that the laws of phenomena alone are within its reach, and persists in seeking the essence and the first or final cause for some among them. There was a time when the whole of reality was so understood. The conception of the world was then

entirely metaphysical or partly theological. But the human mind has gradually constituted the positive science, first of the more simple and more general phenomena, and then of the more complicated ones. Finally the most complex of all, that is to say, the moral and social phenomena alone remained untouched by the scientific form. Let us suppose that this last order of facts is conquered by the positive method: the metaphysical mode of thought being no longer possessed of real objects, *ipso facto* disappears. At the same time the positive mode of thought becomes universal, and positive philosophy is founded.

In this way two great connected facts which occupy a considerable place in the philosophical history of our century are explained. We understand: 1. that the fate of metaphysics appears to be closely bound up with that of psychology, of ethics of the philosophy of history and of the moral sciences in general, while the connection between physics, for instance and metaphysics seems to be very weak; 2. that the foundation of sociology determines that of positive philosophy. So long as psychology speculates upon the nature of the soul and upon the laws of thought; ethics, upon the final cause of man, the philosophy of history, upon the final cause of humanity; metaphysics remains standing. Indeed it seems better able than positive knowledge to lead the human mind to a conception of the whole of the real. It appears to be all the more appropriate for doing this in that the point of view of the Absolute can be easily made to harmonise with the point of view of the Universal, in the same way as the conception of substance, whatever it may be, leads without any difficulty to the conception of the unity of substance. But, from the day when we no longer

should seek anything but the laws of psychical, moral and social facts, refraining from any hypothesis as to causes and essences, (a method already made use of for all the other categories of phenomena), three results would be obtained at a single blow: metaphysical philosophy would disappear, social science would be created, and positive philosophy would be founded.

According to the essential law of social dynamics, the metaphysical stage is never anything but a transitory one between the theological and the positive stages. The human intellect could not pass immediately from the former to the latter. The metaphysical stage which can assume an endless number of forms and of degrees, insensibly leads it from one to the other. Metaphysical philosophy partakes of the theological in so far as it claims to "explain" the totality of the Real by means of a first principle, and of the positive, in so far as it endeavours to demonstrate its "explanations," and to bring them into accordance with the real knowledge already acquired. It originates in theology and it ends in science. But, however near it may come to positive knowledge, its original theological brand is never effaced. Were they compelled to choose between the theological and the positive doctrines, metaphysicians would certainly adopt the former. The essence of metaphysical philosophy is to tend towards the absolute, whilst positive philosophy only seeks the relative. In favouring the progress of positive science, metaphysical philosophy was working to make itself useless.

To those then who reproach him with not leaving any function proper to philosophy, Comte would answer that, in his doctrine, philosophy is on the

contrary better defined and more fully constituted than in any other. Indeed metaphysical philosophy has never been anything but a compromise, destined to satisfy more or less, the needs of theological explanation and of rational science. But positive philosophy is pure and unalloyed with heterogenous elements. It gives to the whole of experience all the intelligibility which we can hope for, through the discovery of laws, and, in particular, of the encyclopædic laws. By making humanity the supreme end at once of our speculation and of our activity, it furnishes morality and politics with a definite basis, and gives religion an object. In this way, according to Comte, positive philosophy is more truly a philosophy than metaphysics, since it secures the homogeneity of knowledge and the "perfect mental coherence," and it is also more truly religious since, as its final conclusion, it shows that the end of the intellect itself lies in devotion to humanity.

III.

Every new philosophical doctrine is in general guided by a double tendency. At the same time it seeks to establish its originality and to find out its antecedents. In order to reach the former result, it criticises preceding and contemporary doctrines, and shows that, better than any of the others, it succeeds in "summing up experience." But, at the same time, it discovers a pedigree for itself in history which is never very difficult to establish.

Like the others, positive philosophy fulfils this twofold requirement, in such measure, however, as its particular nature and the definition of its object

reasonably allow. Properly speaking, it does not undertake to refute the metaphysical systems which it deems itself destined to replace. Those systems in refuting positive philosophy, are faithful to their principle; and positive philosophy is faithful to its own principle in not following their example. It suffices for it to "locate" them in the general evolution of the human mind, and to show, according to this law of evolution, how the very necessity which brought them into being is also the cause of their disappearance. Their office is fulfilled, their part is ended. It matters little that they should seek to prolong an ebbing existence; cases of survival may slacken the rate of progress, but they are powerless to arrest it. And so positive philosophy is the only one which can be perfectly just towards its adversaries. "It ceases," says Comte, "being critical in regard to the whole of the past." In order to be established, it does not require to combat and to supplant the philosophies which have preceded it. With itself, it places all doctrines in history. It substitutes the historical genesis to abstract dialectics.

Undoubtedly Comte recognises a long series of his precursors properly so-called, in the double line of philosophers and scientific men who have contributed to the progress of the positive spirit from Aristotle and Archimedes to Condorcet and Gall. But positive philosophy, none the less, looks upon itself as heir to all the philosophies, even to those which are most opposed to its principle. For they, like the others, have been necessary moments in the progress which was to end in the positive system.

Thus considered in its relation to the metaphysical speculation which preceded it, this system does not

refute it, for it is neither necessary nor even possible for it to do so. Neither does it incorporate it within itself, for it could not do so without a formal contradiction. Still, according to Comte's own confession, it proceeds from metaphysics as much as from science properly so-called. In what then does this relation consist, if positive philosophy neither opposes nor adopts previous doctrines?—It *transposes* them. What its predecessors had studied from the absolute point of view, it projects upon the relative plane.

As we proceeded we have noted more than one of these *transpositions*. It may perhaps not be useless to make a recapitulation of them here, without, however, claiming for it perfect completeness.

Metaphysical Philosophy.	***Positive Philosophy.***
I. Distinction between potentiality and reality.	I. Distinction between statical and the dynamical points of view, or between order and progress.

II.	II. Principle of finality	Principle of the conditions of existence.
III.	III. Theory of innateness	Definition of human nature as immutable, evolution creating nothing, but bringing out the latent potentialities in that nature.
IV.	IV. The idea of the universe	The idea of the world.

V. All the phenomena of the universe are related to one another.

V. The idea of humanity is the only really universal conception, because the conditions of existence of human societies are in a necessary relation, not only with the laws of our organisation, but also with all the physical and chemical laws of our planet,

		and the mechanical laws of the solar system.
VI.	VI. The Aristotelian theory of science, (knowledge through causes, *a priori*), and Cartesian theory, (deductive knowledge starting from the simple).	Science consists in substituting rational prevision to the empirical establishment of facts.
VII.	VII. The principles of mathematics are synthetical *a priori* propositions (Kant).	Geometry and mechanics are natural sciences, and pure analysis can never establish their principles.

VIII. The order of the universe is the basis of moral order: (Stoics, Spinoza, Leibnitz).	VIII. The conduct of man is regulated externally by the whole of the laws of the world in which he lives.
IX. The history of humanity is directed by a providential wisdom.	IX. The evolution of humanity is accomplished according to a law.

X. The notion of a natural law does not necessarily imply a mechanism.	X. The various orders of natural phenomena are irreducible and nevertheless convergent, this real becoming richer at each new degree.
XI. Theory of the immortality of the soul.	XI. Theory of the "subjective existence," or of survival in the consciousness of others.
XII. Rational theology.	XII. The positive science of Humanity.

This list might easily be prolonged. Once again it shows us that, in the history of philosophy as in

history in general, the result of the most apparently radical revolutions is not so much to abolish as to transform. Thus, Kant's philosophy might seem to be entirely opposed to that of Leibnitz. Yet we see that the metaphysics of Leibnitz is to be found almost in its entirety in Kant. Of this dogmatic philosophy Kant has preserved the doctrine. He only rejected its dogmatism; which, as a matter of fact, was of capital importance. In the same way, positive philosophy has often been presented as the formal negation of the philosophy which preceded it. When we verify this, we nearly always find them both concerned with the same problems, and often reaching analogous solutions. Here again it is only a question of transposition; an extremely serious one it is true, on account of all that it implies.

Errors of interpretation are very often due to a lack of historical perspective. Once they have been formulated and adopted by current opinion they are difficult to rectify. Time is needed in order that beneath superficial differences, deep seated resemblances may appear. During many years Kant was in all sincerity looked upon as a sceptic in France. Those who criticised him could not conceive how any one could give up metaphysical dogmatism, without at the same time abandoning the doctrines which had been cast in the metaphysical form before Kant. In the same way, in the eyes of most of his adversaries, Comte's system must have appeared as the very negation of philosophy, because the terms "philosophy" and "relative" seemed incompatible to them. But this system, which is an effort to realise, from the point of view of positive science, the unity of the understanding, and the "perfect logical coherence," in reality ends by putting the traditional problems of philosophy in a form suitable to the

spirit of our age.

IV.

If the relationship between Comte's philosophy and the doctrines which preceded it is sufficiently evident, it does not follow that this philosophy has brought with it nothing new. On the contrary, the "transposition" of problems and the constant effort to substitute the relative to the absolute point of view, entails serious consequences with very far reaching effects. Some of these were at once apparent, and first served to characterise positive philosophy in the eyes of the public. Others, more remote, but no less important, appeared more slowly.

The negative consequences almost alone attracted attention at first. The chief characteristic of the new philosophy seemed to be the denial of the legitimacy and even of the possibility of metaphysics in all its forms: rational psychology, the philosophical theory of matter and of life, rational theology, etc. It seemed also to deny the possibility of introspective psychology, of ethics in its traditional form, as well as of logic. In a word, one after another, it excluded all the parts of what constituted a "course of philosophy." No wonder, then, if this doctrine which took the name of "positive" appeared to be chiefly negative.

However, in reality, the negation only affected the so-called "rational" or "philosophical sciences." Comte reproached them with what Aristotle calls τὸ κένως ζητεῖν. Stringently applying the principle of the relativity of knowledge, he refused to admit anything absolute. He was therefore perfectly true to himself in rejecting doctrines founded upon

metaphysical principles. But this entirely negative aspect of his philosophy is very far from being the one according to which we can best understand it. Truly speaking, it is only preparatory, and historians have often committed the mistake of allowing people to believe that it is essential. "*We only destroy what we replace*," said Comte.

The question was not to ruin but to transform the psychological, moral and social sciences. As we have seen, positive philosophy does not deny the possibility of a psychology.

On the contrary, it establishes that psychical phenomena, like the others, are subject to laws, and that these laws must be looked for by the positive method. It only rejects the psychology of the ideologists as abstract, and that of Cousin as metaphysical. It claims that, in presence of the phenomena which he is studying, the psychologist should assume the same attitude as the biologist or the physicist, that any search after cause or essence should be carefully avoided, that any metaphysical or ethical after-thought should be set aside. Then a science of physical phenomena will be established; still it will only be able to study the highest mental functions in the "universal subject," in humanity. If we wish to do so, we may continue to call it by its traditional name, although it is to the old psychology only what the chemistry of our day is to alchemy.

A similar transformation gives rise to social science. Here again, the indispensable condition for the scientific knowledge of facts and of laws is a new attitude of mind in presence of these facts. We must set aside what interests us subjectively in them, and consider what is "specifically social" in them, just as

the physiologist studies what is "specifically biological" in the phenomena of the organism. M. Durkheim, as a real heir of Auguste Comte, reasonably maintains that this is a condition *sine qua non* of positive sociology. This only exists as a science if there are facts which are properly social, subject to special laws, besides the more general laws of nature which rule them also, and if these facts, by constant objective characteristics, are sufficiently distinct from the phenomena called psychological.

Positive psychology is now already constituted. Positive sociology is being formed. The science of language, the science of religions, the history of art are also assuming a positive form. The movement which has begun, and of which we only see the beginnings, will probably extend much further than we think. It supposes at least a provisional separation between the scientific interest and the political, moral and religious interests. Being already constituted for a considerable part of our knowledge, this separation for the remainder is still distasteful to the traditional habits of the majority of minds. We are accustomed to speculate upon physical or chemical nature with perfect disinterestedness as to the metaphysical consequences of the results which we may obtain. For we are convinced that the laws of these phenomena do not necessarily imply any consequences of this kind, or that they can be almost indifferently brought into accord with any form of metaphysics we may be pleased to adopt. What do physics, chemistry, natural philosophy *prove*, as to the destiny of man or the supreme cause of the universe? Nothing, and it does not occur to us to be surprised at it. We consider that these sciences are in accordance with their definition if they give us a knowledge of the laws of phenomena, and if this

knowledge enables us within certain limits to exercise a rational and efficacious action upon nature.

Are we in the same position in what concerns psychology and the moral and social sciences? This is doubtful. The very name of "moral sciences" is significant enough on this point. We cannot refrain from thinking that these sciences "prove" something outside themselves. For several of the schools of this century, psychology is still the path that leads to metaphysics. Spirituality and the immortality of the soul seem to have a direct interest in it. In a more or less conscious manner orthodox political economy has found itself "proving" the legitimacy of the modern capitalist *régime*, and has represented it as being in conformity with the immutable laws of nature. The historical materialism of Marx "proves" the necessity of collectivism. History too often serves national interests, or political parties.

Comte's most interesting and fertile leading idea is that the sciences conceived in this way are still in their infancy and do not deserve their name. Those who take them up should, in the first place, convince themselves of the fact that they prove no more in favour of spiritualism or materialism, of protection or of free exchange, than physics or chemistry prove in favour of the unity or the plurality of substances in the universe. In the school of the more advanced sciences men may be taught to distinguish between the objects of positive research and the metaphysical or practical questions. They will see also that the human mind did not begin by making this distinction in the case of inorganic and of living nature. For a long time it could only think of physical phenomena religiously. Without the admirable effort of the Greek

men of science and philosophers, we might yet find ourselves in this period, and positive philosophy might still be awaiting the hour of its birth. To-day this philosophy has come into being. In order to prove finally established, it requires that individual and social human nature should become the object of a science as disinterested as physics and biology have already become. From that day alone will the "Social sciences" be definitely constituted.

It is true that since in a certain way the object of these sciences is ourselves, it seems paradoxical to look upon them in the same way as if it were a question of salts or of crystals. We persist in believing that any knowledge of this order, as soon as it is acquired, admits of immediate applications to our condition or conduct. But this is an illusion. Is not the importance of the "*milieu*" in which we find ourselves, and of the forces which affect us from without for our welfare and even for our preservation which depends upon them at every moment, a simple matter of evidence? Nevertheless, we seek a purely abstract, scientific knowledge of the laws of phenomena, because we know that our effective power upon natural forces is subordinate to science. In the same way we separate physiology from therapeutics and medicine, and we especially await the progress of these from physiology. So in the same way, pædagogy, rational economy, politics, and in general all the social arts in the future will be subordinated to the theoretical science of the individual and social nature of man, when this science has been constituted by means of a purely positive method, and is no longer expected to "prove" anything but its laws.

This may perhaps be the work of centuries. We are

only witnessing its early beginnings. We still have only a vague idea of a polity founded upon science; and we do not yet know what individual and social psychology will yield as a positive science. Comte anticipated results which could not be immediate. This is yet another feature which he has in common with Descartes, to whom we have so often had occasion to compare him. Having conceived a certain mathematical ideal of physical science, Descartes pictured the problems of nature, and especially of living nature, as being infinitely less complex than they are. Our scientific men to-day no longer venture to put to themselves the biological questions whose solution appeared to Descartes to be comparatively easy. In the same way, Auguste Comte, having recognised that moral and social phenomena should be objects of science, just as those of inorganic and living nature, believed this new science to be far more advanced by his own labours than it was in reality.

It is easy to understand his mistake. He was anxious to proceed to the "social reorganisation," in view of which he was constructing his philosophy. Then, given the conception he had formed of social science, he was bound to think that the discovery of the great dynamic law of the three States was sufficient to finally constitute it. In his eyes "the hardest part of the work was done." Sociologists at present believe that almost everything remains to be done. But, here again, we may renew the comparison between Descartes and Comte. In the work of both, without much difficulty, we can distinguish what is done by the scientific man properly so-called and what is done by the philosopher. It is the same with Comte the sociologist as with Descartes the physicist. Their hypotheses have met with the fate common to

scientific labours, of which Comte himself has so well set forth the necessary transitoriness. The other portion of their work, more general in character, is possessed of more enduring qualities. In this sense, and setting aside his political and religious views, which belong to another order, the speculative philosophy of Comte is living still, and pursues its evolution even within the minds of those who are engaged in opposing it.

THE END.

W. Jolly & Sons, Printers, Albany Press, Aberdeen.

FOOTNOTES:

1 Lettres à Valat, p. 156-7 (25 Décembre 1824).

2 Lettres à Valat, p. 99.

3 Lettres à Valat, p. 128.

4 Revue Occidentale, 1881, I, p. 288.

5 Politique positive, II, p. XX.

6 V. book, I, ch. vi. p.

7 Correspondence de J. S. Mill et de Comte, Lettre de Comte du 14 juillet 1845, p. 456-7.

8 Correspondance de Comte and de Stuart Mill, p. 456-7. Lettre de Comte du 14 juillet 1845.

9 cf. infra. book iii. ch. v. p.

10 Cours de philosophie positive, I, 19 (5e edition, Paris, 1892).

11 Cours, VI, 786.

12 Pol. pos. IV, appendice, p. 77.

13 Cours, I. 3.

14 Cours, I. 6.

15 Cours IV, 526.

16 Cours IV, 548.

17 Cours, IV, 554-5.

18 Pol. pos., IV. Appendix, p. 144.

19 Correspondence de H. Comte avec John Stuart Mill. Lettre du 5 avril 1842, p. 51.

20 Cours, V. 573-5.

21 Cours, IV, 523.

22 Cp. infra, book II, chap. V, p.

23 Cours, I, 46-47.

24 Cours, I, 14-15.

25 Cours, I, 82, 12.

26 Herbert Spencer: The Classification of the Sciences. London, 1864, p. 42.

27 Discours sur l'esprit positif (1844) p. 24.

28 Cours, VI. 610.

29 Correspondence de H. Comte and de John Stuart Mill. Lettre du 5 novembre 1842, p. 132.

30 Cp. infra, book I, ch. VI.

31 1 Cours, vi. 651-3.

32 2 Cours, vi. 651-3.

33 Discours sur l'esprit positif, p. 16; Pol.

pos. III, 25.

34 Cours, III, 4.

35 Cours, VI, 647.

36 Cours, I. 108: II. 18, 188-9.

37 Cours, VI. 646 sqq.

38 Cours, II. 18: III, 11-12.

39 Cours, IV, 147.

40 Cours, II, 195-7.

41 Cours, II, 187.

42 Cours, IV, 672-3.

43 Revue générale des Sciences, 30 septembre, 1897.

44 Discours sur l'Esprit positif, p. 15.

45 Cours, 756., VI.

46 Cours, I. 4.

47 Discours sur l'Esprit positif, p. 23.

48 Cours, II. 505.

49 Cours, VI. 648.

50 Cours, VI, 659.

51 Cours, VI, 655.

52 Discours sur l'esprit positif, p. 17.

53 Lettre inedite a M. Papot, 8 mai 1851 (archives de la société positiviste).

54 Cours, VI, 662.

55 Cours, II, 36.

56 Cours, III, 362.

57 Cours, VI, 833.

58 Cours, III, 339, 365.

59 Cours, IV, 452.

60 Cours, IV, 470.

61 Pol. pos. i, 641.

62 Cours, III, 235.

63 Pol. pos. iv, Appendice p. 17.

64 Cours, ii, 26-27.

65 Cours, iii, 366.

66 Dialogues on natural religion, VIII.

67 Système de la nature, II. 187.

68 Cours, III. 363-4.

69 Pol. pos. II. 42.

70 Cours, IV. 274.

71 Pol. pos. Appendice, p. 25.

72 Cours, III. 325.

73 Cours, I, 128-9.

74 Cours, III. 642.

75 Pol. pos. II. 427.

76 Pol. pos. 431.

77 Cours, VI. 690.

78 Pol. pos. I. 588.

79 Pol. pos. II. 30.

80 Cours, XI., 740-46; Pol. pos., I, 494-5.

81 Pol. pos., IV., 173-80.

82 Pol. pos., II. 33.

83 Cours, III. 336-7.

84 Synthèse subjective, p. 85.

85 Cours, VI., 708.

86 Cours, I, 32.

87 Cours, VI, 709.

88 Cours, V, 79.

89 Cours, VI, 731.

90 Cours, VI, 704.

91 Cours, II. 324-5.

92 Lettres à Valat, p. 93 (24 septembre, 1828).

93 Cours, VI. 712-15.

94 Cours, VI. 720 sq.

95 Cours, VI. 74.

96 See above, Introduction, pp.

97 An allusion to a famous passage in Victor Hugo's "Notre Dame de Paris."

98 Cours, III, 210.

99 Cours, VI. 610.

100 Pol. pos., I. 447.

101 Pol. pos., II. 101-2.

102 Cours, I, 101.

103 Cours, I, 121-4.

104 Cours, I, 112

105 Cours, I, 256.

106 Cours, I, 195-7.

107 Cours, I, 286-7.

108 Elements de philosophie, I, p. 132-3.

109 Cours, I, 298. sq.

110 Cours, i, 314-16.

111 Cours, i, 383-4.

112 Cours, i. 322-3.

113 Cours, i. 422. sq.

114 Cours, i, 455-463.

115 Revue générale des sciences pures et appliquées, 30 septembre 1897.

116 Pol. pos. I, 499-507.

117 Cours, VI, 749.

118 Cours, III, 93.

119 Cours, II, 16-17.

120 Cours, II, 14-15.

121 Pol. pos. I. 500.

122 Cours, II, 153.

123 Cours, II, 132-3.

124 Cours, VI, 751.

125 Cours, II, 133.

126 Cours, II, 266-7.

127 Cours, II. 7.

128 Cours, VI, 751.

129 Pol. pos. I, 508.

130 Pol. pos. IV. 212.

131 Pol. pos. I. 508-13.

132 Cours. II. 297.

133 Cours II. 310.

134 Pol. pos. I, 516-18.

135 Cours, II, 313-15; Pol. pos. I, 519.

136 Cours, II, 317.

137 Cours, II, 321.

138 Cours, II, 336 sq.

139 Pol. pos. 520.

140 Pol. Pos., I, 532.

141 Cours, III, 3-4.

142 Cours, III, 186-9.

143 Cours, III, 195.

144 Cours, I. 118: II. 311.

145 Cours III. 11-12.

146 Cours, III. 206.

147 Cours, III. 35.

148 Cours, III. 87-8.

149 Pol. pos. I. 551.

150 Cours, II. 24-26.

151 Cours, II. 331.

152 Cours, III. 75.

153 Pol. pos. I, 561.

154 Cours, VI, 772.

155 Cours, IV, 285-7.

156 Cours, III, 8-239.

157 Cours, III, 490, 510.

158 Cours, III, 224-7.

159 Cours, III, 271-2.

160 Cours, III, 237.

161 Cours, III, 326 sq.

162 Cours, III. 259-65.

163 Cours, III. 284-5.

164 Cours, III. 282-546.

165 Cours, III. 437.

166 Cours, III. 456-7.

167 Cours, III, 452.

168 Cours, III, 444.

169 Cours, III, 441-2.

170 Cours, III, 452-3.

171 Cours, III, 529-31; Pol. pos., I, 594.

172 Cours, III, 553-6.

173 Cours, III, 380-1.

174 Cours, III, 562-3.

175 Pol. Pos., I, 591.

176 Pol. Pos., I, 587.

177 Pol. Pos., I, 587; Cours, III, 419-20.

178 Pol. Pos., I, 589.

179 Cours, VI, 766-68.

180 Correspondance de Comte, et de John Stuart Mill, p. 162 (27 février 1843.) p. 365 (21 oct. 1844).

181 Pol. pos., IV, Appendix, p. 218.

182 Lettres à Valat, p. 89-91.

183 Cours, III. 614-16.

184 Cours, III, 618-19.

185 Cours, III, 601-2; 621-22.

186 Cours, III, 611.

187 Lettres à Valat, p. 134 (8 septembre 1824).

188 Cours, III, 631-2.—Gall, Anatomie and physiologie du système nerveux, Paris 1810, II, 6-7.

189 Cours, III, 626-7.

190 Cours, III, 666-8.

191 Cours, III, 654-5.

192 Cours, III, 15-26.

193 Pol. pos., I, 729.

194 Pol. pos., I, 671-2.

195 Pol. pos., I, 672-3.

196 Pol. pos., I, 731-2.

197 Cours, III, 596-8; Pol. pos. I, 598-9.

198 Pol. pos. I, 727.

199 Pol. pos. II, 383.

200 Pol. pos. I, 712-14.

201 Cours, III, 660.

202 Pol. pos., IV, Appendice, p. 218.

203 Maine de Biran, *œuvres inédites* (éd. Cousin), II, 55-58.

204 Cours, III. 661.

205 Pol. pos., I, 602.

206 Pol. Pos., I. 638-9.

207 Cours, I. 81.

208 Cours, IV, 498-500.

209 Cours, III, 624-5.

210 Pol. pos. II, 229-30.

211 Pol. pos. I, 613-4.

212 Cours, V. 30.

213 Pol. pos. II, 348-9.

214 Cours, V, 100-1.

215 Cours, III, 563.

216 Pol. Pos. II, 248-52.

217 Pol. Pos. I, 722-3.

218 Pol. Pos. II, 226.

219 Pol. Pos. II, 220-1.

220 Pol. Pos. II, 217.

221 Pol. pos. I, 288-9.

222 Pol. pos., II, 250-1.

223 Pol. pos., II, 254-6.

224 Pol. pos., II, 240-1.

225 Pol. pos., II, 260-2.

226 Pol. pos., II, 237.

227 Pol. pos., II, 254-6.

228 Cours, IV, 200.

229 Cours, IV, 191-2.

230 Cours, IV, 193-99; Pol. pos., IV, Appendice, p. 106.

231 Cours, IV, 200-205; Pol. pos. IV, Appendice, p. 109.

232 Cours, IV, 243-4.

233 Lettres à Valat, p. 138-9 (8 septembre, 1824).

234 Cours, IV, 2-3.

235 Cours, IV, 391; VI, 775-6; Pol. pos., IV, Appendice, p. 124-7.

236 Pol. pos., II. 288-9.

237 Cours, IV. 326.

238 Cours, IV. 387.

239 Pol. pos., IV. Appendix, p. 124-7.

240 Cours, IV. 279-80.

241 Cours, IV. 337.

242 Cours, IV, 342-44.

243 Cours. IV. 354-sq.

244 Cours, IV, 360.

245 Cours. IV, 225.

246 Cours, IV., 366 sq; Pol. pos., IV. Appendice, p. 135 sq.

247 Cours, IV, 371-3; Pol. pos., I, 624-6.

248 Pol. pos., III, 47-48.

249 Pol. pos., I, 442.

250 Cours, IV, 430.

251 Cours, IV. 258.

252 Pol. pos., II, 265.

253 Cours, IV, 432-6.

254 Cours, iv, 459. Correspondance de Comte et de John Stuart Mill, p. 219-288.

255 Cours, IV, 450.

256 Cours, IV, 472 sq.

257 Pol. pos., II, 281-3; IV, Appendice, p. 67.

258 Cours, IV, 482-5.

259 Cours, IV, 430.

260 Cours, IV, 299. See also chapter II in Book I.

261 Cours, IV, 290-7.

262 Cours, IV, 182-6.

263 Pol. pos., II, 332-3.

264 Cours, V, 366.

265 Cours, IV, 185-7.

266 This referred in the Author's mind to the famous quarrel in French literature between the admirers of ancient poetry like Boileau, who declared it to be superior to modern poetry, and their opponents like Perrault and Fontenelle, who took the contrary view.

267 Cours, IV, 257-9.

268 Pol. pos., I, 60-3.

269 Cours, IV, 188.

270 Pol. Pos., IV, Appendice, p. 199.

271 Cours, IV, 304-6.

272 Discours sur l'esprit positif, p. 59-60.

273 Pol. Pos., I, 106-8.

274 Pol. Pos., I, 54-56.

275 Lettres à Valat, p. 140 (8 septembre, 1824).

276 Cours, IV, 314-20.

277 Pol. pos. II, 450.

278 Cours, IV, 273.

279 Cours, VI, 825.

280 Cours, IV, 30-1; V, 241-2.

281 Cours, IV, 266.

282 Pol. pos., IV, Appendice, p. 95.

283 Cours, IV, 326.

284 Cours, IV, 510-12.

285 Cours, IV, 310-11.

286 Cours, VI, 457.

287 Cours, V, 4-5.

288 Cours, V, 360-1: VI, 50.

289 Cours, V, 318.

290 Cours, V, 124-7.

291 Cours, VI, 148.

292 Cours, VI, 156-7.

293 Cours, VI, 248.

294 Cours, VI, 194.

295 Cours, V, 325.

296 Pol. pos., II, 121-131.

297 Cours, V, 306 sq.

298 Cours, V, 362.

299 Cours, V, 335.

300 Pol. pos., II.

301 Cours, V, 541-5.

302 Correspondance de Comte et de John Stuart Mill, p. 458 (14, juillet 1845.)

303 Pol. pos., IV, Appendice, p. 193.

304 Cours, V, 413.

305 Cours, VI, 23.

306 Cours, V, 414.

307 Cours, V, 314-16.

308 Cours, V, 431-33; 467-8; 511-13.

309 Cours, V, 531.

310 Cours, V, 435.

311 Cours, VI, 236.

312 Cours, V, 589.

313 Pol. pos., IV, Appendice, p. 180-1.

314 Cours, VI, 36.

315 Cours, IV, 60.

316 Cours, IV, 159.

317 Cours, IV, 75 sq.

318 Cours, IV, 40.

319 Cours, IV, 100.

320 Cours, IV, 46.

321 Cours, IV, 46.

322 Pol. pos., II, 436-7; III, 46-50; IV, 233, Catéchisme positiviste, 57-59, 121-123.

323 Cours, V, 345-6.

324 Cours, IV, 103-8.—See Book III, chapter V.

325 Cours, IV, 104.

326 Pol. pos., I, 9.

327 Pol. pos., I, 92.

328 Catéchisme positiviste, p. 10.

329 Catéchisme positiviste, p. 138.

330 Pol. pos., II. 26-30.

331 Pol. pos., I, 23.

332 Pol. Pos., IV, appendix, p. 18.

333 Cours, VI, 376.

334 Pol. pos. I, 128-9.

335 Cours, V, 357.

336 Pol. pos., II, 410-12.

337 Cours, VI, 268-9.

338 Cours, V, 608; Pol. pos. III, 585.

339 Cours, IV, 218-24.

340 Cours, IV, 212-15.

341 Pol. pos. I, 154.

342 Pol. pos. I, 160-3.

343 Cours, IV, 97-9.

344 Pol. pos. I, 159.

345 Cours, VI, 480; Pol. pos. I, 361-3; II, 87.

346 Cours, VI, 543-6.

347 Pol. pos. 156-64.

348 Pol. pos. II, 409.

349 Cours, VI, 511-15.

350 Pol. pos. II, 16.

351 Pol. pos. IV, Appendice, p. 211.

352 Pol. pos. I, 169.

353 Pol. pos. I, 97-8.

354 Lettres à Valat, p. 54, (15 mai 1818).

355 Cours, III, 232 sq.

356 Cours, IV, 810-11; Pol. pos. I, 363-5.

357 Cours, IV, 365.

358 Pol. pos. I, 221.

359 Cours, IV, 351.

360 Pol. pos., II, 59.

361 Pol. pos., I, 341.

362 Pol. pos., I, 411.

363 Catéchisme positiviste, p. 30-31.

364 Pol. pos., I, 411.

365 Discours sur l'esprit positif, 75-6.

366 Pol. pos., I, 346-7.

367 Pol. pos. II, 60-62.

368 Pol. pos., 262.

369 Pol. pos., IV, 36.

370 Cours, IV, 237.

Transcriber's Notes

Obvious typographical errors have been silently corrected. Variations in hyphenation and accents have been standardised but all other spelling and punctuation, in particular the inconsistent punctuation of the footnotes, remains unchanged.

Opening or closing quotation marks are frequently omitted. Where these are obvious they have been inserted, otherwise they have been left unchanged.

In Book I Chapter VI, part II the quotation "the work of the species gradually developed in the long sequence of centuries." is referenced as a footnote, but no footnote is present.

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