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SCIENCE AND FAITH

OR

MAN AS AN ANIMAL, AND MAN AS A MEMBER OF SOCIETY

WITH A

DISCUSSION OF ANIMAL SOCIETIES

BY

DR. PAUL TOPINARD

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Sometime Professor in the School of Anthropology

TRANSLATED FROM THE AUTHOR'S MANUSCRIPT

BY

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TRANSLATOR'S PREFACE.

In 1895, the editors of *The Monist* extended to a number of prominent European and American thinkers an invitation to discuss, from the points of view of their several specialties, the main problems of the philosophy of science and of the reconciliation of science and faith. The most extensive outcome of this invitation was the present work, by Dr. Paul Topinard, the eminent French anthropologist.

Dr. Topinard's book is essentially a contribution to sociology; but it possesses the additional merit that it has been made by an original inquirer of high rank in a department of science which constitutes the groundwork of sociology, and that consequently its conclusions have sprung from a direct and creative contact with the facts, and not from derivative and secondary theories about those facts. Whatever objections, therefore, some of its special tenets may evoke, its importance as a first-hand investigation, and the weight consequently due to its utterances, cannot be underrated.

But, while written by a specialist, the discussion is not exclusively anthropological and ethnological. The physical, historical, cultural, and psychological factors of social evolution receive the same emphasis of consideration as the biological and sociological proper.

We shall briefly indicate Dr. Topinard's central view.

To begin with, anthropology, supposing it not to concern itself with societies, discovers in man an animal only; man is in his primitive stage perforce subjective, and by a rigorous natural logic egocentric; the law of self-preservation, as determining his conduct, both towards nature and his fellow-animals, is paramount with him. Sociologically considered, therefore, man's animality, man's primitive and inherited egocentrism, is the primal source of all the difficulties that arise in society, the arch-enemy to be combated. And this contradiction, apparent or real, between the individual and

society, between the social evolution as it actually is and the social evolution as we should like it to be, constitutes the problem to be elucidated. How has man been changed from an egocentric to a sociocentric animal? By what ideas? By what forms of reasoned conduct? By what organised impulses? By what forms of evolution, natural and artificial? And finally, what norm does the past furnish us for guidance in the future?

A glance at the Table of Contents will show the reader the manner in which Dr. Topinard has endeavored to solve this problem. Man as an animal, the factors and conditions of evolution, the animal family, animal and human societies, the human family, political and religious evolution, social evolution proper, the high rôle of ideas in progress, the functions of the State and of education in shaping conduct, are successively considered. We would call especial attention to the pages which deal with the evolution and differentiation of the ego, in all its multitudinous forms.* Here lies the key to the situation; and the results of modern biological and psychological research on this subject Dr. Topinard has exploited to the full. The analysis of the ego, so called, furnishes the mechanism of establishing right conduct. Right conduct is originally to be based upon right reasoning, upon an adequate and comprehensive consideration, both from the individual and social point of view, of the determinative facts involved. For the purposes of practice, that reasoning is to be consolidated into fixed and automatic habits; the individual must, so to speak, be de-individualised, or rather, super-individualised; altruism in the form of the maxim of Christ, "Love ye one another," and as a species of differentiated and enlarged egoism, is the basis of his system, habits and social instincts are the means. In a word, a rationally and socio-centrically acquired ego, mechanical in its habits and super-individual in its impulses, is to be substituted for the primordial, self-seeking animal ego. This has been the method by which, in all history, right conduct has been secured; and modern psychology has found the mechanism of this method of education to harmonise with the results of its purely scientific analysis of the human soul.

T. J. McCORMACK.

LA SALLE, ILL., September 25, 1899.

*See the Index, under the heading *Ego*.

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SCIENCE AND FAITH.

CHAPTER I.

Anthropology in its Restricted and in its Broad Sense. Differences and Resemblances Between Man and Animals. Place of Man in the Classification of Mammals. His Descent. Progressive Evolution and its Factors.

In the year 1878, in the course of the first Exposition of Anthropological Sciences at Paris, I exchanged a few words with a celebrated Dominican, Père Didon, on the irreconcilability of science and faith.* In 1893, in a memoir published in *L'Anthropologie*,† I concluded that man as an animal and man as a member of society were contradictory, that society was a compromise between the truths of science and the necessities of practical conduct, and that to establish firmly the foundations of ethics it was necessary to admit as dogmas, or articles of faith, which should be exempt from discussion, certain principles which were implied in all social solidarity, as the principle of justice and the distinction between good and evil, the principle of altruism, and so forth.

These conclusions were distressing to me. I have not ceased since to ponder on them. I have searched

**Revue de France*, Sept. 15, 1878, and *Moniteur universel*, Oct. 31 and Nov. 1, 1878, Paris.

†Paul Topinard, "Quelques conclusions et applications de l'anthropologie," in *L'Anthropologie*, 1893, pp. 657-696.

for some property of living beings possessing a nervous system that would give body and objective reality to these dogmas. I have reread the pages of Herbert Spencer* and of many other philosophers on the subject. I have devoted my best attention to Guyau's *Ethics Without Obligation and Without Sanction.*† I have read the works of Dr. Paul Carus, his *Problème de la conscience du moi*,‡ which has been translated into French for the Library of Contemporary Philosophy,§ the lectures‖ which he delivered at the Congress of Religions during the World's Fair in Chicago, his *Primer of Philosophy*,¶ etc. The doctrine which Dr. Carus upholds in *The Monist* and *The Open Court* is alluring. Will it convert the masses, which it is our aim to lead into the ways of righteousness? Will it prove sufficient as a sanction of the moral obligation? That is the question.

We are among scholars; we are seeking in the same paths; we are in accord as to the object aimed at. Let us then be clear.

The first thing requisite is to bring matters scientifically to a head, to look the enemy squarely and fearlessly in the face, and to let the truth stand forth in its full entirety and nakedness. It is necessary, therefore, to recall what we know about man and societies—that is, to ascertain what is the upshot of

*_System of Synthetic Philosophy_. American edition published by D. Appleton & Company, New York City.

†_Morale sans obligation ni sanction_. Félix Alcan, Paris, 108 Boulevard Saint-Germain.

‡A French revision and digest of _The Soul of Man_ (Chicago: The Open Court Publishing Company).

§_Bibliothèque de philosophie contemporaine_. Published by Félix Alcan, Paris, 108 Boulevard Saint-Germain.

‖The titles are as follows: (1) _The Philosophy of the Tool_. (2) _Our Need of Philosophy_. (3) _Science a Religious Revelation_. Chicago: The Open Court Publishing Company.

¶Chicago: The Open Court Publishing Company. London: Kegan Paul, Trench, Trübner & Company.

the final data of my specialty, the science of anthropology. The field is vast—too vast to be traversed, even hurriedly, in its whole extent. But there are parts of more importance than others, and of these I shall try to give as brief a recapitulation as possible. We shall begin with man considered as an animal, then take up the animal itself as a link leading up to man considered as a member of society, and finally discuss the application of the results to Social Science and its aims, generally.

Anthropology, in its broad sense, comprises everything that relates to man, and is divided into anthropology in its restricted sense, or anthropology proper, and into ethnical anthropology. The former studies man as an animal; first the individual, then the principal varieties, called races,* and lastly the species in its relation to other species—all three in the double point of view of morphology and biology. The second studies men as associated together in peoples, tribes, civilizations, and societies, and that in all points of view, as to distribution into different epochs, history and pre-history, modes of life, habitat, alimentation, industry, manners and customs, languages, religions, arts and letters, institutions and ideas, morality, etc., and their evolution from the past to the present; it is divided into ethnology† and sociology.

I have long admitted a third division of anthropol-

*Races are permanent varieties of the species, I say. They should not be confounded with peoples or with languages. Races belong to the province of the anthropological naturalist, and can be extricated from the peoples among which they are mingled only by the special knowledge and methods of the naturalist. The word should never be used in ethnical anthropology.

†I should not have employed this word if I were writing for France, because it was wrested from its legitimate meaning sixty years ago by W. Edwards. He took it as synonymous with the natural history of races, whilst it designates the general history of nations.

ogy for moral or psychical man. Reason being the highest attribute of man, it seemed to me expedient to assign to man a place apart, were it only for the purpose of applying here certain methods not employed in the other two divisions. But the elements of which this third division is composed require to be examined alternately in man as an animal and in man as a member of society. In this phase of my scientific ontogeny I said that anthropology had three objects of study—animal man, mental man and social man. To-day I see drawbacks to this division, and reduce the objects of anthropological study to two only—animal man and social man.

Anthropology, in the restricted sense, is the anthropology of Blumenbach and of the French school. It belongs to the department of the naturalist, or of the physician with the training of a naturalist. It thus embraces all that the natural history of an animal involves, and is distinguished by no special feature except the very extensive scope of certain of its chapters. The knowledge which it necessitates is derived from three sources: (1) The knowledge which the naturalist acquires concerning all organized beings, particularly animals, but notably Vertebrates, Mammals and Primates, and which he applies as his taste dictates to this or to that animal; (2) the knowledge which the physician acquires,—anatomy, physiology, pathology, embryogeny, teratology, mesology, etc.; (3) the knowledge which the anthropologist reserves for his own proper domain, and which relates to the two following grand subjects about which all his researches turn:

A. Human races in the present and past, their origin, relationship and history.

B. The human species, its various characters, its place in the zoölogical classifications, its genealogy.

We shall pass over the races and speak only of the species. To be sure, classifications are only "artificial expedients," to use an expression of Lamarck, or "subjective conceptions to which no absolute demarcation corresponds in nature," to use the words of Herbert Spencer. Nevertheless, they express and sum up the state of our knowledge, and that is precisely what we want. Classifications, not systematic but natural, give a succinct tableau of the common characters or resemblances that animals present, whether of the primary, secondary, tertiary, or other order, corresponding to groups more or less circumscribed, called divisions, classes, orders, families, genera, etc.—and of the particular characters or differences which distinguish each of the included divisions of these groups. To give a place to man in the classification means to strike the balance of his differences and resemblances to the various species of animals, to decide upon the distance which separates his type from the nearest types of his special group, and lastly to assign to him his hierarchical position in the animal scale. This is what we shall now attempt to do.

First of all, man is a Vertebrate, because, like all animals comprised in this division, he possesses an internal skeleton, the fundamental constituent of which is a chain of vertebræ (or better, a dorsal cord, the point of departure of this chain), provided at the front and back with costiform arches which separate the body into two cavities: one anterior, for the viscera, and one posterior, for the cerebro-spinal system. Secondly, man is a Mammal, because, like all

animals of this class, he has breasts, hair, a neck, four members, a corpus callosum, a heart with four chambers, a complete diaphragm, two occipital condyles, etc. Lastly, man is a Primate, because, like all other accredited animals of this order, he possesses a special type of brain characterized by the absence of the limbic lobe of other terrestrial Mammals, by a prominent frontal lobe, by a parietal, a temporal and an occipital lobe, by a peculiar system of convolutions, and by a cerebellum covered by the hemispheres; because he has a type of skull no less special, characterized by the rounded form of the occipital part, by developed frontal fossæ, by eye-sockets closed at the back, near to each other and pointing forward, by an os planum, by a mandible, of which the two parts are fused at birth, etc.; because he possesses an anterior member more or less adapted for prehension, a forearm capable of movements of pronation and supination, a hand (that is, long and slender fingers, a thumb relatively short and opposite to the other fingers), a small and exceedingly mobile wrist; because he has three kinds of teeth with omnivorous molars, flat nails on the hands and feet, two pectoral mammæ, a unilocular uterus, a discoid placenta, a simple stomach, etc.

The Primates include the Lemurs, or semi-apes, sketch-plans of the Primates, and transitional links from the Insectivora (which were undoubtedly without placentæ) to the real Apes; the Apes, or Primates proper, comprising the Arctopitheci, a small family belonging to the New World, the Cebidæ or common monkeys of the New World, the Pitheci* or

*The *Pithéciens* of Broca and the French school. The term might also be rendered by *Pithecidæ*.—*Trans.*

tailed monkeys of the Old World, and the Anthropoids, or apes without tails, also of the Old World.

What position does man occupy in this group of animals? Which does he most resemble? Does his distance from the nearest make of him a suborder, a tribe, a family, or perhaps a genus?

Hitherto we have spoken only of the characters which are common to man and to the other animals. We have now to speak of their differences.

These differences in man as compared with the Apes have been sought for with the greatest care in all parts of the body. We no longer live in the time of Galen, when to learn the anatomy of man the Barbary ape principally was dissected. We notice to-day the most unobtrusive characters, such as we should never pay attention to were it not that they concern our own species. It happens thus that the differences in question are exceedingly numerous, but reducible to a few of primary importance. In the skull, for example, craniometry furnishes at least twenty, which are reducible to three. In the skeleton, the muscles, and the viscera, there are more than thirty worthy of notice, but all reducible to one. Let us examine the most important.

But first a remark. To determine the distance which separates several species or groups of species—that is, their degree of unlikeness—their mean specific types must be considered, and not, as is sometimes done, their extreme individual variations. By the last method the characteristic differences are submerged, and in general we arrive at a graduated but continuous series in which the lines of demarcation disappear, as Herbert Spencer has said *à propos* of this

question. The method of mean types alone exhibits the intervals sought.

Another remark. To solve our problem we are obliged to proceed analytically—that is, we must take up the characters one by one and construct from their gradations in the different species a scale which admits of its appropriate conclusions. Now these conclusions are sometimes contradictory. The truth can be extricated only from their combination, otherwise called their synthesis.

The first characters distinguishing man from his nearest animal neighbors relate to the cerebral nervous system. Let us hurriedly follow its developments. At the bottom of the invertebrate scale a few fibers and nervous cells are discoverable, at first dispersed. Then aggregations of cells or ganglia appear, among which are readily remarked those consecrated to the special senses, at the point where the cephalic extremity is to be formed. In this last place they approach each other in pairs with a tendency to fuse. Thus the brain takes its origin. In the lowest Vertebrates it is represented by a succession of swellings or lobes having their seat on the prolongation of the spinal cord. The largest are the olfactory and optical lobes, the smallest are the future hemispheres. Soon the rôles of the parts are reversed, the rudimentary hemispheres grow larger, expand in all directions, cover and envelop the lobes beneath, and end at the summit of the scale by constituting alone almost all of the brain. The gray cortical substance, which is the essential part of the brain, finds thus an extensive surface to spread upon, which surface, on ultimately not sufficing for the demands made upon it, folds and refolds upon itself, and by this ingenious artifice

is increased in extent still more. The results are the cerebral convolutions. The folding takes different directions, and assumes different types in the different classes of Mammals. In the Primates it increases together with the increase of volume. The hemispheres, divided, as has been said, into four lobes, end at the back by running over the cerebellum, and in front by hanging over the face. The hemispheres efface the last traces of the limbic lobe, and their convolutions by a final leap attain in man their highest degree of complexity. In this last respect there is only a difference of quantity, which is not striking, between the anthropoids and man. If we place on a table by the side of each other two brains, the one of an orang, for example, and the other of a man, we should recognize the latter, apart from its volume, only by the asymmetry of the lateral convolutions, by their smaller size, as also by their number and by their sinuosities, especially of the third frontal convolution, that of language.

As to volume, the difference is striking. The brain of man is larger than that of the three large Anthropoids, both in relation to the volume of the body and to the volume of the containing skull, and absolutely in that its mean weight is treble that of the anthropoid brain.

Next to the differences between man and animals exhibited by the nervous system, come those which concern the organs of locomotion. All the members are locomotor in their origin; prehension of objects being performed directly with the mouth. From the first steps taken by Reptiles on solid earth the members are seen to differentiate in a definite manner. When Reptiles creep the fore members grasp the

soil and pull the body, the hind members brace themselves against the soil and push the body. The fore members act as prehensile organs, the hind members as locomotor organs *par excellence*. Both thus acquire distinctive initial characters which they never relinquish. Later, in the Mammals, the adaptation varies with the mode of life, the needs and the habits. Excepting man and some aquatic species, the Mammals are essentially quadrupeds, but in different degrees. In the Marsupials generally the anterior members are utilized as organs of prehension; among some the posterior extremities are organized as hands. In the Ungulates, or hoofed animals, the adaptation is exclusively quadruped. In the Unguiculates the anterior members serve accessorily for prehension. In the lower Primates, which are ordinary arboricole animals, the necessity of clinging to branches develops the function of prehension in the anterior members, or in some species in the posterior members. In the middle Primates or Cebidæ and Pithecidæ, the adaptation to arboreal life is perfected and increased in all four members. They are at once quadrupeds and quadrumanes; the entire body is in unison; they are expert gymnasts, running from limb to limb, shooting backwards and forwards, and hanging downwards by their four extremities and by their tail, which in Cebidæ is prehensile. Their forehead is the most advanced product of adaptation in this direction which the animal scale has yet shown. Their posterior hand is still a foot, but modified in the direction of a hand. In the Anthropoids the same is also true, except that the posterior hand resembles more a pair of pincers with curved tongs, and that the tail has disappeared. In man, adaptation has restored the original character

of the four members. The anterior members have become fixed in the direction begun in the Monkeys; the posterior members have abandoned absolutely that tendency and are entirely adapted to the locomotor function. Man is the only perfect bipedal adaptation, excepting birds, that the animal kingdom presents, just as the Cervidæ are, not the only, but the most perfect adaptation of the quadruped attitude and gait.*

This brings us to the second group of characters which distinguish man from Monkeys—namely, to the erect attitude which is peculiar to man. Monkeys, we have just said, are arboricole animals, marvelously adapted to their mode of existence. Their body is light, their vertebral column is supple, their members are long, slender and mobile, their four extremities furnished with hands. On the ground they walk awkwardly on all fours. They stand erect sometimes by seeking a point of support with their fore hands on a tree or a rock. Some Pitheci and Cebidæ even show in their viscera indications of adaptation to this last occasional attitude. Some Cynocephali show traces of it also in the vertebral column. In the Anthropoids, two of which have a comparatively heavy gait, walking on the ground is more frequent. They walk in a half-bent position, supporting themselves on the dorsal surface of the fingers and the outer edges of the feet. Do they straighten up often? In any case, the adaptation to this straightening up has produced a marked advance in the viscera, in the vertebral column and particularly in the pelvis. As an offset, the head and the lower members have made

*See P. Topinard, *L'homme dans la nature*, Chap. VIII, Paris, 1893. Bibliothèque Scientifique Internationale. F. Alcan.

none. In the pelvis the Anthropoid approaches very near to man. In the foot he is radically different from man; in fact, he is more simian, more monkey-like, than the other Apes. The foot, the calcaneum and the astragalus fold inwards upon the tibia, so that the sole of the foot can apply itself laterally to the trunk of a tree in climbing; the first toe, which is short in comparison with the other toes, but slender, is widely separated from the others, and plays less the part of a finger with the power to oppose the others, than that of a pincers enveloping the limb and running to meet there the other fingers, which are long and recurved.

Man himself is terricole in habits, with vertical carriage, and walking on two feet. In all parts of his body he is marvelously adapted to this mode of life. His head rests in equilibrium upon his vertebral column without effort. He has not the large posterior cervical ligament which prevents the head from falling forward in other Mammals. His vertebral column is solid, with a double dorso-lumbar curvature, and is larger in the lumbar region, so as to fit firmly into an enlarged pelvis. Everything in the lower members is arranged to support the weight of the body. The tibio-tarsal mortise permits only exact movements of extension and flexion. All the bones of the tarsus are heavy and strong. The axis of the tibia, the vertical axis of the astragalus, the antero-posterior axis of the calcaneum, the axis of the foot, are all in the same plane. The first toe is large, almost of the same length as the second and parallel to it. Its cuneo-metatarsal articulation is an arthrodia which permits neither adduction nor abduction. The sole of the foot is arched and rests solidly on the

ground at three points. The foot of man is a masterpiece of adaptiveness to the vertical attitude, and the opposite of that presented by the Monkeys: Pitheci, Cebidæ or Anthropoids.

The characters derived from the differences of attitude furnish, accordingly, contradictory arguments; some putting man in the same family with the Anthropoids (the pelvis, vertebral column and viscera), others (the foot) placing him in a different order. In my opinion the latter factor is more potent.

The other differences to be noted are not of such great importance. They are such as spring from the gradual perfection which takes place in the adaptation of the upper members to the function of prehension, commenced in the Lemurs and even in the Reptiles, attaining a high stage in the Monkeys, and gradually specialized in a supplementary direction in man. The whole member takes part in this adaptation, and not, as is commonly believed, its terminal segment only. In Monkeys the fingers are slender, long and recurved; the thumb is short and also slender; the trapezo-metacarpal articulation which supports it permits thus the two movements of oblique adduction and abduction, or of opposition. Nevertheless, this articulation in its movements is rude. It is a kind of tongs with curved branches, an organ made for encircling the limb of a tree, and only secondarily to grasp small objects and break them into pieces. On the other hand, the radius is capable of a movement of rotation on the cubit of about eighty degrees, and the articulation of the shoulder is very mobile. In the Anthropoids the rotation of the radius rises to one hundred and sixty degrees about, and the scapulo-humeral articulation increases still more in

mobility. But the hand undergoes no improvement. In man there is no notable change either in the hand or in the rest of the member, but all has become pronounced and has more precision; a certain simian fold of the palm of the hand has disappeared, showing a marked independence of the index finger. The hand is an organ of prehension, an organ of exploration and of touch, and also an instrument.

It has been said that man alone possesses a true hand, and that owing to it he can manufacture for himself tools. This is an error. The differences which it presents as compared with the hand of the most favored Monkey in this respect are only differences of kind. The faculty which enabled our prehistoric ancestors to manufacture the hatchets of St. Archeul, then to discover cleavage by repercussion and the art of edge-making was less the hand than the intelligence which directed the hand. The great dexterity which the human hand has acquired, for example, in playing on the violin or the piano, or in the adjustment of the screw of a microscope, is the fruit of experience and intelligence combined. In fine, the point of departure of the hand was an adaptation to arboreal life, its point of arrival an adaptation to intellectual life.

The differences which are now to be noticed are more decisive. They relate to the disappearance of the snout, the consequent reduction of the nasal fossæ, accompanied by the effacement of the last vestiges of the limbic lobe, and especially to the reduction of the maxillary apparatus, caused no doubt by the transference and localization in the hands of the function of prehension, before divided between the hands and the mouth. The orthognathism of man's face, which

stands in such marked contrast to the frightfully bestial face of the Anthropoids, is the result of this.

We have reserved the differences presented by the other parts of the skull because they result from the association of three orders of adaptations or influences on which a preliminary word is necessary, viz.: (1) The volume of the brain, which, in its increase from the Anthropoids or some analogous type, to man, exerts a strong pressure on all sides, elevates the vault of the skull, depresses its base, tips the frontal bone forwards, the occipital bone backwards, and adapts everything to its wants; (2) the adaptation to the bipedal attitude, which takes place by the overthrow backwards of the occipital bone, above mentioned, where the occipital foramen, which in the Monkeys and other Mammals is at the back of the base of the skull and in man is in the center of it, is transported from backwards forwards; (3) atrophy of the facial part of the skull of which we have just spoken. One of the consequences of this atrophy, associated with the development of the anterior lobe of the brain and of its frontal compartment, is the formation of the forehead, one of the distinctive traits of man.*

I have set forth at length the mechanism of this transformation of the animal skull into the human skull in *L'Anthropologie.*†

All in all, then, we are led by our rapid review of the craniological and craniometrical characters to the following conclusion. There exist among the Primates three widely different types of skull; first, that of the Lemurs, which is that of the other Mammals

*At the other extremity of the face the chin also is a human character.

†P. Topinard. "La transformation du crâne animal en crâne humain," in *L'Anthropologie.* 1891. P. 649.

generally; secondly, that of the Monkeys, both of the Old and of the New World, including the Anthropoids—a type of skull which is intermediate between that of the Lemurs and that of man; and thirdly, a type which is *sui generis*—that of man. Accordingly, an abyss which nothing fills separates man from the Monkeys. On the other hand, here and there, in isolated characters, some Monkeys, now a Cebus, now a Pithecus, now an Anthropoid, and usually always the young, present some point of resemblance with man.

There are still other differences to be noted, but of less interest. Thus, we have characters of growth; for example, sutures which close earlier or later. We have also simplifications of organs or secondary harmonical adaptations, such as the decrease of the usual number of nineteen vertebræ in Monkeys to seventeen in man; the arrangement of the summit of the sacrum and of the coccyx in consequence of the disappearance of the tail both in the Anthropoids and in man; the atrophy of the laryngeal sacs, which have become unessential after the acquisition of language; the disappearance of the auditory bulla of Lemurs, progressive in the Monkeys and the Anthropoids and replaced in man by the mastoid cells, etc. Other differences are the particular adaptations to the life and the new habits of man, such as certain modifications of the condyles and of the articular surface of the mandible, absolutely acquired, and certain characters in the structure of the molar teeth, on which I must dwell.

I wish to speak, not of the canine teeth, which are less voluminous in man, but of the tubercules or cusps of the superior and inferior molars. Like the pelvis and the union of the sacrum and the coccyx, the

fundamental types of these molars join man and the Anthropoids together in a common group, and distinguish them conjointly from the Pitheci, in which the corresponding types are entirely different. Their construction is as follows: Above we have a quadricuspidate type with an oblique crest separating the fourth or postero-interior tubercle from the three others. Below we have a quinquecuspidate type, arched, with three external and two internal tubercles. But here is the extraordinary fact. In man and not in the Anthropoids, two new types of which we can follow the gradations take the place of these very frequently: one above tricuspidate by the disappearance of the fourth tubercle, the other below quadricuspidate like a cross. Professor Cope, who has studied the first of these accidental types, the tricuspidate, sees in it a reversion to the lemurine type. For my part, I take it to be an adaptation to the alimentary system of man, a perfective character in process of formation, one of the traits of the man of the future. Even in the absence of other proofs, and others do exist, this fact shows that man is still in process of evolution, and that if he is progressing by his brain and its functions, he is also advancing and being transformed in other parts.

But I must hasten to conclude. Of the differences we have discovered, some are equivalent to intervals of an order or suborder, others to intervals of a family, others to intervals of a genus. It is incumbent upon us to weigh the physiological value of each, to set them over one against the other, and to obtain their approximate mean. The brain and the skull are of most importance; the attitude comes next, the hand, the teeth, the muscles and viscera come last.

Briefly, then, my conclusion is: (1) That the Cebidæ, the Pitheci and the Anthropoids, all of them arboricole creatures by equal rights, cannot be separated from one another, but that the same name of Monkeys properly applies to them as much as does that of "quadrumane" given by Cuvier; (2) that in this group the Anthropoids have reached the highest stage of evolution and are consequently less remote from man; (3) that the distance of the Monkey group from man is on an average greater than that which commonly separates families and *a fortiori* genera, and less than that which separates orders; (4) that this distance is about equal to that which separates the Monkeys from the Lemurs; (5) that man, therefore, forms a suborder in the order of Primates, as shown in the following table:

ORDER OF PRIMATES.

First suborder: Man.	
Second suborder: Monkeys	First family: Anthropoids. Second family: Pithecidæ. Third family: Cebidæ. Fourth family: Arctopithecidæ.
Third suborder: Lemurs.	

To sum up, the Lemurs of this classification are simply the starting-point of the Primates. The Monkeys are animals adapted to arboreal life and perfected to this end. Man is an animal adapted to intellectual life and perfected towards this end.

Is it a consequence of this schematic statement of the intervals separating *present* man from the other *present* Primates that man is descended from the highest Monkeys, the Anthropoids? The question is prejudged, but not settled. Suppose we have two phyla or types. Both become differentiated into secondary branches or types; the latter come into different

environments and different modes of life, adapt themselves thereto and evolve separately. Some diverge from each other, others approach nearer to each other. others go along side by side. This is what is called resemblance by convergence and difference by divergence. Therefore resemblance and dissimilarity are not a criterion. This same view is applicable to human races; two or three may have originated apart at remote epochs and have come to resemble each other by convergence. The unity or the plurality of the origin of the human races is not a solved question.

Be that as it may, in the hypothesis of a single origin two opinions are tenable. One, which Professor Cope defends, is based upon palæontological evidence, and makes man and the Anthropoids descend directly from Eocene Lemurs, through a series of precursors doubtless, of whom we have as yet no direct evidence. The other, which is based upon existing species, would make man descend directly from the Pitheci or the Cebidæ, with or without the intermediacy of the Anthropoids.

In 1885-91, when I was particularly studying the evolution of the skull in the Primates, I had a tendency to think the descent of man from the Pitheci or the Cebidæ possible without the intermediacy of the Anthropoids. But when studying the teeth of the Primates in 1892 I concluded in a like manner, but with the intermediacy of the Anthropoids. I repeat here my last conclusion, modifying my phraseology slightly to be more clear: "From my studies on the cusps of the molars and premolars of Primates I am disposed to conclude that the type of Maki and Tarsius, the first group of Lemurs, has engendered on the one hand that of Lori, Propithecus and Galago, the

second group of Lemurs, and on the other hand that of Indri, the third group of Lemurs; that the type of Lori, etc., has given the Cebidæ, and the type of Indri the Pitheci, from which would have issued the common fundamental type of Anthropoids and of man."*

What is certain is, that man by all of his characters is descended from some Primate. The brain, the hand and all that relates to his way of standing, with the exception of the foot, are proofs of it.

But from what branch and in what epoch was the initial shoot thrown off? That is a question which it is wise to reserve for a future time. We should not forget that families and genera of Primates must have existed which have now utterly disappeared, and that the present types may be only descendants of others of which we know nothing.

The comparison between man and the other animals is not restricted to morphological characters. If anthropology gives them the preference, the reason is that they can be got at, analyzed and weighed with great precision, and that they faithfully reflect the functional characters, in virtue of the principle that the "function creates the organ." The proper complement of the preceding review, therefore, would be the examination of the physiological characters, and particularly of those which relate to the really characteristic organ of man—his psychological characters. But that would carry us, for the present, too far.

We should have to show, if we entered on this subject, that man has the same functions as animals, slightly modified here and there, the same general

*P. Topinard, "De l'évolution des molaires et prémolaires chez l'homme," in *L'Anthropologie*, 1892, p. 709.

needs, the same modes of satisfying them, the same sentiments, desires, impulses and motives, the same reflex actions, with or without the intervention of the ego. We should have to show the psychical faculties that are brought into play between sensation and action, isolated and rudimentary in this or that lower or higher animal, less isolated and more marked in others, forming associations in greater or less numbers in one class, and attaining a remarkable degree of development in another, as in the elephant, the dog and the ape, but arriving at their highest degree of differentiation and complexity in man when the volume of the brain and its convolutions have reached their maximum. We should have to show in these animals the powers of curiosity, attention, observation, reflection, determination, the sense for cause and effect, memory, and incontestably ideas, for which only the formula is lacking. The studies which have been pursued on this subject in England for many years teem with examples. It would be our task to show in the Apes malice, imitation, the need of play, the spirit of examination, of sympathy, of defiance, the need of talking, of hearing and being heard, the sense for assistance in raising a large stone or in crossing a river, the sense of mutual understanding for making forays or for self-defence, the sense of common utility in disposing sentinels, who are punished when they permit the band to be surprised, etc. Is there reason to be astonished if one of these animals, having acquired by dint of hard efforts articulate language, which helps him to fix his memories and ideas and simplifies these operations, or by having become gradually more precise in his acts of reason, more careful in his acts of will, more highly conscious of

himself, more inventive in satisfying his daily needs—is it to be wondered at that he should have created for himself new and peculiar needs, even psychical in character, and that little by little he should have lifted himself up to the level of the æsthetic sense, the spirit of philosophical inquiry, and the love of truth?

True, the volume of the brain and its convolutions are far from explaining all this. But there are other morphological factors of mental power: for example, the number, size and relations of the cerebral cells, and particularly their intrinsic qualities, which still vary so much with individuals that in our species a scale running from ten to a thousand, I should say, could be established for them. Think of the psychological difference between the extinct primitive races and the higher races of to-day, and in these last between men who think and act in a totally vegetative fashion and the leading intellects of the nineteenth century!

Finally, from the morphological characters which we have summarized, and the psychological characters which we have alluded to, this fundamental truth emerges, which must be distinctly emphasized: that man, perfect as he may appear to us, is still not a being apart in nature, but that he is by his whole organization continuous with the other zoölogical species, that he is connected with them by a multitude of characters, if not by all, and that the differences are only relative differences of degree in an evolution in the same direction, augmentations and diminutions of organs or of parts of organs more or less utilized, modifications of development, primary adaptations to new habits and modes of life, second-

ary harmonical adaptations, etc. It is that man is an animal by the same right as every other vertebrate, mammal and primate, and that anthropology properly so called is merely a chapter of zoölogy.

No; man is not a creature apart in creation, and it is rather a concession to the spirit of the times than a protest against the idea of our animality that some naturalists have proposed to place apart all that concerns the intellect, and make of man a fourth kingdom—the human kingdom. De Quatrefages, who advanced this view after the precedent of Isidore Geoffroy St. Hilaire, averred none the less that "man was only an animal, nothing but an animal"—the rational animal of Aristotle and Linnæus, Franklin's tool-making animal.

Certainly, man has been favored by evolution. The organ which alone really characterizes him appears from its first progress in the fishes to have been predestined for its future rôle. In the birds the hemispheres have already much importance, but their development is arrested. In the various orders of mammals, the brain has more progress to show, but does not go so far as to overshadow adaptations in other directions. Evolution furnishes here various types, all of them highly harmonious and highly adapted to the habits, but relating to muscular force, rapidity of progression, or elegance of form. In the elephant the cerebral organ and its faculties attain a certain superiority, but the enormous size of the animal and the exigencies attending the needs of its tremendous body prevent its advancing beyond this stage. In the order of the Primates alone, evolution, modest in its beginnings but always properly directed, takes a happy leap, and attains its highest stage in

man. But the favored lot of man, that good luck of which the acquisition of language was certainly the determining cause, has not at all deprived him of his animality.

Whatever may be said to the contrary, man forms an integral part of that great tree which took its birth untold centuries ago in the Moners, which grew and waxed great throughout the ages, and which sent forth the boughs called Worms and Crustacea, Reptiles and Mammals, and those others called Carnivora and Primates, from which have issued so many innumerable branches, among them man. As Monism would have it, this tree is one and continuous in all its parts. Some of its branches are descendent, others ascendent, others parallel or divergent (retrograde, progressive, parallel and divergent evolution). Many have vegetated, or have arrived at the goal of their evolution—or of their potencies, as we might say —and have died, leaving behind them no trace. Many have survived without notable alteration, or have perfected themselves and multiplied.

The extinct and now existing species are the extremities of boughs and branches emitted at different epochs of the world. Man is merely one of them, having appeared in the Pliocene or Quaternary epoch at the summit of some ascending branch. All these species have thus the same origin, at the expense of previously existing species; all have risen by a similar mechanism, have evolved according to the same laws, and have, or will have, the same destinies: to bear witness to the splendor of nature and to disappear, leaving or not leaving a posterity.

I shall sum up these laws or factors of evolution, as follows:

1. The law of spontaneous expansion or proliferation of living matter,—first cause of evolution.

2. The law of spontaneous variation of living matter; whence result, with the concurrence of other laws, the multiplication and differentiation of forms, the division and specialization of labor.

3. The law of reaction of living matter (irritable or sensible) in the presence of external or internal stimuli; whence results the law of conformity of organs to their ends or adaptation to the environment and conditions of life.

4. The law of heredity or of resemblance; whence result, with the concurrence of favorable circumstances, the accumulation and fixation of habits and of characters insensibly developed.

5. The law of the survival of the best equipped and the best adapted.

This evolution is effected through individuals and is furthered by their free competition, their struggle against the environments, circumstances and conditions of existence. Those most favored by some spontaneous variation, those which know best how to utilize their advantages, which know best how to conform to circumstances, the best adapted and strongest, the nimblest, those most obedient to the injunctions of nature, survive and multiply.

This struggle operates only indirectly among species, although the general result of it is the modification of their type; it operates through individuals. It is they to which this or that variation, this or that adaptation, this or that particular circumstance gives survival and predominance. The instinct of conservation, the necessity of satisfying personal needs, the desire to enjoy life to the full, all exalts individuality.

For the individual the world is what he perceives—a series of impressions from his earliest infancy, the memory of his acts, of his struggles and of his sufferings. His sensorium is the focus in which all is gathered. He is perforce subjective. He is by sensibility and by logic egocentric. *I* first, *others* afterwards. What touches him has his first consideration; what touches others has it not till he is moved to it by impulses, by interest or by pleasure. If others succumb it is a void for him; if they suffer he attempts to realize their sufferings, shares them, and will even seek to assuage them, often with the ulterior thought that in similar circumstances they will render to him a like favor. If he make sacrifices, if he loves his companion, if he takes care of his children, he is recompensed for it by the pleasure which he derives therefrom. The more powerful his individuality is, the more powerful is he. The more energy the individual has, the more he affirms himself, the more his life is fulfilled, the happier he is, and the more he shares and assists in the progress of the group to which he belongs.

There are, moreover, two beings in the individual: one, the initiative element, which reasons, wills and is the fruit of his personal education; the other, the routine element, which is the product of habits acquired by his ancestors, repeated and established by accumulated heredity — habits of family, race, species—organic, motor and psychical habits. To the last are due the greatest number of the acts of life, our impulses and so-called innate ideas; the first intervenes only occasionally. As I stated in my memoir of 1893 above cited, as Dr. Paul Carus has well expounded in his book, *Le problème de la con-*

science du moi, and as the majority of physiologists to-day admit, all acts are more or less reflex and co-ordinated beforehand for every aim that is to be attained. The center of reflex action in the vertebrates is in the spinal cord or in its intra-cerebral prolongation. In one category of acts an external or internal peripheral impression is the origin of the action; in a second category the excitation comes from the brain and is a sensation or a sentiment, in both cases unconscious or obscurely conscious; in a third, the excitation still comes from the brain, but the sensation or the sentiment is entirely conscious, gives rise to a ratiocination, a decision, a given order. The two first categories, accordingly, are more or less automatic, the second being so both by the act and by the incitation. They answer to what are called instincts. These may be divided into instinctive sentiments and instinctive acts, and have as common characteristics on the one hand that they are produced without the intervention of reflective volition, and on the other that they are of ancestral origin.

Now instincts are the rule in animals and the commonest case in man. It is they that control individualism, that bring back incessantly and unconsciously to man his antecedents, that have as their object what is useful and as their *raison d'être* submission to the exigencies of struggle and to the higher laws of nature. Is the third category of acts, those which take place as the result of deliberation, commoner? Do they carry with them a vestige of altruism? Are they able in certain circumstances to modify or to annul the instincts? These are questions which we cannot examine without encroaching on the subject of social man, which lies beyond our immediate purpose.

Anthropology, in fine, as long as it does not occupy itself with peoples, civilizations and social constitutions, discovers in man an animal only, to which it applies the general truths which natural history and particularly zoölogy teach it. For anthropology there exist only differences of form and degree between invertebrates and vertebrates, and between the different classes, orders, families and species of these. The laws which control one rule the others. The mechanisms, theories and doctrines which apply to animals apply to man, and vice versa. As they have the same substance and are of the same origin, so they have the same destiny. From the irritability of a moner to the sensibility of a mollusk endowed with a nervous system; from the sensibility of an insect possessing the rudiment of a brain to the sensibility of the horse, of the ape, or of man, who is provided with a centralized brain with highly differentiated sensibilities, anthropology sees degrees only. From the consciousness, entirely mechanical, of the moner, distinguishing what is beneficial from what is injurious to it, to the rudimentary consciousness of the fish or the reptile, to the consciousness of the dog or the elephant, and lastly, of man, it still sees only degrees. A professor in a Catholic university, whose name I may withhold, conceded, in conversation with me one day, the doctrine of transformism. "Your doctrine does not disturb in the least the teachings of the Church," he said; "we will give you the body if you will leave us the soul." "Very well," I answered, "but what do you understand by the soul? Do you admit its existence in animals?" "I do," he replied, "but as a *less developed* soul." That professor was an intelligent man. Such is, in fact, the soul in man;

such it is in different degrees of evolution in animals. What is true of man is true of animals, and vice versa.

There are two methods of considering nature—one from our own or the human point of view, and the other from the point of view of Nature herself. For Nature, the spectacle which we offer is that of a busy hill of ants which swarm hither and thither with no aim beyond their present life. For Nature, the species succeed each other with no other motive than to bear witness to their marvelous proliferation. For Nature, everything that *can* take place in her broad bosom *does* take place; the elements combine, dissociate, meet again, forms succeed forms, disintegration follows integration, equilibrium is fleeting, there is no end, the movement is perpetual. Man in this whirlpool, like all the rest, is but a grain of sand; he has to think only of himself. He may fashion for himself ideals, he may assign a goal to his progress, he may impose a programme on his beliefs, he may close his eyes to reality. Well and good. But the thinkers that exercise their ingenuity in adapting him to the conditions of his existence, in creating for him a world of his own, in laying down the rules for his conduct, and in seeking foundations for it least open to attack, must not forget that his only cherished aim is his own happiness.

CHAPTER II.

Contributions to Biology. Protoplasm and its Properties. Properties of Animals. Evolution of the Ego. Egoism and Altruism. Evolution of the Function of Reproduction.

Man, as scattered over the surface of the globe in clans, tribes and peoples, forms the subject of ethnical anthropology or ethnology, just as man viewed as an animal forms the subject of anthropology proper or zoölogical anthropology. United politically under one flag these groups take the name of nations or nationalities. Viewed as to their modes of thinking and their methods of satisfying their wants they bear the name of civilizations. Considered in the relations which individuals bear to the group as a totality they take the designation of societies. Sociology is the science which treats of societies. There is an animal sociology and a human sociology.

Conformably to the principle laid down in our preceding chapter, that man is merely one of the exalted, or rather the most exalted, of the forms of animal life, and that the laws which regulate his existence, the phenomena which he exhibits, and the organs which constitute his being are, *in form and degree approximately*, but the application, repetition and development of those which we meet with in the different stages of animal evolution, we shall commence with animal sociology. This subject, accordingly, will form a transition to a third and last in which we shall

treat man as a member of society. It will enable us to dwell at length on certain points which we were obliged to curtail in the preceding chapter. We shall divide it into three chapters: (1) Preliminary biological data, which will be the subject of the present chapter; (2) the animal family; (3) animal societies.

Life reduced to its simplest expression is the resultant of an *ensemble* of properties or operations of a peculiar species of substance called protoplasm, which impregnates all the parts of organisms and which we meet with in the isolated state only in moners. The four first properties which must be signalized are: (1) The *oxidation* of protoplasm, which is the source of its energy or stock of vital power; (2) *excitability* or *reflexibility*, which gives rise to its actions and is the intermittent cause of its loss of energy; (3) *nutrition*, which maintains the integrity of the protoplasm and is the cause of its increase; (4) *reproduction*, which supervenes when the augmentation has reached a certain limit. The results, as regards the protoplasm, are contained in two words: life as an individual during a certain period of time, and self-perpetuation in like forms; M. Delâge adds a third characterization: the performance of work. These four properties, viewed alone, are physico-chemical in character. If a particle of matter, for example, comes within reach of a moner, an excitation takes place. If the particle is nutrient in character, the pseudopods of the moner will be extended, its cilia will be set in motion, and the nutrient particle will be engulfed. There is nothing mystical in this performance. A property merely is put into play—a reaction succeeding an

excitation. At most we might say that the centrosome acted as the center of attraction.

But, reduced to their properties as above defined, protoplasms are merely inert bodies—admirably constructed machines, yet operating without coal and having no actual materials to work upon. Their impulse and direction are given by outward stimuli. They are constrained to respond to the commands imposed upon them, to put themselves in harmony with the stimuli offered—in a word, to obey the exactions of their environment agreeably to the law of necessity, and on pain of death to accommodate themselves to the conditions of existence in which their lot is cast. Hence results a fifth property of protoplasm—that of *adaptation.* Three factors unite in insuring the perfect action of this property: (1) The plasticity of protoplasm, the result of the joint action of its reflexibility and nutrition; (2) its slight variations, with the consequent chance of modification; and (3) its capacity for transmitting new peculiarities. A word as to the first two of these. Simple and regular as the vital acts of protoplasm *per se* may be, they involve nevertheless more or less perceptible differences. Nutrition has its irregularities; the nutrient particles are not always seized and ingested at equal intervals of time nor always on the same side; the elaborated products are not always disposed with perfect uniformity from the circumference to the center. *Variability* thus appears a primitive property. As to transmission, or *heredity*, it is involved in the fact of the reproduction of individuals like the parent protoplasm, as it exists at the moment; thus we have another primitive property.

Nor is this all. From the union of all these prop-

erties, now numbering seven, but more particularly from the growth of the protoplasm, from its repeated reproduction or multiplication, and from its adaptation, results not the last, but the most fecund and the most general of the primitive properties of protoplasm—its power of indefinite development, that is progressive *evolution.*

Evolution! Without which living beings on our planet would never perhaps have emerged from the unicellular state, and which has caused the growth from the protists of the vegetable and animal kingdoms, of the vertebrates, and at last of man. Titanic power always in action, always alert, profiting by the least circumstance, yet whimsical, capricious, seemingly groping and without set purpose;* employing sometimes the most insignificant means and neglecting at other times the most direct; pursuing different lines in its advance—curved lines, straight lines, crooked lines, parallels, divergents—yet frequently arriving at the same result; limited only by absolute impossibility for the time being; having but one guide, that which is good and directly useful to the present individual, and but one sanction—success!

Was not that what the divine author of Genesis strove to express when recounting how the heavens and the earth and the plants and the animals had been created, he stopped at each stage, and before continuing said: "And God saw that it was good"?

*The sole objection to this manner of conceiving evolution is that which I have already set forth in my *Elements of General Anthropology*. Certain organs, or arrangements of organs, certain functions are alike, or are developed in the same direction, in different branches of the animal tree, although the common trunk from which they have diverged presents no trace nor prophetic germ of them. To this I reply that these organs or functions being good and useful, it is natural that evolution should have led up to them several times by different paths. It is thus that prehistoric men, not in communication with one another and of different races, have independently invented flint-edged instruments or erected menhirs.

The first results of evolution affect the interior of the protoplasm. Granulations, a nucleus in the vicinity of the centrosome, one or several vacuoles, perhaps filaments, make their appearance there. The moner has become an amœba, which is classified as a protozoön or a protophyte, according as it leans towards the animal or towards the vegetable kingdom. Some years ago a considerable group of homogeneous protoplasmic bodies without nuclei were supposed to exist; but the increasing power of microscopes has steadily reduced their number, and we are now constrained to conclude that few of the primitive protoplasmic bodies have come down to us. The following effects of evolution relate to the exterior: the pseudopods, the cilia, the vibratile filaments, the various irradiations, the more or less viscid envelopes, and even the calcareous or silicious teguments, which other divisions of the kingdom of protists present.

But the decisive stage in this distant epoch of the history of the animal kingdom is that which turns to account a final and hitherto latent property of the protoplasm, its power of blending or *aggregation* (the ninth property). This occasionally occurs in the protists. Protoplasmic bodies, with or without nuclei, born by the ordinary method of scission, adhere by their pseudopods to the bodies which have engendered them, or detach themselves therefrom, to form afterwards aggregated masses. Others having been left at liberty for a time, encounter one of these aggregates and join it. Thus appears at the beginning of our research this grand property of association whose fortunes and development we have now to follow. By virtue of it the metazoa succeed the protozoa; multicellular, unicellular beings. By it all

the numerous animals that inhabit our planet have been built up from the simplest to the most complicated, progressively to the vertebrates and man. Aggregation and adaptation by differentiation within the aggregated groups, are undeniably the two most potent factors of progressive evolution.

Without inquiring into the relation which the species of aggregation now under discussion, which is at once morphological and physiological, bears to that which we encounter under the name of *societies*, we will continue our investigations and cast a glance at the phenomena which the first kind offers.

The first aggregates, the so-called *animal colonies* of naturalists, were undifferentiated. All the cells were alike and constituted so many distinct individualities arranged in simple juxtaposition. Upon their first entrance into the kingdom of the metazoa, where henceforward they bear the name of plastids or anatomical elements, these cells were placed in conditions of life which varied by reason of their different situations within the aggregate, and each cell was constrained to adapt itself to this situation. The first differentiation of their mass and the one which was most urgent was effected at their center, where a digestive cavity arose; the next was effected in the walls of this cavity, which were doubled, the external layer being in contact with the circumambient medium, and the internal layer with the water which penetrated the cavity, both acquiring the special character which their functions demanded. Olynthus, a primitive sponge, is an example. The second adaptation is in the various forms which this primitive plan is led to assume according to the circumstances of its condition, becoming elongated or ramified as it

is in polyps, or taking some other form. One of the extremities, that which is in contact with the ground, becomes attached to the ground; the other, the free extremity of the cavity, or digestive tube, provides itself with tentacles and becomes the mouth. The primitive cells, conjoined in groups, have thus given rise to distinct sorts of individuals, which have been denominated according to their functions, digestive, prehensile, fixative, etc. Quatrefages has counted as many as seven kinds, not including the cells of junction or indifferent cells, which in some polyps are formed in sheets.

So far we have had nothing but the application of the grand law of necessity; adaptation to the conditions of the environment or death. Every plastid or group of plastids is subject to the exigencies which its situation brings with it. Morphological differentiation, that which is most favorable to the tasks imposed, is spontaneously effected. Every group is individualized in the functions which are allotted to it. Each has lost in a corresponding degree its ability to discharge other functions, and has been supplanted in their performance by its neighbors, which it in turn has supplanted in theirs. Some of the cells of the community have obscure parts to fill. The parts of others are leading, and necessarily the latter take the supremacy. The inequality between the members of the colony is striking, but it is in the interest of the common weal. Solidarity is the result—a solidarity which cannot help augmenting at the expense of all the individuals, but especially of the less useful, and which tends to culminate in the general unity of the whole. When this point is reached, our adapted and

solidarized* colony forms throughout all its parts a single organism only—an individual which has taken the place of all the old, minor individuals, which are now fused and lost in its interior. This is the *méride* of Professor Edmond Perrier.

The animals comprised under the designation of *merids* are all metazoans, more or less low in the scale. Their young migrate and become fixed elsewhere, or live at liberty, or adhere together, thus laying the foundation of a new species of colony of the secondary degree, the members of which pass, or at least may pass, through the same stages of development. The colony augments and is differentiated; its parts become solidarized, and the whole again forms a single organism, a colonial individual. This is the *zoöide* of M. Perrier.

In their turn, these zoöids lead independent lives as distinct and ambulatory individuals, or they gather together in groups and by coalescence give rise to colonies of the tertiary degree. More complex adaptations than the preceding, yet analogous thereto, arise. The parts not only adapt themselves to the external conditions, but also to one another. Fusion, atrophy and overlapping of organs result. Solidarity and harmony are established, and the result is again a single organism — the *deme* of M. Perrier. The higher invertebrates and all the vertebrates are demes. The human organism is a deme—that is to say, a solidarized colony of zoöids or zoönites of which the initial cellular aggregates are represented by anatomical elements.

*At the suggestion of M. Topinard we use throughout this chapter the words *solidarize*, *solidarization*, etc.; no existing English words have the exact meaning of the French equivalents of these neologisms, which find their justification and their analogue in *solidarity*.—*Tr.*

Merids, zoöids or demes; colonies of plastids, of merids, of zoöids, or of compounds thereof; colonies of elements of what degree of individualization or solidarization soever, all depend on the varied conditions of existence in which they are placed. In the higher animals the factor which seems to have the most influence is food. In the lower and middle invertebrates it is difference of habitat and hindrances placed in the way of free development of parts. The animal is fixed or natant; it crawls about in the water, in the mud, or creeps about upon the earth. Of all the circumstances most favorable to its evolution and perfection the first, beyond dispute, are unrestricted liberty and struggle of the liveliest sort. Fixed colonies, says Perrier, never become completely transformed into individuals. Colonies which at liberty have attained a certain development, retrograde if they become fixed. Such is the predicament of the ascidians, which through having immobilized themselves have fallen from the rank of vertebrates to that of worms; and it is also the case with anatifa, the stalked barnacle, which is a degenerate crustacean. Among the causes which produce deviation of development is the formation of squamous valves, of a tubular or spiral calcareous case—the compressed parts atrophying. Another cause of deviation is parasitism. Certain zoöids or colonies of zoöids, on coming into media where life is easy and food constantly at hand, lose nearly all their organs except their digestive tube, and are practically reduced to the apparatus of reproduction. Slave-holding ants, becoming wholly incapacitated for self-support, die when deserted by their slaves. And yet these degenerate species on being restored to favorable habits

regain their power of evolution in any direction. This is universally the case with ascidians. When they have attained their liberty they give birth to exuberant colonies called pyrosomes.

There is left us from our survey this fundamental fact: If evolution is to be profitable, progressive and productive of its best results, the individual must conserve its full liberty, must possess its full power of reaction; in other words, for obtaining the normal play of the conditions of existence no hindrance must be interposed. As the economists say, *Laissez faire, laissez passer.*

In sum, evolution beginning with primitive protoplasmic bodies, has produced the metazoa by following five directions and proceeding from five sources. As enumerated by M. Edmond Perrier these are as follows: The larva of the sponges, the planula of the polyps, the gastrula of the echinoderms, the nauplius of the arthropods, and the trochosphere of the worms, from which are descended the vertebrates, and consequently man. This gigantic work was accomplished during untold ages substantially by means of *association* with its attendant consequences — division and specialization of labor, functional and then morphological differentiation, reciprocal adaptation of parts, and finally their solidarization, culminating by progression in unity.

Let us return to one of the primitive properties of protoplasm, to its excitability or reflexibility. In fact, this may be subdivided into two properties, as the preceding designations indicate. An infusory or organic débris passes in front of a moner and an excitation is produced; the matter is seized; this is

reflexibility or reaction. Subsequently, on the protoplasmic substances or cells becoming aggregated, these two properties are combined and pass through the same stages as association. Like the latter they are differentiated according to position and according to needs. They partake of the fortunes of the different groups or individuals, which are here digestive, here reproductive, there nutritive, and there prehensile. They become severally strengthened in their distinctive characters, and appear in various forms. Excitability becomes buccal, visceral, tegumentary, exploratory, locomotor or general sensibility. Reflexibility is made to harmonize with different sorts of corresponding reflex movements.

But physiological differentiations cannot persist without being followed by morphological differentiations. In the protoplasm or cell there is nothing material to indicate a differentiation of the two properties. At a certain stage the repetition of the same impressions and of the same acts forcibly compels certain plastids to adapt themselves to the double rôle, and thus gives the impulse to their transformation. Thus are born, at this spot and at that, the first nervous fibers and nervous cells—fibers for the transmission of impressions or reactions, and cells as an intermediate focus of reflex action. This step accomplished, the rest proceeds of itself. The cells by association and multiplication become ganglia, the fibers nervous cords. The most active, the most necessary ganglia, assume the hegemony. Each merid, each zoöid in a radiate or linear colony, has its own ganglia. Their mutual adaptation is accomplished in the most favorable manner agreeably to the principles of necessity and economy; the superfluous

ganglia disappear, others are newly formed, communication between them is strengthened. In short, the first type of a nervous system of high solidarity arises—the type which I call *ganglionary*, and of which the higher arthropods are an example.

A delicate question arises here. Where, when, and by what mechanism is the sense of personality formed which inheres in the merids, zoöids and demes—that is to say, the ego?

We have seen that the second property of protoplasm resolves itself into an excitation followed by a reaction. All inquirers do not look at matters in this simple light. A moner or an amœba presents itself to the observer under different aspects. It is immobile, and has its pseudopods more or less extended or contracted; it roams about, impelled by influences wholly beyond our power of detection; it circles round a chance infusory or organic débris which has strayed in its path; and finally, when the latter has come within reach, it lengthens out its pseudopods and seizes it. In these phenomena, which are certainly rather complicated for so simple a being, some observers have seen intention, memory and will, in a word, have discovered in them an ego, obscure though it be. Others have held, and experimentally proved, that the property of performing movements, and particularly of lengthening and shortening pseudopods, can be effected by various physical and chemical agents. Shaking the water in which an amœba is immersed, touching it with a blunt needle, causes slight contraction of the pseudopods, and if the operation is repeated, marked contraction. At a temperature of 35° C., or thereabouts, the movements of the

amœba are exaggerated to the point of rigidity; below this they are normal, and lower still they are much weakened. Light is without action on amœbas, but it causes bacteria and diatomes to run from its presence—a fact, parenthetically, which marks the degrees of development of motility in protists. Among chemical agents some attract, others repel amœbas; some excite, others destroy their movements; anæsthetics have the last effect. Oxygen stimulates their movements, and its withdrawal stops them.

From these effects, to which those due to electricity might be added, it is permissible to conclude that protoplasmic bodies obey in a general manner the same influences that living matter much farther up in the scale obeys. But they do not prove that the movements normally produced by natural stimuli, as by the passage of an infusory, are necessarily directed by any sort of centrosome. When a mineral with an avidity for oxygen discriminates and picks out that oxygen in a medium containing nitrogen and carbonic acid, we do not say that it exercises choice. Amœbas have been observed to perform the same movements in engulfing substances unfit for nutrition, such as fragments of hair, for example. An amœba which makes for an object or circles round an infusory may be simply obeying the excitation which imperceptible disturbances in the water produce. If we attribute an ego to the simplest protists, by way of a preface to the ego which exists in high orders of metazoa, it would be incumbent upon us also to attribute it to sensitive and carnivorous plants, which would certainly be extravagant. And yet, if we grant the existence of individuality in unicellular beings, and that cannot be a subject of doubt, it is difficult to

refuse to them a corresponding *sense* of individuality. The preferable course would be to admit that in the kingdom of protists, particularly before their differentiation into protozoans and protophytes, the properties of protoplasmic bodies, viewed singly, are of the physico-chemical order, that life is their result, but that the ego, in however infinitesimal a degree we may assume, is not yet existent—in other words, that the movements in question may be classified as mechanical reactions following mechanical excitations. With this reservation, and for brevity of description, we shall not hesitate to make use of the word ego as a synonym for the virtual center of individuality.

In the initial associations, the cellular individuals being all alike, there is no change. But when groups are formed, collective individualities having a definite value are constituted, each being in relation to particular functions of the group. From these spring and are to be distinguished a like number of *partial egos*, which busy themselves only with what immediately concerns them. Those buried in the depths of the aggregate interfere only in the obscure phenomena of digestion. Those which are superficially in contact with the exterior world are incessantly alert. The operations of the one set are restricted to a domain of limited interest, those of the others extend to important organs designed for the capture of prey and for its prehension, for attack and for defense. Naturally the latter attain a greater development. So long as the groups are not united by nervous elements these egos will remain isolated and will sustain no relations with their neighbors, except through shocks mechanically transmitted from place to place. But as soon as the ganglia have centralized the individuality

of each group, and as soon as the nerves have put them in mutual communication, each will take what is its due, a hierarchy will be established and the responsibilities be divided. There will be the particular interests of each partial ego, and the interests of those charged with the dominant functions and the general welfare. Each will have its independence in its own sphere, but in certain circumstances all will be solidary. Solidarity, however, implies some sort of general and higher ego.

In the generalized ganglionary period, at which we now are, acts are always reducible to an excitation followed by a reaction, but with the three following complications: (1) The conversion of the excitation into movement is no longer effected at the spot, but in the nearest ganglion; (2) the ganglion discriminates between the different kinds of excitation and responds by simple or co-ordinated movements varying with the excitation; (3) the excitations occasionally pass beyond the ganglion and spread in greater or less degree to others. Suppose an impression is produced on the antenna of an insect. If it is slight, it will act locally on the cells or tissues, and the extremity of the antenna will wrinkle. If it be increased, it will be reflected to the nearest ganglion, and the antenna and jaws will be set in motion. If it is strong, the entire animal will respond to the reaction. Does an ego intervene in this last case? If the co-ordinated movements have already been produced and repeated under the same conditions and a habit has resulted, then this assumption is useless. But if the impression is novel, if there is occasion for a modification of the act—in a word, if initiative is needed—then necessarily an ego must intervene. But

where, on this hypothesis, is its seat? In one or in several ganglia together? I conclude in several. Morphological unity does not exist as yet in the ganglion of the insect. The insect has its sense of individuality, it discriminates what is parcel of itself from what is extraneous to it. It has its subjectivity, but this subjectivity, its ego, is diffuse. All the facts set forth by Sir John Lubbock in his work on bees and ants, and by other authors who have written on this subject, confirm this conclusion.

At some unknown period in evolution a grand advance is made in the nervous system. A series of ganglia arising from the zoönites of a linear colony are fused into a long cord, the spinal cord of vertebrates. We know of no living animal limited exclusively to this organ, excepting the larva of the ascidian and amphioxus. But physiological experiments on ordinary vertebrates have indicated what would be its functions. In this hypothetical organism certain impressions will be converted into movements by scattered ganglia in the viscera and along the paths of the nerves; others, more intimately connected with exterior acts, would have their centers of reflex action and of co-ordination in particular zones of the cord; those which play a controlling part and induce modifications of the preceding movements would end in the sensorial ganglionary net of the cephalic extremity of the cord. We say in the net, because everything leads us to believe that the ego is as yet diffused.

The last and greatest progress is accomplished when around the sensory ganglia of the extremity of the cord a proliferation is produced of the cells and nervous fibers, which gives rise to the cerebral hemispheres. Henceforward there is no more doubt, the

centralization of the ego is effected, it has found its true expression; seemingly the ego has been transported from the cord to these new organs, but it is so only in appearance. It is a new ego, *sui generis* and intelligent, that has been formed. The ganglia of the body continue their organic rôles and maintain their petty individualities. The cord fulfills the same functions and also preserves its powerful individuality. The hemispheres are simply a superadded organ—the organ of thought.

Ganglionary animals (insects, etc.) do not think; they reflect impressions, by associating or not associating under given conditions the action of several ganglia. Animals having hemispheres — that is to say, vertebrates—alone think. Rudimentary thought, at its beginning in the lizards of M. Delbœuf, in the crocodiles of the Nile, and in fishes generally; having less value perhaps at this period than apparently it has in certain ganglionary animals; but already reaching considerable heights in the birds and the mammals, attaining its highest in man, and always proportional to the diverse morphological factors of which it is the result! Through it the ego of the hemispheres intervenes occasionally, and at its leisure, more or less conscious of its motives of action, suspending, accelerating or modifying the co-ordinated acts relating to its exterior life, of which the cord still remains the center of production. The scattered ganglia have their habits, the results of the repetition of the same acts confirmed by time; the cord has its habits; the hemispheres have also their habits, but of a different kind. The hemispheres alone, when their attention is sufficiently solicited, when the interest, pleasure or caprice of the individual is at stake, and when

they will it, are able to alter their own habits and those of the cord. They alone represent the reasoning ego.

It follows from this examination that the ego, such as we have experience of it in ourselves, is the final product of a long evolution which can be reduced to four stages. In the first, or in the solitary cells of the protist kingdom, it existed merely in a potential state. In the second, or in the non-solidarized colonies, it was presented in the form of partial and scattered egos whose sphere was restricted to the special functions with which the group that each represented was clothed. In the third, or in the solidarized colonies of the generalized ganglionary type, it had its seat in a diffuse form in the main regulative ganglia, and as yet furnished but a vague sentiment of general individuality. In the fourth, or in the vertebrates, it is housed in a special organ subsequently superadded; here it had its modest birth, developed little by little, and ended at the summit of the scale by becoming the mighty ego of man.

Virtual, diffused or centralized, its rôle in all animals is to afford individuals the sentiment of their conservation, of their needs, and to force them to obey the injunctions of nature on penalty of annihilation. In its highest degree it comprises memories of the past, acts, sensations and thoughts, the sum total of its internal and external impressions; it gives to the individual the sentiment of its present corporeal existence and the notion even of its faculties and intellectual operations. Animals provided with hemispheres alone think; man alone knows that he thinks; *cogito ergo sum.* The ego is the consciousness of self—it is the soul.

Let us go back to the first law, not of life, but of the conservation of life in individuals, be it protoplasm, cell, merid, zoöid or deme — the obligation to conform to circumstances—that is, to satisfy their needs while yielding to outward necessity and acting in the best interests of the organism. The partial egos had control of the individual functioning of each group or organ to which they belonged. The diffused ego, predominating in certain ganglia, was charged with more general interests, such as related to the exterior world. The centralized ego was established to look after the same interests, but was vested with more authority. This is its whole part. It distinguishes what is external to it from what is within the sphere of its interests. The external world is indifferent to it, according as it does not or cannot affect its existence. It has no other concern but to perceive and foresee. It refers all things to itself; it is zoöcentric—that is to say, egoistic. We cannot conceive of a unicellular or multicellular animal that is not egoistic. It is the very essence of individuals. It remains to be seen whether this egoism cannot assume different forms, and whether it is not subject to differentiation according to the law controlling all properties, functions and organs.

The acts of animals always involve conservation. In the protoplasm or cell, in the sponge or the polyp, before the nervous elements have made their appearance, it is contained in the good which results therefrom for the organism and in the evil which is avoided thereby. The good is useful to the individual as the bad is harmful. Later, when the first nervous elements have appeared and sensibility has become established, the impressions are distinguished into

pleasurable and into painful; all partial egos, be they inward or superficial, are aware of this distinction, each in the matters which concern it. These impressions at a given moment become accentuated, constitute actual feelings of pleasure and pain, and remain henceforward the criterion *par excellence*, impelling the animal to act in this or that direction. The diffused ego of crustaceans and of insects, scarce holding predominance in certain ganglia, has certainly no other immediate guide. The ego of the vetebrates centralized in a special organ is in the same predicament; impressions of pleasure and of pain coming from the periphery or awakened in the hemispheres by the recollection of prior impressions are the determining causes of reactions. Here a new factor intervenes.

To avoid immediate pain, to experience immediate pleasure, and by means thereof to obey the direct injunctions of the external world, has been hitherto the sole motive spring of action. But the ganglia, the spinal cord, and particularly the hemispheres, have become complex organs endowed with new properties, the result of differentiation. They no longer restrict themselves to brutally responding to present peripheral sensations. The impression agitates the organism in its entirety, awakens prior impressions which memory has stored up in latent forms; the response need not be that which the impression of the moment demands, but that which awakened prior impressions prefer. We have here an association of impressions, as in a different sphere we have an association of ideas. Actions are most frequently the result of such a process. And hence we arrive at a second formula—the shunning of circumstances wherein previously pain was produced, and the seeking those in which pleasure

was felt. The lizards of M. Delbœuf creep into their keeper's hand in order to find there the agreeable warmth which they have experienced before; they allow themselves to be caressed, because the passage of his hand over their rough skin has previously occasioned them pleasure of which they preserve a lively recollection. The crocodile who flees when he sees the stick with which he has been struck obeys the impression aroused by the present impression, but not the present one itself. Animals generally are led thus to approach individuals of their own and other species who have never done them harm and with whom are associated recollections of pleasure. They return to such persons and acquire the habit of doing so. This custom being repeated from generation to generation, a particular sentiment is formed, increases, and the habit thus established becomes a need—the need of living with others, *sociability*.

A remark as to the advantages procured by this life in common: The animal is less frequently attacked by his habitual enemies; he has a chance of concealing himself in the mass of his fellows in times of danger; one or another of his companions possesses qualities by which he may profit. His interest and pleasure combining to start him on this path, the animal will, unawares, gradually come to love his comrades. On occasions he will represent to himself their joys and their sorrows, will endeavor to feel and to share them. As the sight or memory of delicious morsels makes his mouth water, so he may be led to shed tears, as seals do. At the right moment he will run to the aid of his fellows, will perhaps forget his own personality to save them, and may be capable by reflex instigation of the most praiseworthy

devotion. It signifies little that the habit has grown up progressively without his suspecting it; that the first cause and the secondary causes were the pleasure felt; that the personal interest of the organism was the direct or the indirect motive. The unconscious sentiment which responds to it is designated *altruism.* Sociability and altruism are joint terms. They imply mutual concessions, advantages mutually tendered, and consequently a lessening of egoism. This latter is the love of self, altruism is the love of others, in various but marked degrees.

The difficulty is that the two frequently come into conflict; that personal interest, the first by birth, is of the essence of personality and has anteriorly contracted deep-rooted habits which never lose their hold; that the altruistic habits which are born subsequently are more feeble and less direct; and that in all struggles the first have the advantage. The life of animals, like that of man, daily offers examples of this conflict. Happily for altruism the animal is extremely spontaneous. He thinks little or only obscurely before acting; he readily abandons himself to secondary automatic impulses. Habits are his second nature, they are multiple and conflicting; the animal obeys the strongest at the moment, according as circumstances favor the one or the other, or as reflexes of this or that character intervene with more or less rapidity. The animal, like man, frequently yields to temptations which can only involve him in pain; sacrifices a useful act for some immediate pleasure. He has his passions, and is subject to all the forms of nervosity, some coming from his egoism, others from his altruism. But when equilibrium has been restored, when the individual has got possession of himself

again, when he has recovered the sentiment of his conservation, and the memory of the pains and pleasures consequent upon his acts, when he is put in a position to choose—his ego, that is to say, his true interests, once more regain the upper hand and direct his conduct.

Certain peculiarities of the animal organism of vertebrates re-enforce the predispositions to sociability and altruism just described. One of the most remarkable characteristics of life is its property of extending itself, of propagating itself like the flames of a conflagration, of multiplying, and of never being fully satisfied in this regard. This, properly speaking, is the primal cause of evolution. Every cell increases, every organ augments, every function expands proportionately to its activity. This exuberance in the young, where anabolism predominates over catabolism, to use the jargon of the day, engenders an excess of muscular activity which requires expansion, and of which one form is the need of play. Insects often show traces of it; it becomes marked among the fishes and reptiles, and is quite pronounced in birds and mammals. The Felidæ and Canidæ run, gambol, wrestle, caress and maul each other from sheer joy. The life of monkeys is passed almost entirely in play. Although this need diminishes in adults and disappears among the old, it could not help contributing strongly to the formation of groups. The same exuberance of life impels animals to be noisy, if I may so generalize the idea. There is the so-called cry of insects, the croaking of frogs, the singing of birds, and the various means of communication which obtain among animals. But these manifestations of activity on the part of certain

organs are contagious through imitation; they draw auditors and solicit admirers. There is no doubt but this factor has contributed largely to establishing *rapprochements.* If we wished to adduce the case of man, the proof would be easy, but it is sufficient to recall to mind the case of birds, of nocturnal carnivora and of certain monkeys.

The same exuberance of life has resulted in the irresistible need of testing the range of one's power, and of making extensive use of it, of directing one's actions to surrounding things, especially to animated nature, and particularly to one's fellows. This is the impulse of appropriating prey which has been captured, of taking possession of the caves used for shelter, of the territory of the chase, or of the pasture to which one is accustomed; it is the need of exerting one's authority, of subjecting, of protecting, of reigning, and even of tyrannizing.

But if there is exuberance of life and sense of force in some on the other hand, and comparatively there is the sentiment of weakness and the need of protection in others. Indolent, slothful, or really inferior, these feel themselves incapable, less fitted to cope with circumstances, to supply their needs, to defend themselves; they require assistance, protection, participation in groups where they are less isolated. Hence arises the natural division of individuals, as of species, into the strong and the weak, the protectors and the protected, the courageous and the timid, into individuals predisposed to egoism and to combat, and individuals predisposed to altruism and to quietness. This distinction exists in their life as a whole as well as in that of sex. The male is strong and exploits his power, the female is weak and yields in her weakness.

These two factors—directing and being directed—are extremely influential in the formation of social groups.

It would be supererogatory to remark how these various springs of action, which are ultimately reducible to two—the need of affirming and of satisfying one's ego, and the need of taking possession of the non-ego—must necessarily exert a powerful influence on the development in animal societies of likes and dislikes, passions and active or sensitive faculties. Egoism and force engender emulation, the desire to do better and more, self-love, pride, jealousy, hate, the spirit of reprisal. Weakness inspires submission, sympathy, recognition, suffering, fear, love. But we must not enter now on this subject.

Let us recapitulate: Egoism is the expression of the centralized ego; it is love of self; the need of a large life, with a maximum of pleasure and a minimum of pain.

Altruism in its general sense is the love of what is outside of self, or, to be more precise, the love of that which, being outside of self, promotes or tends to promote the welfare of self. Nevertheless, the word in its current sense applies only to fellow or kindred creatures of the same species. Altruism is a differentiation of egoism. We ought to say altruistic egoism.

To be in connection with the exterior world, to receive exterior excitations, and to multiply the sources of enjoyment which they afford, is a need of the organism which grows in intensity according as the central sensibility is more developed in the individual and in the species. It leads to the need of living with one's fellows, or to sociability.

To seek assistance and protection, to share difficul-

ties, to desire much and give little, is the characteristic of personal interest. It also leads to association.

The ego and the association of egos are the two poles of evolution. In the merids and zoöids the egos, aggregating under the name of animal colonies, are weakened by the progress of solidarity. In the demes, associating under the name of animal societies, the egos maintain on the contrary their entire physical independence. But is this detrimental to the solidarity? This we shall discover by degrees.

A few words, before continuing, on reproduction. It is of two kinds—asexual and sexual. In the first, a part of the individual separates by scission or by gemmation; in the second, two elements, differentiated in opposite senses, unite into one. Reproduction by scission is peculiar to individuals formed of a single cell; it is to be met with, however, among certain merids or zoöids, such as Medusa, Asterias and Microstoma. In the latter it furnishes the key to the formation of linear colonies. It is maintained in the vertebrates in particular cases, and within the organism for the multiplication of anatomical elements, like the cells of the epidermis and the cells of the glandular secretions. Reproduction by gemmation is a second stage of asexual reproduction. It is peculiar to the lower invertebrates, where it multiplies individuals, completes colonies, and frequently alternates with sexual generation, which tends more and more to take its place. Sexual reproduction is the definitive stage. It becomes established as the types get fixed and determinate species are constituted. Elementary in some protists, it becomes more common in the lower invertebrates, and is generalized in

the higher invertebrates and in the vertebrates. It consists essentially of the coöperation of two different cells, one male and one female, which are blended into one, possessing the combined latent characters of both. From the protozoans to man all gradations of sexual generation are observable.

At first there are two cells, presenting no appreciable differences, but which meet, exchange parts of their nuclei, and then separate to continue independently their existence, and to reproduce by the ordinary process of division met with in unicellular organisms. It would be opportune to ask here, what the utility is of such a union, which apparently affects no change. These two cells, it is asserted, have severally exhausted their capability of division, and have nothing left but to die until the exchange which is made rejuvenates them and renders them fit to pursue a new career. In the second stage, two cells, still alike, blend totally and form but one, which reproduces the type of the common parents. Here, some will add, teleologists no doubt, that the divergent characters are neutralized in this manner, and that the common characters being better transmitted, assure the perpetuity of the type. Be it so. But that does not suit with the theory of Weismann, that the differences between two copulants alone produce the variations of types which natural selection subsequently makes use of. In the subsequent stages the two cells become gradually differentiated morphologically, and take on the characters of their respective sexes; the female is large and passive, the male is small, lively and flagellate. At last the profound phenomena of fecundation are exhibited, and the fecundated ovum pursues its ontogenetic evolution by

reproducing in epitomized form the phases through which has passed the phylogenetic evolution of its parents.

Here a difficulty arises, touching the conjunction of the two sexual elements. At the start in the metazoa the two reproducers are individuals, differentiated in opposite senses, but belonging to the same colony; the distance for meeting is short, chance favored by currents produces the conjunction. For some time, in radiate and linear colonies, the sexes continue thus united in the same individual, which is styled monœcious. But gradually they get distributed on different individuals. A succession of cases shows the transitions. Thus, one individual is hermaphroditic, and plays in juxtaposition with another the rôle of both male and female simultaneously; another, hermaphroditic also, assumes the function sometimes of a male and sometimes of a female at will. Suppose in these last conditions one of the rôles is weakened; the corresponding genital apparatus becomes atrophied, and the individual remains either male or female as the case may be

All vertebrates to which we limit ourselves are bisexual. In a very early phase of evolution the female restricts itself to depositing its ova in places where they are afterwards fecundated by the male. Neither the one nor the other is solicitous as to consequences. The young break their eggs as best they can, immense numbers perish for want of care, but the prodigious fecundity of the female compensates the losses. At this point evolution seems to hesitate as to the direction which it will follow. In some fishes and batrachians the male takes charge of the eggs, but this care does not extend to the young.

Selection, the supreme judge of the value of the path followed, has pronounced itself against this system. Then appears the second phase, in which the responsibility for the eggs and the young falls entirely upon the female. This is evidently the procedure which best assures the perpetuation of the species. Adaptation to necessity has acted wisely. But is there not, corresponding to this specialization of the final phases of reproduction in the female, some useful complement, some assistance on the part of the male who has coöperated in the initial operation? In some invertebrates he dies after having fulfilled his task; in the vertebrates he lives. And here intervenes an instinctive impulse, a special sentiment, which is to the general function of reproduction what egoism is to the general function of relation with the external world.

The germ of this instinct is discovered in the fecundation of the very lowest beings. The attraction which the female cell exerts on the male cell is visible: the one rests immovable, the other advances towards it, and, before union, gives evidence by its movements of genuine agitation. In some fishes, less indifferent than the general run, a like agitation called rut or heat is observed, accompanied at times by concomitant and diverse physiological phenomena, such as a change of color of their external scaly integument. It leads in some reptiles, and then in all birds and mammals, to the phenomena of copulation.* But at this stage is awakened in the female a sentiment of a quite special character and without precedent in the phylogenetic line. There is an

*Some fishes, it has been observed, already present phenomena of interior fecundation.

obscure presentiment of it in certain reptiles, and it reaches its highest expression in the birds and the mammals. It is the sentiment of the proprietorship of eggs and of the young—*maternal love*, one of the most admirable creations of evolution. A similar sentiment is developed in the male, but obscurely and laboriously, being subject to numerous exceptions, and varying from zero to perfection. After rut the male becomes attached to the female, protects her, and transfers his cares and affections to the little ones which are born from her. From the sexual union of the two results a family union which generally lasts until the young are able to take care of themselves.

Such, rapidly sketched, are the phases which, beginning with the differentiation of the sexes in the first cells, have led to their separation in individuals, and, in this, from complete indifference to offspring to association in families having in view the training of children. It remains for us to pass on to the facts.

CHAPTER III.

The Animal Family. Its Evolution in Fishes, Reptiles, Birds and Mammals.

Whatever may be our attendant regrets, for the subject is interesting particularly among hymenopterous insects, we shall pass by the invertebrates and confine ourselves to the vertebrates, a province sufficiently vast in itself. Three forms of association are presented to us: the first, intermittent, between two individuals of different sexes, with a view to reproduction; the second, eventual, between two or several individuals, with a view to mutual assistance and companionship; the third, temporary or permanent, under the form of assemblages or societies.

We shall commence with the first, and devote some space to it. The facts involved are of a special nature; they are either mingled with or alternate with those which refer to societies, and they render the latter facts obscure; the family in which they culminate is regarded rightly or wrongly as the foundation—the formative cell, as it has been called—of societies. There are disadvantages attending the separation of the two subjects, and there is danger of repetition; but the drawbacks are outweighed by the advantages.

Fishes come first. They are divided into those in which the young are born alive, in which case there is interior fecundation, and into those in which the female lays its eggs in some place, selected or not selected, where they are fecundated by the male.

Most of the cartilaginous fishes and some of the bony fishes belong to the first group; the others, which constitute the great majority, belong to the second. Among the first a certain degree of maternal love has been met with; a female plagiostome has been observed swimming in company with her young, which she would not abandon until they were able to look out for themselves. The second answers to the archaic type of fishes. Considerable variation is found in it. The rule is complete indifference; the female lays, but evinces no further concern for her eggs; the male passes over and fecundates them, but likewise exhibits no solicitude for their fate. Then at times a certain attraction is manifested between the two sexes; the female when laying her eggs is followed by one or several males. An agitation analogous to that of rut has been observed in the male, its object being either the female or the eggs laid; this rut proceeds so far as to occasion combats between rivals. A further period appears when the male, alone or conjointly with the female, prepares a sort of nest. One or the other, or both, watch over the eggs. I have seen in the aquarium at Naples a fish living with a female companion, and even exhibiting extreme jealousy. The most curious case is that of Gasterosteus. This fish very carefully and by its own exertions constructs a cylindrical nest; to this it conducts a female, and expresses its joy while the latter is laying her eggs, whereupon it goes in search of another; it then walls up the entrance to the nest, watches over the eggs until they have been hatched, and defends them against females which visit the place with the intention of devouring them; finally, it takes care of the little ones, and does not give them their liberty until they have no longer

need of its protection. Other and more astonishing cases still are the following: That of several male Lophobranchii, which harvest the eggs, and taking their station directly upon them, protect them until they are hatched; that of Hippocampus and Syngnathus, in which the eggs are kept in a ventral or caudal pouch; that of two or three species in which the male hatches the eggs in its mouth.

Sent living into the world, or hatched by themselves, the young of fishes, consequently, are abandoned, and perish in large numbers on account of lack of care. But the prodigious fecundity of the majority compensates this loss. The salmon lays nearly twenty-five thousand eggs, the sturgeon millions. Finally, diverse tendencies are manifested as regards the care of the young, some species leaving to the mother the reproductive rôle until the very end, and others confiding it to the father. Is it maternal love or paternal love which is destined to gain the ascendancy? There is also a quite curious marsupial tendency. Evolution seems undecided as to the most advantageous path to follow.

Batrachia come next, the anurous, and after them the urodelous. They first deposit their eggs in the water or in the sand, where they are fecundated in an unknown manner. Incomplete coition is effected in some species, the eggs being fecundated as they are produced. A few special cases must be noted. In the South American Surinam toad the male places the eggs on the back of the female, where they sink in and are hatched in tiny cellules. In other anurans the male winds chaplets of eggs around his legs, and devotes to them the proper care till birth, when the young are abandoned. In *Nototrema marsupialis*,

incubation is effected in a special pouch carried on the back of the female. Evolution is again making attempts in different directions. Is it the father or the mother that is to have charge of the eggs? On quitting the oviduct, whither are the eggs to pass—into a pouch furnished by the male, or into a pouch furnished by the female? Of brooding or sitting there is yet no question.

The Urodela enter a new phase. "Here," says Espinas, "the males fecundate the eggs in the body of the female." Of these eggs, which are laid subsequently, some care is taken by the female; but the male is ignorant of their whereabouts. This, in conjunction with certain facts presented by the anurans and fishes, has led Espinas to a theory which we shall enlarge as follows: When the female lays her eggs, she is relieved, and abandons them without further concern. When the male afterwards comes and expends upon them the ardor of rut, he regards them as his own property and takes care of them.

Reptiles. Here all hesitation is at an end. Fecundation always takes place in the interior, previously to laying, and by copulation. The female lays fecundated eggs; conceals them more or less carefully; but as a rule shows little further concern for them. She believes her task is finished, and is not prompted to continue it further. Nevertheless, some females watch their eggs a little, or even sit on them. Some, after hatching, carry their young to a place of safety, or lead them to the water; but afterwards they forsake them. In the trigonocephalous serpents of Martinique, and in the cayman alligator, the female takes care of them for a longer time. In the latter she has been seen to defend them with great fury, and has

exhibited symptoms of genuine maternal love. As to the male, his rôle is almost entirely limited to copulation. Some reptiles fight at the period of rut; some go in pairs. In certain crocodiles the male and the female sit in turns. Some males even go as far as to assist the female in hatching. The most instructive case is that of the Iguana. This lizard lives during a portion of the year with the same female, and will vigorously defend her against others of his species, as he would his own property. But neither takes charge of the eggs or of the young. They have the sexual passion only. With the rattlesnake it is the same. Male and female wander lovingly about together, embrace at times, but leave their eggs to hatch alone.

To sum up: in the four groups which we have examined, isolated cases exhibit different tendencies, some of which open the way to what is to become habitual in the succeeding groups. Omitting details, the following is the outcome: In the Fishes and the anurous Batrachia there is no maternal sentiment, but as an offset there are rudiments of a paternal sentiment, arising from the circumstance that the passion accompanying rut, not being awakened by the female, is expended entirely upon the eggs, and tends to be continued in favor of the young. In the urodelan Batrachia and in the Reptiles, copulation changes the situation. The ardor of rut is mutual, and engenders a pronounced bilateral sexual sentiment. This moment past, the male takes no heed of the consequences; the female, left to itself, lays the fertilized eggs and takes charge of them, but does not go much farther. The maternal sentiment begins to dawn, but the paternal sentiment is zero.

Here are presented the two branches which have

sprung from the Reptiles—namely, the Birds and the Mammals; and in these are accentuated and generalized the exceptional cases which have preceded, and which are most favorable for the direction which is now to follow. But before proceeding we must make a digression, in order to assign the precise meaning of the terms which we are to employ.

The phenomena of reproduction in Birds and Mammals are divisible into three acts: In the first, we have rut, copulation and fecundation, which are consecrated by a more or less intense sexual love. The second is represented by the incubation of the eggs in the case of Birds and by gestation in Mammals. The female is here either left to herself or lives with the male. In the last case we have the conjugal period, to which corresponds conjugal love. The third act begins with the birth of the young, and continues till the latter are able to take care of themselves; this is the family period. The family is *maternal* when the mother, left entirely to herself, alone has charge of the young; it is *paternal-maternal* when the father associates with the mother; it is *paternal*, if we may call it so, when the male, having one or several females, is the center of the family. Espinas has not considered this last distinction. The care taken by the mother being a constant fact, without which in the Birds and Mammals it is almost impossible to conceive the young being raised, we shall reserve the name of family proper for the last two forms.

Family, then, for us, is constituted by the association of three elements: a male, one or several females, and one or several offspring. Its consecration is family love, which is distinguished into mater-

nal love, paternal love and filial love, to which must be added conjugal love—a legacy and modification of the preceding rut period.

One word more. In the pages to follow we shall speak only of wild species, roaming at large. Domestication and even simple sequestration in zoölogical gardens frequently produce modifications in the phenomena of reproduction.

Birds. The specialization of the work between the sexes is decidedly fixed. The active rôle falls to the male in the first period, while in the female is vested the direct responsibility in the second and the third. Let us consider them separately.

The female, in the first period, plays the passive rôle. She is coquettish, but reserved, allows herself to be seduced, abandons herself with grace, is obedient to the male, even when he is fickle, and generally remains faithful to him. Among the exceptions to the last rule are, it is said, certain doves, whom the sexual sense absolutely infatuates. In the second period, the laying and even more so the brooding of eggs occupies her whole attention. She is still attached to her spouse, but on the condition that he respects her eggs. If he does not do so, she abandons him and conceals the eggs. In the third period, all is concentrated on one sentiment: care of the loved young ones. The attachment which is still reserved for the spouse is proportioned to the part which he takes in this care. If her spouse leaves her, her devotion, foresight and ardor in defending her young increase commensurately. The hen is the model type of maternal love. The instinct of brooding is carried so far here that certain females of the eider-duck will plunder one another's nests to obtain

more eggs. Her tenacity in sitting, and in covering her unfeathered young in her nest, is sometimes such that she cannot be driven away, as is the case, for example, with the kingfisher. If her eggs be broken or her young die, she will repair again to the male who has abandoned her, or to another, to be fecundated afresh. We may furtively introduce strange eggs into her nest, and she will care for the young with the same solicitude. She will adopt the orphans of another mother. In a word, the maternal instinct is consolidated in her in its last degree of efficiency, and is one of the marvels of adaptation to ends. Enfeebled forms of these qualities are met with in only a few cases, as, for example, in the ostrich, the cuckoo, the molothrus, the ring-dove, the tetragalle of Australia, and, according to Van Beneden, in the phalarope.

The male, in the first period, on the contrary, plays an active rôle: he chooses his female, fascinates her by his song and by demonstrations of all sorts, gives combat to his rivals at times in real Homeric style, then copulates upon the spot, or, more frequently, leads her victoriously off. In the subsequent periods, his rôle being optional, his conduct varies: at times he remains with the female and sympathetically shares her labors; at others he basely abandons her in a spirit of contemptible egotism.

Let us follow the first case. During the conjugal period he assists the female in the construction of the nest or does it alone, fetches food, entertains her by his songs, takes turns with her in sitting or even sits alone (Rhea, Phalarope), and shares both her joys and her sorrows. Audubon recounts that *Muscicapa fulva* exhibits great agitation while its female is laying, that

it encourages her, and when the operation is finished, soars off in her company with great joy. During the family period, the picture is a charming one. Male and female are intimately united in the same sentiment; they vie with each other in their efforts to cause the young to swallow the food which each has furnished; they teach them to fly and to hunt.

In the second case, of the female's abandonment, three degrees are presented: in the first the abandonment is complete and immediate directly after the male has satisfied his sexual desire or has become exhausted. Examples are the turkey, the pheasant, the prairie-chicken, and in fact the majority of the Gallinaceæ and some stilt-birds and palmipeds. Let us take the turkey. The two sexes habitually live apart. In the spring the female approaches and calls. The male hastens by, abandons himself to all the affectations accompanying rut, and copulation begins. As soon as the female begins to lay, her sexual desire is extinguished; she gradually withdraws; the male seeks her, exhibits dissatisfaction, is jealous of the eggs, which he seeks to devour and which the female defends. He finally seeks solace in renunciation, retires for a while to recoup his strength, and at last returns to his friends without exhibiting further concern for the female or her young, or rather for his females, as he is polygamous in rut. In the second degree the male prolongs slightly his stay, withdraws from time to time, returns at night, waits until the female has finished laying, and then quits her definitively. Such is the case of the eider-duck and the quail. In the third degree he abandons the female sooner or later, but returns to her when the young are born and have progressed slightly, and then takes

upon himself the direction of the family. Examples are the hazel-grouse, the wood-cock, wild duck, and great bustard. I should add that among those of the first degree there are some who return to their female when the young are emancipated and voluntarily remain in her company until the succeeding rut, when the various stages are repeated.

In fact, correct unions—conjugal in the second period and familiary in the third—are the rule among birds. There are divers types. The type Raptores forms intimate unions, but is profoundly egotistical from wildness. Its couples are monogamous, live apart with their young, and savagely repel all attacks on their nests. Again there is the type of several stilt-birds and of palmipeds, like the swan; in the latter the family circle is rigorously closed; all are closely attached to one another; this again is egoism, but it is from excessive mutual love. Further, there is the type of monogamous pigeons, of which the second and third periods are merely a continuation of the sexual period, which is always intense. The care here taken of the young seems accessory, a sort of playfulness, and a constant occasion of sexual love; at times in certain of these species the young are greatly neglected. Then there is the type Rhea, the American ostrich, polygamous from rut until the rearing of the young is completed. The last and most widely spread type is met with in the Paseres, Corvidæ, Hirundinidæ, the majority of stilt-birds and palmipeds, and in some sea-birds. Its most complete expression is found among the parrots. Sexual love, conjugal love and family love are here blended into a whole and leave hardly anything to be desired.

The two preceding categories concern the purely

maternal family and the paternal-maternal family. A few particular cases do not fall under either. One case is that of the tetragalle of Australia, in which the eggs are left to themselves and hatch alone. Another is that of Rhea, in which the male broods by itself all the eggs laid by its females. That of the ordinary ostrich approaches to this type, and deserves a few words in detail. It is polygamous; the females lay their eggs in the sand and conceal them on retiring. During the day, when the rays of the sun are strong, they sit on their eggs alternately with the male, but irregularly; during the night the latter alone sits. When the young are hatched, all join in taking care of them, but the father, we are assured, exhibits the greatest solicitude. The strangest case is that of a certain number of birds which occasionally or constantly lay eggs in the nests of other species and thus shirk the cares of maternity. Examples are the honey-guide or indicator-bird, the cow-troopial or molothrus, and the cuckoo. We have seen many unnatural males among birds, but unnatural females of the stripe of tetragalle and molothrus are rare. The female of the latter indulges in the most shameful polyandry, contracts conjugal unions of no sort, and when moved to lay seeks out in the thicket the nest of some other bird, where it deposits its eggs and never again thinks of them. The cuckoo is better off; he has a female and lives with her. The latter lays her eggs in the nests of different other birds, but returns from time to time to see whether their foster mother has taken care of them. When the young are able to fly she comes to them with her spouse, calls them, and thereafter both take charge of their education.

The Birds are monogamous or polygamous in the period of rut, but the males who live with their females during the second and third periods are all monogamous. The exceptions are so rare that they hardly count for anything. There are from one to three broods a year; the same couple, as a rule, remain together during the whole term. Almost always this couple separates when the bringing up of the last brood has been completed. But sometimes they continue their conjugal union until the succeeding rut; frequently this union lasts for years, if not indefinitely. Examples of this type are the eagle, *Picus principalis*, and the stork.

The purely maternal or the paternal-maternal family in some exceptional cases breaks up before the young are able to venture from their nests, as is the case with the albatross. Usually it is prolonged until the young are able to take care of themselves, or even until their education is finished, when the return of the sexual desire permits it. In the species having two or three broods a season its return in most cases virtually puts a premature end to the family, the double maternal and paternal instinct disappears, the married couple, again becoming lovers, expel willy-nilly the young from the nest. Two broods, however, may succeed each other in exceptional cases and live on good terms. In the water-hen the young of the second brood fraternize with those of the first and assist their mother.

The young have no desire but, first to get out of the nest, and then to prolong their excursions. They make the attempt, fly away, return at night, and end by never coming back at all. They then generally wander about with their brothers, the time vary-

ing with the habits of the species, but in all cases they emancipate themselves on the appearance of the sexual desire. From that time on all is ended. Parents and children recognize one another no longer. There is no reminiscence of family sentiment discoverable in them.

To recapitulate, evolution tends towards the most favorable conditions for attaining the ends of reproduction, outlined in the fishes and reptiles and reaching in the majority of birds approximate perfection. It is no longer the isolated male or the isolated female that has charge of the development of the young, either within or without the egg. A contract of union is established between the two agents of reproduction, an association has been effected, a more or less powerful sentiment unites the male to the female and to their young. The two concur in the work, each according to its organization.

In both, the initial period is what one would imagine it ought to be physiologically. The ardor of rut is sufficient and moderate in the female, who is passive. It is violent and capable of overturning all obstacles in the male, who is active. In the later periods the mother has the entire direct responsibility; she is equal to her task, and fulfills it with a tenacity and continuity which is marvelous. The instinct corresponding to the two periods is in her as firmly established and consolidated as is necessary. In the same periods a goodly number of males have taken no step forward, have acquired nothing which is useful to the species; but in the grand majority an instinct at once conjugal and familiary is established which leaves little to be desired. On one hand and on the other it is the triumphing of adaptation of means to ends.

There are still, however, a few discouraging features. One is the rapidity with which the sexual needs put an end to the family life, the drawbacks of which affect the second part of the rearing of the young, namely, their education. The cause at fault here is plainly the plurality of broods. For progress to ensue, it is necessary that these should be reduced to one per year. The second point is the mutual forgetfulness of parents and offspring for one another after separation, and particularly when the latter have attained puberty. But the end has been accomplished, some will say; the species has been renewed, the parents have fulfilled their task!

Mammals. The exterior phases of reproduction differ here slightly from those observed in birds. The second period is frequently long, brooding being replaced by gestation. The third period may be divided into three: nursing, which concerns the mother only, the interval between this period and that in which the young have become entirely emancipated, which is short, and the time which subsequently elapses before puberty, during which the young are either free or still follow from habit the footsteps of the mother.

Mammals from the point of view of family or of society, as we shall see later on, may apparently be divided into three groups: First, the lower mammals, comprising the Monotremata, the Edentata or Insectivora, and the Marsupialia; secondly, the higher mammals, comprising the Ungulata, the Carnivora, and the Monkeys, men forming a class apart; and lastly, the intermediary mammals.

The Monotremata, the Edentata, and the Insectivora are the lowest with regard to family. The arma-

dillo meets a female, copulates and goes his way. The Sorex is little better; the male and female, when not in the period of rut, devour each other whenever they can. Nevertheless, some couples keep together until the period of the young, namely, in the Ornithorynchus, the great ant-eater, the hedgehog and the mole.

In the marsupials the instinct of maternal love is naturally quite pronounced. Gestation lasts with them about a month, but for a space of six to eight months the young occupy an abdominal pouch where they are entirely in the hands of the mother. In the wombat, however, she ceases to interest herself in them after they have quitted the pouch, but in others she continues to bestow upon them the most assiduous care. The opossum is a model of maternal love. *Phalangista* and *Phascolarctos* carry their young on their backs, clinging to their long tails. As to the male, he is indifferent after rut. In the kangaroo the male has been observed to approach and to contemplate with curiosity the young who show their heads from the pouch. In the flying squirrel he assists in forming little families.

The Chiroptera, allies of the Insectivora, are no better with regard to family. Bats copulate and do not seek each other again until the succeeding rut. The mother has sole charge of the little ones, exhibits affection for them, and carries them around clinging to her body. The reappearance of the sexual desire alone puts an end to her maternal love. The Rodentia offer various types, but as a rule these are little favorable to family life and even to the development of maternal functions. The first type is that of the hamster (*Cricetus*). The male repairs to the abode

of the female, copulates, lives with her for some time on good terms, and finally leaves her. The female, five weeks after, bears five or six young, which she fosters for some fifteen days, and finally drives away when they are able to take care of themselves. The dormouse (*Myosus*), *Eliomys*, the porcupine, rats and mice, the vole (*Arvicola*) and the lemming (*Myodes*) belong to the same class. With the meadow-mouse or mole the solicitude of the mother turns to indifference as the young grow able to take care of themselves. A second type is that of the hare; he never abandons his female, for the reason that he is always in rut, as is also she, even during gestation. But more scandalous is its behavior to its children. There is not a trace of maternal love in the female; she carries her young thirty days, casts her litter of from two to five upon the bare ground, cares for them at most but a few days and abandons them, only returning to them when her milk burdens her. A third type is that of the beaver. It presents phenomena similar to those which we have met with in some birds. The male abandons the female after rut, and does not return to her till several months after, when their two to four young have grown large enough to move about (Audubon and Bachman). A fourth type is that of certain squirrels, the male and female of which keep house until their young are able to look out for themselves; these are monogamous. The fifth is that of the rabbit. Each monogamous couple has its burrow, into which it suffers no stranger to pass; they never leave each other; the male loves his young as much as he does his female; he carries them, polishes their skin, and teaches them to seek their food. The mother digs a burrow expressly for them.

One of the peculiarities of certain Rodentia is their prodigious fecundity. The number of their young is generally from three to five, sometimes one, and amounting often to as many as ten. The real cause of their fecundity is the frequency of their litters, which is noticeable, for instance, in mice and rats, and which occurs almost every month in certain voles, and seven times or more a year with the rabbit. They are all voluntarily polygamous and polyandrous, copulate a few days after parturition, as is the case of the vole, if not immediately, as is the case of the mouse. Furthermore, the young are very soon capable of reproduction: the time being from one and one-half to two months in the vole or field-mouse. It has been calculated that one couple of the latter can give birth to five hundred individuals in a single year, and a couple of rabbits to the incredible number of one million in four years. The gigantic emigrations of the lemming from Norway and the pest which the invasion of our domestic rabbit inflicted upon Australia and California are proofs of this.

In marine mammals, the male rarely abandons the female after rut. Still, we meet with troops of old "solitary" males, as they are called, who have abandoned their progeny before the proper time, as we meet also with special troops of adolescent young. Some are monogamous, like the walrus and probably the dugong or halicore; the others are polygamous. In the latter, the father, the mothers, and the offspring remain together until the offspring are brought up, and in some, as it seems to me, even after the succeeding rut; the maternal and paternal sentiments are not highly developed, the male occupying the position of a sultan of a harem, who distributes his

favors among many. These polygamous or paternal families having some social characters, we shall consider them more in detail in the chapter on "Animal Societies."

While on the subject of aquatic mammals I may mention the sea-otter (*Enhydris*), which is a transitional Carnivore. The family is intimately united and monogamous. It is composed of the father, the mother, the sucking infants, and the infants of the year preceding. The male caresses the female with his forepaws and plays with the infants. If the infants are taken away from them they weep and groan, as do the seals. The mother carries her young in her mouth like the Carnivora.

The Ungulata are not very fecund; as a rule they have but one offspring each year. The *Bos frontalis* has but one every two years, and the Aurochs one every three years. The musimon or wild sheep, the Capreolus or roe-buck, have two or three young, the pig three to nine. Some are plainly monogamous, like the reindeer, the gazelle, and, according to Audubon and Bachman, the buffalo; others are polygamous, particularly during rut, like the Alpine ibex and the musimon; others are polygamous to the very end, like the Solidungula and the elephant. The female has the direct charge of the young. When the male abandons her after rut, she frequently forms with other pregnant females a special group. When the moment for casting has arrived, she modestly retires aside. Her little one follows her everywhere; she suckles it, leads it to pasture, shows the liveliest affection for it, and defends it with courage. When her spouse shares with her the care of her young she is extremely grateful for it, loves him, and proves her

affection for him in a touching manner. In the Capreolus, where the union is of a charming character from rut until the termination of the bringing up, the only interruption happens when the female retires for parturition. A few days after, she is seen to return happy and exultant, followed by her little one; she calls her spouse, who hurries near, abandons himself to joy, caresses his child and its mother and resumes the direction of the family.

But this spectacle is rare. Among the Ruminants the male is most frequently impelled by the sexual instinct alone, or by this and the not less striking necessity of commanding, of being master. Conjugal love after rut and family love are luxuries with them. In the Solidungula, and I shall cite particularly the wild ass (*Asinus hemionus*), as soon as the male is capable of reproduction he has but one ambition, that of imitating his father, of gathering round him as many females as possible, and of making himself the head of a troop from which he jealously drives away all young males who are approaching puberty. In the Cervidæ at times the male lives with the female only during rut, at times he prolongs his amours until the approach of parturition, and again he often remains with her until he has performed all his duties. Thus it is with the reindeer and with Capreolus. In the Capridæ and Ovidæ the ardor of rut controls the situation, and the polygamy is entirely sexual. In the antelopes the gazelle is monogamous and assisted throughout by the male; the capricorn is polygamous; the chamois tarries with the female only during the time of rut, afterwards resuming his solitary life. In the Bovidæ the male prolongs slightly his stay with the female, but afterwards departs to associate entirely

with his companions, whilst the female and her young join the other females in the general herd.

Among the Pachyderms two examples will suffice. The wild boar or *Sus scrofa* lives with its females during the autumn rut, which lasts for some weeks or for two or three months, resuming afterwards its solitary habits. The female carries its young four and a half months about, and has a litter of from three to nine; she suckles them four and a half months and protects them for some time thereafter. Several litters will follow her at the same time, and thus form a little society entirely maternal in character. The elephant is polygamous. He has on an average eight females, but there are reasons for believing that he is attached to one by a sort of preference for a certain period of time. The female is in gestation twenty-two and a half months, has but one offspring, and takes extraordinary care of it. The father is also attached to his offspring, but apparently after the manner of a chief of a polygamous band rather than as a father, which is the rule among the Ungulata.

The Carnivora are less fecund than the Rodentia, but more so than the Ungulata. They are monogamous in the sense that during the period of rut they associate with but one female, and that in the minority of cases where the union persists until the family phase they have *a fortiori* but one. The mother is often excellent and devoted to her young, but sometimes leaves much to be desired. The wildcat, the puma and the hyena, for example, quickly abandon their young in the presence of danger or upon the approach of man. The female ordinarily chooses among the males competing for her favor. The male

generally abandons the female after rut or continues to live with her for a short time. In the latter case he hunts with her, or they hunt separately, each for itself, like selfish egoists. Some, like the tiger, occasionally run to the assistance of the female when she is defending her young. Among the few cases where family love exists must be classed the lion, the cat, the dingo, the fox, the wolf, and the ichneumon of the Nile. The wolf, however, voluntarily devours his offspring or abandons them in the event of the mother's death. The lion, who is extremely attached to the lioness during the sexual period and the simple conjugal period, is indifferent to his offspring when they are born. After a little, however, his heart is touched by their mewings, their gambols and caresses, and he becomes a model father. The harmony between the three constituent elements of the family is perfect.

The Monkeys, from which we here exclude the anthropoids, are the highest of all the mammals in point of family. They are salacious and fickle in the period of rut, but in the end they make good husbands and good fathers. They never abandon their females after rut or before the birth of the young. They are polygamous, like the Ungulata and the marine mammals, but despite their polygamy there is no trace, or at least there is but little trace, of a need to pose as the head of a troop of females and offspring. Affection plays the highest rôle here. One only of the monkeys is monogamous, the Nyctipithecus, and perhaps the Maki. The monkeys have but one offspring, or, by way of exception, twins.

Their maternal love is admirable. Personal witnesses have described traits which are profoundly

touching—of a mother in her last breath thinking of nothing but bringing her infant to a place of safety, imploring the mercy of the hunter with an expression perfectly human, or dying from grief at her loss. The female suckles her infant, carries it in her arms, upon her back, or wound round her body. She prepares its food, caresses and plays with it, gently corrects it, and shows much foresight for its welfare. Paternal love is not less developed. The two parents vie with each other in their attention to their little one, teach it to walk, climb, and to find its food. The father will run to the aid of his offspring in critical moments, and will extricate it from perilous positions. A male arctopithecus has been observed to take his infant from the arms of its mother and to carry it himself for a while. It is not known at what period the young are emancipated, but it is certain that parental affection and care are not limited to the first year, or, in other words, that the family is composed of infants of various ages.

In the Anthropoids the conjugal and family sentiments are the same. All interest centers in ascertaining whether they also are polygamous or monogamous, and what is the duration of their union.

I can give no opinion regarding the Gibbon (*Hylobates*). Duvancel's account of having seen mothers go to the river bank to wash the faces of their infants in spite of the latters' resistance, proves that maternity here comprehends its rôle. The orang-outang (Simia) exhibits a peculiarity which is frequent in mammals and which we shall speak of later—namely, a family disposition different in the adult and in aged males. The old males are reported to abandon their females after rut. The adults, on the

contrary, live with them and prolong their union for an unknown time. The family of the orang-outang is composed as follows: of a male, a female and several young of varying ages amounting, as in the case of Wallace, to as many as four litters; the Anthropoids, as we know, have but one offspring. As to the care devoted to this offspring the details are lacking. But when we see in our menageries the passion which orang-outangs have for infants of all kinds, and even for dolls, the gentleness with which they lift them into their arms and caress them, there can be little doubt that they are the same in the savage state. When the time for accouchement comes, the female withdraws. On the gorilla I possess unpublished data, in addition to those already known. The cases reported by negroes of gorillas having been seen with several females do not convince me. For me he is monogamous; he retains the same female in all likelihood indefinitely. He has been seen with one, two and as many as three offspring at least, of different ages, which he watches and defends. The chimpanzee is also most likely monogamous. In the case of Savage the family comprised a male, a female and two infants of different ages. The following passage from Livingstone leaves no doubt concerning one of the species, the Soko: "He lives in society: some ten males together, each having its female. . . . If one seeks to possess himself of the female of another, he is knocked down and beaten by all the other males. . . . When a difficult spot has to be crossed, the father takes the infant in his arms, carries it over and hands it to its mother."

To sum up, the Mammals, taken as a whole, are

disappointing. They offer but rarely that almost ideal spectacle which so often captivates us in birds. Among the lower mammals maternal love has made a great step in advance of the reptiles, the maternal family having been constituted. But the male has remained at the same point: he abandons the female after rut.

In the Rodentia progress is restricted to a few who experience the joys of paternal-maternal family life.

Among the Carnivora and Ungulata, to which we must add the marine mammals, matters tend in two opposite directions. In the Carnivora the paternal-maternal family exists; the father takes his share in the care of the young; the sentiment which binds him to his consort has not the purity which is presented in birds, but is sufficient and accomplishes its end. The lion is the most advanced example of this type, father, mother and offspring having for one another the tenderest affection.

In the Ungulata and marine mammals tne family is paternal-maternal, but with an entirely different character; what was the rare exception has become the rule. Some are polygamous during rut only, as are many birds; but the majority are polygamous during the two other periods. In the last case, however, the spring of action is falsified. It is not a transformation of sexual love into conjugal love and alternately into paternal love which moves the father, but vanity, the desire of being surrounded by underlings, of possessing a troop over which he can exercise unrestricted authority. The number of females, which is at times excessive, and of the young which result from his many unions, proportionately weaken his altruistic tendencies. Some lose here the notion

of personal responsibility and suffer it to be merged in a collective responsibility of the herd. In short, among the Ungulata, the female is what we have seen her to be among birds, submissive in the first period, an excellent mother, devoted and courageous in the third, her ardor to fulfill her tasks growing with the more or less complete abandonment of her male. The male on his part experiences the same agitation in rut, offers the same combats to his rivals, but subsequently deports himself differently. At times he deserts his females with indifference, at times he keeps them by him to lord it over them, at times he restricts his activity to protecting them from afar as an integral member of the herd, and again and by way of exception he still associates with his family, as is the case with the monogamous reindeer and the almost monogamous Capreolus.

The Monkeys seem to be descended from the Ungulata with regard to family, but they have a less marked sentiment of domination, and on the other hand exhibit a decidedly pronounced conjugal and family sentiment. They never abandon their females; they are all good husbands and fathers. The anthropoids differ from these only in the respect that they are monogamous.

It is on the female, in fine, that adaptation has concentrated all its efforts. The maternal family is a necessity, the paternal-maternal family a luxury. Outside of the hours which he devotes to reproduction, the male has always time for living and enjoying his individual life. As to the female, she has among the birds no leisure except in winter, and none at all among the majority of the higher mammals, where rut, gestation and bringing up succeed one another

rapidly and without interruption. From the moment she is capable of reproduction the object of her life is one thing—love. She seeks to please her nearest spouse, she loves him and admires him. She loves the eggs on which she broods and the offspring which are born of them; she loves him who has made her a mother and who shares with her her affection for her offspring. What a difference between her and the male, particularly among the mammals! From the beginning it is pleasure which he seeks, frequently without any ulterior motive; later it is satisfaction of his activity, the need of possessing and of dominating. The male is the egoistic element in the association, the female is the altruistic element. If, to employ a word which has been much abused, the male is superior to the female in all that touches the functions of outward life, the female is superior to him in all that concerns reproduction. United they form a complete whole—the physiological unit. All this is realized in the monogamous form of the family.

The polygamous form is a contrary deviation of the physiological law. If we regard the male simply as a fecundator, whilst the female is conceived merely as a layer or bearer, it is admissible that the male should wander from female to female and fecundate as many as possible. But physiology is not of this mind. It shows that it is less important to procreate enormous quantities of young, who will necessarily be exposed to wholesale destruction from lack of care, than to assure the existence and prosperity of a small number. It shows that in the struggle against the causes of mortality the advantage is with those who with the assistance of two parents only, have exhibited the greatest powers of resistance. According as we rise

in the scale of vertebrates the fecundity diminishes; the number of eggs or of young which was so large among the fishes is diminished among the reptiles, the birds and the mammals. But the common care devoted to the progeny is also proportionately augmented. There is no doubt, even leaving man aside, that the male is devoted to his female and to his young in the inverse ratio of their number. To reduce the male to a simple fecundator, a sultan of a harem, a chief of a herd, is to misrepresent the requirements of bringing up and of education. Polygamy runs counter to the end to be obtained. Equality of number between the sexes in the various species is proof that the unions should be made by pairs and not by pluralities.

A physiological difference will explain perhaps this resistance of the mammalian male to the development of the conjugal and family sentiments as compared with birds. In the latter the total time required for hatching is short; the interval which elapses between the termination of rut and the birth of the young is not long enough for the male to contract new habits with his comrades; the love which he cherished for the female continues during brooding, and is readily transferred from her to the infants. In the higher mammals, on the other hand, the time between rut and the end of the bringing up is long; the period of gestation, which varies from several months to twenty-two in the elephant, gives rise to a long gap between the love of rut and the birth of the offspring. During this time the male grows unaccustomed to the female and seeks out his old friends. It is true that there is but one litter a year, and that the return of rut, having no relation to the natural termination of the bring-

ing up of the young, does not put an unseasonable end to the family as is the case with birds.

We have mentioned a dark point in the case of birds—the extremely rapid separation of the offspring and the parents and their subsequent mutual forgetfulness of one another. Is it the same with the mammals? We have cited among birds the case of the water-hen, where two broods of one season fraternize with one another, with the result that the mother is at the head of a considerable flock.

The mammals frequently present analogous cases. In the Virginia opossum, says Audubon, there are three litters and more a year. The young of one may still be seen in the abdominal pouch, whilst those of the two others are found running about under the watchful eye of the mother. In the squirrel the three to seven young of the two annual litters form a troop of from twelve to fifteen following their mother. In Enhydris the family goes about, formed of a father, a mother and of the suckling young and the semi-adults. In the wild boar the mother moves about with the young of different years. In the orang-outang and the gorilla the mother and father have been met accompanied by young of widely different ages. There is no doubt that in mammals the family shows more tendency to be prolonged than among birds. In the case of the marmot the young pass the whole winter in the same burrow with their parents. Take also the case of the roe-buck (*Capreolus*). Rut takes place in April or in May, gestation lasts from eight to nine months, and the suckling young are three months old when the second rut takes place. These still remain six months with their mother and do not leave her until the birth of another offspring.

In the roe-buck, says M. Trouessart, brothers and sisters have been seen to copulate and to remain together throughout their whole life. There are reasons drawn from the social state, to be learned later on, which lead us to believe that between the moment when the young are emancipated, particularly from their mother, and that at which they reach puberty, the bond is less broken than among birds. But what is certain is that in both, the first rut breaks definitely this bond, and that among mammals as among birds no trace of affection survives between parents and young. They no longer recognize one another.

Conclusions. The family, in the vertebrates, is nothing but one of the phases of the reproduction of the species—its outward terminal phase. It solves for animals the problem of the development of individuals during the interval which separates the rupture of the egg from the moment when, being able to take care of themselves, they have only to reach puberty

Bi-sexual generation, outlined in the highest protozoans, has been pronounced by the accidents of evolution to be the form most favorable to the reproduction of constituted types—that is to say, of species. Instead of leaving the sexes united in one and the same solidarized colonial individual, adaptation obeying the law of specialization of functions has separated them and lodged them in different individuals. A difficult situation resulted—that of two individuals having the same rights to the proprietorship of the resultant offspring, and the same physiological obligation of caring for their development. In some invertebrates the question is simplified; the male dies when he has fulfilled his indispensable rôle. In this

uncertain epoch in the history of successive creations, where the fishes and the reptiles are born and differentiated, there are traces of hesitation. The hatched eggs perish, for want of care, in large quantities. Here was the opportunity for selection. The egg having been laid and fecundated, or fecundated and laid, who should assume charge of its outward development—the male or the female? In the birds and the mammals, the solution has been reached—it is the female. Organic and psychical impulses have been created in her as the result of the law of utility: the best survive, the poorest perish. But seeing that the male does not disappear after having fulfilled his necessary rôle, why is not some use made of him? Analogous impulses to those formed in a female, prompting him to share with her the family burden, are then produced. But we have seen that adaptation has not attained absolutely identical results in the birds and mammals. In the majority of the former the male, prompted by a high sensibility, has become an excellent *pater familias.* In the majority of the latter adaptation has gone afield; the sensibility of the animal has labored under disadvantages; the egoistic impulse has gained the upper hand over the altruistic impulse. And this stands to reason. The female, passive by nature, has uniformly yielded to sensibility from her earliest origin in the protozoan cells; the male, who has been active since the same period, has been confirmed in his consciousness of will and of initiative. He has retained the active rôle in rut. He has also remained active in the majority of mammals in the sense of seeking to possess and to have around him as many females as possible. While from a different aspect of the same egoism the Carniv-

ora have become monogamous, the majority of the Ungulata, of the marine animals and of the monkeys have become polygamous. The goal is thus missing here towards which adaptation has so successfully proceeded in birds. The conjugal union, instead of being an altruistic association having in view reproduction, is the supremacy of the male over one or several females. The family, instead of being confined to one female and to a reasonable number of young which could be reared and protected, is a clan, of which the male is the chief. Polygamy in the Ungulata is a digression of adaptation. If it still persists in the Monkeys, it is because it has not been able to regain the straight path. In the anthropoids, it is true, the scene is changed, and these animals have again become monogamous.

It remains for us to see what influence the various groups connected with the family and also the family itself have exercised on the formation of animal societies—a study which will carry us to the next chapter.

CHAPTER IV.

Animal Societies. Their Evolution in Fishes, Reptiles, Birds and Mammals. Concluding Remarks on the Present and Preceding Chapters. Parallel between Animal Colonies and Animal Societies.

We have seen that the principal agent employed by evolution in the creation of organisms of increasing complexity is association. Individuals join together in aggregates, preserve their independence for a greater or less period of time, gradually adapt themselves to one another, and end by becoming amalgamated in a single organism. Where there were many individuals there is now but one; cohesion has given rise to continuity among all the parts—that is to say, to a morphological unity.

The kind of association which we are now about to consider is entirely different. Here, the individuals are unrestrained and distinct; they come and go; their egos are preserved intact; the bond which unites them is virtual, not material. Nevertheless, a large body of philosophers regard the two sorts of association as essentially the same, some restricting themselves to simple comparison, others going so far as to contend that their principles, their organizations, and the laws that govern them, are identical. We shall see what this amounts to.

We have already learned that morphology and physiology both tend to reduce the causes which lead animals generally, and the highest particularly, to

form temporary or continued associations, to two: the necessity of satisfying the wants of the organism, the upshot of which is egoism, as a matter of imperative duty; and the need of relations with one's fellows, which culminates in altruism, a product of development from egoism by differentiation.

Struggle for existence, emulation and competition—three things which hang together—are the logical consequences of egoism. The best endowed, those which know best how to take advantage of the opportunities offered, survive and increase. The acutest form of this antagonism is where one animal, to stay his hunger, is forced to devour another. A second widely-spread form is *parasitism*, in which the animal takes up his abode upon or within another and partakes gradually of the latter, according to his needs. Next comes *commensalism*, in which the animal still selects its abode on the surface or in the interior of another, but confines its operations to taking advantage of its situation without doing harm to its host. Example, the little red crab of our common oyster. The following cases are of an allied order: the case of Amphibena, a bird which inhabits ant-hills under sufferance of their proprietors; that of *Elaphis esculapis*, which shares its nook in the thicket with a swarm of hornets; and that of the pilot-fish and the remora which keep company with the shark.

Next comes the state of *unilateral mutualism*, in which one species is made use of by another and performs services for the latter, but without receiving anything in exchange. The instance of the crocodile and of the bird Trochilus, on the banks of the Nile, is well known. This bird performs two services for the crocodile: it enters its mouth and dispatches there

the worms and leeches which trouble the crocodile; it flies rapidly away, giving vent to a peculiar cry when the ichneumon, the enemy of the crocodile, approaches, thus apprising its companion of the ichneumon's presence. In return the crocodile shakes its tail whenever it wishes to close its mouth, thus giving the bird warning. The crocodile in no wise recompenses the little animal, but contents itself simply with respecting its person. The service rendered is unilateral. But it is easy to understand that by the exercise of extremely little intelligence, if not unconsciously, the crocodile may be led to defend its Trochilus. The same remarks are applicable to birds which associate with certain Ungulata—as Hyas and Ardea with the hippopotamus, Textor with the buffalo of Kaffraria, Buphaga with the elephant of Asia, Ardeola with the elephant of Africa—and which follow them and devour the insects lodged in their thick skins. Interest is the sole impulse of these birds, and in all likelihood it would also be that of the Ungulata in defending them.

The domestication of one species by another is a further instance of unilateral mutualism. A good example of this is that of certain ants who reduce other species to slavery and allow themselves to be fed by them. When man causes domesticated animals to administer to his wants, his pleasures or his caprice, he supports them in return for their pains, but it is also true that he cruelly slays them when they have ceased to be useful or pleasing to him.

As an example of *bilateral mutualism* we shall cite the case of certain aphids and ants. The aphids secrete an abdominal fluid which distends them; the ants are passionately fond of this secretion, suck the

same from the aphids, and finally, in order to keep this precious source of nutrition always at hand, provide them with food; the result being that the aphids are converted into genuine milch cows, which are kept and watched in stables. Another example is that of the indicator-bird, or honey-guide, and man. The former arrests the latter by his cries and points out to him the location of beehives, by which both then profit. If this partnership were not formed, the one could not obtain the chrysalids of which it is fond, nor the other the honey. Continuing thus, we come to the cases where one animal borrows the services of another temporarily, as is the case with the serpent, who is ferried across a river by a duck, or to the cases where several animals assist one another in crossing streams of water, in lifting a large stone, in moving the trunk of a tree, in constructing a dam, in hunting, or in mutual defense.

So far, the only cause which induces animals to associate together is *interest.* The second cause, though of a quite different character, is possibly more powerful—*the need of company.* The struggle for existence is not so general nor merciless as some extreme disciples of Darwin would maintain. There are frequent lulls. Many species do not have antagonistic wants; the animal is not always possessed of blind hunger; he does not always covet the place of his neighbor; his motives for quarreling are sometimes extremely slight. The Carnivora are the born enemies of the species that constitute their food, but the Herbivora have only a desire for plants, fruits, roots, barks, etc. Both the one and the other have their moments of necessary repose. Rest is as imperious a want as activity. The Carnivora give most of their

time to activity, but the Herbivora spend the greater part in rest. Buffon goes too far, but is in a measure right, when he says: "The animals that live on the fruits of the earth are the only ones that form societies. Abundance is the foundation of social instinct, of that gentleness of manner and peacefulness of life which characterize only those who have no grounds for quarreling." In fact, a danger which keeps one constantly on the alert, a gloomy climate, a desert country, the necessity of always thinking of the prey which one stands in need of, lead to agitation, to defiance and to egoism. On the other hand, security, the absence of anxiety, beauty of environment, abundance of food and rumination, lead to *far niente*, to sympathy and to love. The animal has no aversion for those who intend him no harm; he approaches, regards his observers with curiosity, and even seems to solicit their caresses. Darwin has described the tameness of wild birds towards man. The latter is shunned only by animals who have learned at their cost to fear him. Man is the greatest enemy of animal societies. Prior to his time, they were unquestionably very numerous. The pastures of Pikermi in the Miocene epoch, the innumerable and multifarious herds of mixed species which the first travelers in Central Africa encountered are a confirmation of this fact. The societies of buffaloes, of beavers, of chamois, and of numerous other mammals, all dwindled and melted away on his coming. Extensive societies of birds are encountered only in regions sparsely settled by man, as in the northern countries which Dr. Labonne visited. Where man does not slay, he domesticates. The natural troops of the Andes and of the Himalayas have been replaced by

more or less domesticated troops. We assist in the destruction of animal societies.

Whatever be the physiological mechanism by which it is engendered, whether it be that which I set forth in a preceding chapter or some other, it is an undeniable fact that the social sentiment does exist in varying degrees in the majority of animals. All, from the reptiles up, but particularly the birds and the higher mammals, possess the emotional sensibility from which it is derived or which is the consequence of it. Animals associate individually with their fellows or with different species; they exhibit sympathy, and they love, sometimes intensely, sometimes unto death. Every one has witnessed the surprising friendships which frequently spring up between two animals of contradictory characters, even among Carnivora—friendships which sometimes neutralize the most antagonistic instincts. This sensibility is differentiated in a multitude of ways. Mr. Romanes has followed it up under the heading of "Emotions" in his work on *Animal Intelligence.* It is an admitted fact that in domestication man has only developed qualities which pre-existed in the species. No one will deny but altruism has attained its highest development in the dog, to mention but a single instance.

In the *Fishes* we meet with five or six kinds of associations or assemblages, to-wit: (1) Assemblages between species or between individuals of the same species, which should be styled *indifferent.* These are numerous, even throughout the entire range of invertebrates, as among the sponges, corals, mollusks and insects, and depend on conditions of nutrition, of temperature or shelter, of sandy or rocky

bottoms, of calm or agitated environments, according as these conditions suit with the same needs of different species. All that is necessary is that such contiguous species should have little ground for quarreling. (2) Assemblages of the same species, the object of which is hunting in company. Such are the shark and the dog-fish, which form shoals in the Channel and pursue the herring; or the carps, which also "live together," we are told, and hunt in company. (3) Associations of the same species for distant voyages. The simple fact that we have to deal here with one species only, like the herring or the sardine, proves that such assemblages are less indifferent than the others. At certain times of the year bands of fishes assemble and travel off either for a change of climate by passing from a cold to a warm region, or in order to find certain kinds of food which abound elsewhere. These bands or shoals frequently comprise a countless number of individuals. Fishes enjoy exceptional facilities for such migrations; they are fast and easy swimmers, and the currents, too, help them much. (4) Migratory associations, having in view the special end of spawning in remote but favorable localities, to which it is their custom to resort for this purpose. (5) Still another sort of this last kind of association, the object of which is less definite. The salmon is an example of it. Born near the sources of rivers, the salmon descends to the sea, sojourns there seven or eight months, and then again ascends in shoals of from thirty or forty to the place whence he came to perform there the functions of reproduction. Are the fishes acquainted with one another under such circumstances? We do not know. At any rate, in certain species they play together.

In the *Batrachia* and *Reptilia* one of the conditions of assemblages is greatly weakened. These animals have not the same facility for moving about that fishes have; they creep around on the earth and are frequently very clumsy. Among the terrestrial Reptilia certain crocodiles undertake migrations, but only for short distances, along the banks of rivers. Among the marine Reptilia may be cited the turtles, which journey annually to deposit their spawn on distant shores. Indifferent assemblages are frequent, for example, among lizards upon a surface exposed to the sun, or among crocodiles upon the shores of a lake or of a river. Does any durable bond actuate them? Crocodiles thus associating are totally indifferent to one another; no tie whatever results from their union. The lizards, on the other hand, live in perfect harmony and play together; some wander about in little bands, like the Varunus and the Gecko. The blind worm (*Anguis*), the rattlesnake and *Tropidonotus viperinus* also associate in bands. Marine turtles remain together even after spawning, but seem to take no interest in one another; they neither engage in mutual attack nor make mutual defense, but swim along together from force of habit. Was it this sort of companionship which led to migration for spawning, or was the contrary the case? A special cause of assemblages, entirely passive in character, may be observed in reptiles. I refer to their hibernation, or periodical torpor, during the long months of winter, where great advantage results from keeping one another warm in holes. Snakes and blind worms (*Anguidæ*) are thus frequently found twined together in solid masses. In 1876, in the forest of Fontainebleau, opposite Thomery, while blasting rock, the

workmen came upon a cavity containing three hundred and twelve vipers, which had taken up their abode there for the winter.

Birds.—These present all kinds of assemblages save that of hibernation—to-wit, indifferent assemblages; assemblages from pure sociability; assemblages for migratory purposes; assemblages between different species; assemblages for nesting together; and family assemblages.

The kind which gives rise to the largest assemblages is migration. The birds are in this regard even more favorably situated than the fishes; they cut the air with almost vertiginous velocity, changing their climate at will. Some in Europe, for example, descend from the northern countries, as is the case with the duck; others, starting from central regions, fly to the shores of the Mediterranean and Africa. The life of a migratory bird in our Northern Hemisphere is passed as follows: In the winter in the South it lives according to its habits, either alone, or in groups, or, in exceptional cases, in pairs, dating from the preceding season. In the spring it departs. Reaching its destination, it devotes several months to reproduction, and during the time which is left to it it resumes its usual habits. In autumn or later it takes its flight again to the South. Sometimes it departs alone and remains alone during the whole passage, as does the woodcock. Sometimes it departs alone, but falls in with companions on its way, which is the case with the quail, who ultimately arrives in flocks of some size, part of which stop in Provence, but the majority of which reach Africa. In some cases the two sexes form distinct groups, which do not join each other until after their arrival, the males

being in one flock and the females and their young in another, as is the case with the turkey and the fighting sandpiper (*Philomachus*). Most frequently a signal is given, all the individuals of the same species within a certain region assemble, turn, soar upwards and depart in a body. Of this kind are the passenger-pigeon (*Ectopistes*), the swallow, the stork, the crane, the crow, the goose and the rook. Some journey only by day, others by night. These flocks vary in number from a few individuals to hundreds, to thousands, and, in one instance of the passenger-pigeon, estimated by Audubon, to one million one hundred thousand. Sometimes isolated individuals or whole flocks of other species join them. In the majority of these societies harmony reigns; in others quarrels and serious combats arise. Save in the turkey, there is no noticeable head or chief of the flock, but frequently, as is the case with the crane and wild duck, there are leaders who take the head of the column and relieve each other by turns. Their flight is confused, in the shape of a triangle whose vertex cuts the air, or in columns or in groups. Sometimes the aged males, or the females with their young, or even the young males, will fly separately. The few couples which are observed are those which had not separated on departure, or which, on returning, had just begun to mate for the coming season. On their arrival the assemblage or flock may remain intact for some weeks, or for one or two months, but in most cases it breaks up and is dispersed. In sum, they all obey collective habits which have been insensibly formed, consolidated and converted into a periodical instinct which the bird obeys. A quail, for example, kept in a warm cage, well fed, and ignorant of every-

thing about him, experiences lively agitation at the time of annual migration, seeks to escape, dashes himself against the bars of his cage, and, as the upshot of his desperate attempts, may drop down dead. It would be useless to add that sedentary societies are transformed most readily of all into migratory societies, and that the spirit of sociability which is habitual with them has also its effects upon the latter.

Sedentary assemblages present many gradations from the indifferent or interested form to that which I have styled assemblages from pure sociability. It is not a temporary and intermittent necessity that is in action here, but commonly a quite pronounced need of playing together, of singing together, of making responses, of abandoning one's self to all manner of pranks and crochets — in other words, of thorough enjoyment through companionship. They are permanent, but principally so between the periods of rut or of the whole series of reproductive phases. They are made up, according to the season and the species, now entirely of males which have completely or partly abandoned their females, now of males and females followed by their young, which have grown up and are continuing their education under the supervision of both parents or of the mother alone, and again of males, of females, and of offspring which are totally emancipated, the males and the females either paying no regard to each other or continuing united.

Contrasted with the sociable birds of the preceding category are the unsociable birds. The following are a few types leading from the latter to the former.

The first type is that of birds which are perfectly egotistical, which live entirely alone or indifferently

with others without bestowing on them the least concern or paying them the least attention. Examples are the woodcock, the pheasant, the thrush (*Turdus*), the kingfisher, the cuckoo and the albatross. The second type is of birds which in general life are egotistical, but possess some traces of family sentiment, and occasionally associate with a few of their fellows for purposes of hunting. The eagle, the vulture and the falcon are varieties of this type. The third type is of birds which assemble in vast numbers without manifesting any interest at all for one another, but which understand on occasions how to combine their movements for common defense. Examples of this type are several marine birds, like the sea-swallows and many stilt-birds. The fourth type is composed of birds which are egotistical, but which form closed and exclusive societies into which no strangers are admitted. An example of this type is the swan, which perfers to live alone rather than to join other groups even when it could be admitted. The fifth type is of birds which form open associations where harmony and happiness reign supreme. These are the immense majority. Such are the passenger-birds, the swallows, the Corvidæ, a large number of stilt-birds and palmipeds and the creepers. The parrot is the most advanced representative of this type. Parrots make expeditions like those of the cercopithecoid monkeys, (which we shall speak of later), form organizations and station sentinels.

One of the most striking proofs of the spirit of sociability among birds is found in the facility with which many of them associate with individuals of different species, but slightly distant from them zoölogically. Here again a gradation appears, run-

ning from absolutely indifferent assemblages to the most complicated and harmonious societies. The following are the degrees: (1) Unsociable species which chance temporarily holds together but which take no interest in one another; examples of which are the eagle, the buzzard, the vulture and the kite. (2) Species whose mutual company is agreeable, but which do not seek one another, which contract no unions with one another, and derive no advantage from their mutual society; examples of these are the nut-hatch (*Sitta*), the tomtit (*Parus*), the finch (*Fringilla*), the kinglet (*Regulus*) and the creeper (*Certhia*). (3) Species which are egoistic and solitary by nature, but which possess qualities that lead other species to gather around them in order to take advantage thereof, and which neither avoid these species nor take any notice of them. Examples are the green-shank and the curlew, which by a peculiar warning cry give the danger-signal to all the inhabitants of a locality. (4) Species which associate together pleasantly, the one having qualities by which the other profits. Examples, the godwit (*Limosa*), a genus of stilt-birds (*Hypsibates*) and the avocet; the first, which is more intelligent and more vigilant, ultimately acquires through these unions a considerable authority over the others. Another example is the unions in the marshes of Hungary between the heron, the ibis, the cormorant, the tern, the goose and the pelican. (5) Sociable species in all their relations with their own fellows and with stranger species, without there appearing to be any interest on either side, the motive being absolutely the instinct of sociability. These are almost the same as those of the preceding fifth type: the passenger birds, the parrots, the Corvidæ, etc.

The last form of assemblages is for nesting in common. Females abandoned by their males immediately after rut sometimes *lay* their eggs all in one nest, not with a view of sharing the common burden, but for the better defense of their eggs. The turkey is an example of this type, the male being the sworn enemy of its eggs. The polygamous females of the ostrich do the same, but for a different purpose. We can recall no example of females abandoned by their males actually *nesting* in common. On the other hand, this practice is frequent in the second and third periods when the father participates in it. Examples are the gannet, the cormorant, the petrel, the swift, the chimney-swallow, the rook, the heron, the weaver-bird, the bee-eater, etc. At times a single species, and again different species, associate thus together.

Let us stop and consider a few cases. The gannets, one of those species which in other latitudes help to produce guano, have been described among others by Audubon as they live at the mouth of the St. Lawrence. They arrive from the South in successive flocks of from fifteen to one hundred and take up their abode on the islands there. Here they copulate and construct their nests, two feet apart in parallel rows. If one of the females steals the twigs of her neighbors, the others will all combine against her. When they brood the males hunt for them in the surrounding regions and on occasions will even sit themselves. Later, when the young are able to run about, or fraternize with one another, the nests are trampled upon and the lines effaced. At the end of about four months, all is finished, the young quit the rocks, emigrate and do not return until the following year. Audubon also describes the nesting-places of

chimney-swallows, which are the same as tree-swallows, at least prior to the transformation of their instincts. These, too, are migratory birds, and form in their nesting places veritable societies. Audubon has counted fifty nests in the cavity of a sycamore tree, and has seen as many as eleven thousand swallows repair nightly to this place in search of shelter. He saw as many as one thousand enter a chimney one evening.

The communal nesting-places of the heron (*Ardea*) of our country are extraordinary from another point of view. A more or less extended group of trees is chosen by them in a swampy country. Thousands of couples repair thither, each tree supporting, at different heights, from fifteen to one hundred nests, together with the nests of other species, such as Nycticorax, Ardetta, Phalocrocorax and Herodias. Nothing is more deafening than the hubbub which these various united species make. The most curious case is that of the weaver-bird (*Ploceus*), and particularly that of Philetærus. Levaillant, the South African traveler, has counted as many as three hundred and twenty nests or couples on the same tree, and in this instance all of the same species. The nests touch and are covered by a sort of umbrella-like tent fastened in the branches. In these cases the subsequent life of the bird is not prejudiced. The Philetærus, when its family is broken up, returns to its old life with other and different species. In its social intercourse with these no trace survives of the families which temporarily existed in the previous state.

This leads us to close our remarks on birds by insisting on the facts relative to the varied influence which the family instinct exercises on the social

instinct. It is certain that in a general way the species which are most sociable are also the most highly endowed with family qualities. And as examples we might cite the passenger birds, the Corvidæ and the creepers. But a large number of species with a family turn are quite refractory to any kind of social alliances, as is the case with the Raptores. On the other hand the Gallinaceæ, which are considerably averse to family unions, are strongly inclined to sociability, whether with their fellow-birds or with other species. I need only recall the case of the wild duck, which abandons its females and does not return until the young have grown up, but is yet extremely sociable. Of particular cases I may mention the water-hen, which has a strong family turn, but forms neither sedentary nor migratory societies, and particularly the Molothrus, which lives a social life, but has so little of the family sentiment as to be given to polygamy and polyandry, which, further, does not form couples, and whose female lays its eggs in the nests of others.

In another point of view, while the sexual instinct forcibly brings the sexes together, and the family instinct brings them together as a matter of option, on the other hand the sexes are frequently observed to separate in general life and to form distinct groups within the flock or apart therefrom. The young males themselves separate from the young females, who stay a much longer time with their mother. Thus, in the pheasant, the young males quit their mother in the autumn, whereas the young females do not leave her until the spring. As to the natural duration of the family, which is fixed by the ability of the young to take care of themselves, we have already seen that it is sometimes curtailed by the return of the sex-

ual desire in the parents, who drive away their young *nolens volens*. Nevertheless, when there is but one brood a year, or where only the young of the last brood are concerned, there is a distinct tendency on the part of the young to remain longer in the society of their mother, who is then not opposed to their staying, or may be even desirous of it. Such is the origin of the coveys of partridges which pass with us the winter and do not break up until springtime, when rut returns. Coveys of this kind even join others and form multifamiliary societies. In the American ostrich (*Rhea*) this occurs; but the society has here little coherency; the members wander off or pass from one flock to another. In the great bustard several families join and form flocks amounting to several hundred individuals; but in the spring, during the period of rut, the society breaks up. The only case among birds favorable to the theory that the family is the nucleus of society is that of the guinea fowl. It has from fifteen to twenty young, for which both parents care. At the end of the season six or eight families are joined together, harmony reigns in the bosom of this little society, an old male governs it; and yet they do not know how to render each other mutual assistance in times of danger, but all flee in different directions. We shall conclude on this subject later.

Mammals.—These enlist our whole attention. They present all the forms of assemblages, of a more or less social character, which we have as yet encountered: indifferent, accidental and temporary, for purposes of migration, for purposes of reproduction, sedentary, between different species, and for purposes of hibernation. Marine mammals, which have the same facilities

for speedy locomotion as fishes, bats which fly like birds, and certain Rodentia and Ungulata offer examples of associations for distant voyages. In the same order of facts, we may recall the short journeys which the marmots and chamois undertake in the winter from regions of snow to the valleys. The seals and the Chiroptera afford examples of distant journeys for reproductive purposes. We shall next say a word regarding assemblages for purposes of hibernation.

We have spoken of snakes and slow-worms (*Anguidæ*), which enter a state of torpidity during the winter, and which are found entwined in large masses in cavities and holes. Birds fly from the cold with too much facility to have any need of hibernation, and besides they are warm-blooded. In the lower mammals hibernation is pretty common, but only in individuals of solitary habits, like the hedgehog, the shrew (*Sorex*), the dormouse (*Myoxus*), the hamster (*Cricetus*) and the harvest-mouse. Hibernation in common is rare, but occurs, for example, in the mole, which has a disposition to burrow in common, in the squirrel, where the whole family burrow by the side of one another, but it is notably the case with the marmot. In the higher mammals a trace of hibernation, relating not to society but to family life, is observed in the white polar bear during the period of gestation. The female of the white polar bear digs a hole, and getting into it, causes herself to be covered by snow, staying so covered until spring. In short, hibernation points to nothing as regards the disposition of mammals to form societies.

In the lower mammals, such as the Monotremata, the Edentata and the Insectivora, social troops are not formed at all. The majority, if not all, live soli-

tary lives, and some are entirely wanting in the family spirit, as is the case with the porcupine ant-eater, the Armadillo, the ant-bear, the pangolin, the sloth, the tanrec and the shrew, while others are less refractory in this respect, like the duckbill and the hedgehog. The aardvark (*Orycteropus*) is the only one of the Edentata that is met in twos or threes. The mole is the only one of the Insectivora that possesses any social instinct; each has its special burrow, but common corridors exist in which as many as fifteen to twenty individuals dwell.

In the Marsupials the progress is scarcely perceptible. The majority live alone. Still, in the kangaroo-rat several congregate in a common burrow. In the common kangaroo we meet with indifferent assemblages; these animals graze together in bands numbering as high as eighty individuals, the same ones returning on the morrow either as before or with others, as chance decides. Sometimes three or four evince a preference for one another, but no mutual interest. On the slightest occasion each one flees in his own direction without any attempt to join the troop again. And yet the kangaroo exhibits some susceptibility to education in the hands of man; all have heard of the kangaroo boxers.

In the Rodentia the progress is apparent. Some live solitary lives like the dormouse, the hamster, the porcupine, the jerboa, the hare and the squirrel. The jumping-hare, it is said, lives in large families comprising several couples. In the South American rodent, Lagostomus, a dozen families occupy the same burrow, over which a male watches and gives the signal in case of danger. The vole or meadow-mouse is very sociable, and sometimes lives in large colonies,

the burrows of which communicate with one another and are dug side by side in the same field. The voles, and particularly the lemmings, are celebrated furthermore in northern countries for their enormous emigrations. Their excessive fecundity enables them rapidly to exhaust a country, whereupon they set out in quest of new feeding grounds, in obedience to habits which have persisted for ages and frequently survived their reason for being. Mice and rats, as we know, gather in considerable numbers in localities favorable to their wants. Rats sometimes sleep in a sort of common nest, embracing to keep warm. At night they travel in troops, either in quest of new localities, or to make excursions in the open, all the while observing strict rules of prudence. Rabbits are divided into tribes occupying separate fields; each couple has its own burrow, connected with the others. They go out together in the morning, and at night are watched over by an old male, who apprises them of danger and urges on the stragglers. The marmots live together and have two kinds of dwellings—one in summer on elevations, the other in winter in lower places, where they hibernate in common from seven to nine months. The prairie-dogs have what the Indians call villages. Each has its burrow, with well-kept winding pathways between; the lookouts show here and there their heads; they pay one another visits and play together; the habitation of some important personage being the main point about which their wanderings center. If one of them is wounded or killed, another will quickly drag its body into the nearest burrow while the hunter is reloading his piece. Other and not less celebrated villages were those of the musk-rat and the beaver. The huts of the latter are

grouped about a pond; all the members of the community join in cutting and hauling trees, in the constructing or repairing of dams, in digging canals and in storing provisions. Their works are maintained from generation to generation, and from time to time the excess of the population moves off and settles farther away.

The question may be asked with regard to the beaver, whether mutual assistance is the original motive of their living in societies, or whether this mutual assistance is a secondary outgrowth. In the prairie-dog everything points to the conclusion that the desire for company is the sole motive. In the multitudinous swarms of lemmings necessity and imitation may account for everything.

The Chiroptera resemble the Insectivora. They all live in bands, which hibernate together, and sometimes migrate from one distant isle to another. In France there are famous caves which bats have inhabited from time immemorial and where they have accordingly deposited a thick layer of guano. The interesting point in the history of Chiroptera is this: The females, having been abandoned by the males after rut, gather together in groups of a dozen each in some hole of the cave, where they give birth to their young and rear them in common.

The marine mammals present a similar case, which recalls the practice of communal nesting in birds, and which is complete, complex and prolonged. We shall speak of them now, although in some respects they are allied to the Ungulata.

The marine mammals are all polygamous, with the exception of the walrus and the dugong, which are monogamous. They all live in herds. The whale is

less social, often living a solitary life, yet sometimes forming herds for the purpose of voyaging or of rut. Some assemblages, the main object of which is play and companionship, are also met with, as among the dolphins. They are also sedentary societies. Thus M. Trouessart speaks of a colony of seals which had taken up their abode in the Bay of the Somme. The five hundred sea-lions at the Golden Gate, near San Francisco, which are protected and fed, form also a sedentary colony. But the interesting groups, although difficult of explanation, are those which have the triple object of voyaging, companionship and reproduction. Let us essay a sketch of them. These assemblages are composed, according to the season, of complete polygamous families, with a male swimming at their head, of groups of so-called solitary males, of groups of pregnant females, of groups of variously aged young, and of scattered bachelor males. Under what circumstances do these elements separate or come together? Let us abridge the description given of one of these species, the Arctocephalus or sea-bear of the Falkland Islands, by Steller and others.

In November, we are told, the old males arrive at these islands and scatter out on the beach in long files. In December the females arrive, and immediately violent combats are fought for their possession. The young males arrive several months later. At the end of April they all put to sea; in the middle of June the beach is deserted. So far as I should judge, their conduct has reference solely to rut. The female has one to two young, and carries them from eight to ten months, which brings us to the following season. The following, then, is the picture which is drawn for

us: Each male has from three to fifteen, thirty, and even as many as forty females, and his entire family may amount to as many as one hundred and twenty individuals, which includes, surely, the young of one year. The beach is divided off into sections ten meters square, each occupied by a different family. The females pass their time in sleeping; the young play together like little dogs; the male is near at hand, and looks on; if the young ones come to blows he comes growling upon the scene, separates them, embraces them, and continues with them their game. If the females behave badly he chastises them; they crawl at his feet, seem to beg his pardon, and shed copious tears. At times males and females weep together. At a period which is not mentioned the old males separate and go away. A little later all of them quit the beach, each family swimming together. What happens afterwards? Do these families and the various other straggling groups unite and form assemblages comparable to herds or societies?

Among the mammals the Carnivora are the counterpart of the Raptores among birds. They live on flesh, spread terror about them, are ferocious, and reap none but the fruits of egoism. In hard times they devour one another, and, when forced to it, even eat their females and their young. Nevertheless, some associations are formed among them having in view useful ends. At the head stand the Felidæ. These live alone or in couples, chance alone occasionally inducing some of them to unite for the purposes of chase. The leopard is met in troops of from six to eight. The Canidæ vary. The Colsun of Deccan hunts in packs of from fifty to sixty individuals, the dingo in families. The wild dogs of Constan-

tinople and of Egypt are divided into tribes, each having its headquarters and admitting no stranger. The jackal sometimes hunts alone, sometimes in company. Wolves lead solitary lives in summer and combine in winter into large packs. The blue fox of the poles live in packs, station sentinels, but are not less unsympathetic for this reason; they quarrel incessantly and engage in bloody combats. The Viverridæ live solitary lives. A species of the mongoose (*Herpestes*) and the daman (*Hyrax*), of Abyssinia, are often found together, and give an instance of association between different species. The Mustelidæ also live solitary lives; of these the badger is the most egoistic specimen. There is one exception, however, the weasel, which has a developed social instinct. Two or three stories have been told about it in this connection. A man once carelessly attacked a weasel, which, driven to bay, uttered a war-cry to which twenty weasels responded; these, issuing forth in all directions from their burrows, charged the hunter and forced him to flee, covered with wounds. This is solidarity. The Ursidæ live partly solitary lives and partly in small troops. The coatis (*Nasua*) in this respect are of two kinds. One lives a solitary life when not in rut, and the other lives in troops of from fifteen to twenty individuals, conducted by the oldest. But the harmony in these groups is far from perfect. The otters (*Lutra*), finally, live solitary lives, although in one marine species family life is, as we have already remarked, considerably developed.

The Ungulata are quite differently situated from the Carnivora. They are herbivorous, their food is obtained with a minimal effort and without strife. They pass a part of their time in ruminating with that

serenity which every one has noticed. Their life has all the quietness and peace which Buffon regarded as the fundamental condition for developing the social spirit. They all live in small or in large herds, at times temporary, but generally permanent, with regard to which the sole problem for us is to discriminate between what is accessory to the family and what is social. Some of them emigrate, and their societies are then combined in greater or lesser numbers. Among the latter we will cite the reindeer, which annually migrates from regions near the pole and returns there to obtain its favorite lichen in herds which have been known to reach one hundred thousand heads; the antelopes of Central Africa, which go in quest of fresh pastures in herds numbering as many as fifty thousand heads; the buffalo, which was formerly seen in incalculable numbers. A pioneer's wagon once took eight days to cross an unbroken column of buffaloes.

In the Solidungula all three kinds of herds occur: family, social and migratory. The first is simply the permanent polygamous family, such as we have described among the wild ass (*Asinus hemionus*) and the onager, and which, as we have seen, was created as much by the desire of the male to have about him a herd as by the sexual impulse. The second is a union of a larger or smaller number of such families; the number of individuals here amounts to hundreds in the so-called turpans or wild horses of Mongolia, and to thousands among the cimarones of La Plata. In the latter there is no observable leader. In the turpans there is also none; the command is collective, and is lodged in the heads of the families. When the herd is attacked, they all form in a circle, with

the mares and the foals in the center; their style of defense is methodical. The herd is not a closed one; if a domesticated horse takes refuge with them he is cordially received. Nevertheless, stallions without females and young males likely to give umbrage to the old males are compelled to follow on one side. The third kind of herd is formed for purposes of migration, and may be either the one or the other of the two preceding kinds, but particularly the second, created or augmented as the circumstances demand. A fourth kind is also met with among some Solidungula and resembles that which we have so frequently encountered between different species of birds. The zebra is an example of this class. It comprises two species, the dauw and the quagga, of which rival herds, numbering from ten to one hundred individuals, do not mingle. One of these, the quagga, receives into its herds other species, such as the gazelle, the antelope, the gnu and the ostrich. Is it need of company or utility which gives rise to these associations? As in the birds the most vigilant of this species act as guides, particularly the ostrich, who is highly esteemed for his prudence and sharpness of sight.

The ruminants have the same kinds of associations. In the guanacos and vicugnas of the Cordilleras the herd resembles that of the wild ass. It is polygamous during the three periods of rut, gestation and family life. The male is a chief of a herd, is jealous of the young males as they approach puberty, and is followed by his females and their young with devotion if not servility. In the mouflon two species behave differently. In the Tragelaphus of Africa all live solitary lives; when capable of reproduction the males ap-

proach the females in the season of rut, form with them a temporary polygamous herd, and then abandon them, each resuming his old habits, and the females being left alone with their young. In the musimon of Europe, permanent herds exist in which all ages and sexes are mingled. In the season of rut the males form polygamous herds, with which they retire aside, whilst the remaining young males and females and the males without females select the oldest among them as their leader. When the season of rut is over, all rejoin the herd and pick out a general leader, the strongest and most esteemed among them. The females are merged in the general body, each having sole charge of her offspring. The males evince no solicitude for the young, but assume their share of the collective responsibility and interfere in a body in times of danger.

Among the Cervidæ the monogamous reindeer is a type apart. There is a general herd in which all ages and sexes are mingled. Rut arrives; couples are formed, which go aside on the approach of parturition, afterwards wander around with their little one until the latter has waxed strong, and then rejoin the troop, where the family appears to be prolonged. There is a period, thus, at which the herd is represented solely by the young of both sexes. Outside, a few solitary individuals are found, old males which have been driven from the herd. There are several leaders who relieve each other; for example, in the nightly watch. In the stag (*Cervus*) the old solitary males are found isolated; the adult males are most frequently found forming a little herd apart; and the females with the fawns and the brockets are found united. In the season of rut the males capable of

reproduction and the females come together and form a temporary herd, whilst the celibates and other abandoned individuals gather in a second distinct herd, over which they appoint a temporary chief. After rut, the solitary individuals return to their old ways of life; the most sociable of the males remain with their females for a longer or shorter period of time. In Capreolus this union is intimate and protracted. In the Capridæ the whole breaks up into polygamy at the period of rut. The herd is formed by the females and their young of all ages. As is the general rule, the grouty and ill-natured aged solitaires are expelled from the herd. In the Bovidæ the herd is formed upon the model of the European musimon. The male performs the sexual functions, deserts the female who joins her companions, and then assumes the post of chief of the herd in partnership with the other males, one of them being selected to discharge the principal rôle.

In the antelopes differences are observed. There is the herd of the gazelles numbering from forty to fifty individuals and formed of monogamous families; there is the polygamous troop of the capricorns (*Cervicapra*), in which the old females are utilized as sentinels; there is the temporary troop, during times of rut, of the chamois, and the migratory troops, numbering from ten to fifty thousand heads, of the springbok. We even meet here with associations among different species.

The Pachyderms are the oldest of the Ungulata. Several are on the eve of disappearing, not only by the hand of man, but by the law of evolution, which requires that species which no longer conform to present conditions of life shall disappear. There is

reason for believing that certain of these species formed anciently numerous societies, of which we now possess barely the remnants. They all live in troops of from three to more in the tapir, of from four to twenty in the wild boar (*Sus scrofa*) and Phacochœrus, of from four to ten in the rhinoceros, of from three to four or from fifty to sixty in the hippopotamus, and of from four or five to fifty, and anciently to two hundred, in the elephant. The three individuals to which reference was made in the tapirs appear to bear to one another no family relationship, but are rather an indifferent assemblage, such as we meet with in the kangaroo. In the hippopotamus the groups of three or four may constitute families, but the groups of fifty or sixty are certainly assemblages of families. Among the Suidæ the twenty individuals which I once counted in the hog (*Sus*) correspond without doubt to a maternal family with the young of several farrows and not to a polygamous family, for the male is not at all sociable nor even disposed to make himself the chief of a herd. Assemblages of several polygamous families are met with among the peccaries of South America, concerning which we read: "They come in numerous herds, the male marching at the head, and the females following, with the young in the rear."

The elephant may be seen in herds ranging from five to ten, to fifty, to one hundred and fifty, and formerly in one case, to two hundred. Each herd is a family into which no stranger is admitted. The unfortunate individual who has lost his herd or who has escaped from domestication is taken up by none of them. He is obliged to lead a solitary life. They allow him to approach and drink at the same spring, but they never permit him to mingle in the herd at

large; thus he becomes ill-natured. The most prudent and most vigilant is chosen as the chief. Generally it is a male, but sometimes it is a female; the chief is deposed when his capacities wane. He has extensive authority and is always obeyed. He has been seen to station as many as five outposts around the herd, to whom he gives his orders and whom he changes. Harmony reigns in this society. The cardinal point is that this herd is really a family, I might add, a large family, composed of relatives of all degrees. My reasons for so believing is Tennent's statement that each of these herds can be recognized by special physical characters which are common to all. This is a certain proof of consanguinity.

These lines were already written when my friend, M. Louis Rousselet, the author of *L'Inde des Rajahs*, informed me that the males were often found separately in small bands. This would indicate a resemblance to many ruminants, like the deer and the big-horn. The males always show a tendency to assemble apart, as do the females with the young. This last division would be the repository, so to speak, the center of the community,—its constant fraction.

The Monkeys, from which we still exclude the Anthropoids, offer us numerous examples of the fusion of family and social elements, as well as instances of polygamous troops in which the male is master, and also some cases of solitary monogamous life. Several of them undertake journeys, but they do not form special migratory bands.

The Lemurs may be seen according to circumstances in couples, in small families, or in troops. Thus, the Maki by day sleeps rolled up in couples, and by night roams about in troops of thirty or more.

The Monkeys of the New World present all forms. The Nyctipithecus, as we have said, is monogamous, but does not form bands. The Mycetes lives in polygamous families of from three to ten members, and has been seen in groups of forty, which points to the association of several families. The Ateles lives in small bands, in which, besides the young and the females, are several males. The Cebus lives in large troops comprising both sexes, which other kinds of monkeys sometimes voluntarily join. The Saki, the Callithrix and the Arctopithecus also live in troops of varying magnitude, some forming but one family and others composed of several. In both cases there is a chief, who in the one is the father and in the other the male in highest esteem. The line of demarcation between the isolated polygamous family and the society is difficult to assign with the defective data now at our command.

As to the monkeys of the Old World no doubt prevails. All live in troops formed of banded families. Examples are the Semnopithecus, the Macacus, the Cercopithecus and the Cynocephalus. The expeditions of Cercopithecus are well known. The strongest male is the chieftain, and directs the movements of the troop, stations sentinels, is the first to advance, climbs trees to reconnoiter, accelerates the movements of the tardy, restrains the precipitate, exacts silence, and by divers grunts and growls issues orders which are both understood and obeyed. They all help one another, cleanse one another, and mutually extract thorns and slivers.

The Cynocephalus is more remarkable still. Brehm, who gained his experience of them in Abyssinia, describes their life in considerable detail. Their

troops vary from fifteen to one hundred and fifty individuals, quartered in districts of from a mile to a mile and a half wide, not far from a spring. We find together, for example, from twelve to fifteen old males and from twenty to thirty females, the rest being the young of different ages. In the morning, or if it rains, they may be seen in the highest galleries and cavities of the rocks massed together in a body, with the young supporting themselves by preference on their mothers, and the older ones on their fathers. Later, or if the morning is clear, they go in search of their breakfast, lifting the stones, tearing up roots and gathering fruits. After breakfast they climb up again to the rocks; the males take their seats upon the flat slabs and silently contemplate the landscape, while the females watch their infants play and quarrel. Towards evening they repair to the spring, seek their evening meal, and then pass the night in an old or in some newly found lodging-place. Brehm describes their offensive and defensive tactics under the direction of a commander-in-chief, their habit of prolonged observation before making a decision, the daring of some of them in their bold dashes to extricate a comrade from danger, and their overawing by attitude and look the dogs of their pursuers, which flee forthwith and take refuge behind their masters. He speaks of their collecting stones at a given point to throw at their enemies, of their even carrying these missiles up trees, and of their aiding one another in rolling the largest of these. Harmony reigns in the bosom of these societies, but between different species, as the Gelada and Hamadryas, old scores are sometimes settled in free and open-handed combat. M. Mizon has encountered in the neighborhood

of the Benue, bands of Cynocephali numbering as many as one thousand, which would allow no other monkeys, such as the Cercopithecus and Colobus, in their domain. The most remarkable instance of coöperation which I know of in the Cynocephali is that which Romanes has reproduced—of a regular combat delivered at the Cape against English soldiers. There was a perfect hail of stones. An old gray-headed male directed the operations of the various squads according to the strategic needs. The English were forced to retreat.

In the Anthropoids our knowledge is far from what we should wish. Like the hippopotamus, rhinoceros, and so many other animals, they are gradually becoming extinct, and their present state gives us no indication of what they anciently were. If at this day they live little in social groups it is likely because they are not numerous. The following is a summary of our knowledge of them: The gibbon and the chimpanzee love to play, and frequently unite and render actual concerts by striking with clubs the branches of hollow trees. The gibbon has been seen in troops of from one hundred to one hundred and fifty. The orang-outang has little social instinct; he lives a solitary life when old, or as a member of a family. Wallace has seen a male or female accompanied by semi-adult young, or three or four infants together, but never two males together. The gorilla has been met by Du Chaillu twice in bands of from eight to ten individuals. As to the chimpanzee, there is the statement of Schweinfurth, based on the accounts of natives, that the young associate in small troops. But particularly valuable is the exact affirmation of Livingstone, which we have already quoted,

that one of these species, the Soko, lives in troops composed of monogamous families.

Let us compare mammals and birds. The mammals, in the matter of society, do not offer the picture which, coming after the birds, we should naturally have expected from them. The sentiment which engenders the paternal-maternal and monogamous family in the birds, is weakened and has been diverted in the mammals, where in most cases it gives rise to the paternal and polygamous family. Also the social sentiment, which most commonly engenders societies in birds, has been weakened and diverted in the majority of the mammals. As a rule, the bird is more altruistic, the mammal more egoistic. In the birds the two sentiments of family and society are quite irregularly distributed in the different orders; in the mammals they form a scale running from zero in the lower orders to a high point in the monkeys. The natural linkage of the orders will perhaps explain these differences: they radiate in the birds, they proceed by steps in the mammals.

The lower mammals, such as the Monotremata, the Edentata and the Insectivora, are hardly better endowed with regard to family than the reptiles. In the Marsupialia, the Carnivora lead a solitary life, while the few herbivorous species that graze together are still in the indifferent period. The Chiroptera form a special group. They seem to crowd into caves, not from any social instinct, but because they find there conditions suiting their individual tastes. In the Carnivora, though high up in the scale and in intelligence, there are no societies, properly speaking, but simply temporary assemblages, having as their object attack in common, in which ferocity takes the

place of cordiality. In some Rodentia two forms of association are highly developed—the one for migrations on a large scale, and the other sedentary for mutual help and companionship. In the marine mammals association is developed with the twofold end in view of migration and reproduction, in the latter case in the form of polygamous families. In the Ungulata association is generalized under the triple form of isolated polygamous families, of banded polygamous families, or of associated monogamous families; the first being under the direction of a chief, who is necessarily the common father, the two others under the conduct of a single chief chosen from among the fittest, or under that of all the old males, acting as a single person. In the monkeys the associated polygamous form is general, but mingled with less spirit of domination and with more altruism in the male.

Among the birds we have noted: (1) associations among different species both for companionship and for mutual service, as frequent here as they are rare among the mammals; (2) large temporary associations for migrations, general as a rule, but rare among the mammals; (3) sedentary and permanent associations, of a cordial, gentle and ingenuous character, quite different from those ordinarily presented by the mammals. A few orders here and there may be made the subject of parallels. The Raptores among the birds and the Carnivora among the mammals are quite analogous. Egoism, monogamy, family spirit and no social instinct are their common traits. The owl and the weasel are exceptions; both are sociable. The parrots and the monkeys likewise are counterparts. Clamorous, easily teased, high family spirit

and sociability, concerted expeditions—such are their characters. In certain societies of birds, as the rooks, the swallows and the crows, there are indications of the formation of a species of tribunals for judging and punishing crimes and misdemeanors committed either within the flock or by strangers. In some mammals, and notably in the monkeys, sentinels are said to have been punished for neglect of duty in permitting the troop to be surprised. It is certain that some mammals, like the domestic dog, the cat and the elephant, have a confused but trustworthy notion of good and bad, of what is permitted and what is forbidden, and of what is just and what is unjust.

Let us summarize now some of our general conclusions:

1. All assemblages of animals, whatever may be the social form in which they have culminated, began as indifferent assemblages. Vague habits were unconsciously established between a few individuals; these habits were extended to others and even between different species. Pleasure resulted. The habits were confirmed, the pleasure grew. The social spirit was the result, it increased and led to organizations of life in common, often in the roughest and crudest form, but furnishing the framework within which were developed the customs and characters leading up to those which may be observed in the society of man.

2. At their origin these assemblages, whether they were temporary or prolonged, had no object. Each obeyed his own caprice, the impulses and wants of the moment. Some individuals endowed with the spirit of observation, vigilance, and initiative, ventured

upon some act which the others imitated. Imitation is a powerful factor in all social and individual phenomena. We observe it on a large scale in man, although his reason ought in a measure to preserve him from it; *a fortiori* we observe it in animals, in which reflection is rare and routine common. I shall always remember on the eve of the siege of Paris in 1870 the concourse of cattle which were gathered in the Bois de Boulogne. They wandered about dumb-founded; if one started by any chance in one direction, a second, a third, then ten, a hundred, a thousand would blindly follow; the first, pushed on by those behind, seemed to be the chief, leading, although unconsciously, the entire troop. Hornaday has given a like description of the buffalo on the prairies. In this manner may be comprehended those astonishing migrations of immense bands of fishes, birds, and of some mammals; chance crowned by success actuated the first, imitation drew after him the others; the habit once acquired the band was formed over again each year. There are migrations which have persisted for ages, although their original motive has ceased to exist; the instincts acquired are modified, transformed, and adapted to new conditions, but with difficulty.

3. The causes of the formations of animal societies are numerous. The first is habit following upon indifference. The second is imitation. What shall we put third? We were prepared, we must avow, after our biological review of the conditions of the problem, to find always in the front rank of the facts, individual interest, egoism, that "categorical imperative" which forces the ego to comply forthwith with the physical exigencies of the organism which it

represents. It is not so. And why? Because it is not logic that determines most of the acts of an animal, but spontaneity. Without doubt, the first impulse of the animal touches his conservation; he flees by reflex action when a danger is presented; he throws himself upon his prey when he is hungry; he demands tooth for tooth when attacked; he avoids the traps which are set for him. But when the first impulse for defense is past, under ordinary conditions, the other natural tendencies quickly regain the upper hand. He gives way to his sensibility, he does not reflect, he does not forestall. Between utility and what is pleasing, between the possible pain of to-morrow and the pleasure of to-day he is not long in hesitating. The true cause of the formation of more or less sedentary and of permanent societies is altruism: that altruism which we have seen to be simply the love of self through others, and which subsequently becomes a native sentiment as imperious under certain circumstances as egoism. It is the desire, the pleasure, the need of not being alone, of having companions, of exchanging with them one's impressions, of loving and being loved.

There are two kinds of animals: those which in daily satisfying their alimentary needs are obliged to be constantly on the alert, defiant and ready for combat; and those which having no ordinary ground for conflict give themselves up to the enjoyment of living and are naturally inclined to an existence of peacefulness and pleasure. The first are refractory to the social instinct; their egoism interferes. If they ever come together it is from necessity, accidentally and temporarily, to hunt their prey. They form assemblages and not societies. The animals of the second class,

when once on the way, rapidly acquire social habits and progressively gain in altruism what they lose in egoism, coming finally into the possession of a social instinct which in many species is quite powerful. Our meaning is not that individual interest is not manifested in the animal societies, but that it is secondary there: animals live together, they are exposed to the same difficulties of existence; it is necessary that their action should be mutual and concerted. In the social weaver-bird, as it is called (*Philetærus socius*), they have combined for the building of nests and for the rearing of the young side by side with one another; they have arrived, without a thought of the ulterior end, at the construction of a common umbrella-shaped roof for their nests. The beavers most likely gathered together in social assemblages before they undertook the construction of their great works. The leaders which the majority of constituted societies appoint, the expeditions which parrots and monkeys organize, are the outcome of a common interest; but the societies in question were formed beforehand to satisfy the need of living in company.

In a word, sedentary societies, according to the theory which we present, took their rise in and were developed by the altruistic spirit; individual interest by itself does not lead to anything consistent. Animals, contrary to certain appearances, as well as to the preconceptions of physiology and to current ideas, are more altruistic than egoistic. We judge them from our point of view, which is that of refinement and breeding. In this light, they are fierce and brutal; when their immediate material needs speak strongly in them, when their legitimate nervosity intervenes, they are violent, much to be dreaded, and quick in

defense. But when these needs are subdued or are easily satisfied, they are gentle, kind and affectionate. The numerous species which man has succeeded in domesticating, from the lizard and the snake up to the elephant, are proofs of this. One must not be guided by particular cases, but must look at the facts in their general bearing. The animal is perhaps superior to man in point of altruism! Animal societies are less polished, but perhaps more humane, all things being equal, than our own.

4. We shall not dwell on the subsidiary causes which concur in the foundation of societies, and which we have already discussed or touched upon incidentally—the need of play and of outwardly venting one's surplus of vitality, the impulse to sing, to be noisy, or to be heard, the need of exercising authority, of being feared and admired, and conversely the need of being assisted, protected, petted and loved. (See pages 50, 51.)

5. We now come to the influence of phenomena of reproduction on the formation of societies. In the first period of reproduction everything is opposed to the social spirit. The male and the female flee from their fellows, retire aside, and recognize only themselves. The instinct which presides at this period is egoistic to excess: the male must possess his female. Before reproduction he beats her when she does not yield with alacrity to his desires; afterwards he continues to beat her to assure himself of her being absolutely his. The solitaries are everywhere the most unsociable and the farthest removed from the family spirit, even in those species where the adult males remain with their females. Nevertheless, they are the most ardent in the period of rut. In the second period, of brooding or gestation, when the male and

the female have separated, both may enter the group of which they form parts; in the mammals the female never misses doing so. But when they remain together, the preceding situation is protracted, although it is less animal in form; they form a couple by themselves, have common joys, and experience no desire for comrades. In the third period two cases again are presented. When the family deprived of the male is maternal, at times the mother takes refuge in the general social group, seeking its protection, and at times she remains apart with her young, which fill her whole existence. When the family, on the other hand, is paternal-maternal, the mother, satisfied with having a protector for herself and her young, has no other desire, while the father also is happy in the task which he fulfills. The happiness and egoism of two, which we observe in the preceding periods, have become the happiness and egoism of three. They are indifferent to everything which is not themselves. Nothing could be more contrary to the social spirit. Towards the end, however, the male gets surfeited with his task, wanders away more and more, and finally rejoins his companions, when his social instinct carries the day over his family instinct. At other times, when the young are definitively emancipated, he keeps on with the habits which he has acquired with his consort: family love disappears, conjugal love is left. They remain together, and the year following, sometimes throughout their whole family life, they begin over again their romance of love and of family life. It is still the egoism of two individuals. The gain of this egoism is the loss of the social spirit.

So much for the monogamous family. Is it the

same with the polygamous family? Let us explain first what is meant by the word polygamy. It is applied vaguely to the three periods of reproduction and differs from promiscuity, which is sometimes improperly used. Promiscuity is free copulation, each one of the two sexes indulging in the function with equal rights and according to its caprice. It is divided into polygamy for the male and polyandry for the female. Polyandry is rare among animals; the infidelities committed by the female are less rare, but they are not uncommon. Generally the female gives herself absolutely for a whole season, and as a rule gives herself to one only. The male in polygamy does not give himself; he takes the females, and considers himself, so long as he is not satiated, as their master. If he remains polygamous in the second period, it is because he maintains his rights of proprietorship, and if he remains polygamous in the third, it is because he still maintains them by including the infants which are the issues of his females. But polygamy in the first period by no means determines his conduct in the second and third. A male may have an entire harem in the first and yet subsequently attach himself to but one female, discharging the duties of a father with the infants of the latter only—in a word, may be monogamous. Example, the little bustard, or Tetrax. The opposite case is presented by the great bustard, or Otis. The male has but one female, but as soon as this one has laid and has begun to brood, he goes in search of another, and thus founds several families. In short, the polygamy whose influence we have to examine is not that of the first period, which is mere licentiousness, functional incontinence, as in the turkey and the goat,

but that of the third period, as in the seal or the elephant.

The conjugal and family ties are looser and consequently, as we have seen, less egotistical and less antisocial, according as they are more removed from monogamy. The more females and infants a family comprises, the more the total store of affection, attention and protection of which the male is capable, is weakened and dispersed. The more this family resembles a harem or a herd of which the male is sultan or chief, the more is it comparable to a little society under the conduct of a single leader. It is very difficult in the accounts of travelers to distinguish the simple numerous family from the troop or herd of small dimensions. In the Ungulata the polygamous family often comprises the young of two or three years, although a little later when they have become capable of reproduction their parents usually drive them away. But in other cases, as in the elephant, the young remain in the troop, procreate there, or more probably abandon the troop temporarily to return to it again with their young, with the result that in the end the herd is consanguineous, and formerly often embraced as many as a hundred or two hundred members. It is certain that some societies of monkeys are simply augmented families of this kind.

Are polygamous families more capable than monogamous families of forming what Espinas calls *peuplades*, and which we regard as societies *par excellence*? This is the important point to know. Reason answers in the affirmative. Polygamy disperses the sentiment of sympathy, monogamy concentrates it. Polygamy is the egoism frequently of from fifteen to twenty individuals; monogamy is the egoism of three. We

have seen numerous instances of polygamous families associating, as in the Tarpan and the buffalo; we have also seen monogamous families, as in the reindeer. But it is my opinion that the former are the most frequent.

We shall take it for granted, then, that polygamy tends more strongly to the formation of animal societies than monogamy, although it is a lower form of family than the latter. A last reason tells us so. The family of three is a narrowed individuality, intermediary between the individual proper and social collectivity. The family of ten or twenty is a large and diffuse individuality, also intermediarv but approaching to collectivity.

It remains to be seen whether, through the instrumentality of the young alone, the family favors the formation of society. We have seen, and only the fear of being too prolix has prevented us from dwelling upon it, that the young are invariably controlled by a single dominating tendency—the desire of getting out of their nests as soon as possible, of giving free vent to their activity, and of emancipating themselves, while braving unknown dangers and forgetting their parents. But we have also seen that they are possessed of a powerful impulse to play and to tease one another, to cry out and to compete in song, even meeting from time to time in some common place for this purpose. To have comrades is a necessity with them. There exist, thus, two contradictory tendencies. The result in the young varies with the species, but in general the more the family state is prolonged the stronger does the habit of living together grow; the more they are conscious of their weakness, the more easily is their food obtained, as in the Herbiv-

ora, and the more they yield to the desire of being together; whilst under opposite conditions they abandon themselves readily to their instinct of liberty and of egoism. Nevertheless, small groups of young are formed for hunting in concert among the Carnivora; but occasionally more extensive groups, afterwards rallying to a general flock, are found among the Ungulata.

However, a third factor is bound to intervene some day in the case of the young, which puts an end to their inclinations either for independence or for life in common—the arrival of puberty. Birds or mammals, all surrender themselves to the sexual instinct; the solidest ties are broken and the accomplishment of the first act of reproduction takes precedence over everything.

It is certain, however, that the spirit of sociability is most developed in the young who have not yet attained puberty, that it is maintained fairly well after the first rut and even after the first family state, and that it then wanes and quickly drops to zero in the aged males. "Solitaries" are met with in the most sociable species. They are the old males which have spontaneously abandoned life in common or have been expelled from the troop because they were grouty and ill-natured. Age is a factor which must be taken into account, both as regards family and as regards society, when a given species is to be judged. As for the rest there are sometimes wide variations of character, manners and conduct within the same species. Two travelers may have expressed different opinions and yet both have made correct observations. In many cases it is the mean that has to be sought.

Our concluding considerations on the three preceding chapters will be a parallel of the differences and resemblances between animal colonies and animal societies—of course, the highest.

1. Colonies form a coherent whole, morphologically continuous in all their parts and at all the epochs of their evolution. Societies form diffuse and artificial wholes, having a virtual tie only.

2. Colonies are a process employed by nature for multiplying animal forms in time and on the surface of our planet, and for creating new organisms, more and more complex, at the expense of prior simple organisms. Societies are modes of existence devised by individuals for their own satisfaction, and never result in the creation of a coherent organism or new creature of any kind. Their rôle is a zero one in the general evolution of the animal kingdom; they are a mere incident, leading to nothing from the point of view of nature.

In fact, evolution has no goal. It proceeds at random, essays and realizes everything that it can, as we have before said, and scoffs at our teleological speculations. Nevertheless, it cannot be denied that among its various marches and countermarches, regressive, indifferent and progressive, we are most vividly struck by those which best succeed, by those which engender the admirable harmony lauded by poets. Progressive evolution follows, thus, a principal direction—the *best* by comparison with what has preceded, the best for the species, considering the conditions in which its lot is cast. One of these *best*, as physics and economics have taught us, is the maximum output with a given instrument or organism. We have seen that for the functions of reproduction,

progress, amidst attempts of all kinds, has always tended in this sense. Among the fishes we had quantity, but the majority perished; in the higher mammals we attained quality—that is, a less number, but with survival assured. As to the functions of outward life, the same end has been set. The first step was the multiplication of species: the animal colonies answered to it. The second step was that they should become perfected, that the species should individually yield the maximum output—that is to say, that they should exhibit the maximum of activity, of enjoyment, of prosperity and of well-being. Hence resulted the process of virtual association among demes which evolution followed by habit, and which leads to the strengthening of the ties between the individuals of a species, to their living better, and to the bestowal upon them of more power. By the family, evolution ended in better progeny; by society, it ended in a greater amplitude of life for the species.

The first two differences, in fine, create an abyss between colonies and societies; comparison seems impossible. But let us proceed to the resemblances.

3. In colonies, division and specialization of labor are promptly established and more and more accentuated. The individuals form groups which become organs, each organ concurring within the limits of its specialty in the fulfilment of the general wants. In societies it is the same, the individuals specialize their work, groups are formed, some favored, others sacrificed; a hierarchy is also established. This is the feature of formal resemblance and one which should be emphasized.

4. In colonies the individuals preserve their independence only for a short time. They almost imme-

diately make concessions to their neighbors, then to groups, and finally to the colony entire; so much so that their individuality at last becomes entirely absorbed, and they retain no other functions than that of cog-wheels in a great machine. In societies a certain sacrifice of individual independence is also required. The social state is an exchange of concessions; individuals submit in order to be protected—in other words, give in order to receive. But there is a limit; one always preserves the greatest part of one's individuality; one is not bound to suffer oneself to be absorbed, whatever be the degree of the accepted solidarity. This difference is profound.

5. Colonies are presented in the invertebrates in all periods from simple assemblages of individuals with scarcely any adhesion, up to complete and absolute solidarization. We may reduce them hypothetically to three periods. In the first, the individuals still remain their own masters, they lead their own life, and the colonial whole is but their numerical sum. In the second, they have lost half of their individuality, and the colonial whole possesses the other half. In the third, the individuals no longer count as such; they are subordinated to the colonial whole, which wields all the power and all the initiative. In which of these three periods would animal societies fall, supposing that we were obliged to class them with colonies, and that they would develop like them in the course of time and in the ascending mammalian scale? In the first, with traces of a tendency here and there towards the second.

In fine, the classing of colonies with societies, which the positivists hold as proper, is a pure fiction, although in some points resemblances exist. If cer-

tain laws are applicable to like phenomena in the two orders of association, it is because the grand laws of nature are universal in character, and relate as well to sociological or biological facts as to physical, chemical or astronomical. The plain truth is this: the variously graded associations between merids or zoöids called colonies are morphological; the associations between demes are virtual. The first create new species, the second perfect them, extend their activity and develop all that they can produce. Will this evolution culminate in the greatest intrinsic good of this or of that species, or in its complete annihilation by very excess of vitality? That is the secret of time.

It remains to be learned whether man is situated in this regard the same as the other animals, whether his peculiar attributes do not transform the situation, and whether consequently he will not suggest some modifications of the outlooks gained in the present study.

CHAPTER V.

Human Societies. Primitive Man. Prehistoric Peoples. Lowest Savages. Progressive Evolution: Family State, Clan, Tribe, Nation. Retrogression.

The chapters on man as an animal, which have formed the transition to the present chapters on man as a member of society, have been long. It could hardly have been otherwise, seeing that we presented there the broad initial thesis that man is of the same nature as the other animals and subject to the same laws, and that the points wherein he differs from the nearest mammals are only matters of form and of degree.

One of the propositions which resulted from our inquiry was this: Impressions engender acts, with or without the intervention of the will; these acts by repetition become habits, which are handed down from generation to generation, and becoming established form what are called instincts. We have followed the evolution of three of these, viz.: (1) the *instinct of preservation of self*—that self, which in the invertebrates is represented by scattered egos or by egos that are predominant at certain points, and which in the vertebrates has its seat in a special organ and is centralized in a single ego of which the physiological characteristic is egoism; (2) the *instinct of reproduction*, differentiated in the birds and mammals into the sexual instinct and the family instinct, which latter in

its turn is differentiated into a maternal instinct highly consolidated and free from all impurity, into a paternal instinct feebly consolidated and complex, and into a filial instinct maintaining a mean in the matter of consolidation and purity; (3) the *social instinct*, which has for its foundation the need of relations with one's fellow beings, or altruism—an extremely variable and complex instinct, scarcely more consolidated than the paternal instinct, yet one which has given rise to a multitude of animal societies, from the primitive and negative stage known as indifferent assemblages, up to a form which already reaches a high plane in the Cynocephali and the Cercopitheci. We have seen the variations of these societies. Some are intermittent, others are permanent; some are of the family type, pivoting about a polygamous male, others are formed of families more or less amalgamated.

We have now to continue our inquiry with man. The field is quite different. With wild animals—the only ones we were obliged to consider—our information was as a rule insufficient. We were fortunate if we were able to reconstruct the approximate social type of the genus or the species. It was impossible for us to consider the variations according to groups, environments, and *a fortiori*, with few exceptions, according to periods. The question of the evolution of social forms throughout the course of centuries was inaccessible. With the exception, perhaps, of the bees and the ants, science can establish the sociology proper of no animal.

With man it is different. Although all the knowledge we might wish is not always forthcoming, yet generally speaking it is considerable. Man speaks

and can personally give us information concerning his manners, customs and sentiments. He has his history, his archæology and his legends. He is spread over the whole surface of the globe and divided into an infinite number of groups, frequently having no communication with one another. In his case the problem is no longer that of describing a social type, but of describing a multitude in time and space, where it is our task to determine both the differences and resemblances. Human societies give rise thus to a human sociology proper, if not to a comparative human sociology, the scope of which is broad and which involves an endless number of problems. Let us recall the position which this science occupies in the general body of human knowledge.

The second branch of anthropology is divided into two parts: the first, descriptive, or ethnography, in which the facts are gathered and classed according to two methods, by tribes or nations, and by particular subjects; the second, speculative, or ethnology, in which are established the concatenation of the facts so reached, their causes and consequences, and the laws or general truths which flow from them.*

Similarly, human sociology is divided into sociography and sociology properly so called. It occupies itself particularly with the facts gathered by ethnography, as these bear upon the family, society and morals. It studies in man the associations between individuals free to move and to act, just as in invertebrates we study the associations between the merids or zoöids that adhere together. A third part is the complement of the foregoing, social science—that is

*Dr. Daniel Brinton has excellently remarked: "It is the aim of ethnography (ἔθνος, people, and γράφειν, to describe) to describe, and that of ethnology to explain."

to say, the applications of sociology to the present phases of human societies, which it is incumbent upon us to correct and to perfect, or, as some say, to remodel, so as to secure the greatest happiness of all, or of nearly all, consistently with the greatest possible equity. The present and the succeeding chapter will deal with the first and second parts.

What was man at his origin? How were his first societies constituted, and how have they been evolved so as to attain the present phase? Such are the questions on which we shall have to dwell.

Thus considered, the history of human societies is arbitrarily divided into the following stages: (1) Primitive men, in the true sense of the word; (2) prehistoric men; (3) the lowest savage societies as yet discovered; (4) the more or less barbarous societies; (5) the more or less civilized societies of Central America on the one hand; of China, India and Egypt down to Greece and Rome on the other; and (6) societies subsequent to the Christian era, down to the present.

Darwin, Spencer and some others have sought to reconstruct the *primitive man.* To start with, he has been progressively formed at one or at several points of the globe at the expense of one or of several precursors. According to the first hypothesis, he was subsequently differentiated into branches, which, to judge from the morphological facts in our possession, may be reduced to five or to seven at least, viz.: (1) The blacks, with woolly hair, divided into the dolichocephalic and the brachycephalic; (2) the blacks with straight* hair, designated by Huxley as Australoids; (3) the yellows, divided into the dolichocephalic

*The word "straight" is ill chosen but is consecrated by usage. The word "yellow" has the same fault.

and the brachycephalic; (4) the browns or Melanochroids of Huxley, small and dolichocephalic; (5) the blonds or Xanthochroids of the same author, tall and dolichocephalic. Both hypotheses are tenable, but that of the unity of all is the more probable. All the primitive varieties of the human species may be said to have been produced by differentiation, adaptation and crossing, in the same manner as the present varieties of the domestic dog according to the palæontologists are sprung from the *Canis familiaris fossilis.* The initial progenitor would have been black, dolichocephalic and prognathous.

The characters which essentially distinguish man from the anthropoids are four in number (see pages 8–23), two of which are physical—perfect adaptation to the vertical posture, and a greater development of the brain in volume, convolutions and inward structure—and two of which are physiological: speech and reason.

We say reason, so as to conform to usage. In reality, at the beginning it does not deserve that name. The animal species, from whose bosom primitive man has sprung, presented, like any high or low group of present men, a scale of very extensive variations. There were found here incapable individuals, absolutely refractory to new acquisitions, indifferent individuals, forming the large majority, and finally, individuals evincing some endowment and talent. The latter were the most active, remembering best their sensations and their prior acts, and seeking the hardest to understand things. Some fact attracted their attention; they stopped to consider it, compared other prior facts with it, drew from their comparison some relation, some view of the whole, and acted with

a more exact notion of the consequences of their acts. One of the highest faculties of certain monkeys, if not of the majority, is the eager persistency with which they scrutinize an object that has been put into their hands, and keep turning it over until they have got clear concerning its ways of working and its use. (See Romanes, *Animal Intelligence.*) They then throw it aside and give it no more thought. Primitive man goes farther here. Where a monkey opens a nut with a pointed object or breaks it with a stone, repeating his act with little improvement, primitive man essays to manufacture some similar pointed object or to make of the stone a hammer. Attention to things which directly concern the satisfaction of his needs, the desire to appropriate these things to this end, and the initiative which he takes, are the characteristics of his first cerebral acquisitions. The ape, his precursor, or the dull primitive man, abandons himself to his hereditary habits—that is to say, to routine; talented primitive man modifies his conduct and profits by his experience. The making of tools or of means of defense against wild animals was without doubt the first step taken by man in the domain of intellect. I take it that the discovery of the means of obtaining fire was not made until some time later: among the lowest savages with whom we are acquainted, we find legends relating to this discovery, but none concerning the origin of the simplest weapons.

Subsequent progress must have been slow. To judge from the lowest savages of to-day, primitive man showed no foresight; his horizon in countries where his congeners were scarce was almost limited to the animals with which he struggled. His needs were mediocre. The excitations which later exercised

so great an influence upon the development of his faculties were almost entirely lacking. Yet selection, despite these circumstances, was still at work: the individuals who were best equipped with the power of initiative survived and multiplied. The day came when those who knew how to put to its best use the new instrument which they possessed, the embryonic intelligence which had formed in them, came into the majority, and were formally distinguished from the species which had given them birth.

The question has been raised as to which was prior, primitive language or primitive reason. Every impression or sensation tends to give rise, in the absence of attention being directed to it by the ego, to a simple or complex reflex action, in the last case anteriorly co-ordinated by habit. To this class belong the gestures and contractions of the facial muscles accompanying actions, voluntary or involuntary. Thought, by itself, awakes such reflexes. We screw our eyes, the face expresses joy or pain, the body bends, the hands are unconsciously extended in different directions, as if to deliver the thought. From this point the step is not far to expressing emotions and desires voluntarily by gestures, and even to varying them in particular cases. Gesture-language necessarily preceded every other. The physiological analysis which Ribot has given corroborates this position. The imperfectly developed gesture-language of the Australians and the very highly developed gesture-language of the Indians of North America are survivals of it. It had long to supply the needs of primitive man and to contribute to fixing and multiplying his first elementary ideas and particularly his first emotions, but sooner or later it led perforce to

the word. Lacking the word, animals possess the general faculty of expressing their needs, sensations and sentiments in various ways. These ways vary in form and number with the species; many have three, five or ten ways, according to what they wish to express. The majority, if not all, are simply co-ordinated reflex acts, some of which are unconscious and others of which are voluntary or alternately unconscious and voluntary. It is quite natural, therefore, that primitive man, as his gesture-language became more precise, should have made an effort to accompany it with sounds in some way connected with what he desired to express. Unconsciously at first, and then consciously, he modulated his utterances by his larynx, and then progressively articulated them with his mouth. He thus soon attained the power of calling out in moments of danger, of commanding in the management of his household, or in the chase, and even of recounting during the evenings his adventures after the manner of the howling monkeys, but better.

The power of the spoken word having been once acquired, the development of mind advanced more rapidly, hand in hand with the development of language. Although words do not engender ideas, they have upon them a powerful influence: they fix them, render possible their classification, and aid thus in the acquisition of new ideas.

In fine, primitive man did not for a long time greatly differ from the animal, monkey, anthropoid or precursor from which he sprung; from the animal stage he drew away but slowly.

Then, during the interval between the moment when he was definitively formed and the period represented by the lowest savage which we will soon

describe, what was he, particularly from the point of view of family and society? For his psychical characters we might consult the infant, on the principle which is true in its generality, that ontogeny is a reproduction of phylogeny; but this would carry us too far. In conjecturing what were customs, we should be guided less by present savages, who may all be more or less modified and perhaps falsified in their habits, than by the animals to which primitive man is nearer.

First, how did primitive man comport himself with regard to reproduction? Did he restrict himself, as is possible, simply to combating his rivals when seeking the female of his choice, to satisfying the needs of rut, and then departing after the manner of many other mammals? Or did he prolong the union until the birth of the young, until weaning, or until after the rearing only, as do the solitaries among the orangs? Or did he prolong the union until he had several offspring, that is to say, indefinitely, as some gorillas certainly do? Was he monogamous as is the Soko of Livingstone or polygamous as certain chimpanzees are said to be? As to sociability, did he live alone with his family as it is certainly to-day the habit of many anthropoids, or in small associations of distinct families as is the case with the Soko, or in large societies, as undoubtedly the anthropoids do when they are numerous, and as do also the Cynocephali and the Cercopitheci? This we cannot say exactly.

As for ourselves, in consideration of the varied habits of the anthropoid, and in consideration of the nature of man generally, such as we know him, we think that his social and family types were not everywhere the same and depended on habits unconsciously contracted, but that generally speaking he was rather

monogamous and distributed into social groups. Do we not see him even to-day accommodate himself to all systems? Several considerations corroborate this view. On the one hand, man is even more influenced than the other mammals by the development of those elements that make for sociability and for companionship with his fellows. He has need of comrades, he is fond of domineering and of displaying his talents, he has need of talking, of singing, of playing, of being listened to and admired. All this is as strongly developed among the lowest savages as among civilized men. Negroes love to laugh, to play the buffoon, to make noise: it is the small coin of altruism as of sociability.

On the other hand, man is possessed of more or less motives which impel him to egoism. He reviews his acts, their advantages, and their disadvantages. His reason causes him constantly to vacillate between two tendencies: the one of associating with his fellows for the advantage which he expects to derive therefrom, and the other of entirely dispensing with them, of eliminating their competition.

His conduct, therefore, will differ according to the circumstances. In one place, where climate, abundance of nutrition, and the absence of dangerous enemies, render life easy, primitive man ought, after the manner of herbivorous animals, to be gentle and disposed to living in society. In another place where existence is difficult, the means of subsistence scarce, ferocious animals numerous, himself naked and in addition poorly armed, always upon the *qui vive* against surprises or against the possibility of letting slip good opportunities—here he is or was in the position of the general run of the Carnivora, and must

have lived a life of seclusion, having as his retreat and that of his family some hidden cave, like the lair of the wild animals which were his prototype.

In fine, we may conclude that primitive man was neither better nor worse than the other animals, and in particular than the apes; that he was neither more nor less sociable and that he had different habits according to the circumstances; the most widely spread tendency being monogamy and life in little bands.

It is unnecessary to mention that no primitive type of man has come down to us. The six or seven so-called primordial races which we assume are only probabilities, induced from those which we observe to-day, mixed, crossed, married and remarried, ten, twenty, or one hundred times perhaps. The races which must have approached nearest to the type in question are the prehistoric races,—but which? For lack of others, let us look at those of Europe—the only ones that are a little known.

If we accept the conclusion generally admitted in the United States regarding the end of the Glacial Epoch in the region of the Great Lakes, and the approximate parallelism of glacial phenomena in America and Europe, the most ancient authentic remains of human industry in the latter country would not go back to more than about 10,000 years. That is not much. It would oblige us to divide this space of time in Central Europe approximately as follows: The Palæolithic Epoch, 4,000 years; the Neolithic Epoch, 2,500 years; the Bronze Age, 1,300 years; the Iron Age, 300 years; the Christian Epoch, 1,900;

total 10,000.* We must draw the conclusion that the most ancient race of men we know of in Europe, that of the glacial alluvium of Chelles, cannot be primitive, and therefore that it took its origin elsewhere. At that moment, in fact, a formidable barrier of ice descended from Scandinavia not far from the Hartz Mountains and the Black Forest, and joining almost with the glaciers of Switzerland and Upper Italy left only narrow passageways, which greatly restricted communications with Eastern Europe; whilst on the other hand on the South communication with Africa was quite easy by way of several strips of land which have since disappeared. It has been assumed that the men of Chelles, that is to say of the first Palæolithic Epoch, were of the Neanderthal race. The assumption has not been proved; the number of pieces upon which it has been based is insignificant. I am more inclined to believe that the Palæolithic race of Chelles was that which we find later on, small, brown, dolichocephalic, extremely orthognathous and with microseme orbits, spread through all Southern Europe, the isles of the Mediterranean and Northern Africa, and which I have called the Troglodyte race of the Lozère, or better, the Mediterranean race. Evidently it came northward, step by step, from Africa at the end of the Glacial Epoch, that is to say, from the country where recently in the South of Tunis enormous quantities of Chellian† Quaternary instruments have been discovered, and where five or six thousand years before our era the scattered tribes

*I suppose it is well understood that for us the origin of man is older than ten thousand years, but that it must be searched for in other parts of the world than those alluded to in the United States and in Europe.

†Réné Collignon. *Les ages de la pierre en Tunisie*, in *Materiaux pour l' hist. prim. de l' homme. 3me Sér.*, T. IV, 1887, Paris.

circulated that gave rise to the Egyptians, a race of a type still far removed from what the primitive type must have been.*

But nothing enables us to say what were the customs of the Chellian race. Its well-fashioned weapons lead us to believe that it manufactured other utensils which have not come down to us.

In the Post-glacial Epoch, with the Reindeer or Laugerie period, the elements of valuation increase. The men of that day lived partly in families in separate caves, partly in small and large aggregations in neighboring caves, or under long shelters beneath overhanging rocks. Although hunters and fishers and without agriculture, they were sedentary, fashioned implements of bone and flint, which they decorated somewhat artistically with the figures of animals, plants, and even of men. They had ornaments and funeral rites, as M. Cartailhac assures us, and procured the articles they needed from considerable distances; at times they undoubtedly exchanged them for others, and they certainly had chiefs. At Solutré, where they lived in villages, they appear to have had reserves of horses for food. In shaping their images and in chipping their pointed flints, they evidently conversed and indulged in the amenities of friendship. Nothing proves that the wound of the woman of Cro-Magnon was the result of a conjugal quarrel. In a word, they had a social organization which they must have brought from Eastern Europe and which precludes our regarding them as savages of a low type. At this juncture the barrier of ice had disappeared, and new men of high stature, dolichocephalic, and

*We willingly admit that the type of Java, Neanderthal, and Spy is one of the primitive types of man—scattered over the whole habitable surface of the globe at a certain epoch, but accidental in Western Europe.

probably blond, had crossed the passage. For us, the type to which the name of the race of Cro-Magnon has been given is a crossed race, the result of a mixture of the local Mediterranean race of which we have spoken above, with the tall blonds who came as conquerors.*

In the Neolithic Epoch which followed, the number of blonds increased; another race, the brachycephalic, was added, which came by the same route. Thereafter the population is divided into groups differing both in physical characteristics and in civilization. In one place we have the Troglodytes of the Lozère, the most ancient race, a poor and conquered people, who had been forced to take refuge in the least accessible localities. In another, we have the blonds more or less crossed, the makers of the long megalithic monuments. The brachycephalics are scarcely ever seen to predominate at any one point, which may be accounted for by the fact that they practiced cremation. One of the most remarkable of the latter groups is that of the Palaffites of Switzerland, among whom we see the Polished Stone Age pass into the Bronze Age, and where agriculture and industry are considerably advanced. We shall not stop here; the knowledge we might gather can be more readily gained in connection with the populations that come later. We may confine ourselves to stating that with the exception of the refugee groups of the small-statured race, which led a really savage life as a whole, the Neolithic Epoch bears witness to a civilization which is considerably advanced as compared with the epoch called barbarous. Vestiges of superstitions (amulets

*P. Topinard, *La Caverne de Beaumes chaudes, d'après les registres de Broca.—Revue d' anthropologie*, Paris, 1886.

of human bones) and even of worship (the caves of Baye, etc.), if not of religion (the cromlechs and *alignements* of Brittany) are also found.

Let us now pass to the lowest savages known to us, as they are represented by the historians of antiquity, the travelers of the sixth to the thirteenth century down to the time of Marco Polo, the navigators and foreign conquerors from Christopher Columbus to the end of the eighteenth century, and particularly by the travelers of the present nineteenth century. These descriptions gradually conduct us to the highest savages and from these to civilized man.

In the second half of the eighteenth century the ethnographical movement began to make itself felt. The first work in this direction was, we believe, that of Henry Home or Lord Kames, a philosopher of the Scotch school, who published in 1773 two volumes entitled *Sketches on the History of Man.** The first society was that "for the observation of man," at Paris in 1799. The first "instructions to travelers" were those which were published by that society in 1800†. But little progress was visible until the foundation of two other societies now well known, the Ethnological Society of Paris in 1839, by W. Edwards, and the Ethnological Society of London in 1840, by Prichard. The decisive moment, however, came in 1888 when Messrs. Tylor and Galton applied to the analysis of the manners and customs of peoples the statistical method employed in physical anthropology. To-day ethnology is one of the most popular sciences. England and the United States hold the first place in

*P. Topinard, *Éléments d'anthropologie générale*. Paris, 1885. Vigot Frères.

†*Revue d'anthropologie*. Année 1883, p. 132.

it by the number and the value of the contributions which they have furnished.

The published works are of four kinds: Original matter consisting of descriptions by travelers and their classified replies to the "instructions"; monographs upon some single people or tribe; monographs upon innumerable special subjects, such as marriage, property, polity, beliefs and folklore; and finally works which aim at synthetical views of the field in its entirety. But as is frequently the case with young sciences, inquirers have not been overcautious, premature theories have been promulgated and systems produced which were based upon insufficiently established facts, and which have had to be withdrawn. Still, the light is gradually spreading, and I believe I am not too presumptuous in attempting to sum up now in a general way the results of my reading and researches on this subject.

The great difficulty concerns the palpable beginnings of the evolution of societies. Here inquirers have been carried away by preconceived ideas or insufficient facts. The ethnographical material relative to the higher savages and barbarians is very extensive, but is absolutely meager with regard to savages very low in the scale. When we consult the narratives of travelers we find contradictions. The first person who sees a certain group sees it in one light; another, coming later, sees it in a different light; a third sojourns a long time with the group in question, examines it more minutely, and, being less hampered by European preconceptions, annuls by his description a part of what his predecessors have said. The traveler who travels fast always claims to

have seen extraordinary things; he describes savages in the lowest imaginable stage which he knows of only by hearsay.* We might almost formulate this proposition: there are no very low savages, except such as we have not had the means of carefully studying. The truth is that there are no existing savages justifying the denomination of *primitive* so frequently and wrongly used. We have assumed that the oldest Europeans go back ten thousand years, but in other countries man goes back much farther. The antiquity of man is certainly to be doubled or tripled, if not more. Think only of all that must have happened in Africa prior to the tribal precursors of the Egyptians; or in India, among the blacks of the jungle, before the Dravidians, whom the Aryans came upon, had made their appearance. The physical type of the Neanderthal, and even of the Java man, is almost as far removed from the probable primitive type in cranial capacity as some normal Europeans of our days are from that primitive type.

The lowest known savages, those that we can make use of, are only the remains of peoples which have had their history and which, at a given moment, have been driven back into places not sought by others or

*The following is an example. A certain author indicates as the lowest type of savages which one can imagine, the Guaharibos of the sources of the Orinoco, and gives an astonishing description of them, referring in a note to the Geographical Congress at Havre in 1887. Naturally I ran to the original, but found nothing. I finally discovered elsewhere that at this Congress a lecture had been held by M. Chaffanjon, who had visited the sources. In short, I found a book in which this traveler had given an account of his expedition. It turned out that he had never met one of these indigenous savages; that he had once stumbled upon a camp of seven huts that they had just abandoned; that he had seen a bridge built by them, and that he had derived all his information regarding the indigenous people in question from another tribe who had accompanied him, but who also knew of that people only from hearsay. In short putting all together, I found no ground which justified in the least the detailed description which had originally so startled me. I supposed that it had been taken from reporters who had listened to the lecture. See I Chaffanjon, *L'Orénoque et le Caura*, Paris, Hachette, 1889, and Letourneau, *L'Évolution politique*, Paris, Lecrosnier, 1890.

possessing natural defenses. They are degenerate and retrogressive groups from lack of stimulus; taking the cases singly, the proof can be established; for the Esquimaux the evidence is complete. A tribe, a people, or a whole race, may become immobilized at a certain stage for a long time. China is an extremely remarkable example of this in four or five points of view. Most of the negroes in Africa are another. A tribe, a people, may even fall behind and be at the point of extinction, when suddenly it will assume new life and energy. Ethnography and history offer numerous examples of this, but in the very lowest stages prolonged retardation is difficult; a certain minimum is necessary for subsisting in given conditions. The group dies away, as is the case with all the very low and even with the ordinary savages we know of. They are powerless to recover their lost vantage-ground, and no case of their having done so is yet known. Happily for us, the degenerate groups stand us in excellent stead for reconstructing the probable course of evolution of the first men, for retrogression is, by privilege, of inestimable value, being a retracing of the steps through which progression has passed.

We shall cite the groups concerning which we have the best information, and which can best guide us in our inquiry.

First, the Veddahs, who inhabit the cliffs of Ceylon, and whom we should not confound with those of the coasts and villages, who have been more or less changed by contact with the Singhalese. According to a Greek author of the fifth century, they occupied the forests they now inhabit, for 1,500 or 2,000 years. According to the census of 1881 there were only two hundred of them still alive.

Secondly, the Boshimen* of the desert of Kalahari, who are one of the southerly scattered fragments of a race formerly spread over a good part of Central Africa, of which the Obongos of Du Chaillu, the Akkas of Schweinfurth, the Wambuty of Stanley, are other fragments. The Obongos are a stage higher in type than the Boshimen, and the Akkas several stages higher still. The poisoned arrows of the Wambuty, and several details which we have from Sporck who has recently visited them, lead us to believe that they are not so low as Stanley thought.

Thirdly, the Fuegian Yahgans of Tierra del Fuego, who must be distinguished from the Fuegian Onas and Alcaloufs, who are near to the Patagonians. They were evidently driven back at some unknown period into the benighted region which they now occupy.

Fourthly, the Andamans, who have inhabited the islands of the Bay of Bengal from the year 851 of our era at least, and whom anthropology regards as the most typical representatives of the Negrito race, of which other fragments are found here and there in the Malay Archipelago.

It is difficult to establish the exact rank of these four groups. In certain traits they are lower, in others they are higher. The Veddahs seem to come nearest the primitive state.

Next come the Tasmanians, a race which has recently become extinct and which we can only appraise by information which dates anteriorly to the time when the English began to exterminate them.

Then we have the Australians, who have long been placed at the lowest stage, but who are now

*Commonly called Bushmen. *Boshimen* is the spelling preferred by M. Topinard.—*Tr.*

ranked several degrees higher. But here and there in the ancient reports we have accounts of isolated groups which poor conditions of existence had rendered inferior.*

There are also the Esquimaux, who formerly extended far south to the boundaries of the United States on the one hand and into Asia on the other, whom warlike tribes drove back into arctic regions and who to-day are disappearing.

We shall merely refer to the few extremely savage and not well known groups of the interior of the isles of Northern Melanesia, of the Sunda Archipelago, of the Philippine Islands, and of the Peninsula of Malacca. In the Deccan, the Ghats, and the Nilgiris, we have found nothing that can serve us. I must say the same for Siberia. In America the lowest savages after the Fuegians are probably the Botocudos of Brazil and certain tribes of Yumas of Lower California. In Africa nothing is to be added to the Boshimen.

It goes without saying that with the space at our command we can make no citations, nor refer to our authorities. We shall give nothing but a simple picture, dwelling only upon the points which we desire to place in relief.

The formation and successive enlargements of societies are reducible to four phases: (1) The family state, leading to the family clan; (2) the clan proper, or political clan, with its two stages of outward defense and interior organization; (3) the tribe, or *peuplade;* (4) the people or nation.

*P. Topinard. *Instructions sur les indigènes de l' Australie*, Paris, 1872.

1. The lowest savages differ in character, disposition, and manners, according to the more or less difficult conditions of existence in which they are found, and according as they have more or less connection with other men, savages or Europeans, who stimulate or falsify their character. In himself, the savage is usually gentle, kind, of an easy disposition, and with a tendency to jollity. He is honest, does not lie, and attempts to do no harm either to his own people or to strangers. He is sensible to kindnesses which have been extended to him, well wishing, and endowed with a goodly portion of altruism. Distrustful, like animals who see for the first time a creature which they do not know, his second impulse is that of gentleness. Nevertheless, he is quick and violent in responding to impressions and may abandon himself to regrettable acts, but he quickly regains his natural tendency and grants pardon when the offense has not been too grave. Before marriage the girls and boys come early under the sway of the sexual instinct, and yield to it neither more nor less than in our civilized countries. The savage woman is chaste and modest, although nude. Her parents carefully watch her; she will have one lover or several, or she will be debauched; if, in the first event, she has a child, public opinion requires that the youth shall marry her and take charge of the offspring. After marriage the couple are faithful in the same degree that they are in our modern societies, if not more so. The husband always keeps the same woman. The instance which Darwin cites without mentioning the source is typical. "The cliff Veddahs are monogamous until death," said Bailey to a polygamous Singhalese. "Yes," responded the latter, with a contemptuous smile, "like

the Wanderoo." The ape to which allusion was here made, is a semnopithecus of Ceylon. Bailey was a missionary who had lived twenty years with the Veddahs, and has described them in the *Transactions of the Ethnological Society of London* for 1862.

The husband repudiates his wife only exceptionally. In case of adultery he punishes her or strikes her, and no one interferes. Marriage takes place without any formality. The young man asks the consent of the father, and sometimes makes him some small present; the girl is not consulted. Sometimes marriage is not definitive until after conception or the birth of a child. The very low savages are generally monogamous (Veddahs, Boshimen, Andamans, Esquimaux, and the Negritos of the Philippine Islands). But if the man feels himself capable of supporting several wives, either from vanity or from finding his interest therein, he becomes polygamous, his first wife in that case retaining the supervision of the household. The monogamous father loves his wife; she is his companion in this social phase, and not his slave. She shares his labors. He hunts, manufactures arms, canoes, and does the heavy work; she has charge of the household and the children, gathers wood, fetches water, and carries the burdens during expeditions, particularly the burning brand which preserves the fire, whilst the husband remains free, ready to take advantage of every occasion the chase offers. When the children are old enough, the boys accompany their father on the chase and learn from him the ways of gaining their subsistence, whilst the girls aid their mother in the care of the household. The polygamous household is less exemplary, even when the husband is more particularly devoted to one of his wives. His

wives rather resemble servants, and the children are less kindly treated. The paternal affection, as in the lion which we have described, does not exist at birth. At this moment the father frequently commits, without the least tinge of emotion, acts of infanticide, either as an economical measure, or because the child is weak or malformed. But when the child has once been accepted, he readily yields to its smiles, caresses it, plays with it, loves it, and carefully discharges all his duties. As to the maternal instinct, it is upon the whole as strongly developed as in the animals, and if at times the mother assists with dry eyes in the execution of her child, the case is rare. Were there not even among the animals examples of unnatural instincts of this character?

The family state is without the least doubt the first pseudo-social phase of man. Families are independent. Each seeks in its own behalf to satisfy the needs of the common existence. They are nomads in the good seasons, changing their localities according to their needs in search for food. They sleep and sojourn for longer or shorter periods of time in the places they happen to come into, be it in the hollows of rocks, as did the Cynocephali of our last chapter, or in cavities which they dig, or in huts which they construct from branches. When they meet neighboring families they chat and play together for several days, if their stock of provisions permit it, then they leave each other, each going his own way in search of food. In the bad season they seek slightly better quarters in caves which they know; the different families being installed in separate and independent lodges, unless the proximity of the habitations obliges them to be near.

But the families grow. The boys having reached

the age of puberty are solicited by new sensations, and roaming about more or less in the surrounding territory they meet the daughters of other families. It is the free love of the young. But some day the youths feel the desire of having a family for themselves. They get married as we have described above, and sometimes proceed to found a new family, or sometimes remain with their wife and children with their old family, which is thus increased. The families which above accidentally met and stopped to enjoy life together for a while, were likely allied by blood. Sooner or later these intermittent associations become more frequent and prolonged. The company of one is sought more and more by the others, and individual bonds of friendship are established. Circumstances present themselves where they are directly in need of one another's services, either for a general battle or for attacking some large animal. The social habit is thus created in the way in which we have seen it rise sometimes among the birds and the mammals; and from this results the primitive or family clan, by two processes: (1) By the direct growth of the family, the children, brothers and sisters, continuing to center about the oldest father, who naturally becomes the chief; (2) by the spontaneous association of different families living isolated in small groups and forming gradually a general coherent group of relationships of all degrees, even very remote. This is the first phase of social evolution which may be called the *family clan.*

2. We have seen that among the animals personal property, family property, and communal property exist. The individual is here master of his prey, of his cave, of his female, and of his young. Some

couples establish themselves on the shores of a lake in some rocky or grassy nook, and defend its approaches against their fellows. Some bands appropriate a part of a forest or swamp land, or take possession of an entire country, and forbid other bands, like the Cynocephali, from entering it. Among the very low savages, personal property always exists. Each is the owner of his own prey,—subject to the restriction of dividing it upon his return, in the expectation that on the morrow his fellow-hunters will divide their share with him. He is the owner of the beehives which he has discovered and which he marks (a mark always respected), of the weapons which he has manufactured, and of the wife whom he has taken under his care. There is no question of family property at first; there is room for all, and the chosen camp whither they return for the bad season is respected just as is the territory where each family is wont to hunt, all by a sort of tacit agreement without the interchange of a word. When families unconsciously joined in clans, the merging of property rights must have been spontaneously effected. The family property of cave or hut was confirmed, the territories of chase became the general property of the clan; agriculture not yet existing, there was no necessity of reserving much ground about each habitation. In sum, it was an ideal life, as Rousseau surmised. If it be admitted that such was the life of the primitive family clan,—in nature essentially patriarchal,—the question arises, How long did it last? Undoubtedly very long. As long as men were few in number, the means of subsistence easy, and the passions of the members restricted to the clan itself.

But a day came when the population waxed great,

when the members of a neighboring clan encroached upon territorial property consecrated by time, when the young men, impelled by the attraction of novelty, carried away by persuasion or force the women of another clan, when accidents, quarrels, and deaths resulted, when the neighboring clan assumed the right of appropriating a more favored country, etc. Then hostilities broke out, reprisals became rife, and a transitory or permanent state of war succeeded, tacit or declared. At the start, when the allied families who formed the clan were still scattered about in small groups, each defended itself after its own fashion without preconcerted plans; the father commanded his children and connections. By force of circumstances the families joined, some one gave utterance to some advice, showed himself more capable and more brave, and spontaneously assumed the direction of operations. Necessarily he thenceforward preserved some influence in the clan. Later when an attack was repeated and the families were more coherent, some *head-man* was named. The danger past, his powers ceased, but his influence persisted. They selected him as a judge when difficulties and quarrels were to be composed, but without granting to him the right of punishing, which was left to the council of the fathers or elders. Subsequently the nominated chief came into possession of the whole authority, which he partly shared with the council, and with one of those personages who rise so promptly in primitive human societies, the medicine-man or sorcerer.

The first effect of such hostilities was the tightening of the communal bonds and the awakening of the sentiments of solidarity and of general interest. Each

came to understand that it was above all necessary to defend the territory from which he drew his subsistence, that the cause of each was the cause of all. In the homes, nothing was changed. The fathers remained masters of their families, each responsible for the conduct of his own, punishing them at will without heed of others. But towards strangers special customs became formed; latent evil dispositions were aroused; perfidy, theft, bloodshed arose. To do harm to an enemy was an act of merit, a claim to glory. The ambition of the young entering on the life of the adult is to become distinguished in this direction, to show to those whom they wish to attract that they are strong and perfectly able to defend themselves. Thenceforth the family clan becomes a *political clan.* It is concentrated and organized with a view to preserving its integrity as opposed to strangers; this is the first stage of the second phase of social evolution. To become complete it must be organized within, which is the second stage, as we shall see.

The immediate effect, we have said, of having to defend oneself is the strengthening of the bonds of the clan; the second is to alter its customs. The evil dispositions which war awakened, the resulting reprisals and accustomedness to shedding blood, have transformed the character of man, who is now no longer the gentle, simple being of the ancient days, accommodating himself to all things and content with his lot, but has grown less patient and more impulsive in the evil sense. His horizon has been enlarged, he thinks more, his character is less frank, he is more active and more turbulent. The inevitable quarrels between the members of the different families grow more frequent, and compel the fathers of the families

to interfere. Women are at first the most common cause of dissensions. The senses are not guided by reason, the youth and even the young married men covet the wife or daughter of their neighbor; yet though there is still no civil constitution among the savages, marriage is none the less a contract, the woman is the property of the man, and he will suffer no one to touch her without his consent.

On the other hand, the clan is increased, either by the multiplication of the various branches of the initial family or by the admission of strangers or the acquisition of servants. The individuals crowd each other more and more; where there is room for few, it is uncomfortable for many; life grows annoying, each one is inconvenienced; separation and a consequent division of labor set in. Some devote themselves especially to the chase or to fishing, others to the manufacturing of arms and of canoes, others to protecting the women and children. Private property is extended to a larger number of objects, to ornaments, to household utensils, and to dwelling-places, crude as these still are. They steal without constraint and even as a point of honor, from the enemy; but they do not steal from their own clan—although of course there are exceptions. The natural inequalities begin to be felt; one is strong, another is weak; one is good, another is bad; one succeeds in the chase, in the manufacture of certain articles, the other does not. Character, aptitudes, intelligence, and tastes differ. Some have more influence, are more readily listened to, and possess greater privileges and distinctions. The contrasts grow, characters become more and more confirmed; emulation begins; rivalry and competition follow; in a word, struggling within the bosom of the

clan sets in, with all the secret or pronounced passions which it brings in its train: suspicion, trickery, lying, jealousy, envy and hate. Crimes and murders occur. Superstition aggravates these tendencies; some sinister accident, some disease or death, is attributed to the wish or intervention of a person of the same or a neighboring clan, and opinion requires that the death so produced shall be avenged by the nearest of kin, by the family, or by the clan entire.

Then, lest quarrels should be perpetuated forever, and the inward as well as the outward security compromised, usages are established. The chief or council of elders intervenes, adjusts the differences, adjudicates the crimes, at the same time seeking to satisfy public opinion and to forestall the repetition of like acts. Punishment is created; compensation for injuries done, and reparation by arms are instituted—in a word, established rules set forth the relations of the members of the clans to one another, rules which time consecrated.

The second social phase is now complete. The political clan is entirely organized, both as opposed to foes without and as dictated by needs within. Habits have accomplished all; they have become empirically fixed under the influence of necessity, that is to say, of circumstances, and have spontaneously become rules.

3. The third phase of social evolution is the tribe or *peuplade*. At times the clan increased by itself alone and divided up into secondary clans, each being a sub-family; at times several clans united, either from friendship or by conquest, and either preserving or losing their relative autonomy. Subsequently the tribes themselves united, thus forming federations or nations. Thenceforward the resulting concatena-

tion of interests grows more and more complex; customs multiply in divergent senses, some dictated by conscious motives of utility, others by empiricism, many by superstition. The clans or groups come together from time to time, either for concerted action or for amusement, such as dancing and singing together — for example, the Australian *corroborees.* Ceremonies and rites are established with respect to the various stages of life, birth, puberty, marriage and death. Rules regulating the chase, the gathering of fruits and roots, are instituted. A frequent form of regulation is the taboo, that is to say, the forbidding of certain things to be done at certain times, or the eating of certain foods. Each family, clan or tribe, has its totems, that is to say, its means of recognition, the symbols about which it rallies. Individuals have marks or insignia connecting them with the group to which they belong. They tatoo or brand themselves on different parts of their bodies.

The forms of government vary; the most frequent is the democratic form. A council formed of the fathers, elders, or the most conspicuous, exists in each fraction of the tribe, just as a general council exists for the whole tribe. At times, however, the supremacy is lodged in the chiefs, or in a head-chief. There are customs distinguishing each single group, and common customs connecting the general interests of all. There is rarely pronounced agreement. The higher customs relate more frequently to religion. Punishments are most frequently fines, administered in kind, and sometimes consist in corporal inflictions, slavery or death. Property is divided into personal, family and communal. The first, and particularly the second, have been extended; the third is the rule, but often with

reservation of certain rights for the benefit of certain families, and concerning especially the ground about the dwelling-place. We regret we cannot enter into details. We had intended to give here, as an example of the daily life of the first stage of this phase, a *résumé* of the excellent work of Mr. Brough Smith on the Australian aborigines of Victoria, and for the advanced stage, a description of the life of the Indian of the United States in general. But we must renounce this plan as requiring too much space. The greatest number of problems which ethnology and sociology are now concerned with bear upon this third phase. Here, from lack of written documents, inquirers are obliged to seek the connection of manners, characters, institutions and ideas, entirely by observation, the method of survivals and logic. We shall revert to some of these problems.

4. The fourth phase is that of peoples or nationalities, that is to say, of federations of tribes or of groups of tribes having a central authority, or of political unifications of tribes or of peoples under the scepter of one monarch, one oligarchy, or even a single democratic representation. The nationalities which we know of belong to history. They appear in the New World with the empires of Peru, of Central America and Mexico, and in the Old World with the empires of China, Babylon, Nineveh and Egypt. They are continued by the Greek municipalities and the Roman Empire, and form a series extending, but little interrupted, to the states of modern times.

A fifth phase would be the present epoch characterized by the tendency to substitute for empiricism in the organization of societies, the rational and scientific method.

Let us revert to some of the points of the first phases before entering on the details of the succeeding.

Our point of departure was man in favorable circumstances, when his character had not yet been falsified. He was kind, gentle, straightforward, disposed to altruism, resembling the herbivorous more than the omnivorous animals. The Veddahs are typical of this state, then the Andamans. The Boshimen of the time of Levaillant and the Fuegian Yahgans, both in unfavorable conditions, are already less simple and candid. I should like to stop an instant at the Esquimaux. They are situated in the worst possible circumstances, in the midst of ice, in a country without vegetation and extremely poor in alimentary resources. But having no competition, the Esquimau has remained kind, frank and affectionate to his wife, children and fellows. Although he formerly occupied more favored southern countries, although he occupied a certain rank in the social scale, had chiefs and tribal divisions, possessed beliefs and legends of distant migrations; although he was intelligent, ingenious, possessed of initiative, acuteness and a pronounced taste for poetry and song—he is to-day in the lowest phase of social evolution, in the primitive patriarchal phase, without a trace of political organization. The few traits of advanced civilization which Mr. Franz Boas and others have described among the Esquimaux are merely survivals. The explanation suggests itself. We have here the type of the human group of which we have spoken, a type not arrested in its evolution, but retrograded from lack of excitation. Its character affords the key. The Esquimau is apathetic, without reaction, resigned, living from day to day, and without light for

half of the year. One is astonished even that he has not passed by adaptation to the state of the hibernating animal. Yet the retrogression has not necessarily affected all the characters and is due to different causes. A tribe of Indians which Brinton cites, the Snakes, although belonging to a race which had probably raised itself to a higher plane than the ancient Esquimaux, has yet fallen back, from economical motives, to the family phase, without the slightest trace of political organization. This is another example of retrogression reproducing the phases through which progression passed.

CHAPTER VI.

The Human Family. Initial Paternal Type. Worship of Ancestors. Secondary Maternal Type. Other Forms. Promiscuity. Types of Social Development. Militarism. The Internal Social Evil.

The preceding tableau involves a great many variants,—particularly in the second and third phases,—of which we will not speak.

The long chapter which we devoted to the animal family and which called forth an exposition of the relations of the latter to animal society seems especially to demand of us a like chapter upon the human family. But numerous works have been published upon this subject, of which the latest expresses perfectly the general ideas at which we ourselves had arrived.* We shall consequently be brief.

The initial type of the human family, such as it appears in an analysis of our knowledge of the lowest savages, and such as it certainly was with primitive man, is not a promiscuity, as has been affirmed, but appears just as we have above depicted it. It conforms to what the animals, and particularly the apes and the anthropoids, led us to expect. Writers have confounded free love outside of marriage with marriage consecrated by formal contract. The family is most commonly monogamous, sometimes polygamous,

*Westermarck, *The History of Human Marriage*, London, 1891. I could not be too profuse in my commendation of this work. The bibliography with which it closes is admirably complete.

always patriarchal. The authority in the hands of the father here supplants every other form of social organization. The father is absolute master, is responsible for all his dependents and punishes them at will. His children bear his name and inherit his property. His authority is generally mild. He voluntarily consults his daughter when he gives her in marriage; sometimes, too, his wife. He is not tyrannical. If he takes to himself several wives, one is particularly favored and is his principal spouse. Later, when the elder and younger branches have separated or have become subdivided, each father preserves his rights over his own, but the father of the elder acquires a higher authority over the others Thenceforth two cases are presented. Either the family maintains its primitive form, whatever be the extent of the clan, becoming even more consolidated, as we shall soon see; or, becoming subject to the predominant influence of the clan or the new usages to which that gives rise, it enters upon a deviating course of development of the most unexpected kind.

Let us begin with the first case, which will oblige us to anticipate a subject which we did not wish to approach until later.

Among the sentiments which animals, for example the elephant, the dog, or the ape, suddenly manifest in the presence of a new or extraordinary fact or object, are to be successively noted astonishment, curiosity, and the desire of getting clear as to its character, and finally, when unsuccessful in this, fear and terror. Such is the case of the dog who, seeing the portrait of his master on the wall, stops, looks at it, barks, then flees, returns, barks anew, and retires, confounded and with lowered head. Such also is the

case of the ape who, seeing his reflection in a glass, looks behind it, seeks to comprehend the situation, and at the close of his efforts runs away, casting glances of distrust behind him. It is the same with man. In the presence of the phenomena of nature and of objects which arrest his attention—the sun rising and setting each day, the lightning cleaving the clouds, the stone which has struck him—he is disturbed and restless, inquires what it means, and receiving no response, makes of it, with that faculty which the dog and ape do not possess, a being endowed with life like himself, a supernatural thing. Thence he comes to regard that thing as a fetish, to convert it into a charm against bad luck, to commend himself to it, to address prayers to it. This is the first stage of human belief and sprang from fear, as Petronius has said. Like the child who strikes the object that has injured him, only going farther still, he attributes to objects intentions and an imaginary anthropomorphic power.

The second stage is that in which by mimicking further the resemblance to himself he gives to objects a spirit, a double, distinct from the object itself. This is the animism of Tylor. The savage has remarked that there are in him two beings, the one attending to the ordinary occupations of life and periodically slumbering, the other pursuing him in his dreams, and when awake forcing him often to do deeds which he cannot resist, or revealing itself in conditions which to-day we call pathological. His imagination is struck with the phenomenon and carries him still farther. Not being able to believe in natural and complete death, not being able to believe that the friend with whom he has lived, the father

who has cared for him, has totally disappeared, he supposes that his double continues to exist, that it has made a voyage or excursion in his environment, and is still concerned about him. This double he sees with the same needs, the same desires, and the same exigencies, as formerly. If something incomprehensible happens to him he attributes it to that double, imagines it irritated. Hence the obligations which he believes he is under to it—first, that of properly interring it with victuals, with arms, and the things which it loved most; then, that of renewing these victuals and of making oblations and even sacrifices to it.

Frequently matters go no farther, the recollection of the father is effaced and *a fortiori* of the grandfather, and all those who have preceded him. But at times, and that among a great number of savages, these oblations are prolonged, and frequently even in some of a more advanced state are confirmed and give rise to the cult of manes or ancestors, which assumes considerable importance and engenders in the bosom of societies, of which these families form part, powerful autonomies.

The eldest son, and, when there are several branches, the oldest in the branch, then the oldest among the survivors, has charge of the offerings and periodical ceremonies in honor of the ancestors. The spot where the latter repose becomes a sacred locality; the dwelling in which they have lived is sacred also. The enclosure where both are situated, marked off by boundaries or stones, becomes the common patrimony, which the eldest responsible son manages in the name of all and is bound to transmit intact or augmented to his descendants. An altar is erected in the habitation, where the fire, at first intermittent, is afterwards

made permanent. Rites are established in which the whole family take part and from which the uninitiated are excluded. The son who is in charge of these rites is a veritable pontiff. He wields at once a patriarchal and religious authority over all the members of the family, now become a clan, not excepting the servants and the few strangers who have been admitted into its bosom after complying with certain requirements.

The bonds thus established between ascendants and descendants are mutual. The ancestors cannot dispense with the cult which is due to them; if the family becomes extinct, the common sepulchre no longer has any one to care for it and to celebrate the rites, the manes of the ancestors are cast off and condemned to wander about perpetually. It is to the interest of the latter, therefore, to protect their posterity. Thus the perpetuation of him who has charge of the rites is a paramount consideration. He is obliged to marry, to have children of the masculine sex, to divorce or to take to himself another wife if the necessity arises, to adopt a stranger as his son in the last emergency—in a word, to maintain his line of descent. There are even more extraordinary measures adopted to stave off the consequences of sterility. In all this the woman does not count. On entering a family she is initiated into its mysteries and renounces that which she has quitted. She assists in its ceremonies, but that is all. Inheritance from one branch to another operates only through the masculine sex.

How extensively is this eminently conservative institution spread? If we examine it closely, we shall find traces of it in a great number of peoples. It

existed and still exists in China, where formerly the Chinese called themselves "the people of the hundred families" or clans, where the family is still organized upon that basis, under the high authority of the father, with the sanction of the domestic gods.* Villages are mentioned here of three thousand souls, forming but a single family. The institution also existed among the Hebrews. The clan of Abraham is a perfect example of it. It existed in India and in all branches, it seems, of the Aryan race, notably in Rome and in Greece, where it has been described in a masterly manner by Fustel de Coulanges.†

At a distant epoch of history several of these clans or gentes became united, and without losing any of their several characters formed phratries or curiæ, which adopted as their principal common divinity the most renowned and powerful of the clan. But let us take an example from Fustel de Coulanges—the most celebrated one. Centuries before Athens existed, Attica was occupied by upwards of a hundred independent family clans, each having its chief or pontiff, its domestic gods, one or two usually, and its "clients." Three, four, or six of these clans united and came to form twelve phratries or boroughs. One of these, the Cecropids, inhabited the rock where later the Parthenon was erected, and towards the sixteenth century before our era acquired the supremacy. One day a Cecropid named Theseus succeeded in consolidating the twelve boroughs, and with the assistance of the patricians, or Eupatrids, founded the city of Athens. But this centralization gave rise to distrust of the patricians, a struggle ensued, the religious and

*Eugène Simon, *La cité chinoise*. Paris, 1885.

†Fustel de Coulanges, *La cité antique*. Thirteenth edition. Paris, 1890.

political offices which had been united in one person were severed, the family organization began to give way, the "clients" were freed, the plebs—that is to say, all persons not included in the organization—came to the fore, and in Solon's time the organization itself disappeared. At Rome its history is virtually the same; and no traces of it are found in the laws of Justinian. The right of primogeniture, which has persisted in Anglo-Scandinavian societies, is its survival.

The second case presented in the primitive paternal family is its deviation under the growing predominant influence of the enlarged clan. This deviation is a step backwards to the less developed family state in evolution, which we met with in the animals and which implies a varying disinterestedness on the part of the male in his family duties. The children are here left to the care of the mother. We have the *maternal family.*

We have seen that the maternal instinct is one of the most beautiful products of evolution in the birds and mammals, that it is free from all impurity and strongly consolidated, whilst the paternal instinct is an unstable compound involving several elements, one altruistic and the other egoistic, and that the latter frequently gains the upper hand. It is the same in the human species. Of the two needs which assure reproduction, the one, the sexual need, has remained imperious in man; the other, the family need, is subordinated to certain satisfactions, to certain influences. When the family is small, isolated, in a calm environment, and when its monogamous altruism preserves its entire hold upon the husband, the wife is his companion and the children his source of joy.

But when the responsibility of the husband is less engaged, when he is accustomed to regard his wife as a utility, when he becomes polygamous, and when a different interest, that which he has in the clan, distracts his attention from his family interests proper, his paternal interest weakens and gets disorganized. He behaves as does the buffalo, which is more at its ease with its comrades in the herd at large than with its females and young in its own particular herd. Of two things, one happens. If he is eldest in the multiple family of which he forms part, his need of domination is largely satisfied to the detriment of his family. If he is a subordinate, his dominion over his wife or wives and his children is lessened; he takes less interest in the performance of his duties, and gradually comes to see in his wife nothing but a means of pleasure and a breeder of children.

Such is for us the point of departure of the secondary formation of the maternal family in the human species. It is met with here and there in Asia, in the Malay Archipelago, in Polynesia, in Africa, and especially in America. It is in concord with polyandry, which is a plurality of husbands, with polygamy, or monogamy.

An early form particularly noticed in Tibet, among the Todas, among the primitive Arabs and the ancient Bretons, is fraternal polyandry, which forms the passage from the paternal to the maternal form. The oldest member of one clan takes a wife from a stranger clan, who subsequently becomes the wife of his other brothers and sometimes also of their nearest relatives. The first pays at the outset the entire dower, for which the others afterwards reimburse him, each according to his share. The causes of this institution rest on

considerations of economy, the scarcity of women, or the advantage arising from the concentration of heritages in a single family. Nevertheless, the Toda who can afford a wife all to himself never lacks one.

Another form, of which the Nairs of Malabar are the type, is as follows: The woman remains at home and accepts from the hands of her relatives from four to twelve husbands (provided they are of the same caste), who jointly supply her needs. In this case the children never know who is their father, and can only bear the name of their mother, whilst in the preceding case they had a collective paternity of the same name. What complicates the situation in the case of the Nairs is that each of the husbands can enter into other conjugal relations of the same kind.

The third is one of the forms of marriage preserved in the Malay Archipelago. The woman remains in the family of her mother, where she is engaged in its management. The husband lives and works in the family of his mother. The father is a nearer relative of the members of his maternal family than he is of his own children. The maternal uncle is the chief of the family; lacking him, the eldest son, if he is old enough; lacking both, the mother. The father does not officiate until the mother is dead, and then only while the children are minors.

Other forms of the maternal family are more widely spread, but are extremely variable. In Australia and America they are almost in the same proportion as the paternal family. Between them and the latter Tylor admits an intermediary form, the paterno-maternal. The custom of the husband to take his wife to his home, or of going to live in her home or with her clan, gives us an insight into the origin of

the maternal family. It appears from the statistics of Tylor that in the tribes where the custom is for the woman to come to the house of the man, the system of calling children by the name of their father is constant; that in the tribes where the husband goes to the house of the wife, the system of giving the name of the mother is proportionally frequent; and that in those where both usages exist the children bear the name of the father when the mother goes to the father's house, and that of the mother when the father dwells with the mother. In Australia, the chief of the maternal family is now the maternal uncle, and now and most frequently the father, although by law the children are dependent on the clan of the wife. Inheritance goes now by the wife, and now by the husband, especially certain articles, such as those which belong to the soil. On the other hand, the boys sometimes bear the name of their father and the girls that of their mother. As we see, we have here an institution imperfectly established, of which the origin at the expense of the paternal family is evident, and which customs, accidentally created, have caused to deviate from its natural type.

In America the institution is more consolidated. Let us take the Iroquois for example. The children bear the name of their mother. If the husband dies, his goods are divided among his brothers, sisters, and brothers of his mother; his children receive nothing. If the wife dies, her goods are divided among her children and her sisters; her brothers are excluded. It is the mother who grants the hand of her daughters and who seeks wives for her sons. The Iroquois are monogamous; polygamy is forbidden to the men, but in a tribe cited by Lafitau the woman can take a sec-

ond husband. The maternal family thus constituted is the nucleus of a social organization which recalls that based upon the paternal family and consolidated by the worship of ancestors. Twenty to twenty-five families compose a clan, of which all the members are solidary, which has a common sepulchre, its own totem, is governed by a council, lives in a common "long house" and is exogamous. Three, four, five of these clans get grouped into phratries, the latter into tribes, the latter into confederations. Each tribe has its own totem, the individuals are exogamous with regard to the clan, and endogamous with regard to the tribe.

Does the maternal family imply the matriarchate—that is, the transfer of the authority of the household from the hands of the father to the hands of the mother? By no means. There is a division of the authority here between the father, the chief of the maternal family, and, in the case of the Iroquois at least, the mother. All things considered, the woman is the gainer. Her responsibility with regard to her children is augmented, as is also her social position. In several tribes of America she is consulted and can be the chief. The women come together in council and send a delegate to the council of the men. Among the Iroquois she is said to have had the right of veto in declarations of war, and could intervene for restoring peace. (Schoolcraft.)

In fine, the complete characters of the maternal family in its most widely spread forms are as follows: (1) The mother is directly responsible for her children and is slightly assisted by her husband; (2) the children bear the name of the mother; (3) the system of relationship is entirely altered, and, from our point

of view, eccentric; (4) the property of the mother is left to her children and to her nearest maternal relatives; and *vice versa*, the nephews and nieces inherit the property and dignities of the maternal uncle; (5) the latter, save in the case where, as among the Iroquois, the woman plays the chief rôle, is vested with the general authority, receiving offers of marriage for the daughters, or even accepting the dower which he divides with the father; (6) the maternal clan is jointly responsible for the children, avenging them when necessary, while the latter, in case of war, are obliged to rally in its defense; (7) the father acts a secondary and extremely tristful rôle; this rôle is restricted almost entirely to the primary act of reproduction. In fact, the maternal family is an instance of a partially retrogressive evolution in manners,—an inferior stage which carries the human species back to the initial stage observed in reptiles, birds, and the more sparsely distributed mammals. The comparison of human sociology with animal sociology is responsible for the belief that in our species the maternal family could have preceded the paternal-maternal, and consequently have been from its beginning inferior in this respect to the generality of apes.

A curious and universal fact, varying in degree, but found in all forms of marriage, is the interdiction of union between near relatives, at first between father and mother and the children (here Westermarck cites but one exception, that of the Kaniagmuts), then between brothers and sisters, between uncles or aunts, and nieces or nephews, then between cousins of the first and second degree, and subsequently even further still. When the interdiction applies to all the members of a clan regarded as of kin, although the kinship

has been lost in the lapse of time, the clan is called exogamous. In certain clans of Australia this fictitious kinship is expressed in the habit of all its members calling one another brother and sister. It has been sought to penetrate the motive of the interdiction of union between relatives. None of the five or six opinions which have been advanced are completely satisfactory. Nothing corresponds to it among the animals.

The meaning of the customs consecrating marriage has also been investigated. In general the young man seeks his own wife and the girl waits until she is asked, as is the custom to-day. At first, the marriage was effected entirely without formality, as we have already seen. The request having been made of the father, and his consent obtained, the young couple depart with full knowledge of the engagements which they have entered upon; protection and the satisfaction of their needs by the one, submission and fidelity by the other. In a second phase the fiancé carries off his bride by violence after having obtained her consent and that of her parents, and rarely without that consent. Generally it is a sham struggle, a simple ceremony, though at times brutal survivals of it are found in modern civilization. It is marriage by capture. The third phase is marriage by purchase, in which the price of the bride is regulated by usage, varies with the standing of the family, or is chaffered about. The price may be another girl in exchange for another young man, services rendered by the suitor, objects, such as one or two buffaloes, or a sum of current money. The fourth system is exchange between the father and the suitor, each one giving. The fifth, which is doubtless derived from the latter,

is marriage with dower, which constitutes the personal belongings of the woman. Marriage by capture is most debated. For us, setting aside the facts of stealing in a hostile or friendly tribe, it is simply a representation of what takes place in animals, and which we find again in man. The male animal, desirous of conquering a female, approaches the latter, gives exhibitions of his force, and shows himself ready to combat all his rivals. The female affects timidity, resists, and does not abandon herself until the male has offered her violence. This is what we still see to-day in our towns and in the country with civilized man; the woman who is most disposed to yield is the one who most resists.

It is unnecessary to indicate the numerous exceptional forms which marriage presents among savages and half-civilized people, such as marriages by trial, after which trial the girl accepts or refuses a suitor, as is the custom with the Todas; the marriages which are not definitive until after the conception or birth of a child, or which are broken if children are not born; marriages for a fixed space of time, etc. The latter already fall under the rubric of licentiousness or prostitution, which we should be on our guard against confounding with hospitable, religious, and seignorial prostitution—a quite different institution, and of which we shall not speak.

The genetic instinct and the family instinct, although often superposed, are not necessarily associated in marriage, of which the object is less to satisfy the sensual impulses of the husband than to establish a home and to have children. In the most felicitous unions, the genetic instinct of the husband, being more imperative than that of the wife, is not always

satisfied at certain periods of the life of the mother (gestation, lactation, etc.). When custom and his position in life permit it, he takes to himself a second wife, and, caprice intervening, perhaps a third; or he is, by permission of law, polygamous. But if that is not allowable, he will either give vent to his impulses elsewhere, or will take to his home a concubine, which public opinion also frequently permits. As to the women, the genetic instinct very frequently leads them astray, even before marriage; the best behaved girls, so a missionary in Lower California recounts, languish after a husband. The first step is everywhere the gravest. They contract what they represent to be a marriage for a period fixed in advance at one year, at several months, or less, or for certain days of the week. Marriage of this sort thus leads by degrees to prostitution or concubinage, with which, among savages or barbarians, in a clan or a tribe, are associated all those variations of the sexual relations which are more or less accepted by usage. If we add polyandry and polygamy between two neighboring clans, we arrive at those irregular customs which are attributed to savages and among others at those assumed promiscuities, "marriages by groups," which figured in ethnography not many years ago.

Inquirers have been fain to see in promiscuity, associated with a complete social anarchy, the first stage of man prior to the appearance of society: the political clan, they said, emerged from this anarchy, the maternal family issued from this clan, and the paternal family proceeded from the latter. This is erroneous. The paternal family was the immediate, habitual form of association of the true primitive man as it is now among the lowest savages known to us.

The family clan, becoming the political clan, is most commonly nothing but an enlarged family. When these clans were united into phratries and tribes, the family still persisted with its primitive patriarchal organization. The maternal family is, as we have said, an accident only, which has drawn evolution into a devious way; it is a retrogression, notwithstanding the fact that it has persisted in this form as the basic element of the clans or tribes in which it existed.

Similarly, polyandry and also polygamy are accidents, reversions to animal forms of marriage, aberrations of the human species. The advanced and essentially human form is monogamy, either acknowledged or concealed under different forms. Westermarck justly remarks that if one of the women in polygamy is the spouse *par excellence*, in polyandry one of the men, too, is the preferred husband. Even in the midst of licentious debauchery, as we find it among the Areois of Tahiti, each man has his own wife, of whom he is jealous and with whom he is very strict. Even in prostitution the woman contracts an alliance with some one man particularly, and makes of him her companion and protector. Monogamy is the conjugal form of the anthropoid apes, as of the lowest savages. In the first phases of civilization it drops off in frequency, but only to increase again at a more advanced stage and to become the accepted and esteemed form. Furthermore, it is the form to which the paths followed by evolution in the animal scale logically lead—the form which answers physiologically the best to the objects of reproduction: not quantity but quality of children.

The forms or types which human societies assume or have assumed, from the epoch of the family or family clan to modern civilizations, are so numerous and varied that the first thing to be done, in acquiring a satisfactory point of view, is the establishment of divisions beginning with the simplest and leading to the most complex, in conformity with the principle of evolution, or of their progression towards societies which we esteem to be the highest—that is to say, towards our own.

The most desirable classification, that towards which all our efforts tend, and which takes into account all the characters presented, rests upon the idea of civilization itself. It would be something as follows: The very lowest savages, such as the Veddahs; the semi-savages, such as the Australians; the barbarians of the first, second, or third degree, as the negroes of Dahomey and of Benin, the Indians at the time of the discovery of America; the Kalmucks of Tartary, the Gauls and Visigoths; the semi-civilized peoples, such as the ancient Egyptians and Assyrians, the Peruvians of Pizarro, and the Mexicans of Cortez; and the civilized peoples, which are divided into the Ancients (the Greeks and Romans), and into the Moderns. But on the one hand science is not in a position to fill up the details of these divisions, and on the other, their lines of demarcation are not at all distinctly fixed: there are everywhere insensible gradations.

A second classification is that which we have sketched out above, based upon the idea of association: families uniting into clans, clans into phratries or tribes, tribes into cities or their equivalent, and cities into federations and nations.

The third mode rests upon the first manifestations of the faculties that constitute man. The making of tools for attack and defense, at first from stone by chipping, cleavage or polishing, then from copper, bronze or iron. The age of fire-arms should be added. It is unnecessary to say that the resulting periods are nowise parallel in the different parts of the globe, in Italy and in France, in Europe and in America. Quite recently the tribes of Lower California were still in the stone age.

The fourth mode of division is based upon the manner in which men in societies, as they increase in number and encounter greater and greater difficulties in supplying their daily needs, organize their life either by *transforming* their means of satisfying these needs, or by *adding* entirely new methods to those which they already employ.

Other modes of division have been suggested, giving rise to other social types, but not harmonizing with the general idea of unbroken progression in the same direction. Such is the division of tribes and peoples into nomadic and sedentary, into peaceful and warlike, into monarchic, oligarchic and democratic, into individualistic and autocratic, two forms compatible with each of the three preceding.

Let us dwell on the fourth mode, which is the broadest. The lowest savages, who are broken up into small families, are either hunters or fishers, according to the country of which they have virtual ownership; or they are both at once. They are nomads, always in search of food, as long as the season permits it. At a certain season of the year the Veddahs are shut in by rains, the country is inundated, and the various families seek refuge on some rocky

eminence, where they come together but do not indiscriminately mingle. Sometimes one of them will volunteer at the peril of his life to go in search of food, which, if he finds, he will divide. This is the first stage of the first period or of the *hunter type*. The necessity of finding certain species of game or fish on the territory of certain families was perhaps one of the first occasions of reunion and of the granting of concessions after the manner of an association. The second stage of the hunter or fisher type is found in savages already organized into clans or tribes. It is characterized by a spirit of foresight and conservation which is quite remarkable. Rules are established for the protection of useful animals and plants; hunting at the time of mating and flowering is prohibited in certain regions; general expeditions are made at certain times only. The Americans of to-day evince nothing like a similar foresight when they suffer their forests to be burned and devastated—forests which even now are in many places utterly shorn of their most beautiful original species.

The second period is that in which man, seeing his customary game diminish as the number of hunters increases, and under the pressure of hunger, takes a step farther in the direction of foresight, gathers together in some enclosure the animals which form his customary food, subjects them to domestication, or leads them in herds to pastures which they successively exhaust. This is the *pastoral type*, which has persisted to our day among a great many peoples and which is essentially a nomadic stage.

The third period, which frequently sets in at the same time with the preceding, is that wherein man applies himself to agriculture. Two forms are met

with here. In the one the culture of the soil is intermittent; man plows and sows, pastures his flocks while living a nomad life, and then returns to the tilling of the soil. In the other, man is sedentary; he inhabits houses with his wife and children, who assist him, or he dwells in villages. This kind of life is eminently favorable on the one hand to the patriarchal family grouped about its patrimony and consolidated or not by the worship of ancestors, and on the other to individual property spontaneously created at the outset by simply taking possession of, breaking, and working undisputed land. In primitive societies which devote themselves to agriculture there is generally collective property of the soil vested in the clan which sometimes culminates in the periodical distribution of lands not reserved; there is also family property, included in the preceding, being the outcome of family labor, and being handed down from generation to generation, according to certain rules; and finally there is personal property. In our modern societies the state is still theoretically the owner of the soil; it takes possession of it again whenever it pleases, for reasons of public utility. For a long time the cultivation of the soil was not held in high repute, the profession of hunter or warrior was a far nobler one, as affording evidence of the individual valor of man. Later, even in civilized nations, agriculture was voluntarily entrusted to slaves. In Athens the farming class was among the lowest. This way of looking at things has changed since a school of economy declared that the goods of the earth are the source of all true riches.

The fourth period, or fourth type, did not assume importance until later, but it has its roots in the first phases of society. Exchange does not exist among

animals, and is one of the precocious manifestations of the human mind. It is discovered during the second stone epoch in France. It is derived from the obtrusive fact, which spontaneously came to notice, that one individual excels in the making of instruments, another in the chase or in fishing. The first says: "Give me what thou hast, and I will give thee what I have." This is barter or exchange in kind. Shortly after, the first rejoins: "Do thou go and hunt for me, and while absent I will protect thy family." We have here exchange of services. This phenomenon takes place in the clan or tribe. Later, certain individuals, adopting definitively this kind of specialization of labor, set out on voyages in quest of the scarcest materials, and consequently those most in demand; for example, good flints which were easily worked, shells for ornamentation, cattle, etc. The distribution of such objects was not always easy. Some one would want something and would have nothing to give in return that the other needed. The needs of the day and the morrow varied. Some conventional object of value was then adopted as a medium of exchange, such as cattle, tobacco, wampum. The latter, being more portable, became the current money, and afterwards was succeeded by pieces of metal and letters of exchange. Little by little the individuals seeking their subsistence from this species of labor multiplied, and the advancement of navigation widely extended their sphere. An entire nation, the Phœnicians, abandoned themselves passionately to its pursuit. With them the *commercial type* was born—that is to say, a society not exclusively devoted to this kind of work, but associating it preponderantly with other means of satisfying the

national needs. In the same perfection this type is not found until centuries afterwards in the Jews of the Middle Ages, and in the Hanseatic and Italian ports.*

As to the fourth period, or the fourth type, its roots are more deeply embedded in the past of man, but it does not attain an advanced stage until after the preceding period. It is the *industrial type.* The manufacture of stone, bone, and ivory instruments was its first stage, that of household utensils, of jewels, baskets, matted fabrics, and canoes the second stage. More than any other manifestation of the human mind, it reflects the latter's progress in satisfying the needs of daily life. The multiplication of needs which it gives rise to, the comfort which it brings with it, the luxury to which it tends, the need of wealth that results from it, are the most palpable measure of the degree of civilization attained. There were shops in Egypt from the fourth dynasty, for the manufacture of glass and pottery, for weaving and dyeing. The Pompeiian collection of the Museum at Naples shows to what a stage industry had arrived in the first century of our era. The art of war was one of its stimulants in all epochs. With printing, steam, and finally with electricity, progress took an accelerated pace. The museums of ethnography, like that of the Smithsonian Institution at Washington and the polytechnical museums, like that of Kensington at London, trace backwards its evolution. The history of the industrial social type is divided into two sub-periods: The one in which the individual, having as his sole possession his arms and hands, and still enjoying high esteem, by virtue of his muscular force, preserved his rela-

*Blanqui, membre de l'Institut, *Histoire de l'économie politique en Europe depuis les anciens jusqu' à nos jours.* Paris, two vols. 1860.

tive independence; the second, in which the individual is outstripped and soon afterwards conquered by machinery with which he cannot compete, and which, as its powers grow, finally takes his place.

Then appears what we deem necessary to regard as the sixth period, a sixth type, the present, the *intellectual type.* These machines, to say nothing of the science which has created them, are the material incarnation of the intellectual power of man, ultimately gaining the ascendancy over the muscular or animal force of the early ages.

Mind, having been *par excellence* the weapon of man in his struggle against nature, could not help culminating in such supremacy. It is the ultimate goal of division and specialization of labor for the satisfaction of needs of all kinds. The consequence is that the conditions underlying the social relations between man and man have totally changed, and that the great problem of the twentieth century will be that of finding the best adaptations to this new state of things. The twentieth century ought rationally to be the pure reign of intelligence.

It will surprise some perhaps that to the six types named, to-wit: hunting, pastoral, agricultural, industrial, commercial, and intellectual, we have not added the military type, to which Mr. Herbert Spencer attaches so much importance. Our motives for not having done so are as follows: (1) What gave rise to the six preceding types was the necessity of living, of multiplying or transforming the means before employed in supplying the urgent needs of life. Militarism belongs to an entirely different order of ideas. It grew from the need of defense, and, later, in response to other needs having no relation to neces-

sity. (2) It has existed at all times, parallel with the types cited, save in countries where the topographical characteristics themselves formed a natural defense. (3) It appeared early, was the result of no social type, and engendered none; it varies, and is hostile to all the social types. (4) There would be just as much reason for admitting a clerical type, likewise appearing as soon as men united in groups, accompanying all social forms and resulting from a like particular need. (5) Perfectly rational at the start, when it was used to defend the home, the clan, the tribe, or to maintain the collective independence of the latter, or even in expeditions into neighboring territories in search of food which was lacking at home, militarism subsequently became the expression of man's desire of dominating, of displaying his power, of satisfying his pride, when it was not, even worse still, madness or sheer debauchery in blood. The six types which we assume may have their defects by the side of their advantages, but they are certainly a logical consequence of amelioration, stages in the path of social progress,—which cannot be said of militarism.

Militarism in its legitimate, primitive form is but a reflex action, the same which impels the frog when deprived of its brain to contract its leg when pinched, or the lion to throw himself upon the hunter when wounded, or the cercopithecus monkey to organize expeditions into corn-fields for the satisfaction of his hunger. The difference in the case of man is that while the animal rarely attacks and destroys without necessity, man ultimately comes to doing so from sheer passion.

The evil in the case of man dates from the day when it was necessary to nominate the chief of a clan,

and when the chief in question, together with his followers, saw in war a means of strengthening his position and of becoming powerful. At the start, every man able to handle a weapon was a soldier. Some were brave, others pusillanimous. The first were hailed as heroes on their return, the others were despised. The first necessarily were the recipients of favors, were consulted in council, had the best places reserved for them at the ceremonies, were invested with definitive marks, honors, and privileges. Selection spontaneously set in, and there arose a class of warriors. The warriors multiplying, their importance waxed great, they looked upon themselves as a superior class, treated the rest with disdain, became proud, arrogant, and finally asserted high prerogatives in the conduct of public affairs. Coming to an understanding with the high dignitaries, whose supporters they were, such as the chiefs, the fathers of families, and the priests; having the forethought to appropriate the major part of the spoils of war, and consequently increasing in wealth, their influence also increased. The administrators of the state were recruited from their ranks. Gradually they came to look upon the state as their special creation, as their peculiar property, and in the laws which they helped to establish they ultimately identified their own interests, whether as a class or as individuals, with the interests of the people. The others below them were humble and subordinate and possessed only nominal importance.

At the origin, war was rational. It subserved the defense of all and was kept within bounds. Savages as a rule never push hostilities beyond the necessary point. The Australians often substituted for it single

combat by groups, the conditions being fixed in advance as in a duel. The Tasmanians, when the war was ended, clasped hands and forgot its originating offense. Hostilities were not perpetuated. But when the chiefs whose power sprang from war alone and the professional warriors became the ruling element, peace was often only a truce. Attacks were wilfully made under the pretense of making conquests and establishing empires; nations advanced in hordes in search of new and rich countries, pillaged cities and bore off prisoners of both sexes. Foraging expeditions were converted into outright robbery. War became a lucrative profession, a man-hunt, a royal pleasure, the highest glory.

Thenceforth the populations were divided into conquerors and conquered, within as well as without the city or empire. Every state was divided into two bodies, the slaves and the citizens, distributed into classes. Slavery in all antiquity was a scourge of blood, sometimes dissimulated under highly civilized appearances. Everywhere here, we see men whose only wrong was that they had been unfortunate on the day of combat, valiant men, sound in body and mind, curbed under the hands of a master, enfeoffed in a society having different manners, a different tongue, frequently different laws and different gods from their own. I say different laws, but no. For them there were no laws. They had lost all quality of manhood.

Our great modern states, the absolute monarchies, with all their classes of nobles and courtiers, are the product of war. The chiefs divided up the conquered countries among themselves, and became so many rivals, disputing for the available spoils. The least happy are the vassals, the happiest the monarch. But

the latter having reached his position by war is compelled to maintain it by war. He must encourage the ardor of his partisans, must distribute among them new lands, and shower upon them riches and honor. The property which we saw to be natural in its origin, thus becomes the prey of the strongest. Then feudalism is born. The true society, the society of the workers, disorganized, shattered, and perverted in its whole mechanism, thenceforth was left to establish itself as best it could, parts in towns where they established communes and obtained by dint of perseverance guarantees protecting them in their work, and parts in the country under the protection of feudal castles on the lands of the seignors, to whom they alienated a great part of their liberty for the permission to live.

These times are gone, people say. Militarism has changed their characteristics. But has the change been so great? When war breaks out, is it less horrible in its methods, less sanguinary; does it absorb less of the resources of a country, does it not destroy in less time the fruits of years of labor and saving?

War has not only its evils of the moment, and disasters which are soon repaired; it has also its reactive influence upon morals within. It habituates the minds of people to certain ways of thought, it teaches them the law of the strongest, causes man to lose sight of justice, and inculcates that there are two schemes of ethics, that of ends and success and that of failure. So long as war is not suppressed, the aspirations of philanthropists will be ethereal Utopias. With Mr. Spencer it must be admitted that contemporary militarism, however legitimate (for one nation cannot suffer itself to be devoured or molested by

another), is the grand calamity of the day, the disgrace of humanity, and that in this respect we civilized people do not stand as high as the Veddahs or the Australians.

By the side of militarism, which is an animal manifestation of our organism, still presiding over the relations of peoples to each other and forming an outward evil of society reacting upon it interiorly, there exists another *social evil*, which works wholly within, but which is not less grave.

One of the first phenomena which the beginnings of human society present, and which bear some similarity to the formation of animal colonies by associations of merids, is the division and specialization of labor. This division begins in the family between the husband and the wife; it is continued in the clan or tribe between individuals; it becomes established and spreads with the growth of the population and as the means of living become more difficult; it attains its maximum extent in our present complex civilization. One of its results is the breaking up of societies into classes and professional groups whose number is constantly increasing. The class which appears first is that of the fathers of families or of the elders on one hand, and of warriors on the other, which by fusion become the superior class, that which the chiefs, the administrators and magistrates affect. The sacerdotal class then forms, and soon becomes associated with the preceding, which has need of its services in swaying the populace. The third, fourth, and fifth social types, which we have described, give rise to the following: The agricultural class, the merchant or commercial class, and the artisan or industrial class. The last embraces all that is not included in the five pre-

ceding, all those whom the family organization not having incorporated has left without a home or domestic gods, those who have never been able by perseverance or their own worth or by favoring circumstances to succeed and rise, the day-laborers, who live from hand to mouth, the tramps, outcasts and outlaws. The slaves, on the one hand, and the strangers on the other, are classes apart. In Athenian times, a while previously to Solon, the proportion of the population was as follows: Citizens of all classes, nine per cent; strangers, subject to severe restrictions, eighteen per cent; slaves, seventy-three per cent. The warrior, magisterial, and priestly classes were the higher classes; the merchants, the artisans and the agriculturists formed the middle classes; the common laborers, the lower class or plebs. But the division did not terminate here. The middle classes were subdivided into professional groups, such as sedentary or pastoral agriculturists, fishermen, sailors, carpenters, shoemakers, scribes, interpreters, etc. These classes existed virtually as such or they were consecrated by laws; some were closed and hereditary, others open; a person was born, for example, warrior or priest. In Egypt, according to Herodotus, there were five classes; according to Diodorus, seven. But the latter must have confounded classes and professional groups, and then have omitted some of the last. The word "caste" seems to have been reserved for closed groups, such as they existed in India.

In India, or to be more precise, in the Punjab, there were originally, according to the code of Manu, four classes—the Brahmans or priests, the Kshatriyas or warriors, the Vaiçyas or husbandmen, merchants and artisans, and the Çûdras or servants. The aim

of this classification was to prevent a mingling of the conquering Aryans with the Dravidians, and consequently the absorption of the former. The first caste was composed of Aryans supposed to be pure, the second of Aryans and Dravidians crossed, the others of Dravidians. The black aborigines were excluded from the classification, and bore the name of Pariahs, a term subsequently invented. Afterwards the castes were modified, although the first suffered the least. Numerous intermediate castes were created, that of the Vaiçyas in particular was divided into a great many sub-corporations, each having its particular customs, laws, and religion, endogamous with respect to themselves, exogamous with respect to one another, and then giving rise to other castes. Take, for example, the caste of Kayasthas, or scribes. We have legends concerning its origin, but none of them are trustworthy; presently it is divided into four subcastes, and each of these into sections, each comprising a certain number of families or family clans. According to the census of 1881 there were in India two thousand five hundred castes of this kind, not including lesser divisions.

Classes, or open castes, are according to the nature of things, and in themselves no evil. They are a logical stratification. One passes from layer to layer, rises or descends according to one's starting point and the success or non-success of one's conduct. But this is not the case in closed classes and corporations. When a strong superior authority, special customs, religion, or secular routine have enervated the character and strained the resiliency of individuals, pushed resignation to the point of self-abandonment, then castes become perpetuated with all their

faults and merits; they improve their work as the specialization of labor requires it, but that is all. When, on the contrary, the individual is active, thinks, desires to be happier, preserves in himself the stimulants that make man, the feeling of solidarity and of general interest is established, aspirations are joined, the caste or corporation becomes an individuality opposed to those of other castes, competition with the latter is aroused and grows great, and at the same time the idea of equality and inequality, the desire of struggling and of having the same enjoyments, the same rights, and of conquering.

It is the war of classes, unknown in India, in Egypt, and in all countries where in the lower stages of society the spirit of individual liberty has faded or never been roused, but frequent in Greece and Rome and in modern civilizations, where the general level is higher. When individuals live in contact with one another, are not utterly ignorant of what is going on about them, when they exchange, be it ever so little, their thoughts (which happens in towns more than in the country, especially in the liveliest), the effect is inevitable. The isolated individual is pliant and submissive. Banded together, individuals support one another, lend themselves more easily to rebellion, and are ready to follow the most audacious leader. Hence in the lower classes there exists always a latent protest against the inequalities in the distribution of happiness, a silent rancor which the habit of submission alone can suppress. Hence the intermittent explosions of the disinherited classes, of the governed against the governing.

The complement of the struggle between classes is that inside those classes, between individuals, which

the works of Darwin have placed in prominent relief, and to which we shall have too much occasion to revert to insist upon it at the present moment. The evils of militarism are patent and striking. The drawbacks of that inward evil, which also is gnawing at the base of society and attacks both individuals and classes, are hidden, and, if I may use the expression, interstitial.

CHAPTER VII.

Factors Influencing Social Evolution: General and Occasional. Race, Population, Language, Surroundings, Adjacency, Circumstances, Individuals, Needs.

Up to the present we have seen: (1) Primitive man acquiring his first specific and distinctive characters; (2) the family at its origin among the savage tribes and the variations which it subsequently underwent; (3) the manner in which the first societies were constituted, and the principal forms which they afterwards assumed; (4) the two classes of evils with which they are affected, the one external in character—militarism—the other internal in its action—the antagonism of classes and individuals. Our purpose has been twofold: First, to describe human societies in their general characters, as we described animal societies; and secondly, to show how the human species, after issuing from the state of nature, progressively attained the elevated social state in which we see it to-day; in other words, to follow its evolution, which was impossible in the case of animals. We have now to inquire what were the general and occasional influences that have been instrumental in determining the transformations of these societies and in bringing about their differentiations.

1. *The Influence of Race.*—If we look at the present distribution of the various groups of humanity which have been arrested at, or have retrograded to,

some given one of the stages which we have examined, (a fact often difficult to establish), the influence of the factor of race is incontestable. The black races of Africa and of Oceanica, physically the ugliest, yet the most authentic and least crossed of all, are the lowest in civilization. Most of them are still in the primordial fetishistic period; none of them have given birth to social organizations at all extended; some black hordes have indeed in times past created military monarchies, but their creations were ephemeral, and have passed away without leaving any noticeable traces. No ruins or megalithic monuments exist among them, giving the least evidence of prior relatively civilized states; the few ruins found in Southwestern Africa are derived undoubtedly from the reddish blacks, or crossed Arabs, who may be regarded as affined to the primitive Egyptian race. The Australoid race of Huxley, of which we really know but one authentic group, the Australians, are in the same predicament. They have created no institutions, have left no memorials. The characteristic of all the black races is their inaptitude to rise by their own efforts.

Passing to the yellow races, carefully excluding here the retrograded groups, like the Esquimaux and the Fuegians, we find them divided into groups which in favorable circumstances are rarely so low in type as the Botocudos, which sometimes attain an average level, like the Polynesians and generally speaking the Indians of the two Americas and the Dravidians of India, but just as often reach a relatively high level, like the Aztecs of Montezuma, the builders of the temples of Yucatan, the Peruvians of Manco-Capac, and, nearer to us in point of time, the Malays, the

Chinese, the Indo-Chinese and the Japanese. The characteristic of the yellow races is a certain quickness in apprehending the means of satisfying the immediate needs of life and of rendering existence agreeable; but they have little initiative, do not know how to raise themselves to higher planes, and seem prone to immobilization.

The white races remain. These are nowhere discovered in the low stages. They have already a relatively high civilization in Europe during the prehistoric epochs—namely, during the Reindeer, Palafitte and Hallstattian periods. They have had their phase of barbarism, like the Franks and the Germans, but one which was already quite advanced. In the Orient and in Africa, since the first glimmerings of history, their civilizations were astonishingly high, and they had already commenced cultivating the sciences and letters. If I may be permitted to advance a rather bold and perhaps premature opinion, I should reduce the white races to four. The first, brown, small, and dolichocephalic, embraces the Mediterranean races, of which I have already spoken; consequently the Greeks and Romans, the Berbers and Egyptians; and further, all the modern and ancient Semites of philology. The second, also brown, but of relatively high stature, embraces the conquerors of the Vedic epoch in India, the Persians, and certain others at which I cannot stop. The third comprehends the brachycephalic Celto-Slavs, concerning the relationship of which to some ancient Asiatic group, of which the Galtchas* are at present the nearest known representatives, I reserve for the present my opinion. The

*P. Topinard. "On the Celts and Galtchas." In *Bull. Soc. of Anthr. of Paris.* 1878, pp. 117, 247, 383, 391; and 1879, p. 220, etc.

fourth is the dolichocephalic race, blond and of high stature, at present predominating in the northern parts of Europe. Now, if we except the brachycephalic group, which, although numerous and prolific, played in prehistoric Europe only a subordinate rôle,* we find it is these white races that founded all the great political states and all the great civilizations of Europe prior and subsequent to the Christian era. The characteristics of the white races are a remarkable aptitude for developing by their own independent efforts or for assimilating the empirical results of others, their ever-increasing need of comfort, their vigorous and comprehensive cerebral activity, and their spirit of initiative, which the expression "go ahead" of one of them so aptly characterizes.

It cannot, therefore, be doubted for an instant that race has had a considerable influence upon the development of human societies. All races, in our opinion, if favored by circumstances, may progress, particularly when they are in contact with stronger races. But they have not all the same aptitude, and many which we have never known and which even anatomical anthropology cannot disclose, must have utterly vanished. There is an exceedingly interesting chapter to write here on the psychological characters of races from this point of view—characters which are just as good for distinguishing between them as are physical characters.

*My opinion that the Celto-Slavic race is one of the primitive branches of the yellow races, and made its appearance in the Neolithic epoch, explains the subordinate rôle which it then and subsequently played. Sedentary by habit, following the movements of the populations with which it was in contact but without notable personal initiative, willing to emigrate, but readily returning home again, adaptable to all occupations, industrious, economical, sober and having few needs, it reminds us of the Chinese. The fact that in Europe, situated between the brown and blonde races who are so given to progress, it has remained stationary like the Chinese, is deserving of remark. Examples of this race are the Savoyards and the Auvergnats, whom I know best.

2. *The Influence of Language.*—At the beginning of this century, when comparative philology arose, an epoch of infatuation set in, which reached its maximum when Balbi, in 1826, in an effort to moderate its pretensions, published his *Introduction à l'atlas éthnographique du globe.* Up to 1869, or thereabouts, and despite the brilliant discussion which took place in the Anthropological Society of Paris, writers invariably confounded peoples with races and languages with races. These times are gone by. We are to-day in the right path. We know that languages perish, decline, and are superseded in part or in whole, that their boundaries advance or recede without reference to race, as circumstances and frequently diplomatists determine. Philologically there are Aryans, but there are no Aryans by race. There is a French race from the point of view of language, there is none from the point of view of anthropology. But if language has no relation to race, it has to peoples or nationalities. A common language strengthens the bonds between the different fractions of the same people, encouraging the exchange of ideas and the conduct of business. It assists in the mixture, crossing and fusion of races, as does everything that tends to bring individuals closer together, and to lessen misunderstandings and causes of conflict, just as the same religion, similar customs, and like interests do. Such is the great influence that languages have exercised on social development. Two individuals who understand each other are nearer to agreeing and fraternizing, whether they are of different blood or not. There are, it is true, federations of states, both large and small, maintained between groups differing in language and religion, but then there are mitigat-

ing circumstances and superior advantages involved, which offset the resulting drawbacks. Moreover, these unions are often only superficially such; the integrant states form national sub-individualities, rivalry between which is always to be feared. In short, unity of language between remote or adjacent groups of men proves but one thing, that at some period they have lived together during a long interval of time. Nations are the products of the events of history and of politics.*

3. *The Influence of Population.*—I can touch only briefly upon this factor, although it is the most powerful of evolution. I have already shown how by rendering existence more and more difficult the increase of population forced man to pass from the hunting and fishing stages to the pastoral and agricultural stages, and from the latter to the commercial and industrial stages. I further indicated how it led to the antagonism of classes and individuals. The increase of population, it is true, is a complex phenomenon. According to the celebrated theory of Malthus, propounded in 1798, in every hundred years the alimentary resources of a country increase in arithmetical proportion only, whilst the population increases in geometrical. But the facts have contradicted him, the resources have increased proportionately more, there have been overproduction and resulting surplus, whilst the rhythm of natality has diminished, because the enlightened and far-sighted classes voluntarily limit the number of their children. If to this cause, which in the present civilization

*P. Topinard, *Le principe des nationalités; Revue critique à propos de la péninsule des Balkans*, in *La revue d'anthropologie*, p. 124, 1886. The same, *La race en anthropologie*, in the *Comptes rendus du congrès international d'anthropologie et de prehistorique de 1892 à Moscou.*

seems to be on the increase, there be added the lessened disposition to have children evinced by women struggling for emancipation, the question arises, What will this ultimately lead to?

4. *Influence of Topographical, Climatic, and Alimentary Conditions.* Although man is a cosmopolitan animal who adapts himself to all conditions, the influence of the factors here in question is indisputable, though it has rather the effect of differentiating than of accelerating or retarding social evolution. It should certainly not be overlooked. Just as individuals vary and are more or less favored in the aptitudes they exhibit, so the countries of the globe present conditions of existence which are widely different for man. One country is naturally defended, as an island, a peninsula, or high valley; it will be protected by a desert or a chain of mountains. Another, on the contrary, will be exposed to all incursions. One country will be rich in fauna and flora, in mines of coal and metals, in rivers and seaports. Another will be arid, sandy, rainless, and exposed to all the winds of heaven, or swampy and unhealthy, too hot or too cold.

Necessarily the stimulants to action will vary in all these different cases as to number, power, and quality, and will give rise to widely different impulses. Progress as a rule is proportionate to the difficulties encountered, providing the latter do not exceed a certain limit and do not bring in their train discouragement and resignation; in some circumstances reaction is impossible. The more a country is the object of rival desires, the more are the probabilities of its giving rise to advanced forms of society. Such are the valleys of the Nile, of the Tigris, and of the Euphrates, of the Yellow and Blue Rivers in China, of the Indus

and the Ganges. Western Europe has always been a bone of contention with the so-called barbarous nations, and has given rise to the highest civilizations. Conversely, the least envied countries, like the deserts of Sahara and Kalahari, the steppes of Central Asia and Siberia, lofty plateaus between two chains of rocky mountains, are the habitats of peoples who have advanced only slowly in civilization. Generally speaking, the northern peoples, who are subjected to an invigorating atmosphere, are more active than southern peoples, who are enervated by heat and inclined to indolence, and yet it is among the latter that the Chaldean, Persian, and Assyrian empires, Carthage, Greece, and Rome arose. Mountains afford a refuge for quiet, sedentary and industrious peoples, and fertile plains for pastoral nations, etc.

5. *The Influence of Adjacency.*—This factor is considerable, although the works never dwell upon it. A society cannot be the same if its neighboring society is warlike and turbulent, or peaceable and sedentary; or if it is enlightened, religious, devoted to the arts, and possessing good laws, or ignorant, skeptical, uncultivated, and badly governed. Emulation and example are factors of the first order. We look about us and acquire the manners, customs, faults, and excellences of our neighbors, just as we acquire their language, religion, their methods in science and philosophy, their fashions in literature, and their ideas of morality. The imitation which M. Tarde has emphasized is more frequently a psychical contagion than a voluntary act. It operates outwardly among nations as well as within them between different strata of society. The enticement of fashion may be observed in all fields of human conduct. Habits, like ideas,

are communicated. Chiefs, legislatures, professions, yield to imitation as much as individuals.

6. *Influence of Circumstances.*—By this word, which Lamarck used to designate the totality of the causes capable of exercising an influence upon existence and of producing changes therein, we understand here simply such determinative facts as occur unlooked for, which in the normal course might not have happened, and which are decisive of a new impulse to a society immobilized or involved in a different course of evolution—an impulse which may give rise to either good or bad results. The circumstance may be violent or feeble, or even insignificant; it may be physical or psychological. Among the violent in the physical order, we have an example in the eruption of the sea, say the Zuyder Zee, over a vast surface occupied by a peaceable people, who are thus forced to become warlike and to go in quest of another habitable country, where their habits are necessarily completely altered. Another example of the same class is an invasion of barbarians, who, after putting everything to the fire and the sword, draw off, leaving behind them a people, who, in one case, never recovering from their exhaustion, will retrograde, or, in another, shaking off their lethargy, will rise again and enter upon a career of prosperity which otherwise they would not have pursued. As to feeble, inconspicuous circumstances, who has not at some time or other observed their puissant efficacy? Events most frequently are the resultant of an *ensemble* of dispositions and circumstances. Ten or twenty will be combined; one of them, perhaps the least effective, will play the part of the drop of water that causes a vessel to overflow, and so will be the determining cause. If

the drop of water had not come at the right moment, the other conditions would have been dissipated and the event delayed or deferred forever. Circumstances, whether potent or feeble, belong to the domain of chance so called, and are a factor with which we must reckon in evolution and in the directions which it takes.

7. *Influence of Individuals.*—This factor is for man what the preceding one is for things. Let us suppose that in the circumstances presumed above where everything has united to produce a certain effect, the right man is not present; either the effect will not be forthcoming, or it will miscarry. Conversely, suppose a situation is not yet ripe, but that some one of that class of men who are called geniuses and whose interposition people regard as providential, arises; then the event can occur and bring in its train decisive transformations. Truly, men amount to little when they are not the expression of their time, when they do not come at their psychological hour. Many, and some of the most brilliant even, have thus passed away without their fellow-creatures having derived the least advantage from their existence. Such are the majority of military heroes whom history places in the first rank, who fill the world with their reverberant personalities and leave behind them nothing but smoke. But by the side of these ill-timed geniuses whose efforts have been bootless, how many there are whom history or tradition hardly mentions, and others whom the world has never known, that at some time, by some little thing, some new instrument, some new process, some law, or simply some example, merit being inscribed among the prime causes that determine evolution. This species of men, these shapers

of progress, seem to be almost entirely wanting among the black races; they are scarce among the yellow races; they are common among the white races. The stages of evolution may be represented by a net, the threaded pathways of which are variously tied together. At the points of crossing are bright, salient knots; the latter are the individuals that mark the changes of the pathways. Whilst in animals progress is effected by circumstances taken in the broad sense of Lamarck, in man it is principally effected by individuals. The *élite* individuals are the wealth of a nation.

8. *The Influence of Needs.*—The needs, infinitely differentiated and multiplied in all directions, are the last and most important, though an indirect factor of evolution. Lamarck made it the second link of his chain which leads to adaptation. Outward circumstances, he said, engender needs, the latter habits, the latter excess or deficiency of use of organs, which last causes adaptation.

The doctrine of Lamarck, which is diametrically opposed to that of Weismann, having regained to-day the position which rightly belongs to it, particularly in the United States, where it has been ably defended, among others by the late Professor Cope, we shall give a *résumé* of the mechanism of the needs which play so prominent a part in it. Let us take the following example: An animal is placed in a new environment, where in order to live it must breathe harder. The quantity of air being insufficient, a painful sensation is produced in the lungs, which reverberates throughout the entire organism. This is the need—that is to say, a solicitation at once local and general, to breathe more energetically. The animal responds to it by powerfully contracting its respiratory muscles;

the lungs dilate more than before, more air enters, the circulation is accelerated, the organism experiences the consciousness of well-being; it is satisfied. The same solicitation is repeated, the same response is made, the animal acquires the habit of the act, the habit being repeated from generation to generation is transmitted and fixed, and becomes an instinct—that is to say, a simple reflex action in which the will no longer intervenes. In consequence, the respiratory muscles have increased in volume, the fibers that best conform to the respiration demanded are hypertrophied, while those which do not so lend themselves are atrophied. The pulmonary tissue, now more active, has augmented, its areoles have multiplied, its vascular and nervous webs have become enriched. The adaptation of the new condition has been accomplished.

In this case the initial solicitation came from without. In other cases it comes from within; for example, when new kinds of food are introduced into the mouth or stomach, the masticatory muscles, the teeth, perhaps the jaws and salivary glands, and even the stomach itself, are forced to adapt themselves to the new function which is imposed upon them. But the following is a more general case: By the very fact that an organ is doing work, the blood is conveyed to it in increased abundance, enhances its sum-total of life, and so it becomes of itself a stimulus to further work, and consequently to improved adaptation to the special kind of work in hand. Let the stimulus which has engendered the activity be continued, and the activity thus excited will by virtue of the momentum acquired go on increasing, perfecting, and differentiating itself, according to the character of the operation and to the parts which have been its principal seat.

Such, more than any other organ, is the brain. Highly vascular, and in richly endowed individuals eminently sensitive to stimulating impressions, it carries within it the principle of its own activity, its own improvement, and its own differentiation, according to the character of the faculties which the individual sets in play, according to the impressions which he receives, the impressions which he accumulates, and the ideas which he elaborates. Few individuals are free to withdraw from its influence, or not to respond in the presence of excitations which have come from without or of incitations which have come from within. There are, it is true, races and groups of men who in all circumstances evince more or less *sang froid*, if I may be permitted the expression; individuals without resiliency and of apathetic temperament, acting only from habit and giving play to their general reflexes, in which the will enters only from compulsion, as in walking and in certain spontaneous acts which are performed without reflection. In such persons cerebral action may become immobilized, may fall off, and even retrograde. But at their side are those who possess in abundant measure that which is the characteristic of man, namely, a powerful cerebral activity, those who are sensitive, lively, and militant. The latter are alert to impressions, direct their attention to wherever it is solicited, think, and never leave their brain at rest. In the latter the potency of the cerebral organ increases, intellectual needs are multiplied and engender progress, both to the profit of the individuals themselves and to that of the society of which they are part.

This remarkable property of the brain, which in some measure is characteristic of all organs, of bear-

ing within itself the stimulus to its own activity, is only a particular application of the broad and general biological law that every function, be it organic, sensory, or intellectual, tends to increase, if active; or that action engenders action, sentiments sentiments, secretions secretions, hypergenesis hypergenesis, and, generally, that everything which has life has the need of living more, of living to the full. This is the sum and substance of that law of proliferation and of expansion which we cited as the first biological factor of evolution, on page 25.

Needs in animals as in man are of two kinds: physical or organic, and psychic or cerebral, the latter attaining in man a development unknown in animals. Physical needs have reference to the conservation of the species or to the conservation of individuals. Breathing, eating, shelter from the elements, covering oneself with mud or dust as a protection against insects, running from the sheer love of exercising the muscles, are examples of these needs. Associating with one another for amusement and mutual happiness, the desire to dominate, to protect, sometimes to sacrifice oneself, and the longing to excel in the chase or in racing, are examples of the psychical order.

Needs and their satisfaction embrace the same elements in man and in animals: solicitation to an act and the desire to respond to it, the pleasure experienced, of which the memory is preserved and which alone forms an inducement to repeat the act, and lastly, satiety. In the animal, the surplus or deficiency of satisfaction obtained may bring about a differentiation of needs. The animal will feel, according to circumstances, the need of this or that kind of

food, of this or that shelter, of this or that pleasure; he will be induced in various ways to satisfy his vanity and his need of society. In man, in whom the psychical element strengthens the organic need, and who discriminates between sensations and so arrives at the most varied distinctions, the physical needs are rapidly differentiated.

Thus, at the beginning man rent and devoured his prey raw. Chance attempts demonstrated to him that cooked flesh gave more satisfaction. He began over again, acquired a new habit, and thenceforth the use of cooked meat became a need, which assumed various forms and led later to the invention of the art of cooking. At the beginning he ate with his fingers and drank directly from the brook. One day he invented utensils and pottery. Eating and drinking from vessels became a necessity. Later a table was wanting, and a seat for making himself more comfortable at his repasts. Then he longed for decorated vessels and all sorts of superfluities—all habits empirically acquired and ultimately becoming needs which he had to satisfy. So also at first he went about naked. He began by using leaves, then skins, and finally sumptuous garments. And so it is in all things.

But with the multiplicity of needs or of demands life became more complex and more difficult. It became necessary to work more and to seek other resources; three hours a day were sufficient to satisfy the original needs of man; ten, it may be, are necessary at present. Hunting was followed by barter, the raising of cattle, agriculture and industry. In those days one constructed one's own dwelling; it is now necessary to run to the carpenter, the glazier, and the locksmith. To the struggle for life has been added

the struggle for appearance—the desire of possessing a more beautiful residence, larger grounds, distinguished social position and politcal power—all desires which men cannot resist, which form the greatest stimulants to individual activity, and which constitute the agents of progress. This leads us to psychical or cerebral needs.

CHAPTER VIII.

Psychical Needs. Objectivity and Subjectivty. Science, Arts and Letters. Religion and Philosophy. The Altruistic Need.

It goes without saying that in the preceding physical needs the brain is not indifferent, although it plays only a secondary rôle, being prompted thereto by external excitations. In psychical needs the case is different; here the action of the brian is primitive; the point of departure, the work and pleasure involved, are inherent in the cerebral organ itself, and are independent of the acts which may fortuitously result therefrom.

The psychical or cerebral needs or impulsions are of two kinds—sensitive and intellectual. The *sensitive* or emotional needs are connected with the sensibility proper of the brain, with that interior sense which is to the brain what the muscular sense is to the muscles, which gives us cognizance of what is going forward in the cerebral organ and which constitutes the sensorium. Examples of this first kind are the need of belief, of worship, and of prayer, the need of loving and being loved, the need of approbation and of admiration, whence the need of shining, of getting rich, of gaining glory, of having rank, of leaving behind oneself a name. But these last are already of a mixed character, closely related to the needs of the preceding chapter and to those that are

to follow. The *intellectual* needs are connected with the internal work which is going on, with the exercise itself of the faculties; they have both their stimulant and reward in the activity exhibited. Examples of this second kind are the needs of knowledge, research, discovery, explanation, the need of inventing, of creating, of imagining, of setting oneself an ideal. They are in general more highly developed according as the action of the brain is more predominant, be it in the evolutionary scale of the human groups themselves or in the scale of individual variations within the same group.

It is among the psychical needs that we may seek with most reason the characteristics of what Isidore Geoffroy St. Hilaire has called the human kingdom, and the personal dominant note of each individual. Nevertheless, we find the germs of these needs here and there in animals. The dog, for example, which, motionless and intent, lovingly regards its master and worships him as a divinity, and when that master slays it, dies with tears in its eyes, is obeying a psychical need, and finds its sole recompense in itself. In the same way, the bird or mammal which soars or runs with its fellows of the same sex, shares their existence, and abandons itself to the joy of the occasion, is moved by none other than a cerebral need which purely internal pleasure consecrates. The ass or the horse which makes itself the chief of a troop for tyrannizing over or protecting those feebler than itself, has also no other motive than a cerebral need. The fighting cock matched in a pit against another which it has no reason for combating, and where there is even no female at stake, is not moved by considerations of advantage; its nervous centers

simply command, and it obeys; its reward is the glory it wins—a psychical sentiment. The monkey, finally, which turns a screw to and fro in order to find out how it enters a hole, or twists a key in a lock in order to open a door, is not concerned about the advantage which it may derive therefrom; to have succeeded in finding out what it wants is its whole joy.

We cannot stop at all the complex types which psychical needs exhibit in man. We shall abide by those which best lead to the object which we have set ourselves, *videlicet*, to the active types which on the one hand have created the sciences, and on the other the arts, letters, and philosophy, and to the passive or sensitive type which has engendered sociability.

Taking as our criterion the way people have of looking at the world there are two kinds of cerebral organization. External objects at rest or in motion are made known to us by our senses, which furnish us with images comparable to instantaneous photographs. These are centralized by the sensorium and stored up in its library. They are the materials upon which the intellectual faculties then exert their activity and from which they draw generalizations and relations—that is to say, ideas of the first, second, third, fourth, or fifth order; some being close to the original images proper, others being more and more remote from the latter, and still others being veritable creations, sometimes without any perceptible bonds with the ideas from which they sprang. Now certain minds can never lose from sight the photographic images of resting or moving objects, which images are the equivalents of the things of nature; they never omit

comparing them with one another, always take account of the additions and modifications which their individual sensibility imparts to them, and appraise and judge their reciprocal relations as if they were spectators observing them from above. They are the objective type. Others, on the other hand, suffer themselves to be carried away by their sensibility, by the labor to which they subject these images, and by their imagination. They confound with the objective images the new images which they have conceived and the ideals which they have deduced from them; they replace them by intuitions; they even go so far as to say that these images are the appearances and that the conceptions are the sole realities. They are the subjective type. The first have given rise to the sciences, the second to the arts, letters, and philosophy—the two opposed poles of human thought.

The Sciences.—These are the outcome of the need of knowing and of explaining, restricted by certain requirements of method, of which the following are the principal: To consider things objectively only; to begin with simple things; to hold steadfastly to the aim of one's research without anticipating the solution of the problem; to proceed from the known to the unknown; to stop when the facts forsake us, and then to take refuge in agnosticism; not to forget the precept *qui va piano va sano;* to begin the edifice at the base. The first thing is to observe the phenomenon or object in the rough. The first operation consists in comparing it with a sufficient number of other phenomena or analogous objects, and to establish their differences or resemblances. The first result is one or several relations obtained by induction. Classification, more and more general views, analysis and

experiment as means of control, and statistics, are the more advanced procedures. The end is the knowledge of the real world.

For a long time man was an observer only. He was led by empiricism, and not by methodical reasoning, to the molding and baking of his first earthenware, to the mingling of tin and copper to form bronze, to the employing of bows and arrows, boomerangs, levers, wedges, rollers, etc. The first science that rises above the horizon of our knowledge is astronomy, which already presupposed considerable mental development. The honor of having cultivated it belongs to the Chaldean and Egyptian priests, and perhaps also to the Chinese. Although counting does not make an early appearance among savages, yet the science of numbers followed, being unquestionably derived from the preceding. Then medicine succeeded with Hippocrates, a good observer but a weak theorist; natural history with Aristotle, who, in his *History of Animals*, advanced this science to a high pitch; human anatomy with Erasistratus and Herophilus, and physics with Archimedes. The start had been made. But with Christianity and the invasion of the barbarians, abysmal night set in. Faith, which is not favorable to the search for truth, diverted men's minds in other directions. In the sixteenth century the sun rose again. The sciences resumed their career, began a majestic development, and have now reached the lofty altitude of the nineteenth century, crowned by its Darwins, Pasteurs and Edisons, the preludes of new conquests, of which the limits cannot be foreseen.

Arts and Letters.—The second species of cerebral activity which bears within itself its own stimulus

and its own reward, has, in a far broader sense than the former, its roots in the animal world, where it is manifested by the distinguishing of certain sensations that have already attained a considerable degree of delicacy. The birds listen morning and evening to one another's songs, respond, and render genuine concerts. Serpents may be charmed by the flute, the horse is roused by the sound of the trumpet; all have heard of the dog which, whenever its mistress played on the piano, ran to her door and listened long and absorbedly. Monkeys strike the trees in rhythmical cadence with their sticks. It is certain that some animals are moved by a bright and joyous morning, by a glorious sunrise when nature is in holiday attire, and it is not impossible that these moods have given rise in man to the sense of the beautiful.

In man the artistic sense is a complex and composite formation, in which the following factors enter: (1) The pleasure afforded by the senses, especially by sight and hearing, which leaves behind it a distinct and lively impression; (2) a quite peculiar subtlety of certain aspects of the sixth or internal sense, rising to what has been denominated the æsthetic sense; (3) the faculty of invention or creation, augmented in certain directions by a more or less lively imagination; (4) the need, frequently but not always expressed, of reproducing the works which one has conceived or the ideal which one seeks to approach, in music, painting, sculpture, speech, or writing.

As far back as our archæological knowledge permits us to go, and as deep down as we descend in the scale of existing savages, we discover some taste for artistic things. We have the drawings of the Troglodytes of the Vézère, of the Esquimaux and the Australians. We

have seen with our own eyes a Boshiman girl of fifteen or thereabouts drawing designs which were remarkably accurate. Songs and dances accompanied by music are a pleasure which the savages of all countries affect. When the Esquimaux have a quarrel to settle they challenge each other to a duel, in which each struggles to outdo the other in song and poetry. The literary collections of the redskins are being daily enriched.

If we pass on from this point to the first civilizations of history or of proto-history, architecture, decorative art, and even literature, appear in Assyria and Egypt in a stage of development which is remarkable. Towards the year 1000 B.C., at the dawn of Grecian civilization, the poems of Hesiod and Homer appeared. And in the age of Pericles we have an architecture, a decorative art, and a sculptor, Phidias, that have never yet been surpassed.

All this justifies us, without going further, in concluding that the various factors which give birth to arts and letters, attained in man a high development far earlier than those which gave rise to science.

Philosophy.—The third species of cerebral activity that has sprung from the inherent need of this organ to labor, and finds in itself the sole reward of its labor, is philosophy. Its place would be between the two preceding. Like the first, it answers to the need of knowing and explaining; like the second, it proceeds from subjective sensibility, from the faculty of inventing, of creating, of imagining, and views its conceptions as absolute realities. Let us follow its development. Animals, as we have seen, in the presence of phenomena which they do not understand, retire confounded. Savage man does the

same. But he at least hazards the attempt of an explanation by investing the objects or phenomena in question with life and sentiments similar to his own. Later, this same savage discovering or believing to discover in himself a double being, the one corporeal and the other spiritual, transfers the new notions regarding himself to objects without himself, to stones, plants, animals, or stars. This is the second period—animism. Here the savage is simply superstitious. Of these objects, or of their doubles, the spirits, he makes fetishes. To worship the products of imagination is superstition. Religions, at first more or less elementary, with their founders and priests, do not appear until later.

For a long time the sorcerer—that is to say, a man less credulous than the rest, and adroit in the sense of knowing how to reap personal advantage from the beliefs of his fellows, stood alone in his clan. Sorcerer and medicine man at once, he distributed amulets, drove out spirits from the bodies of the deceased, and caused the rains to fall. Consulted in the councils and on the departure of expeditions, he added to his prophetic functions of foretelling events, the performance of sacrifices designed to conjure evil spirits. With the increase of population, the number of sorcerers increased. The different sorcerers were led to combine, to act in concert, to consolidate their interests, and to regulate their rights and beliefs, which were the foundations of their power. Thus the sacerdotal caste arose, at times recruiting itself from the outside and at times hereditary. More intelligent than the others, more disposed to reflect, the priests were naturally inclined to seek more satisfactory explanations for the phenomena of nature, to distin-

guish general causes from particular causes, to reduce the number of the spirits, to champion the most important of these, and even to symbolize many of them. The cult of heroes, of personages in the tribe who had rendered it valuable services, and of ancestors, was mingled with the preceding beliefs. Having to speak to simple people, for whom it was necessary to materialize things, they were obliged to recast their ideas and to expound them by the help of fables and myths, which soon essayed to explain in a tangible form the origin of things, the existing phenomena of nature, and often to guide the conduct of men. These were the first attempts of philosophy, already as utilitarian as they were mystical.

Animism was for a long time nothing but crude naturalism, intentionally fostered perhaps in the popular classes. Following the method of survivals, we have found it existing everywhere more or less. It was general in India at the time of the Vedas, throughout all ancient Egypt, and in China before Confucius. It frequently competed with the family cult of ancestors, which existed by its side. Gradually, however, the number of the spirits diminished; some which possessed more general significance displaced the others. Such were the genii of light and darkness, the genii of good and evil, who were opposed in combat; and also the genii of the heavens, the sea, Hades, war, and the harvest, known among the Greeks by the name of Jupiter, Neptune, Pluto, Mars, and Ceres. There were thus constituted hierarchies of divinities, Olympi of gods and demi-gods, the anthropomorphic adventures of whom have been recounted and embellished by the poets. This was the phase of refined polytheism, naturalistic at its

base, sometimes symbolical in its culminations, part for the people and part for the initiated.

Religions consecrated a multitude of usages and ceremonies from which the sacerdotal class lived and which greatly augmented its power; but they also exerted a strong political influence. At times they lodged the entire governmental power in the priests; it is known that the Egyptian monarchy began some five thousand years before our era by Menes having overthrown the sacerdotal domination in Egypt and subsequently having established himself at Memphis. Sometimes they founded a collateral monarchic or oligarchic power, and suffered the laws to be promulgated as ordinances or revelations of the gods. At other times they amalgamated scattered tribes and made of them a nationality. Again, they led up to genuine moral codes, such as those of Brahma and Buddha in India, and Confucius in China.

The philosophical idea and the utilitarian idea were associated in the last instance. In China, without ever a word of God or of the immortal soul, it was held that the law of heaven was perfection and the law of earth the perfectioning of self; that duty is an internal obligation, to which every one should bow, the object of which is fraternity and the basis the family organization, fostered by the worship of ancestors, of which we have already spoken.*

Subsequently to the Vedas in India the two ideas led to a naturalistic pantheism and to a system of morality which was derived therefrom as follows: The

*It may be that the official religion of China is the apparent religion only, and that family religion is the real motive power, that has the most influence upon conduct. This is a question that is still to be looked into. See, among others, J. I. Lanessan, *La Morale des philosophes Chinois. Extraits des livres classiques de la Chine et de l'Annam.—Bibl. Scientif. Contemp.* Paris, 1896.

trinity at the summit of the edifice comprised three principles: The first the creator, or Brahma; the second the destroyer, or Siva; the third the conserver, or Vishnu. The immortal souls passed, for a cycle of years more or less prolonged, from one body to another, higher or lower in the natural scale, according to the conduct of the individual. The end and the final recompense of those who had attained by their conduct the last stage of wisdom or of good was the extinction of all evil by submersion in the great All. When one of these Brahman preachers was asked what the Supreme God was, he replied, Of what use is it to cudgel one's brains about a thing one can never know? It remains to be known whether this doctrine led the Hindus to the conduct which yields the greatest amount of happiness.

The utilitarian idea appears to have dominated among the Phœnician and Canaanite peoples. It gave rise to the doctrine of a personal national god, who had created man and the people whom he had chosen and whose destinies he directed. With them he had made a covenant. He exacted from them blind and exclusive worship and obedience to the laws which he promulgated. In return he protected them, reserving his right of terrestrial punishment. Pantheism and the immortality of the soul are, according to M. Fouillée, the general tendency of the Aryan peoples, as monotheism without the immortality of the soul is the characteristic of the Occidental Semitic peoples. Both seek the sanction of moral conduct in a power beyond the individual, whilst the Chinese place it in the individual himself. The Egyptians are related to the Hindus by their belief in metempsychosis or in the transmigration of souls from animal

to animal, but they have set a limit to the transmigration. The cycle has been fixed at three thousand years. A posthumous judgment is then pronounced by forty-two judges, over whom Osiris presides. This conception of a single judgment after death, if not of a second, when the cycle has run out, passed through these peoples to the polytheism of Greece and Rome. In Greece it was among the philosophers or thinkers by profession, and not among the priests, that the fetishistic idea and then the generalized animistic idea (subsequently simplified and sometimes symbolized) reached its highest and most spiritual form. It became here the idea of unity pervading the All, but of a unity which was ineffable and undemonstrable, which was conceived as universal and eternal, and for which the name of God was reserved. This is idealistic pantheism.

Greek philosophy is the most striking known expression of the cerebral need above mentioned, which impels man to exercise his intellectual faculties from the sheer pleasure of the exercise. It is the most astonishing proof of the progress accomplished by reason since its modest origin in primitive man. It is proof of the unlimited confidence which man subsequently placed in himself and of the immeasurable sweep which his faculty of imagination took. Without any other empirical basis than the common observations which every one makes, Greek philosophy rose audaciously to the loftiest and boldest conceptions, not conceptions crowning an intellectual edifice, but conceptions which dominate it in imaginary realms of space. Its fundamental idea was this: Nature is admirably coördinated in all its parts, things are bound together by a necessary connection and have both

efficient and final causes. Through mathematics, the only science then advanced, that with which all minds were infatuated, they conceived and demonstrated the harmony of forms. By reason man similarly conceives and comprehends the order which reigns in all things.

At the beginning Greek philosophy sought the principle of the world in water, air, and fire; then in motion, atoms, numbers, attractions, and repulsions, and finally in a divine and universal unity.*

For Plato the things which the senses show us are appearances only, shadows (the relative). The true light is that of reason, the only realities (the absolute) are what reason conceives. Individuals die, their sensations are extinguished with them. That which reason has revealed is the truth that persists and is eternal. Ideas take precedence over sensations. God is the highest idea, the last, the supreme idea, the quintessence of the good, the just, and the beautiful. Next comes reason, which has conceived him—intelligence. Finally comes the third general idea, the world, the universal soul from which all particular souls emanate. The nature of man is two-fold. One is the spiritual—that is, the immortal part, the soul; the other is the corporeal part. The first commands the second and should make every effort to approach nearer to the universal soul of which it is an emanation, and consequently to God, the supreme idea, the sovereign good. The virtuous man, the sage, is he whose conduct conforms to these principles. He is a destiny to himself. As a sanction, Plato admits the posthumous judgment of the soul in the manner of the Egyptians and of Greek polytheism, as also the cycle (*Republic*).

*Paul Janet, *Histoire de la philosophie, les problèmes et les écoles.* Paris. 1804.

Aristotle belongs apart. He is at once scientist and philosopher. He observes nature. He is the founder of natural history, of anthropology, of political science, and of political economy. According to Graef he is also the founder of positive philosophy, because he was the first to introduce positive facts into philosophy. In writing his *Politics* he is said to have gathered for the purpose one hundred and fifty different constitutions. In many points he is in accord with Plato, but not in all. For him the attributes of bodies cannot be separated from these bodies. Abstract general ideas are nothing but words and names. The universal good, the universal absolute, do not exist; the individual soul is not immortal, for without memory all personal consciousness is impossible; every thing, every plant, every animal has its end—amelioration, in the sense of its relative welfare. The goal of man is self-perfection with a view to happiness. Nature herself impels him to this end. Virtue is the adaptation of acts to this end. There are three kinds of virtues: animal, moral, and intellectual. Moral virtues consist in preserving a just mean. They are habits which have sprung from the repetition of acts by education.*

But by the side of the theorist in these two philosophers we have also the practical man, who knows how to change his point of view and to place himself on a level with his times. By the side of the above-mentioned transcendental works we have plans for social organization expounded by Plato in his *Republic* and his *Laws* and by Aristotle in his *Politics* and *Morals*. The ideas which here reign supreme are the omnipo-

**The Nicomachean Ethics of Aristotle.* Transl. by Peters. London, 1895. *La morale à Nicomaque d'Aristote.* Trad. par. L. Cassan. Paris, 1886

tence of the state, public utility, and the natural inequality of man. At this epoch in Athens the mass of the population, as we have said, were slaves. A large number were aliens who had taken up their domicile there; a small body, only 9 per cent. were citizens, distributed into higher classes (priests, magistrates and warriors) and into certain lower classes. Now the views of Plato and Aristotle had reference only to the citizens of the higher classes. Aristotle, in his *Politics*, says that the true citizens are only those who are neither farmers nor tradesmen, nor handicraftsmen,* and that some people were born to command, others to obey. The following is the general rule of society for Plato: Each person should strengthen himself in his prerogatives, his rank, his profession, and not mingle in affairs which do not concern him. In the warrior class he demanded community of women and children, and *selection* by the magistrates of the best producers, as in the case of selection for cattle, so as to obtain as subjects the strongest and most beautiful—that is to say, those who would be most useful to the state.† The public welfare is the first social principle, the only one indeed; the independence of individuals is subordinate to it. For Plato, as for Aristotle, the education that makes men is one of the first functions of the state. Both sacrifice the individual to the family and also to property.

Other Greek philosophers also busied themselves with practical morals. Socrates, contends Boutroux, is the real founder of the science of morals. Prior to him the sophists had distinguished in all laws the

**Aristote. La Politique.* Trad. de Thurot. Lib. IV, Ch. VIII, Art. 3. Paris.

†*Platon. L'État ou la république.* Trad. de Bastien. Lib. V, Ch. II, Art. 1 et 2. Paris.

elements derived from nature and those derived from custom. Socrates distinguished unwritten laws, which were universally admitted and had been instituted by the gods, and written or human laws. Happiness, utility, and the good were one. The interest of each conforms to the public weal. Socrates defends woman and the slave.

For the Stoics morals is the art of living. We must contemn the physical needs, which do not depend on us, and esteem only the moral needs, of which we are masters. Happiness is within us in the exercise of our faculties, and, for what does not concern us, in indifference. For the Epicureans, to follow nature and to seek pleasures, preferentially those of the mind, is the best rule. The doctrine of the first, although tinged with pride, is a beautiful one, but, like that of the second, led in its later disciples at Rome to the extinction of all individual energy and to the consecration of egoism.

In sum, the Greek philosophers founded the intuitive method, the yoke of which philosophy has never yet been able to throw off. They opened up, in various directions, some spiritualistic and others materialistic, the paths which we are still following. They were the first consciously to attack the problems of human conduct, both individual and social; and yet in the general run they were dialecticians, sophists, and intellectual gymnasts only. But such as they were, they founded free inquiry, disintegrated the national polytheistic beliefs, and prepared the way for the revolution which was on the verge of accomplishment.

Society, which was soon epitomized in the Roman world, was just attaining in fact one of those critical

phases in the history of evolution where all the circumstances coincide that are calculated to bring on transformations and provoke new adaptations. The evils which militarism had engendered had reached their acme, morals had been perverted to the last degree, skepticism was universal, and the disorganization was complete.

It was then that in an unknown corner of Judæa, on the banks of a lake, the glad tidings burst forth of a coming regeneration, and a voice was heard pleading the cause of the feeble, the humble, and the oppressed, and saying, "Love ye one another!"

The doctrine, at first local and inculcated by a small number of apostles, soon extended with St. Paul to the Gentiles, and thenceforward its progress was rapid. Philosophy was not indifferent to it. Plotinus of Alexandria, who has been named the Jewish Plato, and also the father of the fathers of the Church, desiring to reconcile the Greek philosophy with the new ideas, distinguished in God three things: The Father, the Mediating Word, and the Holy Ghost. A little later Philo, the chief of the Alexandrian school, conceived the same Trinity as follows: The Good, the Intelligence, the Soul, three degrees of the same God, one derived from the other, and consequently unequal—the Trinity which Christianity adopted at the Council of Nice, but modified, despite the efforts of Arius, as follows: The Father, Creator *ex nihilo* by a bare act of his will, the Son, and the Holy Ghost, all three of equal degree and forming but one single God in three persons. The creation *ex nihilo* was a step backwards.

Christianity, in effect, instead of conquering the pagan world, was conquered by it, as Huxley has

remarked. The fathers of the Church were overreached, the councils gave way before manifold influences, concessions were made to the barbarians, the primitive spirit swerved from its initial path. The Church, centralized in one of its patriarchs, became by degrees a terrestrial power, having its needs, its ambitions, and its army of monks. It pretended to universal monarchy, had its political struggles, and ended in a despotic tyranny which lasted for ages, until the schism of Luther—a breach made in behalf of the right to examine the holy Scriptures, and of which one of the ethnical effects was to separate the Northern blond races from the Southern Celtic and brown races.

During the Middle Ages science had disappeared from the West. Philosophy, hemmed in between metaphysics and theology, became scholasticism, which sought to reconcile Plato, Plotinus and Aristotle with the needs of orthodoxy, and split hairs over subtle essences and entities. In the first phase, faith and reason were confounded: "*Credo ut intelligam*," said St. Anselm. In the second, reason was placed in the service of faith. In the third, the nominalists denied all harmony between the two. All this culminated in lassitude and skepticism. It was then that a concourse of circumstances occurred which, as fifteen centuries before, was to transform the Western world, although differently, and which inaugurated modern times, to-wit: The return to the West of the knowledge that had taken refuge among the Arabs, the discovery of printing, which spread everywhere trustworthy texts; the discovery of the New World, which quadrupled the surface of the earth to be observed

and studied; the awakening of science, with Copernicus, Galileo, Kepler, Rondelet, Vesalius, Harvey;* and finally the Reformation.

On the downfall of scholasticism, the first care of philosophy was not the renouncing of what had been its essence, the search for the absolute by intuition and reason, but the overhauling of its methods, which it sought to render more precise. On the one hand, Descartes, the orthodox representative, defended the sovereignty of reason and the mathematical method by postulates, successive unbroken deductions, hypotheses, and intuition. On the other hand, Francis Bacon, who was inspired by Aristotle, contended that the book of nature was the true tome to be deciphered and commented upon; that "for the futile reasoning of dialectics, observation and experience were to be substituted; for deduction, which drew consequences, induction which established principles"; and that observation is particularly necessary for the facts which we inwardly observe in ourselves.

The subsequent divergencies were rooted less in the varying intellectual and logical make-up of each philosopher and in their method of applying their faculties than in their individual ways of feeling and conceiving. Philosophy in effect is simply a struggle between these elements. One is materialistic or idealistic, rationalistic or empirical, sees one's ideal in liberty, altruism, necessity, or something absolute, according to one's temperament. One has given endowments, variable endowments,† partly congenital

*P. Topinard. *Éléments d'anthropologie générale.* Chap. I, Paris, 1885. Edit.. Vigot frères.

†M. Topinard says: "On a telle ou telle grâce, une grâce variable," etc.—*Tr.*

and partly acquired by the first impressions and the first readings of youth.*

Nevertheless, the conquests of science began to make themselves felt. The field of philosophy was narrowed; there was now less insistence on God and more on the world, man, morals, and the conditions of social life. The overhanging metaphysical cloud is still more or less heavy; and it sometimes nears the earth, and at spots suffers the light to pass through. There are two streams: the one continues Descartes, —in France with Pascal, Bossuet, Fénelon, and Malebranche, in Germany with Spinoza and Leibnitz; the other, in England, is represented by Bacon, Hobbes, and Locke.†

It is strange, but philosophers whose minds are diametrically opposed to each other, who have started from different points and have conducted their reasonings differently, arrive when the figurative obscurities of their language are removed, at similar results—results which the freethinkers of to-day would not disavow.

Take Spinoza. He is a pantheist and professes the unity of "the eternal and infinite being which we call God or Nature" and of "the substance." Man has two natures: one which has the consciousness of its eternity, the other which does not remember its existence prior to the body; it is the first which permits us to say that God is in us, or rather that we are in Him. Free will does not exist *a priori*, because everything is derived from the essence of God, nor *a posteriori*,

*Leibnitz narrates that when scarcely fifteen years old he was debating whether he should champion Aristotle or Democritus.

†Alfred Fouillée, *Histoire de la philosophie*, Paris, 1893. The same, *Extraits des philosophes*, Paris, 1897. We have borrowed much from these two works, although not sharing all the views of their author.

because our feeling of freedom is reducible to our ignorance of the causes which determine us. Nature has no end and makes towards no goal; it is what it is because, according to its laws, it cannot be otherwise. There is neither good nor evil in itself, but things are good or bad only in relation to us—that is, useful or prejudicial. The useful is what affords us pleasure, the prejudicial is what gives us sorrow. There is, in a like manner, neither absolute right nor absolute duty. The measure of one's right is one's power. The highest right is that of the strongest. It is necessary to know and to practice the laws of Reason. Morals, which is the science of happiness, is completely summed up in these few words.

Another example is that of Kant, who, in Germany, marks the end of the eighteenth century. For him, God, the immortal soul, and personal liberty, are moral necessities which we must admit if duty is to be justified. "The starry heaven above us, the moral law within us, call forth my admiration and respect," he writes. The only thing absolutely and immediately certain is duty. There are two sorts of commandments or imperatives, the one conditional and proceeding mainly from interest, the other categorical, which is duty itself. To believe in liberty, without which the "ought" is impossible, is the first of all duties. There are in us two egos; one absolute, eternal, and unrelated to space and time; and the other sensuous, connected with our individuality, and subject to determinism. The first is free, the second is not. Nature, such as science knows it, does not appear ruled by the moral law, but by laws which seem quite different from it. Ethics implies three postulates: (1) The possibility of harmony between moral-

ity and happiness, or the sovereign good; (2) the immortality of the soul; (3) the assumption that the sovereign good is the supreme end to which the universe tends and which the universe will reach. In brief, Kant reversed "the old metaphysics which was called the science of being, or ontology, and which thought itself the science of the absolute,"* but he put in its place another which I shall call utilitarian metaphysics.

The other movement, in England, is particularly interesting for us. With Bacon, at the dawn of the revolution in that country,† it entered again on the path which had been opened twenty centuries previously by Socrates and Aristotle.

The end which laws should strive for, says Bacon, is simply that of rendering the citizens of a state happy. Private Right exists by the side of public Right; the study and the practice of law should be freed from pure empiricism as well as from all metaphysics.

Hobbes continues this thought. In practice as in theory, he says, necessity is our sole rule. Our sentiments are egoism transformed. To seek pleasure and avoid pain is the law of nature. The state of nature is war, the strongest wins: *homo homini lupus.* To put an end to this state, man forms societies, he renounces his individual rights, absolute over all things, on condition that others do likewise. This exchange of renunciations is a contract—that is to say, a reciprocal obligation equally binding upon all. But here Hobbes reaches a singular conclusion. In order to assure the execution of this contract, he pro-

*Fouillée.

†The *Novum Organum* appeared in 1620. Charles I. ascended the throne in 1625.

poses to lodge its absolute enforcement in the hands of a monarch, who has unreserved power to take to task any one that seeks to avoid the contract, but who is himself obligated in no wise. The contract of Hobbes is an abdication of the individual. The sovereign that Hobbes had in mind in his own time and in his own country was his friend Charles II.

Locke, fifty years after, resumed these ideas. The state of nature is neither the law of the strongest nor the inequality of men. Societies are established by the consent of all—that is to say, by a contract for protecting the natural rights of each, for dispatching external business with other societies, and for administering justice within. Man is permitted to alienate only that part of his rights which is strictly necessary for the maintenance of the association. He particularly reserves to himself that personal liberty which is the first of his rights, and his right to property acquired by work. The essential thing that he abandons is the right of "taking the law into his own hands." In constituting a legislative power and an executive power he maintains his sovereignty and preserves his right to revolution if the contract is violated. Locke desired the separation of Church and State and tolerance for all religions.

Bacon, Hobbes, and Locke are the inaugurators of the English school, a school which is characterized by its practical spirit, its observation and analysis of psychological facts, and by its disposition to refer the conduct of man to the advantages which he draws therefrom. It led to Adam Smith, who discovers the sanction of morality in the public approbation of what is right; to Bentham, who sees it in interest rationally understood; to Hume and the Scottish school; and

finally to the existing school of John Stuart Mill, Darwin, and Herbert Spencer.

Locke, on the other hand, is also the starting-point of the French school of the eighteenth century, which is characterized by a tendency at once anti-clerical, altruistic, and sentimental. We have here Voltaire, Condillac, and the Encyclopædists; Helvétius, for whom "the whole art of legislation is to make it more advantageous for the individual to follow the law than to break it"; Montesquieu, who defined laws as "the necessary relations which are derived from the nature of things"; Rousseau and Condorcet. The Geneva philosopher best expresses that great love of humanity and that great need of individual liberty which was paramount at the dawn of the French Revolution. For him the social problem was formulated thus: "To find a form of association which protected and fostered with the whole power of the community the person and goods of each associated individual and by which each, though uniting with all, obeyed himself only and remained as free as before." Man in the state of nature was essentially gentle; he has been perverted by civilization. Rousseau accepts the theory of a social contract, as did Languet in 1577, and afterwards Hobbes, Locke, and Spinoza, but admits with Locke that certain natural rights, such as individual liberty, are inalienable.

We shall say nothing of the philosophy of the nineteenth century, of the German school, which represents speculative philosophy, and of the English school, which is physiological in bent, and of which we have the highest opinion. In France the most notable achievement is the attempt which was made by August Comte.

For Comte, metaphysics must be entirely eliminated. The day of intuitions, *a priori* conceptions, entities, innate ideas, is past. If a problem cannot be resolved, it is to be let alone. Psychology is only a branch of physiology, and the latter a division of biology. Morals rest not upon any imperative obligation, but upon the altruism which education develops. There are no rights besides those which society confers. Human knowledge has passed through three stages: one of faith or theology, one of conceptions or metaphysics, and one of observation or science.

These, in sum, are the basal principles of science, and would be perfect if the positivist school were faithful to them. But in its own bosom even, there are refractory spirits who suffer themselves unconsciously to be ruled by their sentiments rather than by observation, and who are constantly lapsing back into the old methods. For example, why should thinkers postulate a social organism similar to the animal organism, which is born, dies, etc.; or a mystical evolution, which marches on inexorably towards a given end? Why have they systems of postulates and successive deductions, afterwards seeking the facts which agree with their preconceived opinions? Why do they characterize, then classify each science, not by the object observed, but by an abstraction? The reason of it is that the majority of those whom positivism attracts are men of letters who have not been properly prepared for the search for the truth by practical preliminary studies in the physical and natural sciences. For me, there is but one method of knowing what is, and of inducing therefrom what has been and what will be,—and that is observation; all suggestions which transgress this method are void.

From this rapid examination of the evolution of philosophy we draw, by way of *résumé*, the following conclusions:

a. Philosophy, like religion, is the outcome of the belief in the supernatural held by man in his more or less primitive state.

b. The philosophic spirit and the spirit which created the arts and letters have as common characters their subjectivity, their need of imagining and of constructing, and their firm belief in the reality of their conceptions. Between the philosophical spirit and the mathematical spirit there is a further relation. We have mentioned the influence which mathematics exerted on the development of Greek philosophy; and that influence persisted after the Renaissance. Pythagoras and Leibnitz, to cite only two names, were as much mathematicians as philosophers. The first discovered the theorem of the square on the hypotenuse; the second invented the differential calculus. Descartes applied algebra to geometry. The connecting link between the two kinds of mind is the constant preoccupation with the logical order of things and the employment of the deductive method. On the other hand, between mathematicians and symphonic musicians we have also often observed a relation. Like these musicians, the mathematicians and philosophers are harmonists; all three start from the *a priori* thesis that nature is perfect and always logical.

c. Philosophy is opposed to science. It answers to the impatient need of man to explain at once things which elude his comprehension.

d. Philosophy, when we clearly see its first expansion, is almost immediately at its culminating point, very likely because it was not yet bothered by science.

Gradually it recognized that outside the facts there is nothing solid, but for a long time it could not tear itself from its illusions. At the present day it still lives, but is losing its initial character and sees itself obliged more and more to reckon with science and practice.

e. If with this waning evolution we compare that of the sciences, modest at the outset, slowly and laboriously advancing, but always with a sure and constant tread, and attaining to-day a height which is dazzling, but which our grandchildren will regard as low in the extreme—if we make this contrast, I say, we shall be obliged to admit that the group of human faculties which has given birth to philosophy has a less prolonged future than that group which has given rise to science.

f. Philosophy, although on the wane, and apparently in disaccord with the end of the nineteenth century, has nevertheless a beautiful domain to exploit. Taking from it everything that belongs to the domain of facts and to the province of the *a posteriori*, there yet remains for it an important rôle, upon which we shall touch later.

The Altruistic Need.—Philosophy is one of the best examples of the active needs of the brain, and of the intellectual evolution which it has engendered. Altruism is the passive and sensitive need of which we have now to speak—a need which has played the first rôle in the formation of societies, and which, after a long eclipse, asks to be reinstated in the place which is due to it in every rationally organized society.

Let us recapitulate what we have seen in animals. The first associations, not induced by sexual instincts, which occur between individuals or groups of individ-

uals were the result of indifferent circumstances. The habit came, then the pleasure, and finally an instinctive impulse to seek the company again. This happens in animals of the same species or of different species which have no reason to fear each other, particularly among birds and herbivora. Collisions sometimes take place, but the pleasure of living together outweighs their drawbacks, and mutual concessions are made; the reciprocal need of altruism and of solidarity gains the upper hand. In short, the social instinct is quite remarkable and quite thoroughly consolidated in a large number of animals.

Man, who has sprung from social animals, has inherited this instinct or consolidated need. In a state of nature, where the difficulties of life are simply of a refractory character, where there is room for all, where one has to struggle only with beasts and with nature, man's need of companionship, as in the case of Robinson Crusoe before the advent of his man Friday, is the more imperious according as he has a highly developed faculty of exchanging ideas, a faculty which the animals lack, and according as these ideas are multiplied. In this stage, moreover, man has not yet learned to suppress himself. He is entirely spontaneous, he has not yet had experience of the necessity of looking beyond his acts.

At first his family suffices almost entirely to satisfy his need of company and the attendant needs of which we have already spoken. He is a good father, a good husband, and easy in manner, if we except certain savage and reflex habits. Later, when life is still not difficult, and when he lives in little bands, his conduct still remains natural. He yields to his first impulses, he does not analyze them, he has com-

rades whose company he enjoys in hunting and chatting, neighbors whom he treats as he wishes to be treated; he renders services without asking for anything in exchange; he spontaneously makes sacrifices for others as they do for him. In all things he behaves with frankness and does not know what it is to lie. He is truly the child of nature. If he is struck he reacts, if he is offended he avenges himself. But without some reason and without being provoked to it, he never commits an injury, but often does good. If he is a youth and makes a girl a mother, he marries her. If one of the members of his family, or one of his friends, is attacked, he springs to their defense, he identifies their cause with his own. Later, when the families become a clan, and the number of men likely to be found together has increased still more, a change sets in. The altruistic need or the desire for company finding wider scope, is displaced and extended far beyond the limits of the family. The individual prefers the pleasures with his companions to the joys of his own hearthstone; between him and them intercourse of friendship is established; a bond unconsciously unites them; if one is attacked by the members of another community, all rise in his defense.

In these different stages acts having appreciably the same motives are appreciably the same in all circumstances; the response to the same solicitation cannot vary much. All the members of a group or clan accustom themselves to regarding their empirical conduct as the best that can be followed. These acts being repeated, become customs, of which all—that is to say, public opinion—approve. To conform to that opinion is to act in the best manner. Not

to conform to it is to oppose it, and, consequently, to deprive oneself of the approbation of that opinion to which one is sensitive.

The elders, the councils of these tribes, make these customs, which are consecrated by opinion, the basis of their judgments when called upon to settle differences. Tradition becomes the rule, and this receives the sanction of punishments. To obey the rule is good, to disobey it is bad. But if the elders assumed the right to judge and punish, and if wrong-doers submit to their decisions, the reason is that the first take it for granted that the individual arraigned before them is responsible for his acts, and that the second are confident that they will be treated on a footing of equality before that tribunal. In the state of nature man is restricted in his acts only by his individual will, with or without thought as to their consequences. If he thinks he can kill an animal without being killed or wounded himself, he does so; if he thinks he is running too great a risk, he abstains from the deed. Towards his fellow-being he is not less free to act as he pleases, but more motives go to influence his conduct. One person is congenial to him, another is useful to him, renders him services, amuses him, loves him; another is indifferent to him; but who knows whether on the morrow their rôles will not be changed, whether that other will then not be of use to him? Will the other not then behave as he himself has behaved? What will his family, what will public opinion say? People will censure him, will avoid him. The savage thus knows what he can and ought to do, and what restrictions he should impose upon his first impulses. The word *rights*, supposing he has any vague notion of anything of the kind, he would be

incapable of understanding. He acts according to the circumstances; his conduct is restricted as regards his game; it is more so when in contact with one of his fellow-beings; it is still more so when in contact with several, and more so again when there are very many, as in societies. It is the same with his obligations. By the very fact that the savage knows how to modify his conduct according to the circumstances and will consider that such and such acts must not be done, or that he must respect the personality of others, so that they in turn will respect his, that he makes concessions, etc., it is evident that the obligations which he assumes are made by way of exchange. The whole matter is one of reciprocity. There is no understanding, nor contract. Duty is but a word, which we apply wrongly to the savage and the animal; the one comprehends it no more than the other.

In short, among men more or less near the state of nature, acts are produced spontaneously, as among animals; they are the best in the conditions given; they are not due to reasoning. The instinct to adapt acts to necessity is the whole thing. The ideas of good and of evil, of responsibility, justice, solidarity, rights and duties, liberty, have no effect upon conduct; they do not exist. The savage, abandoned to himself and untaught, acts empirically, and his conduct is as correct as ours, if not more so. His ethical notions conform to what his daily relations with his fellows demand; his acts are ruder, cruder, and more reflexive; but that is all.

It would be curious to know to what degree his internal sensibility enters into his acts, to what degree man yields to the blind impulse, which leads him to long for the society of his fellows, what degree of

pleasure he experiences in the sympathy he has for others, or that others have for him; whether he possesses in a developed degree the faculty of representing to himself the pleasure and pain of others, of feeling and sharing them; in a word, to what extent he is altruistic, whether in the first, passive degree, which is benevolence, or in the second degree, which is charity (division of H. Spencer and others).

We have pointed out the qualities which savages generally exhibit in the state of nature. When we carefully read, not memoirs, but the long accounts of travelers and of missionaries who have lived in intimacy with them and have gained their confidence, there is no room for doubt. They are affectionate and devoted. It will be objected that their manners are brutal and that public opinion consecrates with them acts which we severely condemn. But are we ourselves so perfect, and are our manners, though refined, much superior? Witness what recently occurred in Armenia and what the courts daily reveal to us. Among certain savages, for example, public opinion approves of the man who has the courage to strangle a friend in agony in order to spare him useless suffering. Among others, sons abandon without food, or bury alive, their old and infirm fathers, who are incapable of following the nomadic band. But among these same savages, these same old men are listened to and respected, the sons know that their turn, too, will come, and they shed tears when in the last extremity they acquiesce in their parents' death. Moreover, facts of this character are rare, and are recounted by travelers because of their extraordinary nature. Savages surely do not understand morals as we do, but they have their morality nevertheless, and

one which though different from ours has yet its value. They are straightforward, frank, loyal and not wicked. In altruism they are at the same stage as the average run of birds and of herbivorous mammals, and certainly at a degree higher than the generality of civilized races. The impulse which originally moved man to pass from the state of nature or purely family state to the social state was not interest, but the need of being happy in the company of others, the need of exchanging ideas and sentiments.

We say originally, for as soon as the contact between men increased, as soon as the conditions of existence became difficult, the character of the scene changed and darkened. The struggle for existence, at first feeble, then gradually increasing in intensity, spread and grew general among societies, classes, and individuals. To live in new conditions, every day more difficult, where fate has placed one, is ultimately the fortune of every one. Individualism augments, and, conversely, altruism diminishes. Men are constantly on their guard, and weigh their acts. Experience renders them egoistic. To succeed, to rise, to dominate, to become rich, are the ruling passions. The more intelligent a man is, the less in general is his compassion, the more deaf he is to the cries of victims. Here and there a few altruists come to the surface, but they are the dupes. We recall again the saying of Hobbes: *Homo homini lupus.*

True, this situation is not entirely due to civilization. Nature is for the most part, if not entirely, responsible for it. It has made men signally unequal—some crippled, sick, and incapable of the least intellectual effort, others strong, healthy, and intelligent; some envious, hateful, wicked, and truculent,

others gentle, loving, and devoted; some predestined from birth to premature death or a long life of suffering, others predestined to success and happiness. Animals have muscles, claws, and teeth, and use them when they are hungry. Man has but one weapon, but more poignant, venomous and deadly—his intelligence—and he uses it even when he is not hungry, to satisfy other needs multiplied a hundred fold by that intelligence. Animals of the same species rarely fight; men rend and devour each other.

Very early, long before Darwin, away back in the dim past, these facts had struck the attention of thoughtful men. In the councils, even of tribes not far advanced, when regulating punishments for deeds considered evil, the effort was made to forestall, soften, and correct them in the interests of the general weal. But as the particular interest of a sect or a monarch gained the upper hand, these efforts decreased; the cause of the feeble, the unfortunate, and the enslaved had none but secret defenders among *élite* men who were more sensitive to suffering than were those about them. At times these defenders were unknown legislators, as in Egypt, where we find a few humanitarian laws inspired by lofty ideas of equality; at times they were members of the sacerdotal class, who sought to offer consolation to the victims of nature and civilization, to give them the hopes of posthumous compensation, as in India, where the preachers of Buddha said: "Life is but a chain of evils; resign yourselves, conduct yourselves well; your recompense is Nirvâna."

Greek philosophy occupied itself little with the miseries of the classes who were really miserable. Its glance was directed higher; it imagined an ideal of

happiness for the sages, an organization useful for the state, and abided by these propositions. The words "justice," "good," and "evil" bristle in their discussions, but in a different sense from that which we give to them nowadays, and with reference to the order of nature, of which they see the excellencies and not the faults. Aristotle distinguished justice of exchange and justice of distribution, but without insisting upon those unwritten laws which Socrates said were inscribed in the human heart. The Stoics and the Epicureans, as we have said, achieved nothing but the consecration of egoism. Some few legislators of antiquity, like Solon and Numa, appear to have been inspired a little with the moral idea as contrasted with the utilitarian idea which was everywhere predominant.

It was really not until the rise of Christianity that we see the establishment and spread of generous and altruistic ideas, having in view not a single class of citizens, but the pariahs of society, who are so much in need of support, and without distinction of class or nationality, but bearing upon humanity at large. These were the ideas of love in its universal sense, of fraternity, equality, compassion, charity, and disinterestedness; the distinction of moral good and evil, of private and public conduct, the notion of one's duty towards oneself and towards others. Nevertheless, the progress was only superficial. Although legislators strove to inspire themselves with the new principles, their acts did not correspond to them. The masses of the population suffered as much as ever: The struggle was just as implacable, altruism was as sparsely sown as ever.

But after the Renaissance, the ideas which we

briefly recapitulated in our review of the history of philosophy steadily gained headway. The latent principles which should govern the organization of society were discussed. The notion hitherto so vague, of rights, of individual liberty, unrestricted or curtailed by the social state, gradually assumed shape and solidity. The sentiments of reciprocal duty, solidarity, and responsibility were extended; the double declaration of the natural rights of man in 1776 in the United States and in 1790 in France, opened up a new era—the era of natural rights—that is, of those which society cannot abrogate and which involve the correlative duty of respect for those same rights in others.

This brings us to the present time, at which more than ever the following questions dominate the whole of practical sociology.

On the one hand, scientific facts show that nature in placing man at the acme of creation, and in having given him his intellect as his weapon of existence, has at the same time and in the same degree as the other animals, condemned him to an incessant struggle for the satisfaction of his needs, which are even multiplied by that intelligence. At the start that struggle was with individuals of other species, as it is among animals. At present it is carried on in the bosom of the species of itself between man and man, congenitally unequal and not responsible for that inequality. It engenders suffering, misery, and ruin, and divides humanity into oppressors and oppressed, conquerors and conquered.

On the other hand, all that is good in the human heart,—love, compassion, generosity, regard for human dignity as a higher animal species,—is aroused and protests energetically against this state of things.

It demands that fraternity shall not be an empty word written on the front of our edifices, that justice and peace shall reign, that each shall be recompensed for his efforts, and have his legitimate share in the general happiness, that solidarity shall be a reality.

On the one side egotism is arrayed, the principal factor in the struggle; on the other altruism, the principal factor of concord.

On the one side is the individual, always more or less an animal, knowing only his present life and desiring it to be the best possible. On the other is society, an impersonal and permanent being, in which are resumed the experience of the past, the hopes of the future, and the happiness of the present, distributed equitably for the best among all.

Is the reconciliation of these opposed factors possible? Are we to conclude, as we did in 1893, that science and practice are contradictory, that we cannot guide ourselves in rigorous conformity to truth? Must we admit social dogmas?

What lesson does our knowledge of social evolution up to the present day convey? In which phase of it are we now involved? Which new adaptations are the best? Towards what point on the horizon is our bark turned? Towards what shores will the wind waft us?

This is the subject which we shall examine in our next chapter.

CHAPTER IX.

Parallel Between Nature, the Individual, and Society. Liberty, Solidarity, Equality, and Justice.

The programme which we drew up for the solution of the questions propounded in Chapter I, and summarized again at the conclusion of Chapter VIII, was evidently too vast. We are desirous of hastening to our conclusion; yet much remains to be examined. The studies leading to the practical goal set by sociology are in reality divided into three parts: (1) The preface, the foundation, so to speak, which is absolutely necessary, and which reposes upon anthropology. We are here concerned with the science of man and of his relations to nature, with the motives of his acts, with his strength and with his weakness. Man is an animal. His animality is the source of all the difficulties in society. It is the enemy which must be combated, and which consequently must be exhaustively studied. (2) Sociology proper, which is the history (*a*) of animal societies, and (*b*) of human societies, of their development, and of the varied and complicated phenomena which they present from their origin to the present day. (3) Social science, the chapter to which we are now come, and which, in its highest domains especially, is the application of the truths discovered in the two preceding parts, to the needs of modern societies.

The apparent or real contradiction between nature,

the individual, and society, between the social evolution such as it actually is and the social evolution such as we should like it to be, between the ends of nature and the ends of society—such is the main problem which we are called upon to elucidate. The misunderstandings which obtrude themselves into the solution of the questions here set, arise wholly from the confounding of the following three points of view—nature, the individual, and society. Thinkers start in their reasonings from nature and draw conclusions as to the individual: or they begin with the individual and draw their conclusions as to society; or *vice versa*. The prime requisite is clearly to separate these three points of view — which we shall now endeavor to do, at the risk of slight repetitions perhaps.

NATURE.

The universe is summed up for man in two words: the ego and the non-ego; the center and the circumference. The ego knows the non-ego by the images it receives from it; it observes their differences and resemblances, fixes and classifies their relations, and gradually rises from particular considerations to more general views. These relations, these views, are ideas, which may be distinguished into positive and negative, particular and general. Among general negative ideas are the concepts of infinity, of nullity, of a beginning from nothing, of an end leaving nothing. Among general positive ideas are the concepts of succession or of time, as in the cinematograph; the concepts of parallelism or space, arising from the impossibility of conceiving two things to occupy the same place at the same moment; the concepts of con-

tinuity and intermission, of causality or independence, etc. Ideas may be further distinguished into relatively direct and relatively indirect ideas. The latter are the product of induction or of imagination. The ideas of absolute welfare, of absolute good, of absolute beauty, are comprised in the last category. They are concatenate ideas, conceived at their maximum of expression in a type which the mind represents to itself. Absolute good, welfare, and beauty are not realities, but the conception of an ideal, of a *ne plus ultra*, along a certain path. The union of the three is absolute perfection, perfect harmony in the whole, a complete adaptation of things to one another, the reaching of the objective goal conceived by the subjective mind, of the non-ego by the ego.

The last utterance of positive and inductive knowledge, as given by the present state of science, may be summed up as follows. Matter and energy are always associated, and, under infinitely varied forms, are eternal. These forms are in a perpetual state of mutation. Rest is but a transitory appearance; change is the life of the universe. Matter composes all bodies—solid, liquid, gaseous, or what not; energy engenders all phenomena. The commonest form of energy is attraction, which by two different processes gives rise either to motion or to molecular cohesion. In new aggregations adaptation to existing things is the first law. The formations or mutations are effected in all directions according to the solicitations and resistances; but judging from the portion of the universe of which we form part, and in its existing phase, one general direction predominates in em—a direction from the simple to the complex, from the similar or non-differentiated to the dissim-

ilar or differentiated, from the unstable or non-adapted to the stable or adapted. This general direction in time and space is evolution, which, when unqualified by an adjective, always means progressive evolution.

Evolution, although single in our eyes, is yet, for purposes of study, divided into as many particular evolutions as there are separate subjects to be considered. Such is the evolution of our solar system, of which our planet is but a fragment, the evolution of life on the surface of our planet, the evolution of the ego and of thought in the animal series, the evolution of human societies. The beginning and the end are the critical problems of the two first. How, in the initial star-dust, were the first combinations of the mobile atoms, which were originally alike and independent, effected? And how through them was the first center of general attraction created? How on our planet was the first granule of protoplasm formed? The end, so far as we are concerned, we know. Our earth will cease to be habitable. It will grow cold, will doubtless lose its atmosphere, its humidity, and will resemble our present moon. Evolution, from having been progressive, will become stationary, then regressive. Some day, as Huxley has asserted, the lichens, the diatomes, and Protococcus, will be the only living beings adapted to the conditions of life, and finally there will be nothing. As for our sun, when it shall have exhausted its present store of fuel, when it shall have become habitable, and shall have had its ascending and descending evolutions, and lost also its human phase, it, too, in its turn will become a dead star lost in space, and other systems will begin and will shine for a period, to end as the others have ended. And

to what purpose is it all? Our imagination, our reason, can they conceive of anything which does not remove and postpone the difficulty without solving it? One need but read pages 446-448 of the French edition of Guyau's *Non-Religion of the Future** to learn what even the most seductive conceptions lose when we seek to support them by speculations regarding the inaccessible in the present state of science. The wisest course is to confess humbly our inadequacy and to take refuge in the agnosticism of Huxley.

The factors of organic evolution on the surface of our planet, as we have already stated in Chapter V, page 25, are as follows: (1) The spontaneous expansion of life, or the augmentation of the matter which is its seat at the expense of other matter received from without and assimilated, up to the time when the separation of a part of the mass is effected—by which act results the creation of other individuals; (2) the spontaneous variation of individuals so created—the first cause of the differentiations and multiplications of living forms; (3) the adaptation and increase of those of these variations which are utilized and suit with the conditions of existence—the second cause of differentiations and particularly of their establishment. Heredity, or resemblance by continuity of individuals, and the survival of the forms best adapted to the circumstances, are but consequences. The expansion of life is effected in all directions, when no resistance is made. A fragment of *Lemna* thrown upon the surface of a pond sends forth its branches on all sides, and finally overruns the whole pool. Variations likewise are effected in all directions. The utilization and adaptation of these varia-

*English translation published by Henry Holt & Co., New York.

tions alone determine the directions which the forms take under the influence of circumstances, such as accident creates, concentrates, and renders efficacious. At times these circumstances come into conflict with one another, at times they confirm one another. They accelerate, retard, or arrest progress in the path followed, up to the point where they change it, turn it aside, pull it backwards, or cause it to describe a zigzag course. They give birth sometimes to types which are marvelously successful, but more frequently perhaps to faulty, aberrant, partly nonviable, types which respond to the need of a day, but not to the general needs. Such, for example, to cite only mammals, is the type of the sloth, condemned by his unfortunate organization to a passive existence, from which he cannot wrest himself; the type of the great animals which became extinct in the Jurassic epoch; and even the type of our elephant of to-day, which requires such great quantities of nourishment that it is surprising that it is still existent. There are admirable linear series, such as that of the Primates, where advance follows in harmony with reason, and which sooner or later must give good results. But there are also series which have been outreached, so to speak, which have been thrown off the track—series which can never lead to anything, which have ended in a *cul de sac*. Thus the highroad of evolution is strewn with victims, with imperfect beginnings, with species incapable of persisting, with misfits. Still, since in this hecatomb the fit survive, and the unfit succumb, the general result, in the present state of things, is what is called progress.

In sum, the evolution of life upon our planet is neither an entity, a cause, nor a force, but a series of

effects, the result of an incessant struggle between the expansion of life and the conditions which confront it. Life expands blindly, capriciously, without plan or design, as circumstances shape its course. In this evolution two things are to be distinguished: a general direction towards improvement in the general conditions which we now know; and possible particular directions, having greater or less duration. The latter are good or bad, according to the particular species concerned, and it may even involve advantage for a given species to resist the natural evolution, and when possible even to direct its course.

We have seen, in fact, that the various species at the various epochs in which we have considered them—the Jurassic, the Eocene, the Pliocene, and the present—are comparable to the terminal efflorescences of a tree of which the dead branches and trunk have disappeared; and that through subsequent flowering these efflorescences are replaced by others; that, in a word, the common lot of all species, both good and bad, is death. Among the mammals very few species have perpetuated themselves through several ages. Does not the conclusion suggest itself that if some one of them by some exception possessed some peculiar quality which enabled it to shape in some measure its destiny, and to secure for itself in some measure its own happiness, it is reasonable that it should make full use of that quality? It is a positive fact that Nature has no concern for the numerous species to which she has given birth, no more than the tree has for the leaves which turn yellow and sear every autumn, and fall to the ground. Nature, like evolution, which is but the result of its mutations, is not a personality. It has neither feeling nor reason; it has

neither the notion of the good nor of the beautiful. Whether a species is good or bad, whether it is adapted or not to its environment, whether ten, twenty, or one hundred die before a good one is reached, is a matter of indifference to her. Nature is a state of things merely, a series of changes, a wheel which turns perpetually, a world inhabited or uninhabited which rolls through space. If man is more favored than other species he has to thank no one for it. He may erect altars to Nature and invoke her aid, but she neither will nor can abate one jot or tittle of her onward movement. If he would escape the common fate, if he would ameliorate his condition, be happy, let him make her his servant, reign over her so far as he can; but let him place his trust in no one but himself.

THE INDIVIDUAL.

The species is merely a definite number of individuals, which have sprung one from another, which have been separated since their birth, and are independent. Among the vertebrates some never know their parents, others abandon them as soon as they can, and preserve no remembrance of them. The individual, in fine, is the real and tangible thing, the only thing in living nature which joins psychical attributes to physical attributes, the only thing which, while subject to the laws of nature, bears within itself some spontaneity of its own, if not a relative autonomy; the thing in which all life, all organic evolution, is materialized, and which is at once the beginning, the middle, and the end; the thing which is born, which grows, dies, and propagates itself, leaving behind it new individuals, always distinct and independent. It

is the individual which varies, works, and is transformed by insensible degrees, donning the infinite forms which people our planet and which the naturalists divide into species, families, orders, etc. It alone of all the bodies of the universe knows the objects which surround it and concern it, the movements it executes, and is cognizant that it exists; it alone rises in the front of and in defiance of Nature, and, reversing positions, makes itself the center; it alone in a certain epoch of its development possesses a centralized ego which thinks and reasons.

Upon this characteristic ego, depend, directly or indirectly, all the acts of the individual which lay a claim to our attention. It is doubtful, as we have shown, whether it exists among the Protista. There are as many particular egos among the lower composite animals as there are parts in connection with their special division of labor. Among animals not so low in the scale, certain of these egos become confluent, and one of these confluences attains supremacy. Among the vertebrates they are centralized in a special organ.

The centralized ego does not intervene in all circumstances, but only after an intermittent and faculative fashion. It abandons to the spinal cord the ordinary acts, which the organism has contracted as habits, and enters into play occasionally only, to modify those acts according to the special needs of the individual over which it has the administration. In the reptile, the vulture, the marmot, these needs are limited to eating, drinking, sleeping, keeping warm, satisfying the instincts of reproduction, avoiding danger, and acting in self-defense. Their foresight is minimal, frequently zero; the individual thinks of the present, at

most of the morrow, or of the winter to follow. Memory is limited, reflection is directed only to the immediate effects of acts; habits or instincts predominate over everything; the ego intervenes but little. In some of the higher mammals, as the elephant, the monkey, the domestic cat, the picture begins to change. The powers of observation, memory, reflection, foresight, increase; the rôle of the ego becomes more pronounced; it interferes more.

In man, especially in our days, the picture is totally different. His needs have infinitely increased, the necessaries of life no longer suffice him, he reaches out for the superfluous, for the comforts of life, and for the pleasures of the intellect. He has ungovernable desires, passions of all kinds; he pursues various ideals. The motives of his resolutions are numerous; he has the most varied ways of assuring their execution; he carefully foresees the effects of his conduct. His ego has unceasing opportunities for intervening, for deliberating, and for taking the initiative. Its task is so great that it would be unequal to it, did not its powerful memory enable it to store up the results of its former deliberations, did it not suppress part of the reasonings through which it has passed, did it not progressively simplify its procedures, did it not establish in itself habits of feeling, thinking, and reacting which greatly diminish its labor. Let us dwell upon this capital point.

The exterior acts of man are of two kinds: the one voluntary and attended by the premeditated and deliberate intervention of the ego; the other more or less unconscious and unattended by that intervention. The latter acts are the results of habits contracted by the individual himself, or bequeathed to him by his

ancestors in the form of predispositions more or less susceptible of inducing the same habits under the influence of the right kind of excitations. The ancestral habits, confirmed and consolidated by their repetition from generation to generation, are instincts or instinctive acts. The individual habits, sometimes just as powerful, are of the same character, have the same mechanism, and deserve on the same ground to be called instinctive acts. The following are examples: Swimming; following mechanically a path which is daily pursued; drawing one's sword and placing oneself on guard in the presence of an enemy; jumping into the water, without reflecting, to save a fellow-being; copying a page of handwriting while thinking of something else; speaking without thinking of what one says, etc.

Instinctive acts when totally unconscious have their seat in the spinal cord. A peripheral excitation reaches that organ and is there transformed into a co-ordinate, reflex movement, the movement which the excitation in question habitually engenders. The excitation extends also to the brain, but that organ is indifferent to it, does not focus its attention upon it, and suffers the movement to be accomplished without its intervention. Nevertheless, the excitation may be perceived, may awaken in the brain analogous anterior sensations which have been stored there, corresponding ideas, and motor reactions which are habitually disengaged without the ego's interference or opposition. This is what I call a cerebral reflex act, whereas the preceding case was a medullary reflex act. It goes without saying that the habits contracted, whether ancestral or individual, dominate the whole phenomenon. The nervous circuit having been trav-

ersed, the response given will conform to the habitual mode of feeling, thinking, and acting under the influence of said excitation. The ego assists more or less consciously, but performs no act of will, or at least executes but a very secondary and feeble sort of volition. Such is the case of the soldier who, transported by his courage, rushes into the face of the most certain danger, or that of a friend into whose arms, yielding to your first impulse, you throw yourself, although he has betrayed you and done you injury. Such are the impulses, more or less unconscious, which impel us to commit acts which are frequently in complete disaccord with our interests, although in accordance, it may be, with what Kant calls the categorical imperative.

The really voluntary acts are those in which the excitation is the object of serious attention, in which the response is deliberate, the immediate and remote results carefully weighed, the various motives *pro* and *con* examined and compared. Nevertheless, there is constantly heavy pressure brought to bear upon the will, from which the ego has great difficulty in extricating itself. The varying forms of sensibility and of faculty which intervene in every intellectual operation are what heredity and personal education have made them. At first the ego perceives, judges, and acts impulsively along the lines in which its ancestral substance swings it. Then it is influenced by the modifications which it has experienced during its life, and notably during its infancy, the time when its brain was growing and absorbed readily everything that was offered to it. It has been molded by its family, by its first comrades, by its first impressions, by the results of its first acts, by the examples which

have been set it, the events of its age, by the success or non-success of its conflicts with society. It believes in what has been taught it, and in what it has reached itself by its own observations and meditations. A mode of thought is formed, favorite ideas are acquired of which it is never the master and which control it. It has a lively or obtuse sensibility for some things, and none at all for others. It has an optimistic or pessimistic temperament, it is idealistic or free-thinking. Besides, the ego is subject to general or accidental dispositions, both of brain and of body. A sound brain in a sound body is the first condition of liberty, just as sufficient preparation for the subject under deliberation is the first condition of good judgment. The volitions of the ego are thus a very complicated resultant of numerous and variable circumstances, both internal and external. The ego does not estimate things by the same standard in its tenth, twentieth, thirtieth, and sixtieth year, in the spring and in the autumn, in the evening and in the morning. Nor is its judgment the same with a peasant, whose horizon is limited, and with the metropolitan, whose views are broad; with the proletarian who has suffered, and with the rich man who is saturated with indulgence; with the ignorant, the man of letters, and the scholar.

Yet there is one thing that is common to all men—an ego entrusted with judging what is good, useful, and agreeable for the individual, with rendering its decisions conformably to its interest, with foreseeing the harmful or advantageous effects of its acts—in a word, with presiding over the conservation and prosperity of the particular individual of which it has the charge. Medullary and cerebral habits enable the ego

to restrict its activity in the generality of exterior acts to a mere Platonic surveillance. But as soon as new circumstances throw the least doubt upon the utilitarian character of the habits, its duty is marked out for it, it is bound to intervene, to throw aside all sentimentality, to array itself in the armor of reason, to appeal to its entire experience, to summon all the light at its command, and to render its decisions in the fullest plenitude of its independence for the best interests of its client.

From these considerations it follows that setting aside common reflex acts which are purely medullary, and holding only to acts which are cerebral in their origin and to their species of determinism, three types of ego may be distinguished. The first, which is *par excellence* physiological, and which goes back to the very origin of the species, is possessed by man in common with all animals; it has charge of the defense of the individual, and can be inspired for no object but his best welfare. The second is the result of habits acquired by ancestors and transmitted to the individual. The third is the product, in the individual himself, of the circumstances in which he lives, of education, of private habits accidentally or forcibly acquired, of surrounding passions, etc. These two last egos, which are more or less automatic, may be comprised under a single designation, which we shall give later. The first is the animal ego, but active and reasoning; on this we shall dwell exclusively now, reverting later to the two others.

Let us put ourselves in the point of view of the individual actuated by this ego. "I have a limited time to live upon this planet," he will say to himself; "of the beyond I am ignorant, or rather I know it

only too well; the thing is to steer my bark as skilfully as I can, and to be happy; not to suffer myself to become a prey to illusions, or to be overpowered by sentiment, when no profit can be expected from it; not to accept as the truth what reason has demonstrated to be false; to see things as they are; in a word, never to commit, from routine and naïveté, acts whose outcome will not correspond with my intentions. My body, my health, my physical and psychical satisfactions, the sufferings that are to be avoided—such are the things I have to consider. The non-ego has value only through and because of the good which it can bestow upon me, because of the profit which I draw from it, of the happiness which it procures for me. I have had experience with men; I know that if some are good the majority are selfish, are not prone to give something for nothing, and have a solicitude for me only in so far as they believe I can be of service to them. The first thing is to wrest from the world my independence, not to have need of any one, and to create for myself a safe and enviable position. The esteem in which people shall hold me, the number of my friends, my credit, my power, will be proportional to that independence and that position. The less that I have need of others, and the more that they have need of me, the more will I be sought after. What I love most of all in the world I must confess is myself. Next come my wife and my children. I love them, protect them, because they belong to me, because they do me honor, and because they render back to me the affection which I render them, and because they will take care of me in their turn when I have grown sick or aged. So true is this, that if they do not give me the satisfac-

tion which I expect from them, that if they cause me more sorrow than happiness, I shall stifle my sentiments, cast them aside, arrange my life differently, and disinherit them. I love my neighbor because I am rewarded in some way by him; he listens to me, he comprehends me, his conversation is agreeable to me, he is indulgent to me. I am willing even to make certain sacrifices for him on condition that I do not run too great a risk myself. I love the country and society in which I have been born, because they procure for me numerous advantages, although I am quite capable of infringing their laws when they annoy me and when their non-observance will bring on me no inconvenience or penalty. I shall be honest for numerous motives, one of them being because I wish others to be honest with me. I shall be charitable if I am rewarded for it by public opinion and if my sacrifice does not exceed the pleasure I can derive from it. I shall profess the most exalted and most generous principles: stoicism, justice, liberty, solidarity, equality for all; first, because I myself am included among the "all"; then because this may just happen to be my favorite idea or a useful thesis; in a word, I shall make it a point to have incarnate in myself all these virtues, for the reason that they are to my best interest. As to going to the bottom of my conscience, as to analyzing my motives in all cases, that is all very well, but it is useless. I prefer to have a high opinion of myself and to be convinced that I am good and disinterested. Of what use would it be to confess to myself a truth which would lower me to the level of the animal?"

The picture is a gloomy one, but it is only too true. Egoism is the essence of the animal ego which

we are describing; altruism itself is but egoism disguised (see Chapter II, page 54). When the two confront each other, when the other type of ego of which we shall speak is silent, and when the cerebral balance is exact, brute egoism will always carry the day. Suppose two individuals upon the ocean in a vessel. No hope, not a sail on the horizon, with enough to eat for one only; they are dying; the two egos face each other, both eager to live; the one will slay the other. From this extreme case to the lowest case of simple distinction of good and evil, all the intermediary stages are met with. And yet the animal ego is neither good nor bad in the nature of things. If it were not for the difficulty of obtaining a livelihood, for the competition and strife which results therefrom, its sensibility would carry the day, and it would be nothing less than kind. In reality, by virtue of his reason man is utilitarian. The more intelligent and enlightened he is, and the more rigorously he adapts his acts to the objective reality of things, the more "practical" will he be, as it is called in the language of the day.

SOCIETY.

Society differs from the individual, as much as the individual does from nature, but in a different direction. The following is the order of gradation: The universe, which is the totality of the stellar systems including our own; organized nature, which we know of only on our planet; the human individual, which is the highest form of organized nature; society, which is a mode of life that new conditions have rendered obligatory for the individual. Man domesticated animals, invented flint instruments, navigation, agri-

culture, exchange. Pressed by the same necessity, he has invented society, that is to say, adaptation to his needs for companionship, which hitherto were less urgent, and he has gradually made of it a sort of permanent personality, taking the place of the real individual personalities. The following is its evolution:

Among animals the assemblages were at first indifferent, as we have seen, and were formed by imitation among individuals having no motive for hostility. Habit resulted, then pleasure, finally reciprocal altruism. The individuals constituting the group lived under the same shelter for warmth, they formed serried bodies for resisting attacks, they hunted in concert, and assisted one another variously. The weak sought out the strong, the strong protected the weak and naturally became the chiefs. The highest stage reached is represented by the instance of strategy among monkeys which we narrated after Romanes, and by the cases where sentinels have been punished for neglect of duty, or where judgment has been passed by a sort of tribunal.

In man the same two phases recur. The first is spontaneous or altruistic; the second reflective and based upon interest. A special cause is added in the first phase: with man the young remain longer with their parents and continue willingly with the family, which by favoring the maintenance of altruistic sentiments becomes the nucleus of a subsequent society. But man, owing to his intelligence, cannot in the second phase help discerning more and more the advantages resulting from life in common, and is incited to go farther. Thus defense against enemies with him rapidly takes on a special physiognomy; collective

defense becomes collective attack; the passions, the love of domination and glory, mingle with the rest, and the curse of militarism spreads on all hands. Yet, within, every one still remains for a long time the master of his acts, and shapes as he pleases his relations to his fellow-men. Customs become established of themselves for each case. But the day arrives when the differences threaten to spread and to compromise the security of all. The general interest requires intervention. Then arbitration is invented, compensation for all kinds of crimes, punishments, prohibitions, etc. Customs become rules, and then laws, the great number of which grows as the population and the complexity of the mutual relations grow.

But in these societies subsequently to the naïve and patriarchal phase of the fathers and the elders, came a second period, where the more adroit and the more ambitious assumed the task of controlling the general interests, while the others kept to their ordinary occupations. Thenceforth free rein was given to individualism, characteristic of human as well as of animal nature. In the hands of the conductors and administrators, the general interest was quickly subordinated to particular interests, society became their special property, and was mismanaged to their profit. Hand in hand with this, as a result of the division of labor and of the transmission of the consequences of the struggle of each for existence, society was divided into groups, for the most part professional, in which individuals, from father to son, became immobilized—one class reputed noble and filling the highest offices of society, the warriors, the priests, the magistrates; the other reputed inferior, if not servile, the farmers, the merchants, and the

laborers. Other groups were added; the strangers, who were admitted into the social group without sharing its advantages, and the conquered who were made slaves. Thus permanent social classes became established—the negation of the principle of equality of the advantages to be derived from a social state—a principle which from the beginning was necessarily the tacit condition of every system of life in common. The internal social evil, war between one another, which resulted therefrom, and the external evil, militarism which we have opposed to it, have thus totally falsified society. The initial object was the happiness of all, and greater facility in subserving their needs, each entirely responsible for his acts but enjoying the fullest play for his faculties and the external means for investing them with equal value for all. This result was obtained only for a part of society, the least part, the strong and the intelligent. The others—that is to say, the immense majority—not only gained nothing, but were placed in a condition inferior to that in which they existed in the state of nature. Society is but a hierarchic scale: at one extremity are the privileged by birth, entering into full and immediate possession of all the honors, of all the enjoyments, without having done anything to gain them. At the other extremity are the pariahs who inherit nothing but the misery and the sufferings of their ancestors, and lack the possession of the meagerest arms for struggling, predestined to defeat before having engaged in the struggle, condemned, they and their children, to the hardest possible fate, often without hope of termination.

At its origin society looked to nothing but the present. When the enemy attacked, all seized arms;

and when the combat was done, they returned to their customary occupations. But little by little the levying of the population *en masse*, the successes collectively gained, the treaties concluded for long periods of time, the necessity of extending territory which had grown insufficient for the population, gave rise to a common sentiment of interests extending beyond the present moment. The rules adopted for the relations existing between individuals were in themselves an indication of foresight, being as much concerned with children born and to be born as with the present existing generation. The council was a permanent institution, of which new members were chosen when vacancies occurred by death; sometimes the office of chief was hereditary. A tradition was thus constituted. The memory of the past, ancestors held in universal veneration, household gods, the annual ceremonies invoking these objects of worship, solidified the bond. The collective qualities of a tribe, its reputation, its prosperity, all its belongings, formed a patrimony which all took pride in transmitting intact and when possible augmented. Every society which had achieved something became thus a state—a corporation possessing a genuine capital at once physical, intellectual, and moral, which was increased from generation to generation by many successive acquisitions—a continuous fictitious personality exerting its authority over the real personalities and having no compunctions against sacrificing them to its interests. Such were the ancient cities where defense and attack formed the pivotal interests. Such are our modern nationalities—a guardianship which is not infrequently irksome; a mechanism of the most complex kind; a scientific concentration of all powers.

The strangest thing is that these social personalities in their relations with other societies have taken on the habits, adopted the modes of thought and action of real individuals, and that like the latter they seem to be in possession of two egos: one reflecting the tradition and distinctive character of the nation (altruistic, let us say); the other sociocentric, egoistic, and given absolutely to its own interests—with this difference, that in the diplomatic science of to-day the first-mentioned ego is looked upon in the light of a weakness and a sacrifice of self, whilst the second is regarded as a mark of power, a proof of capacity and superiority. In international affairs nations which are actuated by sentiment, which base their conduct upon principles and appeal to maxims of duty and humanity, are called chivalrous, whilst those which pursue the policy of results only, and which keep steadily in view their interests, are regarded as utilitarian. If any additional argument were needed for demonstrating that individualism is a synonym for interest and egoism, our powerful modern civilizations would furnish it. Cleverness is the means, our great battalions the sanction. Public opinion is shrewdly respected, because the press supports it, and because at certain crises there is need of it, to say nothing of the occasions when credit is necessary. To divide in order to rule, to reach one's ends even by underground practices provided appearances are preserved, to bend before the strong, to abuse the weak, whether savage or civilized, to succeed without arousing coalitions—such is the international ethics of to-day as it was in the time of *The Prince* of Machiavelli. What is there more odious than the so-called "reason of state" (necessary withal), which authorizes everything, and which at

the moment that I am writing in France causes the same act to be designated on one side of the frontier as patriotism and devotion to country, and on the other as rank infamy? What can be more lamentable than societies all in arms, ready to throw themselves at each other's throats, and to sacrifice thousands and thousands of individuals who are not responsible for the causes of the wars waged? If the animal nature is always present in the individual, it is much more so, though under more polite and refined forms, in international politics.

Yet let us not fail to observe that there has been progress. Treaties are no longer broken with the same facility; they have been invested with more form; the favorable moment is awaited. Contracts, comparable to those of gamesters or of operators on the stock exchange, are now generally kept with faith, because answering to a common need. The ordinary conventions which concern international law, and general conventions, such as those which make certain countries, certain waterways, and isthmuses neutral, are constantly gaining ground; arbitration is becoming more common, and strēnuous efforts are constantly made to avoid recourse to the *ultima ratio.* Some day there will doubtless be permanent international tribunals for settling disputes between societies, the same as there are now for adjusting differences between individuals; but that day is still remote. A society forming part of a vast federation of this kind will always preserve toward the federal union the same attitude that the individual within it now maintains towards society. Society has its sanction in the punishments which it inflicts. Will the federation of

societies we speak of in the future be capable of resorting to the same expedient?

This progressive transformation of a simple and naïve society, given to seeking the best mode of life in new conditions, to extending mutual aid and to realizing general happiness, into a complex social stock company, giving good dividends from the high point of view which we shall speak of soon, but distributing its profits and its losses among its stockholders in a most unequal fashion, giving to the one class the favors and the facilities of existence, and to the other the burdens and all the irksome inferiority—is this the end and ideal to be reached? Man has outstripped the animal; he has marvelously developed the system of life in common. But as regards the real object to be gained, he has ended in bankruptcy. We have seen that evolution in living beings makes ultimately in the general direction of the adaptation of the best individuals forming a species to the external conditions in which they are called to live; but that before arriving there, evolution strays off frequently into useless and regrettable paths. Such has been the case of man considered from his own subjective point of view. If the evolution of human societies is ever to attain the desired goal, we must say that the day is still far distant, and that the bypath into which empiricism has conducted it deserves the qualification of deplorable, whatever passionate admirers of the *laissez-faire* theory may think of it.

But how has this unfortunate deviation been brought about? Why has empiricism, the servant of circumstances, ever led to such a result? It is because nature does not hold the same views as we do, or

rather, because it holds none whatever, because it proceeds blindly with its fatal laws, and takes no heed of our opinions or of our desires. It is because the best for nature is not the best for us; it is because man, in order to attain what he desired, ought to have changed himself, and transformed his animal nature. At the outset, society conformed to the individual, but this did not last long. The reaction of individuals, one upon another, grew stronger. Some struck and cut about them at pleasure; the necessary relations were falsified; everything was embroiled. Society became a thing apart, an assemblage of conditions which were quite different from what they were at the start, a *milieu sui generis*. But the evil was too deep-seated, the adaptation was not effected. Man has preserved his animal nature, which remains in conflict with his environment. Society and the individual have become antagonistic; what the one demands does not suit the purposes of the other. Social life is a composite of sacrifices often imposed without compensation and greatly exaggerated; the individual desires to be free and fully responsible for his acts. Man is an integral part of nature, and is subject to its imperative laws; society is an edifice constructed upon the sand of conventional materials.

This leads us to speak of some of the principles upon which it reposes. These principles will complete our parallel of the three points of view: nature, the individual, and society. For the present we shall reduce them to four: liberty, and its counterpart solidarity; equality, and its corollary justice.

LIBERTY.

Liberty is a human conception involving volition. Liberty does not exist in nature where there is never spontaneity but only effects, determined by one or several causes acting in different directions and counteracted by others acting in contrary directions. The strongest or the resultant carries the day. In plants and animals all phenomena are the consequence of organization, actuated by exterior or interior agents. So-called acts of will are the results of excitations, which bring into play ancestral and personal habits and the moods of the moment, as we have termed them. The same is true of thought, save that here the excitation is sometimes internal, and so bears the appearance of spontaneity. Psychical freedom is relative, and depends on the ego.

This being understood, the individual in the state of nature enjoys all the freedom his organization allows. He is restricted in his acts only by material obstacles, his muscular and nervous strength, and his own judgment of his motives for acting in given cases. In the presence of one of his fellow-beings he behaves as in the presence of an animal whom he desires to conciliate or to combat. According as his relations with his fellow-beings grow more extensive, he learns to restrain himself, but only under pressure of force or for some analogous reason. In society he is subject to necessity which places upon his primitive instincts of liberty, restrictions which he cannot escape.

To describe (1) the province in which the individual is permitted to move about with perfect liberty, and (2) that remaining province where such movement is forbidden; to describe that which is his and that

which is others'—two words have arisen in modern society, *rights* and *duties*. Neither the one nor the other exists in the state of nature. There man does what he wants to and what he can. He has duties towards himself only, and they are of the physiological order. The inalienable rights of the French Revolution are rights that are considered indispensable to the existence of man, and of which he cannot be deprived. They answer to what Thiers has called "necessary liberties." Yet it is admitted that in case of war, or the suspension of social laws, they may be temporarily suppressed. Duties are the correlatives of rights, being the obligation to respect in others what we would have them respect in us. They are embodied in the laws, and may be summed up in the phrase "obedience to the laws." They are absolute, and their infraction entails punishment. By their side there are other duties having no direct sanction, being prescribed by custom, public opinion, self-respect, veneration for family and ancestors. It is needless in social practice to speak of rights; the individual is only too much disposed to broaden their conception. On the other hand, there is a constant necessity of speaking of duties, which are the momentous point, and form the very essence of life in common.

SOLIDARITY.

Solidarity is a physical, functional, or psychical bond between parts. It is extremely widespread in nature. Physical bodies are assemblages of molecules solidarized by cohesion. In a stone, heat, humidity, shocks, are propagated from one grain to another; if we separate a grain, its solidarity ceases. In organized

beings, solidarity gives rise to colonies of merids, zoids, demes. In the first stage, cohesion pure and simple is the cause. Take the simplest aggregate of cells. Each cell has its own life and forms a distinct individual, but being joined to its neighbors it is solidarized with them to a certain extent. If one be separated, it continues to live, but is independent. In the higher stages the solidarity becomes functional. Each part is specialized, is intrusted with some given function, which it performs to the profit of all the other parts of the colony, just as in its turn it profits from the functions which they perform. In the last stage, when the solidarity is complete, all the functional individualities are merged into a single individuality: there is unity.

For the free individual in the midst of a vertebrate species, for example, the word is meaningless. There is neither cohesion, community, nor subordination of function here. Absolute independence is its characteristic. But a relative or psychical solidarity resulting from sympathies, needs, or common interests, may be established. Exchange of service is the first stage. If the exchange is repeated and has grown habitual, if it is premeditated, if something is offered for the general use with a view to deriving profit from it, the solidarity is increased, within set limits. Such is the origin of commercial societies and of all professional associations. Society, so called, is the most advanced stage of solidarity; the sacrifices, the advantages, and the responsibilities, are divided. Yet the solidarity is even here not complete. Every individual has his reservations, and will not suffer himself to be stripped of all his freedom. The first distinction to consider is that of a state of war or of peace.

In the first case the solidarity is complete as regards all the means or needs of common defense. Every individual is under obligation to all the others without their being under obligation to him, as it is in animal colonies which have perfect solidarity. In the second case it remains psychical and general to the extent that when prosperity or misfortune befalls a whole or a part of the community, accidentally or through the administration of the latter, all bear the consequences of it, whether these be good or bad. Similarly, if a change be made in the laws, all either suffer or profit by it. It is this sort of solidarity that engenders the idea of country, which is none other than that of common interests. Solidarity and mutuality are synonymous. It has been spontaneously and progressively produced as a consequence of life in common. It differs totally from the physical and physiological solidarity of the animal colonies; it has no other sanction than the interest of the individual on the one hand and the law with its coercive measures on the other.

EQUALITY.

Equality exists in nature, but fortuitously. Here the effect is always equal to the power expended, or to the sum of the powers, diminished by the sum of the resistances. But excepting the case where they counterbalance each other, the power and the resistance are so unequal and so varied that the effects are generally unequal. Two bodies have rarely the same dimension, the same form, the same properties exactly; two individuals have rarely the same value: the one will always get the upper hand of the other. Among species as among the individuals of a species, inequality

is the rule and is moreover the condition *sine qua non* of evolution. In the most perfectly organized societies equality is merely coterminous with the laws which are common to all. As to the rest it is simply a word, a principle flowing from another principle—namely, solidarity. But solidarity being purely psychical and restricted according to circumstances, and equality never being complete even in perfect solidarities—such as those of absolutely unified animal colonies—equality can make no pretension to being absolute. The foundation of the principle is as follows: Men united in society make equal sacrifices, or, more exactly speaking, sacrifices which are regarded as equal, and assume an equal share of the general responsibility. Therefore they must be equally treated and must enjoy equal advantages. But from theory to reality is a far cry. Equality is a magnanimous dream, the cliff on which all endeavors are shattered.

JUSTICE.

There are few words whose signification has varied so much from antiquity to the present day, and so well reflects the customs of the time. In its present highest stage it is a pure human conception, which in its most widely accepted meaning is equivalent simply to possessing or receiving what is one's due.

Let us see if there is anything in nature corresponding to this idea. A body rolls through space, enters our atmosphere, becomes incandescent by the friction, and bursts into fragments. A storm arises, the oak is torn out by its roots, the reed bends and straightens again. A wolf pursues a stag, which flees; the one runs to eat, the other not to be eaten; both exert their pow-

ers to the utmost; the victorious wolf is recompensed for his perseverance, the stag succumbs through his insufficient powers of respiration. The Tasmanians lived happily; the whites invade their island, massacre them, and appropriate their territory. At bottom all these cases are one. Everywhere that takes place which must take place conformably to the conditions and the forces in action. Nature witnesses impassively and indifferently the phenomena of which she is the theater. The incandescent body, the oak, the stag, the Tasmanian—none has greater weight than the other in her balance. To living bodies, as to inert bodies, nothing is due; there is no justice.

Let us now look at the individual, and place ourselves at his point of view. He possesses his particular organization, of which he is not the author, and which it is without his power to relinquish. As Spencer said, "he is subjected to the effects of his own nature and of the conduct which it involves."* It is due to him, therefore, that his acts should have the consequences which they logically imply, that he should reap what he has sown. Upon this condition only is he responsible. If his ego has been deceived, if he has wrongly judged what it is best to do, if he has suffered habit to produce the act, and has not intervened to modify it, if he was distracted or indolent at the moment, if he has reasoned falsely, he suffers the consequences. But if he has been correct in his forecasts and judgment, the benefits and the profits belong to him. This is the conformity of ends to acts—organic or physiological justice. In the case of the wolf just mentioned, it was justice that its perseverence was crowned with success, whereas in the case of

*Herbert Spencer. *Data of Ethics. Justice.* 1891.

the stag it was unjust that, having put forth his utmost powers to escape the danger, it was after all devoured. A mother carries her infant during the period of gestation, brings it forth in pain, nurses it, and lavishes her care upon it; it is unjust that she is not recompensed and that the child dies. But the following is a complicated case. Two men struggle with weapons which each has at his disposal. The one has greater courage, the other greater skill. Each has a claim upon recompense, but one of them conquers. Where is the justice? From the point of view of nature there is none, for both have obeyed their organization. The stronger has conquered the weaker. But from the particular point of view of each, justice has been done for him who, having put forth his utmost powers, has succeeded; and injustice has been done to him who, having achieved the same end, was nevertheless vanquished. Individual justice, therefore, is relative. Yet even in this restricted form it has wide import and applicability, for it engenders personal responsibility, and so becomes the moving cause *par excellence* of all human activity, involving the reward or punishment of acts, and impelling the ego to be ever alert for intervening, for adapting its commands to the circumstances, and for looking to its interests. If there were no such justice sanctioning responsibility, personal conduct would be without a rudder.

It may be asked if this responsibility has aught to do with the acts or with the intentions which have inspired the acts. Certainly habits frequently assert themselves without intervention on the part of the ego, but in not interfering it has done wrong and should suffer the consequences. Acts are the only

material which lends itself to judgment. Intentions, and the motives from which they spring, cannot be analyzed; they form an inextricable labyrinth. The ego and its acts, whatever they be, are solidary and compact.

We have now come to society. Solidarity, as has been said, involves duties on the part of the individual, while reciprocally society has duties which it owes to individuals. Each in its turn is bound to receive its due. Hence social justice—or the regulations which control and sanction the relations between the two transacting parties. It is a necessity, at once theoretical and practical, for the perfect functioning of these relations, just as above individual justice assured the perfect functioning of the relations between acts and their effects. It renders the individual responsible to society and society responsible to the individual. It is the sanction of the two responsibilities.

But we have seen that theoretically all individuals stand upon an equal footing in society—that is to say, have the same rights and the same duties; for which reason social justice is sometimes defined as the law of equal liberty. On the other hand, social rights, and still more so social duties, at least such as society judges to be most indispensable, are precisely defined by the laws, as are also the punishments which insure their observance, but not the rewards which crown their fulfilment, for to these little thought is given. And hence this other definition: social justice is the law itself, or from another point of view, the apparatus and the means designed to insure obedience to the laws.

Let us recapitulate. There is no justice in nature.

In the individual, and with respect to that individual, a relative justice exists, which is entirely physiological and is the sanction of his acts, the source of his responsibility, the stimulant to his activity. In society a conventional but necessary justice exists, without which all would be anarchy, which is the sanction of the correctness of the relations of the social body to individuals, and likewise their guarantee.

Nothing, we believe, shows more clearly the profound difference existing between nature, the individual, and society, than the different acceptation in these three cases of the words which we have just examined. We might stop here and conclude directly regarding the questions which were restated at the beginning of the present chapter, but we must first insist upon a few points in the mechanism of the social evolution which we have skimmed in the preceding chapters.

CHAPTER X.

Mechanism of Social Evolution. Individual Variation. The Right Man in the Right Place. No Natural Selection. The Struggle for Riches. The Social Capital.

Society not being a product of nature but a product of man, evolution in it presents differences which have not been sufficiently remarked or insisted upon. At first it is natural, or such as circumstances and the regular play of individualities have made it; or semi-artificial — namely, such as the conscious or unconscious will of man has shaped it. It may even be entirely artificial, if it has been built up altogether by man, regularly and methodically interfering with a knowledge of the causes at work and with a well-defined end in view. Social evolution has individuals as its agents, but as its effects a line of permanent results surviving individuals, possessing in some measure an existence of their own, growing, modifying, selecting, and culminating in a majestic *ensemble* independent of man and of the causes which have given it birth.

Let us first look at the agents or initial factors. The first, as in the evolution of all animate beings, is the expansion of life, and in this particular case social life—that is to say, increase of population, of needs, and of faculties. The second is the variability of individuals, giving rise to individual differences or variations.

We shall begin with the latter, and first take up a few physical characters, as they are exhibited in anthropometry by figures showing the degree of frequency of the variations about a maximum center, which represents the type of the character in the group studied. We shall borrow the data from our *Éléments d'anthropologie*,* condensing them to the limits of necessity.

The height of 424,215 Italian recruits from twenty to twenty-one years of age varied, according to Pagliani, as follows:

HEIGHT.	RELATIVE FREQUENCY.
Above 1.80 metres	6 in 1,000.
From 1.80 to 1.70 metres	142 in 1,000.
From 1.70 to 1.60 metres	528 in 1,000.
From 1.60 to 1.50 metres	275 in 1,000.
Below 1.50 metres	40 in 1,000.

In one thousand Parisian skulls of the masculine sex the cephalic index, or the ratio of the width of the skull to its length, varied, according to measurements which we ourselves have made, as follows:

CEPHALIC INDEX.	FREQUENCY.
Above 85	in 87 skulls.
From 85 to 80	in 268 skulls.
From 80 to 75	in 429 skulls.
From 75 to 70	in 206 skulls.
From 70 to 65	in 10 skulls.

The weight of one hundred and eighty-three masculine European brains from twenty-five to thirty-five years, as determined by Broca and Bischoff, varied as follows:

WEIGHT.	FREQUENCY.
1500 grammes and above	25 brains.
1500 to 1400 grammes	44 brains.
1400 to 1300 grammes	70 brains.
1300 to 1200 grammes	39 brains.
1200 and less grammes	5 brains.

*Pages 338, 442, 536.

It follows from this, that in dealing with the variations of a given character we have to distinguish between the variations which are oftenest repeated in a series and which form the mean group, and those which range above and below the mean and decrease in point of frequency, the extremes in both the higher and lower scales of variation being the rarest variations.

The same is true of sensory and psychical characters. Weismann remarks that while some persons are absolutely incapable of distinguishing between two adjacent notes on a piano, Mozart could detect the difference of a fourth of a note between two violin-strings sounded two days apart. In our psychological laboratories individual variations in the duration and intensity of certain reactions are now measured, but for psychical phenomena recourse must be had to descriptive observation.

These variations bear, first, upon the general *ensemble* of the faculties, more or less felicitously balanced—that is to say, upon the entire cerebral capacity; secondly, upon the mode of association of these faculties, which exhibits the most astounding diversity; and last, upon the quality of each particular faculty. With respect to every one of these points of view a scale may be set up running from zero to a maximum. At the bottom are the variations which denote a perfect absence, next those which answer to a feeble functioning; the most numerous variations are at the center; above are found the ordinary high variations, which in ascending the scale decrease in number, and at the very top, finally, the rarest and higher variations—luminaries of the maximum brilliancy which alone emit more light than the whole

series together. From such scales are produced innumerable intellectual categories: such as the incapable, the inert, the insignificant, the nulls, the automata, the impressionable, the incoherent, the ecstatic, the contemplative, the positive, the geniuses, etc.

Take a restricted example—the faculty of observation and induction. Suppose 100 individuals: 30 will daily pass by an object or be the witness of a phenomenon without seeing it; 30 will see it, but will only make it the occasion of a profitless remark or of some trifling conversation; 20 will distinguish in the object or phenomenon the particular point in which it differs from others; 10 will reflect a moment or so upon it; 5 or 6 will immediately induce from it some idea which they will connect with some other thought, and store it up in their memory for later use; 1 or 2 at most will immediately see in it a gleam of light and make it the object of the most felicitous application.

Now, the great discoveries—and this, by the way, is the first ultimate proposition which I am desirous of establishing—the great discoveries, I say, the general ideas which wing their way in advance of progress, the things which subsequently give rise to the most useful practical applications, are the product of these higher individual variations. A society restricted to inferior variations would retrograde. A society having only mean variations, all other things being equal, would be immovable; and whilst the others round about it would move onward in the path of progress, it would remain behind. Every society which has any pretension to holding its own, or which desires to outstrip its rivals, is bound to see that the number of its *élite* individuals is kept constant or increased.

There is more besides. On the one hand the best of the higher adaptations may never come into the environment in which they can be put to use, and may so remain a dead acquirement. On the other hand, the mean or indifferent variations may meet with stimulants which will heighten their efficacy, or with conditions which are suited to their special application, and may so acquire fresh power. In other terms, a physical or an intellectual character derives its real value from the use which is made of it. An individual who in one kind of work amounts to nothing may be strong in one which is suited to his capacity. The infinite diversity of the talents and aptitudes of men is really wonderful! In the intellectual class some show their abilities in the arts, in the sciences, in literature; others in manufacturing and commerce, or in politics. Specialization advances far: in the sciences some show an aptitude for mathematics, others for natural history, others for sociology. Even in the same branch aptitudes are different. A person who is given to either botany, geology, or entomology, may be averse to research in the other branches. And even here again there are distinctions. In botany, for example, one person may be good in the description and establishment of species only, another good only in the physiology of plants, or in the philosophical problems to which they give rise. A third is interested only in microscopic research or in horticulture. In society the division of labor is infinite; there are all sorts of places for all kinds of activities, for all variations whether high, mean, or low. Long ago Aristotle said that some individuals were born to obey, others to command. In a manufactory where all the employés have, by supposition, the same education, one will

never be anything more than a good workman, another a good bookkeeper, while a third will be a good foreman, but incapable of being superintendent. Among the managers themselves, one is best fitted for selling, another for manufacturing, and another for controlling the establishment generally. In the army it is the same. Some will never be more than common infantrymen, some never more than under-officers; a small number attain the rank of captain; the majority of brigadier-generals never become division-generals; very few have the ability to command an army corps.

In short, there are high and low occupations in society for every one, just as there is an ascending and descending scale of aptitudes among individuals. Yet the two factors, the proper aptitude and the proper place in which to make good use of it, must be made to meet. Each must seek his path in life, essay success in different directions, and find the place where his qualities can be best utilized and his defects entail no drawbacks. The very things that are intolerable defects in one position may be the very best of qualities in another. Nothing can be more rigorously true than the saying, "The right man in the right place."

In society the natural inequality of men loses therefore part of its repellent character. Individuals who are high in the scale for one task are often low in the scale for another. An average individual sometimes renders a greater service in the right place, and while performing a work that is much in demand, than an individual high in the scale of capability does by performing a work which is little in demand. It follows that all the efforts of a society desirous of procuring

for the mass of its members ready and ample satisfaction of its needs is bound to favor everything which tends to put in the hands of individuals the means of finding out for themselves the best occupation for their faculties, for augmenting their present value, and therefore for realizing their special and peculiar happiness.

There is a third reason why society should favor emulation, competition, and struggle—three things which hang together. The activity of an organ, of a function, or of a faculty has the effect of increasing its power and of differentiating it in the direction of the work it is doing. The variations which are most used, and which consequently are most enhanced in the scale during the life of the individual, are those which have the greatest tendency to repeat themselves in descendants, and if the same exercise is continued, to be confirmed in the general line of descent. A laboring man lifts so many kilogrammes every day, and finally by exercise succeeds in tripling the amount. His son, if he resembles him, and if he works at the same occupation, will attain a higher figure, and will bequeath to his son the predisposition to increase the amount even more. There is evidently a limit, but the muscular force incessantly stimulated in each generation will reach a higher mean than that which would have been attained had the individuals of the series suffered their muscles to remain inactive. No hypothesis of Weismann can alter the fact. It is the same with intellectual variations. All things equal, they will rise higher in the scale in families which exercise their brain than in those which only exercise their muscles, if the chances of heredity favor them. It is this that explains the transmission of individual

characters acquired by usage or by lack of usage. An indifferent variation, spontaneous in a family, say a special conformation of the ear, the nose, or the chin, some little peculiarity of movement, some peculiar method of thought, will be perpetuated for generations, if the chance of marriage alliances operates in the right direction. *A fortiori* when the variation is not indifferent, when it is utilized, augmented by labor, the chances of transmission are greatly increased. The activity which the search for a better employment of the faculties engenders is, therefore, independently of the material products which it yields, the factor *par excellence* which makes for the amelioration of individuals. Every society that has any thought of the morrow, that is bent upon perfecting the species and on rendering the path of life more fruitful to its successors, is bound to respect struggle, if not to encourage it.

We pass to selection in society. Does it take place here among variations which have been utilized, just as it does among animals? We know its mechanism in the latter. The strong, possessed of variations which are perfectly adapted to the situation, are perpetuated, while the feeble who possess variations which are imperfectly adapted are eliminated. The law is the same with man living in a state of nature, whether alone or as the chief of a family. It is the same with primitive peoples who as yet live only upon game and the fruits of the earth. Those who live in favored regions prosper, while those who are forced into sterile regions, whether very cold or very hot, but without water and without game, vegetate and pass away. Later, among barbarians of all stripes, among civilized nations, and even in the present day,

when war intervenes with all its horrors, the same selection by death and the suppression of reproduction continues. The cleverest and best armed nation carries the day. In this way a large number of peoples have disappeared whose names have not even come down to us. And we have had in recent times a forcible instance of the phenomenon in the extermination of the Guaranis and the Tasmanians. The primitive races, of which rather the evidence than the actual line has been continued to our day, have been produced by differentiation and the successive elimination of the poorly adapted, at a time when natural selection operated in all its original splendor, as it does among animals.

But apart from these cases, and as we go farther away from the primitive phase, selection falls off in intensity and changes its character. The first cause of this is the development of intelligence. According as man learns to protect himself against the elements, and finds means of existing where formerly he perished, artificial selection associates itself with natural selection. What else is agriculture, the domestication and rearing of animals, exchange, industry, association, and changing of customs, if it is not the intervention of the hand of man modifying his original conditions of existence as he now himself modifies the vegetable and animal species which he desires to perpetuate for his own use and pleasure? A second complementary cause of the falling off of selection in the human species is the facility with which the experience acquired in the art and conduct of life is transmitted from father to child, and from the tribe generally to its component members. In animals this transmission operates only through habits or instincts which require

a long time to become established. In man, thanks to his possession of language, and to the prolonged space of time during which he lives in his youth with his parents, and also to tradition which is constantly adding to its store, this education is rapid.

The most patent result of selection in more or less civilized epochs has been the division of society into classes, some satisfying both its necessary and its superfluous needs; others satisfying within the barest limits the first only, but still surviving and reproducing itself. The abyss which separates them does not, nevertheless, prevent them from mingling together, the higher classes appropriating the women of the lower. As to mortality, if misery causes it to be greater in the lower classes, in the higher it is augmented by war, which these classes make their profession.

War, to which we may here refer again, also changes the character of selection. In the beginning the vanquished were taken and eaten; then they were made slaves, with their existence at least assured. For a long time war was a hand-to-hand conflict; courage and strength were the conditions of success; natural selection took its regular course. But when fire-arms were invented death was dealt at a distance without distinction. Selection was transferred from individuals to nations. To-day the change is even still greater. Military conscription seizes upon the strong and leaves behind the weak, who thus become the favored in life.

Even within classes themselves, struggle has changed its character in civilized societies. Its object for individuals is no longer survival, but a greater or less satisfaction of needs, and particularly of superfluous

needs—the desire for comfort, riches, and higher positions than those in which they are born—the highest possible, in fact. In the last century the serfs, grouped about their lord, no longer struggled; they lived wretchedly, but they still lived. Even yesterday our peasants were in the same stage. A majority of the proletarians aspire for nothing but slight improvement. In our days any individual having the least disposition to work and to save can always sooner or later procure a relative competency. Struggle assumes considerable proportions only in the higher classes, where there is an unusual need of superfluous pleasures or unbounded ambition. And even in these conditions death is rarely the consequence of failure. What is left of natural selection is a minimum. Huxley estimates that the social stratum in which it is still operating is represented in England by scarcely five per cent. of the population.

This change in the consequences of struggle, which is now nothing more than normal emulation and simple competition, is in itself a sufficient answer to those who would eradicate it on the grounds of fraternity. The only thing of moment is so to regulate its operations as to prevent it from ever reverting to what it was in primitive societies and among animals. To-day society takes care of its idiots, its cripples, and its orphans; it has asylums of all kinds, and homes and retreats for the aged. Medicine allied with hygiene has almost doubled human longevity. Statistics have shown that the birth-rate is greater among the poor than among the rich, and greater in the country than in the cities, whatever the causes for it may be. Darwin himself admitted that civilization was opposed in many ways to the free action of

natural selection. The truth is that it has been replaced by an unconscious artificial selection which has other effects.

Has this change any connection with the curious and paradoxical proposition which has been set up that the average intelligence of man has not increased in modern civilization as much as might be expected, and that between us and the Greeks of Pericles, as Gladstone and Galton say, and between us and the men described by Shakespeare in the time of Elizabeth (Huxley) the difference is not striking? If we took into account the population then and now, the number of illustrious names belonging to the civil life which antiquity has transmitted to us would be even greater. But there is a distinction to be made. Certainly the Homers, Sophocles, and Aristophanes, the Socrates, Aristotles, and Platos, the Demosthenes, the Phidiases, and Appelles are more numerous, and have not been surpassed by the poets, artists, and philosophers of our days. But the Archimedes and the scientists were rare and obscure. And there is no cause for astonishment at this. In the first place a career in letters and in the arts—that is, of thought and of imagination—was easy then, while in the sciences it was difficult. In the second place, literature and the arts are subjective products inherent in individuals, in their experience, in their *a priori* reason, while the sciences are objective products requiring anterior preparation and long series of observations, and demanding the exercise of reason *a posteriori*. I admit that Hippocrates and Galen, and in more recent times Sydenham, if they had possessed the anatomical and biological knowledge of our day, might have equaled our present medical celebrities. I believe

that Aristotle as a naturalist, or, taking a man nearer to our time, Descartes, would in the position of Pasteur have been led to the same discoveries. But this cannot be proved, and as a matter of fact it is the average type that must be considered, and not the higher individual variations, which are met with in all times and in all races. In literature and in the arts one can be a genius in any epoch. In the sciences it is impossible; here one depends upon one's predecessors, and can apply only what others have gathered or prepared for him. The proposition in question, therefore, cannot be accepted without a more profound examination than has been given to it by such authors as Kidd, for example. Having no object in view but the establishment of the truth, I have several considerations to advance in its favor, considerations which have long been patent to me.

Intelligence is the product of several anatomical factors, among which the most accessible to comparison is the volume of the brain, and when that is lacking, the volume of the cranial cavity which holds it. The brain is extremely rudimentary in the most ancient mammals. It increases in size as we go down the ages, notably so among the primates. In passing from the anthropoids to man, its weight is increased threefold almost, at a single bound—a fact which renders the volume of the brain the cardinal anatomical characteristic of man. In the human species itself pronounced average differences are found among the great principal races. In the Java and Neanderthal race, the first which is known to us, the cranial capacity is 1,000 cubic centimeters at most. The negroes of Africa have on an average in round numbers about 1,400 cubic centimeters, the negroes of Oceanica 1,450,

the yellow races 1,500, and the white 1,550. (Cubical measurements made by the process of Broca.) These differences may be explained by the selection which has operated among men in the state of nature, and which has differentiated these races. There are even in the black and yellow groups mean deviations which are also explained by selection. Among the white races it is different; the average deviations are feeble, and not what the Darwinian theory would require. Between the races of the Neolithic and the Bronze ages and modern Parisians; between the Parisians of the twelfth and the nineteenth centuries; between the Egyptians of the fourth and the eighteenth dynasty, there is no notable difference. However, the second anatomical factor of intelligence, the development of convolutions in the brain, may have replaced in a measure the increase of volume; but this factor does not lend itself to a comparison of averages. Everything else being equal, a highly endowed intellectual individual may have fine, close, and numerous convolutions with a small brain. For instance, Gambetta. In fine, the question is still an open one; on one side the disappearance of selection would explain a less average degree to-day of individual intelligence than should be expected; on the other, the activity of the brain, greater now than ever, must tend to increase either the volume of the brain or the complexity of its convolutions.

Selection in our present societies still operates, but in a different form, and without causing the elimination of the less fit by death. The impulsion, revealed by anthropology, which urges large classes of individuals into the same path of life, is among the number. The following is an example: We know that the

Anglo-Saxons and Scandinavians have as a pronounced physiological character their spirit of initiative and of emigration, and as a prominent physical character their high stature. Now, I have shown* by the aid of the statistics of Gould, taken during the war of secession, that if the corresponding series in the United States and in Europe be compared, the height is always greater in the United States. Further, if we make the same comparison between corresponding series in the East and in the West of the United States, the stature will be found to be greater in the West. Consequently, setting aside the influence of a change of life and of environment for reasons which I cannot stop to give, the conclusion is evident that the majority of Anglo-Saxons have in their physical and physiological characters been twice subjected to selection: first in emigrating from Europe to the United States; and then again from the East to the West. It is by some such process that certain industrial cities attract the brachycephalic population of the country, and others the dolichocephalic. Marriage operates the same as selection, varying with the country. The professions also exercise a selection of this kind. We have spoken above of military selection. The hospitals also have a selective influence, the mean weight of the brain is here much less than in individuals taken from the enlightened classes.

To sum up, the evolution of societies takes place through the agency of individuals whose activity, being hyper-stimulated by competition, accentuates and develops variations in the direction of the best adaptation to the conditions. It is selection, if you

*P. Topinard, *Éléments d'anthropologie générale*, p. 452, etc. Paris, 1885. Publisher, Vigot frères.

will so have it, but selection by work and not by death.

What is now to be considered are the external products of that activity—some immediately consumed by the individuals, and others persisting after them, accumulating, reacting upon one another, arranging themselves in groups, and giving rise in their *ensemble* to that marvelously progressive movement which is called civilization, a movement which was already well pronounced in Græco-Roman antiquity, which then came to a standstill, began again scarcely four hundred years ago, gradually quickened its velocity, and has taken on in the last forty years so great an intensity and momentum that those who have been able to follow it as we have done are stricken dumb with astonishment, and ask to what it will come, even in the period which is immediately before us.

The evolution of men, with which anthropology is concerned, must not, as we have said, be confounded with the evolution of societies, which is properly the subject-matter of sociology. The one leads to the other, it is true, as the cause to the result; the "cause" being the individuals which succeed each other and die, the "result" their works which remain after them. Some of these last we have traced and described in the preceding chapters, in speaking of the family, of social forms, of manners, of institutions, of religion, of sciences, and philosophy. They are of every class—physical, intellectual, and moral. They are handed down by language, example, habits, laws, traditions, songs, writing, and printing, and by the objects collected in our museums of art, ethnography, etc. To trace their evolution, to describe how they have followed one another and how they are

interrelated, would be to write the detailed history of every branch of knowledge, of every profession, of every industry, of every science, beginning with history, so called, its controlling ideas, general and particular. The broad survey which we have attempted is insufficient. It is in the details that the bonds of connection are clearly seen. Take, for instance, medicine. To sketch its history even in broadest outlines one would have to show Hippocrates collecting his first observations in the art of healing, and attaching memoranda of them to the columns of the temple; the physicians of antiquity dissecting monkeys in order to study the anatomy of man; the latter science arising in the Middle Ages, with Mundinus, and later with Vesalius; physiology following with Harvey; histology and the many remaining branches not making their appearance until the present century; every new acquisition being the result of others which precede it, each coming in logical order and at its right time. Weismann has written a beautiful chapter on this subject, taking music as his example. He has emphasized how necessary it is to separate individuals from their products, which have their evolution apart. He has separated what I should call musical art from musical science or technique, springing from a few notes constantly repeated, and rising step by step to the highest forms of symphony. But the really most beautiful example, perhaps, of this secular accumulation of the works of billions of individuals who have now disappeared is undoubtedly the edifice represented by our legislative, administrative, and financial organization, as it stands to-day. Imperfect as it may seem to us, and constructed fragment by fragment, retouched, retrimmed, altered, co-ordinated, it is still

an admirable creation. Our laws in France are made up of the Franco-German law, the Roman law, the canon-law of the Church, and the successive additions of kings, parliaments, provincial and general estates. In the Revolution they were overhauled and broadened to suit with the reigning ideas of individualism. With Napoleon I. they were overhauled again, and made to conform to the prevailing notions of centralization. Since then they have never ceased being re-elaborated; to-day there is not a minister nor parliament who is not desirous of leaving upon them the imprint of his existence, either by overturning them or improving them.

Every society has contributed to the erection of edifices of this kind. Whatever it has added of its own constitutes its particular patrimony, which it transmits enlarged to posterity. Nevertheless, it is distinctive of these social acquisitions to spread without losing their value, to infiltrate themselves in all directions, and so to become the common patrimony of all civilized mankind. From this treasure, which was very small in the time of the Chaldeans and Egyptians, which was much larger in the time of the Greeks and Romans, and which has been prodigiously augmented in our epoch, all derive profit. Every one draws from it in proportion to its magnitude at the time in which he lives. A splendidly endowed individual might do without it, but it would be renouncing his chances of success; he would be as a beginner in the state of nature. The poorly endowed individual, on the contrary, who drew largely from it, might arrive at the best results. It might almost be said that in the struggle for existence the treasure amassed by predecessors is worth perhaps even more than per-

sonal qualities. Thus, a person starting out in life, and having aspirations in a certain profession, finds ready what his predecessors have learned and perfected in that profession, and what has cost long centuries and entire lives to accomplish. In a shorter or longer time he will be conversant with what is known, and will not have to begin *ab ovo*. He enters upon his path at the place where it was left by his predecessors; he has nothing to do but to march on and to extend it, till the day when he in his turn will leave it to his successors.

The marvelous spectacle which the present age offers is therefore not proof of an average intelligence far transcending that of our predecessors, but the result of accumulated capital yielding dividends which constantly grow greater. This is the great economic law which we find in social evolution, just as we do in all things, and which our socialists refuse to understand. The power of the individual of our day has been increased a hundred fold in comparison with the individual of times past, who did not have this capital at his disposal. Thus the principal object of the system of life in society is attained—the multiplication of the powers of man, and that not because union makes strength, but because each profits from the capital which his predecessors have left him, and so is enabled to produce more. It must be admitted, however, in justice to all the facts, that never did the individual display more activity than now, and that never were larger numbers engaged from all classes. So, also, the characteristic of the end of our century is in all branches of thought as well as practice an over-production, not because intellectual capabilities

are greater, but because the struggle has its full effect, because the higher individual variations are less wasted and the average variations better find their place, and so, let us say again, because the capital which we have inherited is immense.

CHAPTER XI.

The Function of Society: Essential and Supplementary. Education and its Two Purposes. The Conscious Ego and the Unconscious Ego. Necessary Habits and Instincts in Society. The Categoric Imperative. Collectivism and Anarchism. Conclusion.

We have now to recapitulate the principal propositions that flow from the developments which we have given in Chapters IX and X.

1. Nature is an unconscious mechanism; she is indifferent to the phenomena which take place within her domain and to the creatures which live there; and man is neither more nor less than other animals. But man happens to possess an advantage over animals, and from this superiority he derives all the benefit that he can. During the time that he lives, his concern for his conservation and happiness is his whole care. He has an ego which protects him against his own weaknesses, over which his reason and sentiment have not always full control. A very large number of his acts are unconscious. Society is a means of existence devised and exploited by man—a means upon which he counts for increasing his power, for diminishing his sufferings, and for obtaining the greatest possible amount of satisfaction. Society has insensibly been transformed into a corporation which embraces both the present and the future.

2. Societies have sprung from two sources: from

the family, the members of which stayed together; and from indifferent assemblages, which were at first altruistic and afterwards interested. External defense was the first stage; internal defense the second. The progression was accomplished by force of circumstances without agreement of any kind. Contracts did not arise until later, and then partly in consequence of some combat or crisis. Such was the case of the English barons and their followers forcing upon King John the Magna Charta of 1215, and such, too, was the case of the Pilgrims of Plymouth Rock in forming a constitution when they took possession of the land granted to them by James I. The "contract" of Spinoza and Rousseau is a mere theory, but nearer to the truth than the "living organism" of the positivists. In every democratic society there is a virtual pact of some kind between the two contracting parties: society has its duties to fulfil towards individuals, just as individuals have duties to fulfil towards society, or towards their fellow-beings—two equivalent terms, for society is the aggregate of these fellow-beings. But to-day the contract tends to become more formal; the drift now is to submit not only the constitution, but even the chief laws of the legislature, to the sanction of a referendum.

3. Societies have evolved empirically according to circumstances and individuals, or, to use a phrase of the day, according to the principle of *laisser aller*. Individuals, by nature very different, have played their part conformably to their special organizations, the strongest causing all things to center about their personal interests, a small number only zealous for the interests of all. The results in different directions have thus only feebly responded to the end for

which society was established, and if among these results selection, which operates with things as well as with animals, has made for the profit of the most prosperous societies, the reason for it is that nature never loses her rights, and always gives her sanction and justification to the most powerful.

Among these results there are many that are good. These are, for example: That permanent form of association, lasting from generation to generation, analogous to a stock company, which compels the society to shape its action with regard to the future as well as to the present of the species; the hereditary capital, which is its result, which is exploited for the greatest welfare of all, and the profits of which must therefore be distributed with equity; the softening of manners; the pleasures of the intellect, reckoned among the most desirable of superfluous needs; in fact, everything which may be recapitulated in the phrase "the progress of civilization."

But there are evil results, too. For example, that horrible militarism to which external defense still forces us, and which, when war breaks out destroys at a blow all notions of morality. Then that internal scourge which comes from the results of the struggles of ancestors being perpetuated among their descendants, and from our being responsible not for our own conduct only, but for that of our forefathers. Next the division of society into strata, the higher enjoying from birth a position and wealth which exempt them from all effort, the lower frequently conquered before they have fought, and predestined to misery and suffering. I have already spoken at sufficient length of the condition of the lower classes. I will but add a word. Whilst among the favored classes the family

is the sanctuary and the focus of all joys, among the proletarians of Europe it is almost totally obliterated. The father and mother labor, each in his sphere; the latter is unable to give to her child that initial education which is so decisive for the whole of life; frequently she is obliged to place her child in a foundling asylum; the boys and girls of more advanced age are scattered in the workshops, or roam the streets exposed to all sorts of bad examples and temptations; even at night they scarcely come together and make the acquaintance of their domestic hearth.

4. The method of life in common was adopted by man with a view to increasing his means of action, and affording to his faculties the fullest capacities of development in the direction which claims his nearest interests. He seeks in this way to free himself from the performance of certain general services which naturally fall to the lot of all, and which would distract him from his immediate occupations. He desires to work out his own happiness in his own way, to be responsible for his acts, and also to enjoy the fruits of his responsibility. Society, therefore, is bound to allow him a maximum of liberty in order that he may have a maximum return; its reason for being would be annulled if the individual were lessened by the social state.

5. Now, it is by competition or struggle alone that the individual achieves his fullest value and finds the employment in which his faculties are best utilized. It is in struggle that the higher individual variations of which we have spoken find their fullest expansion, and that the mean variations, and possibly also some of the lowest, are either heightened or are put to use under conditions which are suitable to them. Society

cannot think for a moment of eradicating struggle. From its own point of view, as desiring the welfare of all, or as a commercial and industrial association working a capital and obligated to declare dividends it ought even to encourage it. The over-production of all things necessary to material life, to welfare, and to intellectual enjoyments, which are the result of the labor of individuals, redounds to the profit of the whole social mass. The activity engendered by the struggle, selection wanting, is the agent which perfects the species. Hitherto that activity was restricted to certain classes; the lower classes, not being stimulated, had few needs and produced nothing beyond what was actually necessary. Now this activity is extended; every one wishes to have his share of the superfluous satisfactions. We have seen that it is not absolutely certain that intelligence has increased since antiquity; the reason for this probably is that this activity was partial and poorly directed. To-day, when it is becoming general and is growing in quantity, it is impossible not to encourage it. Struggle, of which the results are no longer sanguinary, but lead to more or less welfare and satisfaction according to the activity employed, is the highest necessity, both for the individual and society.

6. There are philanthropists who would replace struggle with peace and universal fraternity. Instead of the formula of physiological justice—viz., "to each one according to his faculties, his deserts, and his works," three synonymous terms as here used—they say, with their metaphysical conception of absolute justice, "to every one according to his needs"; that is to say, to the indolent, lazy individual, who shirks work, as much as to the active, useful individual who

produces more than he needs, who, it is true, enriches himself, but at the same time enriches the mass of his fellow-beings. This would be absolute hypothetical justice, clashing with the organic or individual justice, the only demonstrated justice, the only one having a claim to the title of natural justice. For these philanthropists the ideal of society is that of a great family, of which the members are closely joined and solidary, as in completely unified animal colonies, enjoy all their liberties without restraint, share all things with all, live each according to his own tastes, and satisfy all alike their immediate and superfluous desires, all the peers of the others. But this programme is self-contradictory in certain of its parts, and it is contradictory to nature, the individual, and the social idea itself. It is a Utopia impossible to realize even in the most distant future, and as a whole not even desirable. It is equality pure and simple. Establish it, and in a month, in a day, in an hour, it will no longer exist. In a word, what here around me in the schools of jurisprudence is called the moral law is contradictory to the law of nature and but a fiction, a generous conception of our cerebral sensibility.

7. We have not yet stated our conclusions regarding the questions which were mentioned at the beginning of Chapter IX, but they are suggested in so forcible a manner that the reader has himself doubtless formulated them a score of times. The realities of nature and the necessities of life in common are irreconcilable if we refuse to see things as they really are, and if we seek to model practice on absolute conceptions which have no basis but desire, sentiment, and imagination. The individual, unmodified by

habits or impulses more or less unconscious, but left to his own nature and controlled only by his animal ego, recognizes only his own interest and craves for liberty pure and undiminished. Society is a complexus of concessions to the common cause. The individual grants these concessions to society and keeps his contracts, but only so long as he finds profit in it, or because he is not the strongest. Whenever he reasons coolly, where there is no outlook for punishment, where there is no fear of opinion, nor of the mediate or remote effect of his conduct, his animal and egoistic nature appears. Society can only master him by force, and discipline him like a soldier in an army.

But the realities of nature and the exigencies of society admit of easy reconciliation if, instead of dashing ourselves to pieces on the two rocks of animality and the absolute, we steer between them; if we submit to accepting what we cannot avoid — for example, the organic and intellectual inequality of men and the absence of real justice; and if we do not lose from sight the definition of Montesquieu, "Laws are the necessary relations that are derived from the nature of things." This means that rules and laws, being the sanction of the best possible relations between individuals and society, should not be left to the mercy of empiricism, the caprice of a monarch, of a multitude, or of any form of universal suffrage; that they should be dictated by reason, after light has been received from all possible sources; that between all the solutions which present themselves there is one which is best adapted to existing conditions and is the necessary relation sought. Jean Jacques Rousseau has defined law to be "the expression of the general will."

This is not more exact than if we said, "of the will of a monarch or of a parliament"; for will may be poorly illuminated, blind, unintelligent, passionate, and in disaccord with utility as rightly understood. The "necessary relation" of Montesquieu can be determined only by a perfect knowledge of the subject by men who are carefully prepared, independent, and animated by a holy love for humanity; by men who will apply their best intelligence to seeking the solution of each problem duly studied; who will weigh the *pros* and *cons*, the advantages and drawbacks in each case; by men versed in social science and its different branches, notably the science of law.

Evolution left to itself has yielded, as we see, both good and bad results. The latter must be amended, even if we must go to the quick. It is incumbent on man to take matters into his own hand, and to direct their course. He knows the difficulties to be overcome, he knows what he has to renounce and what he has hope of obtaining. The human species in its duel with other species and with nature has won many victories. Man has but to continue his conquests, and to introduce into his efforts method and logical consequence; he has found a way of appropriating certain of the forces of nature, of adapting numerous vegetable and animal species to his wants. It is impossible to suppose that he is not capable of organizing a society as he judges best, and, if necessary, of transforming sufficiently his own nature.

Let us pass to the applications, in broad outlines. We will suppose a society at the stage at which our present civilizations are, of an average size, and democratic; we shall not consider others. We leave

aside the United States, which was founded and developed under exceptionally favorable conditions, which did not possess the fixed routine of Europe, which adopted at a single stroke communal autonomy and the autonomy of states, and which is only faulty in point of federation, in embracing too many different regions and too many dissimilar interests. What would be the functions of such a society, and what would be its attitude towards those for whose greatest happiness it was created?

The first thing which it must bear in mind is that the total mass, the general interest, alone exists for it; that the parts of this mass, the particular interests, figure only through the part which they take in the general functioning of society, and that individuals are molecules only in the pseudo-organism which it is called upon to direct. This is the principle of the unity of state, and the only way to comprehend the "Reason of State" and the "Secret Funds" which are admitted in very exceptional cases, in the present state of things, for the public safety. The members of the parliaments, whatever be the manner, felicitous or unfelicitous, in which they are appointed, represent the country in its entirety and not any particular circumscribed part of it. Their lot is to pass general laws which apply to the needs of the mass, without stopping to consider exceptional individual cases. When their duty is accomplished, which is to grant equality to all before the law, and, more exactly, equality of advantages and disadvantages resulting from necessary laws, they can only submit to the inevitable injustices which they here and there produce. Thousands of innocent human beings are sacrificed in case of war, and in the interior of the state,

too, there are untold necessary victims of the universality of laws. The legislator has an enormous responsibility. What he decides should be accounted infallible, although he may be in error. He must act for the best, knowing that he cannot attain perfection, however much he may be inspired with ideal conceptions. But what he should also never lose sight of is that each of the persons under his administration has in himself the sentiment of relative justice of which we have spoken, of "that which is due to him," and that this justice implies the natural right to insurrection inscribed in the declaration of the rights of the individual a century ago.

The functions of the state are divided into essential and facultative, the first falling under three heads: (1) external defense; (2) internal defense; (3) general services.

External defense. This is of two kinds, military and economical. The former gave rise to the first societies, which for a long time remained at this stage. Unfortunately its counterpart followed—attack and then conquest. Militarism resulted, becoming a need, a passion for domination, for rapine and glory, growing worse with time and falsifying the entire mechanism of society. Even to-day it is the greatest obstacle to the serious progress of humanity. So long as the ethics practiced in time of war is so violently opposed to the ethics professed in time of peace, it will be impossible to inculcate in the minds of individuals that there is but one ethics. And yet militarism is a necessary evil which we cannot avoid, a devouring cancer which we cannot cure. The first need of a nation is to defend itself and to make itself respected, in order to live. War absorbs the best

wealth of a country, it decimates it, it leaves behind it nothing but ruin, it makes of man a ferocious beast. Yet despite it all, we must be ready for it. On the fatal day all the members of a society are here solidary; all devote themselves as a mass to the common safety. The state, even in time of peace, has an army to support; vessels, cannons, munition, ports, fortifications, strategic roads, hospitals, special schools, an entire administration to create, watch over, and recompense. This function alone, bearing as it does upon a large number of points, requires a complete centralization and alone absorbs a great part of the action of the state, gives to it an excessive influence, and enables it to mingle in the life of individual interests more than the principle allows. By its budget it weighs down heavily upon the nation; by its obligatory service in countries which from their geography have no natural defense, it turns from life at the decisive moment of existence the whole able-bodied masculine population. Militarism is the worst of scourges, but a necessity of the times, to which we must submit.

But there is not only the war with cannons. There is another species of warfare, which has been termed peaceful, and which is conducted by its side. The extension of exchange, the facility of communication, has in modern times swollen it to such proportions that the state has been obliged to interfere and to protect its members. Economical, commercial, and industrial competition between individuals has overflowed the frontiers of nations and become international. If we consider the general interest of humanity alone, the system of protection against other countries is wrong. Free exchange, the free

circulation of the means of existence, drawn as water in communicating vessels to the places where these means are scarcest, is the true law. When a country does not produce these means of existence, or does not produce them in the desired form as regards cheapness and quantity, it is reasonable not only that it should accept them from its neighbors, but also that it should demand them, and that in return it should furnish to its neighbors what it produces cheaply and abundantly. Protection is a device for forcing a country to be self-supporting and for creating certain industries, for the products of which it is undesirable to be tributary to foreign markets. The reasoning is correct from a national point of view, but it proves that the sacrifices for the general welfare which society exacts of individuals in its own sphere are refused for the common welfare of humanity. It is always the question of the two schemes of ethics — one for ourselves and one for others. But there are products which one does not possess at all and for which we must have recourse to others. The United States is a new country, rich in mines of all kinds, capable of producing everything of which its people have need. They may permit themselves the luxury of dispensing with the rest of the world. But in Europe the situation is different. The various states are obliged to supplement one another. England, in its insular condition, has long since learned that it cannot with its agriculture contend on an equal footing with the remaining world, and that it is obliged perforce to become industrial, trading, and distributive, as were formerly the Phœnicians, the Genoese, and the Dutch. It is her business. But is it not incumbent also on the other peoples of Europe to

band together, and upon this basis to take the first step towards the United States of Europe? At present, societies protect themselves by the aid of export and import bounties, subsidization of merchant marines, instructions to consuls, and especially by the aid of treaties, which the Powers wrangle over exactly as individuals do.

But if rival societies have hostile interests, fortunately they have also common interests, and here there is ground for understanding, which is destined, we are convinced, to assume greater and greater proportions. From this arises a host of treaties of all sorts regarding postal communications, weights and measures, money, literary property, the extradition of criminals, the establishment of sanitary regulations, and so forth. The sphere of jurisdiction of the state is, therefore, even thus far and for exterior affairs already considerable. In France, if we deduct the interest of the national debt, the budget of the exterior is alone one-half of the total budget.

Defense of the interior. This is the second function of the state—the defense of individuals against one another, against the causes of interior calamity, and against themselves.

The first outweighs the others. It is the protection of individuals who restrict themselves absolutely to the exercise of their recognized rights and observe the laws, against those who violate these rights, trench upon the privileges of others, and break the laws. It embraces assault, material obstruction of one's actions, slander, etc., infringement of property rights, and above all, of the right to labor, the violation of contracts duly attested, etc. One of the sacrifices imposed upon the individual being to refrain from

administering justice himself, save in cases of self-defense, society is obliged to discharge for him this function in some manner.

The second class of measures for interior defense is concerned with salubrity, and embraces regulations for the prevention of diseases of men, useful animals, and plants. The third class is concerned with the protection, in exceptional cases, of the individual against himself. Evidently the individual is master of all of his acts which concern himself only; he may even commit suicide. But when he is obliged to apply to professions whose practice requires special knowledge and ability, of which he is not capable of being a judge, and which may have the gravest consequences, surely the state should come to his help and protect him against his own ignorance. Such professions are those of medicine and pharmacy, of law, of navigation, and even of civil engineering and architecture. The practice of these professions must be sanctioned by certificates or diplomas, awarded, or at least attested, by the state. Probably the day will come when the public will not be deluded by sensational advertising and charlatanism, but that day is still far distant.

The economical protection which we saw at work abroad has its complement in the interior of the state; the one brings the other in its train—both are to be regretted. Bounties are granted here and there for supporting national competition — in France, for example, upon sugars and silks.

By the side of these is seen another species of economical protection which is absolutely condemnable, and which cannot be explained except by the personal bias and interests of legislators, which ought

never to exist. I refer to the special protection of some one industry, some one region, some one group, or even some one class. It rises from the arbitrary and unequal imposition of taxes, made either through partiality or ignorance.

This brings us to the reverse aspect of the protection of individuals, to the total abstention of the state from everything which constitutes a private act, from everything which bears upon the normal course of life, and to that fierce struggle which leaves individuals to their own risks and perils.

In the face of that struggle, which we have shown to be at once legitimate and necessary from the triple point of view of progress broadly viewed, of society considered as the administrator of the common capital and the distributor of its dividends, and of the individual seeking to exercise all his faculties and to bear the responsibility of all his acts; in the face of this struggle, in which the result is no longer selection by death, but the need of enjoyment and the desire for a better position in life—a struggle of which the effect is to disengage the higher individual variations for the general profit of the whole social mass and to furnish that employment which accords best with the average and lower variations—in the face of this struggle, I say, the attitude of the social body is distinctly marked: absolute neutrality, the awarding to every one of the full recompense for his efforts, and the leaving to him of all the consequences of his failures, however they may have come about. Relative individual justice requires this; the intermeddling of the state in the struggle would be injustice. Men are unequal by the fault of nature; society has simply to bow to the fact; all that it can do is to seek to render

the combat loyal and courteous, and if possible to prevent the conqueror from absolutely crushing and destroying the conquered. Without detriment to the principle of non-intervention, it may also prohibit the struggle on the part of those who are palpably without weapons, and to prepare for it those who are not as yet fully prepared. Let me explain myself.

Society should have asylums for idiots and the insane, for congenital cripples and non-developed children. It should gather under its paternal care foundlings and orphans, assume charge of and prepare for life during the necessary period of time, the children of fathers and mothers who are incapable of fulfilling this task. What it should do or seek to do is, above all, to equalize as much as possible the external conditions of the combat at the start. It is customary in a duel for the adversaries to have the same arms, the same kind of ground, the same clothing as nearly as possible, the same kind of shoes, etc. The rest is left to the valor and skill of the combatants. It should be the same in the social struggle. Birth places the combatants in very different positions: the one has capital, property, education, rank; the other has none; the one has all the chances of conquering; the other all the chances of being conquered. In a word, the sons are not exclusively responsible for their own acts; they are responsible for their fathers' and ancestors', and for the situation in which the latter have left them. This is a monstrosity—that which from the beginning of society has weighed down most on evolution, as we know. But, it will be said, this is attacking inheritance, consequently the family, the right of every one to labor for his children, which is one of the most powerful main-

springs of human activity. Unquestionably and precisely it is an instance of the impossibility of reconciling everything. Whatever may be the solution, justice is wrecked on the one side or on the other. There is no amelioration possible except by adopting a middle course: suppress all inheritance *ab intesta* outside of direct ascendants and descendants, and of the wife and husband—that is, outside of the immediate family,—and restrict in some way or other in the same sense the right of testamentary disposition. Bequeathable property would revert to the state, and thus enable the state to abolish all taxes which now press so heavily on the labor of men in society.

General services. The department of general services is the third essential function of the state. Everything which requires the co-operation of all, upon which it would be difficult to come to an understanding, or which would divert the individual from his personal occupations, implies a central direction, and is the province of the state. In truth, all the functions of the state fall under this last category, excepting war, where every one may be put in urgent requisition. Such are the preparation for war itself, the exterior economical defense, the interior defense with its three principal forms, with its two organizations of police and justice, education and public aid, of which we shall soon speak.

The general services to which we refer at present are: highways, canals, and railways, not connected with war, but with the internal prosperity, with the transportation of means of subsistence and of travelers, the postal and telegraph service, depots and markets, forests and parks reserved for general recreation, although collaterally exploited for the needs

of the state, and finally the finances, which we meet with everywhere, and which are the contribution of each to the common expenses, being essentially (1) a fixed part, equal for all, the non-payment of which brings on the loss of the advantages connected with the rank of citizen; (2) a supplementary part proportional to the successes won in the struggle and to the enjoyments obtained—that is, to one's fortune.

These services are of two kinds: The first are permanent in character and require a corps of employés of different grades, which constitutes properly the administration; the second are intermittent and are evoked by the occasions of the moment; they may be let out by private contract, at auction, by governmental concessions, and by franchises, etc. The latter have the greatest possible extension. The rule is that the state should never compete with private enterprise, and that it should always have recourse to it unless there is some serious objection. The state, however, is responsible; in principle it performs the work, it directs its course, supervises its execution, even when it avoids direct participation. It has been proved, furthermore, that work undertaken directly by the state is more onerous, requires a longer time for its completion, and is generally less thoroughly performed; the responsibility of the state is too widely divided, or rather it is only nominal; its employés have not a personal interest in doing their work better; they take no serious risk. The work of man receives its value from the prospective remuneration, proportionate to the care which he bestows upon it and to the perils which he fears. The proletarian who works by the day or the year does not labor as the individual does who is responsible to himself, who

follows his own ideas, who knows that he has chances of losing as well as of gaining, and that the good as well as the bad outcome of his labors depends upon his personal attention and activity.

The three functions of the state which we have just recapitulated, relate especially to the present of individuals, and are strictly speaking the only ones which are obligatory. But the state, being a permanent body having a paternal supervision over the welfare of its members, and being under obligation to look out for the morrow, an irresistible drift has extended its field of action for the better or for the worse. The material which we have now to examine falls under two headings.

COMPASSION is the first. It is the sentiment of pity which society is supposed to feel for those who suffer through its fault, or through the fault of nature. Society, strictly speaking, is not justified in this feeling: first, because not having a right to interfere in the consequences of the normal struggle between individuals or to modify personal responsibility, it is bound to abstain; secondly, because to interfere with those consequences and with individual responsibility is to attack the stimulus to all activity and all progress, and so to run counter to all that goes to the making of wealth; thirdly, because if the individual has a nervous system and an apparatus of sensibility which moves him to make a matter of sentiment out of his risks and perils, to represent to himself the sufferings of others, and to act as if he felt them himself, society possesses no such organization. Society is comparable to an employé charged with a certain labor to perform, or to a manager of a business who has to think only of the dividends to be distributed—

it reasons only with figures, and cannot yield to the stirrings of the heart.

Nevertheless, the fact cannot be disguised that if a community is comparable to a stock company administering a capital in the name of its stockholders, it can also be compared to a society for protection and assurance against the risks of nature. If the strong seek to lord it over the weak, the latter demand protection; the strong and young of to-day may be the weak of to-morrow and the old man of the day after to-morrow. When fathers expect children, are they certain that the latter will be favored by nature? Does not disease attack all? Therefore it is to the general interest to insure against the unknown, and nature being wanting, for society to assume the functions of providence. Furthermore, the sentiment of compassion is so imbedded in the heart of man that no voice is raised in opposition when assistance is made one of the accessory functions of society. The only difficulty is the exact measure to be meted out, a measure which it is difficult to fix as a general rule. The first consideration is not to give to the vanquished the joys to which they have not a right, and not to strip the vanquishers of the entire satisfaction of victory. Permanent or passing aid must not be converted into an encouragement to idleness or a premium upon vagabondage. We said just above that society should witness impassively the struggle between individuals, as did the heralds of the Middle Ages; that it should see to it that every one on his entrance into the arena has fair and equal outward chances, but that it must be able, like the Cæsars at Rome, to stop the final and useless massacre of the vanquished. The doctrine of compassion would authorize society to do

more; it would suffer her to nurse the wounded, to assuage the suffering of adversaries put *hors de combat.*

It follows that the department of public aid so called—that is, of hospitals for the sick and of homes for adults (for we are not speaking here of children, idiots, insane persons, and cripples), for civil and military invalids, for widows and paupers in given cases—are legitimate. And yet, as we said in a previous chapter, many among those assisted will remark, "Why, then, save and work for more than our immediate needs if our morrow is assured?" I do not speak of vagabonds, or tramps, or of mendicants by profession; with these it is necessary to deal severely. "The benevolent action of charity can only be compared to the harm that it does," says M. Émile Chevallier.* Aid is not a personal right for any individual—this must be impressed upon the mind—but a disgrace for the person who is the object of it. Every hand extended, every succor received, saving certain well-established exceptions, must be considered as a disgrace, must implicate the loss of civil rights lasting until rehabilitation. To reconcile all this, we shall recapitulate as follows: It is true, succor must be extended to the unfortunate, the old, the infirm, the vanquished in the struggle for existence, those whom circumstances and their natural inferiority rather than their conduct have ruined, those whom wounds have prematurely rendered unfit for the arena; but the succor should be given with discernment day by day and be reduced to a minimum; it should be given after inquiry, in just the necessary amount and no more. Since compassion, which nature does not possess, and individual justice, which requires that each

*Émile Chevallier. *La loi sur les pauvres et la société anglaise. Couronné par l'Institut.* Paris, 1895

should bear the consequences, bad or good, of his acts, are contradictory, therefore compassion should not be made a clog upon justice.

There are two systems of charity—one administered by the state, and one by private persons or associations. The two may be administered simultaneously; the first in incontestable cases—cases of the infirm and the insane without support; the second in cases which are more doubtful—as the case of those who have fallen in the struggle, etc. But there is a remark to be made with respect to state charity. Every time a supplementary function is added to the work of the state, the money always comes from the pockets of the taxpayers, and it is in reality they who perform the service. The question comes back therefore to this: Will the state distribute its aid better than private persons or corporations? In the first case it is naturally the function of the county, township, or parish, and not of the central authority.

PROGRESS is the second supplementary function of the state. In this point of view, and as the heir of a physical, intellectual, and moral patrimony, from which all its members draw, and which it must transmit, augmented and bettered, to posterity, society has several questions to consider. Should it, or should it not, look with favor upon the increase of its population? Should it stimulate individuals to advance in the path which sociologists declare the best for multiplying its power of production and for most justly distributing the fruits which flow therefrom? Should it endeavor to modify its customs in the most favorable direction, in the direction which gives the most satisfaction under the conditions of life in common? Should it seek to impress a definite direction

upon the best habits of society, upon character, upon manners of feeling, thinking, and acting? And, in such a case, what shall be the means employed? Shall they be employed directly or indirectly, and upon what shall they be based?

The answer to the first question is not ambiguous. In the present state of Europe, men are necessary for defense. But suppose war should be abolished; then an excessive population would be a drawback; men, all other things being equal, will, in a given space of territory, be happier when their number is small than when it is large. With regard to the other questions there is much to say. I shall take but a few examples.

The right of assembling together, the right of association which flows from it, are among the rights which the French Revolution regarded as inalienable. They have given birth to society itself. It would be strange if men could not band together now as they did for the first time and under the same influences—common interest and sometimes sympathy. In our day the principle of association has been considerably extended, and is the force from which the future has to expect the greatest beneficence. There are commercial associations of a small number of responsible members or of an unlimited number of mere stockholders with responsibility limited to their holdings; industrial associations for protection, circulation, or consumption; political, scientific, and religious associations; professional syndicates of employers or workingmen, associations for education, charity, sport; and hundreds of others having the most varied objects. Some are mere instruments in the struggle for existence, employed by individuals,

with which the state has nothing to do, but which it generally must know of, so as to assure itself that their doings are not in violation of its laws. The others have for their object various public utilities, for which the state, if these associations were lacking, would have to care—associations which consequently a state has the best reason to encourage. Every liberty, in fine, should be granted to associations, which are a form of progress, provided they infringe in no way upon the recognized liberty of individuals. In the eye of the state they are simply collective individuals having the same rights and the same duties as single individuals.

A serious question, however, presents itself. The individual is the present social difficulty, the enemy to be adapted to the necessary customs, the element of revolt which is always disposed to substitute its own personality for that of the state. We have seen that society, in consequence of its obligation to restrict itself absolutely to the interests of its clients, is possessed, as its international relations demonstrate, of a cold, calculating, and mathematical character, of an intellectual egoism far more stern than that of the individual, because it is not tempered by the rational sensibility of the latter. History shows the excesses which may result from it when authority is centered in the hands of one man. If this axiom is no longer manifested in our democracies, it is because society is in our day public property, the aggregate of its citizens, who, though scattered and segregated in infinite ways, watch it and prevent it from transcending the proper measure. What will our great syndical associations of individuals become in the future? Are they approaching to the type of social egoism, or to

the type of individual egoism? May they not in certain circumstances, as in the case of strikes and workingmen's unions which embrace both hemispheres, become a menace at once to society and to the individual? Instead of contending with the individual, who is still easily guided by sentiments, and even by pretentious words, society will have to do battle with compact bodies of individuals who have but one dominating guide—the absolute necessity of its nameless and irresponsible members. I have been a close observer of their doings. Such bodies commit sometimes collectively and with calm deliberation monstrous acts of which their members individually would disapprove, for the responsibility falls on no one in particular. The most moral being, despite the picture which we have drawn of him, is the individual, and that for reasons which I shall give later. Associations are less moral. The state would be even less moral than associations, were it not for public opinion and the fear of revolutions. And why? Because the individual alone has a sensibility which at times neutralizes egoism, whilst syndical associations have the same egoism without anything to offset it.

Among associations there are some which merit particular attention: commercial associations for assisting and succoring individuals and "mutual" associations for the same purpose. These are concerned on the one hand with saving, and on the other with insuring the individual and his family against disease, loss of employment, accidents, and all the other unknown possibilities of the morrow. Saving and insurance are the expression of a quality, foresight, which some animal species possess in the highest degree and others not at all, which the lowest human species do

not possess, which among civilized men is more or less developed, and which people are unanimous in regarding as one of the characteristics of the Celtic race (the brachycephalic of western and central Europe). This quality is certainly one of those which are most physiological, and contributes, consequently, the most towards the personal happiness of the individual. It flows from the idea that the existence of every person embraces three periods—one of preparation, one of work, and one of rest; and that in this last period, where the physical and intellectual faculties are reduced in power, the first necessity is not to be dependent upon the care of any one, not to be left to the mercy of any of those numerous reverses, from which the bravest and strongest are not exempt in the struggle for existence, and never to have recourse to private or public charity. It accords with the desire for stability and for the enjoyment of the fruits of life in the environment in which one is born, the enjoyment of a home, which is opposed diametrically to that spirit of Bohemian unrest which tends to become general in the closing days of our century and is the source of so many evils. Evidently society should look with favor upon the practice of saving, of acquiring annuities for life, *pensions de retraite*, and upon the establishment of societies for guaranteeing dowries to young women, competencies to young men beginning life, and provisions for widows and orphans. We say that the state owes protection to children, to the crippled for life, to all whose parents fail in their duty to them prior to the period when they are competent to manage their own affairs. But it really falls to the lot of associations for mutual aid to include within their sphere of action the care of children.

They look nowadays to the needs of adults, but they should also think of the needs of the children and the adolescent. The more the state shows itself to be intractable in the matter of compassion, the more these associations will develop in this direction as well as in others. M. Chevallier, in the work cited above, shows that the great extension of societies for mutual aid in England took place subsequently to the revised Paupers' Law of 1834, that this law rendered the workhouses generally detested, and that the workingman was in this way brought to the desire to protect himself. He shows also that home assistance furnished by the state hindered the development of providential societies, all of which is a repetition of the truth that the state should encourage such things, but should directly interfere as little as possible.

There is a quality inherent in the human race, almost the exact reverse of the preceding, which society should also favor, not for the interest of the individual as above, but for its own general interest. It is distinctly marked in the Anglo-Saxon races, and consists, not in placing one's savings aside in order to draw therefrom interest, dividends, or security for the morrow, but in causing them ourselves to multiply by personal undertakings of more or less boldness. It is the spirit of enterprise, symbolized in the saying "go ahead." Its drawback sometimes is the accumulation of too great wealth in the same hands, and thus the furnishing of a foundation for all the objections which are raised to-day against capitalism. Its advantage is the increasing of the circulation of wealth, the affording of greater chances to it for distribution among the more active laborers and the producing of the means of existence and the objects of comfort in

large quantities, from which all cheaply profit. We will not insist upon this subject, which borders upon struggle, activity in general and its rewards, of which we have spoken sufficiently. There is no doubt but society should look upon all such efforts with favor, and should encourage all initiative in directions which may give profit to all.

Another direction which should be encouraged is the development of the intellectual faculties, the preference for pleasures of a higher order, and consequently the raising of the level of the human species more and more above that of other animals. We speak of the sciences, of arts and letters, and of their applications, whatever be their kind and degree. And this leads us to education.

EDUCATION has two objects. The first is to shape the character of the generation which is entering upon active life, to discover and to develop the aptitudes which children exhibit. We shall see later what is to be thought of the second object. In virtue of the principle that the state should not interfere in things which individuals are willing to do, education should be free. But the duty of the state is to encourage in that way all private efforts, to watch over them carefully, and to give its sanction to the certificates and diplomas which issue therefrom. We have seen that the state should take charge of abandoned children whose parents refuse to prepare them for the struggle of the future. Whether given by the family, by private institutions, or by the state, directly or indirectly, it is at the start obligatory primary instruction. It should aim chiefly to fashion the cerebral organ, to inculcate common sense, spirit,

habits of observation and logical induction, ready memory, etc. At the second stage come the secondary schools of a general character, the different professional and special schools, access to which as the result of an examination revealing the inclinations of the scholar will be made easy by the state to children whose parents are unable to defray the expenses of tuition and maintenance. In the third stage, that of superior instruction, there must be also entrance examinations and also free tuition and support. The difficulty is to make families comprehend the obligation resting upon them of giving to their children the maximum education of which they are capable. With public opinion and some few inducements and expedients, this is not impossible. Why, in our elections, should not two votes be given to persons holding diplomas from the secondary schools, and three votes to the graduates of institutions of the highest grade? Why are not certain diplomas obligatory for filling governmental and administrative positions? Is not politics itself a science? The aim is that no child should be deprived of the means which are capable of strengthening and developing his natural aptitudes. The principle is that the state, without interfering with the rights of the family when the latter fulfils its duties, nevertheless owes protection to childhood, as later it is committed to neutrality towards the individual entering the arena. By a progressive artificial selection of the kind indicated above, society would procure the best and greatest possible returns from its population, with whose prosperity it is entrusted. The higher individual variations would come to the front; the mean variations would be enabled to display themselves in the

best and most appropriate conditions; the lower variations for which there is no hope, would alone be sacrificed, but the emulation of the struggle would greatly diminish their number.

The complement of this education would be laboratories for original research, public museums and collections, a few very special superior schools, model farms, national manufactories, and lectures, which I might style luxuries, and which in the American phraseology are said "not to pay," but which are yet absolutely necessary for societies that are anxious to hold their own in the steeple-chase of progress. The state, if it does not take upon itself these duties directly, should at least carefully see to it that they are fulfilled.

The second object of education implies a broader signification. It looks to the public morals and to individual habits of feeling, thinking, and acting, independently of the useful or disadvantageous effects which they may have, and of the pressure exercised by the laws. It is concerned with the external conditions which are to be adapted to human nature, or with those aspects of human nature which are to be adapted to social conditions, and has for its direct object the intrinsic progress both of society and of the species. Two systems here confront us. In the one, evolution is considered as always ending, after oscillations for good or for evil, in the best possible result, and is consequently abandoned to itself—that is, to the free play of individualities and of circumstances. It is the *laisser aller*. In the other, evolution is considered as not giving desirable results and as requiring, therefore, guidance towards the end to be

attained—the greatest happiness distributed among mankind in the most equitable manner. This is the system of interference.

And this brings us to the ego, whose history we have traced in describing the individual at pages 266–274, of Chapter IX. In every individual, as we have endeavored to show, conduct is the outcome of three factors. The first is the ego which is inherent in the animal and exists in man as in all animals—with this difference, that man having more intelligence, this ego assumes in him a high authority. It is the guide and guardian of the individual, it has no object but the needs of the individual and their satisfaction, it is devoted entirely to these objects; it is egoism incarnate. This is the animal ego which we have portrayed in such somber colors. The second factor is the product of habits of feeling, thinking, and acting as they are formed in ancestors and bequeathed to the individual in the shape of predispositions, which when confronted with conditions similar to those which have engendered them, are appropriately developed and have a weighty influence on the acts of the individual. This is the ancestral ego. The third is the product of the habits of the individual himself, acquired during infancy and the course of his life, depending on his maternal and primary education, on the comrades with whom he has associated, upon the examples which have been set him, upon the methods of feeling and thinking to which he has abandoned himself, upon the ideas which he has formed, and the allurements which they involve. This is the acquired individual ego. It also has a profound influence upon the acts of his life.

The animal ego reduced to itself is powerful; but

its interference is not obligatory, as has already been said—it is optional; it enters into action when its attention is sufficiently aroused and when it is determined to have full sway. The two other egos, on the contrary, enter into action mechanically. An excitation arrives at the cerebral center, awakens these egos, and brings about the reflex action which it habitually produced. Combined, they constitute the semi-unconscious ego which answers spontaneously to the demands of the individual when the real or perfectly conscious ego is not moved to intervene. The conduct of man, neglecting the purely medullary reflexes, is the outcome now of the one and now of the other. The conscious ego is the author of reasoned and directly willed acts, the unconscious ego is the source of instinctive and more or less spontaneous acts which are termed "impulses."

But the peripheral excitation which has reached the brain does not always directly awaken the motor reaction; it also awakens the sentiments and ideas which hereditary habit and acquired individual habit have established in previous periods, together with the entire network of thought which is attached to it. Little as the conscious ego occupies itself with what takes place in this labyrinth, still the sentiments and the ideas awakened arouse of themselves the acts which are in habitual correlation with them, acts which even the conscious ego, if it were in full possession of itself, might probably never have committed. Thus a host of actions are explained, which society regards as proper or deserving, and which are yet in disaccord with the reasoned interests of the individual—among them being acts of self-denial, generosity, and devotion.

Now, of what are the ancestral ego and the individual ego which mutually strengthen each other, the outcome? Of modes of living and instruction, of impulses in ancestors and in the individual, which can be governed, evoked, and created. The animal ego knows but one thing—itself, its interests, and its pleasures; the acquired ego acts as it has been in the habit of acting, and as it has been taught. The first calculates, the second obeys automatically. The first has its roots in the physiology of the organism, and is incorrigible. The second can be molded, adapted to social needs, and trained to feel and to think as the general welfare requires. The results of education, taken in its broadest sense, are brought to bear upon the acquired ego from the first generation, when it was formed, but more so upon those which follow, where the same education is repeated, and where heredity comes to its assistance.

The ways and the means remain. In the first rank appears education by the family, its basis being respect for ancestors, veneration of their memory, and the meritorious examples which are to be cited from this source. The natural rôle of the mother is to form the heart, that of the father to shape the intellect by implanting in it the necessary notions of the reciprocal duties of men in society, of obedience to laws, of the responsibility of every one for his acts, of the obligation of every person to carve out his own destiny—in fine, everything which is indispensable to the existence of life in common. Upon this chapter of the family we should have much to say; we should have to recall all that we have seen of this subject among animals and at the dawn of human society. The problem of woman at the present day would be added.

We should have to place in the foreground the Anglo-American movements for her emancipation and the ideas which a writer in *The Monist* has somewhere characterized as French, regarding her rôle as a guardian of the domestic hearth, as a conserver of altruistic sentiments, and as the educator *par excellence* of children. We should have to ask which of these opposing evolutions is best qualified to lead humanity to happiness, and whether we should in our desires prefer the point of view of nature or the point of view of philanthropy. But this would require much space, and the subject deserves its own separate and full treatment.

In the second place comes the education which falls without the sphere of the family and is effected by the environment; that is, on the one hand by companions, examples, the conditions in which one lives, the allurements to which one is subjected; and on the other by the school, the books, and the magazines which one spontaneously reads. It is undoubted that at the start primary instruction should not run counter to that of the family; that on the contrary it should strengthen it; that one should not make freethinkers of children prematurely; and that without touching the liberty of conscience, one should inculcate in them the necessary principles of the conduct to be pursued in society, which can be recapitulated in the axiom, "Not to do unto others what we would not have them do unto us," and conversely. Of all the agents of education outside of the family and the school, the most active, without doubt, are the books and the journals which one takes,* not for instruction, but for recreation. But under what various aspects

*We may add theaters.

are these not presented? What wonderful services might they not accomplish in the hands of men who had the true sense and feeling for the beneficence that could be spread by them. They could habituate people to sound and comforting ideas; they could set the example of the morals which it should be desirous to establish; they could elevate the heart and the mind and facilitate the task of the wise, who see afar. But in general their action is the reverse. I dare not say what the state of affairs in the United States is in this regard, but here where I am writing, the picture is a sad one. The good is eclipsed by the evil; the liberty of writing and of publishing is one of the conquests of modern times, but in the stage which it has now reached it is merely an unnamable license. The most shameful novels, which show the human species only in its basest aspects, and which glorify vice, are in all hands, and especially among the lower classes, to whom they are furnished for a mere nothing. With certain reviews and journals they contribute more than any other cause to the increase of the number of criminals, and especially of young criminals. In order to sell, these journals shrink before nothing; they exalt the passions, openly cultivate scandal, preach insubordination, and crush the holiest and most useful sentiments under foot. The press should be the great educator; it is the great demoralizer. If any example of the contradiction between the principles, or rather the desires, and reality is conspicuous, it is assuredly here. On the one hand it is desired that the individual should enjoy all his liberties, although the very essence of life in common is the restriction of those liberties. On the other hand, people seem to regard it as their duty to furnish the

proof that unlimited liberty is impossible. There is no middle course. The press, the novel-writers, and the pamphleteers must understand that their mission is to encourage the development of the necessary morals, or that they must be prepared for being repressed.

In the third instance come the laws and institutions which best foster the customs and habits which it is desirous to develop, and the modes of feeling and thinking which it is desirous to arouse. The state should be strict with those under its care, but also strict with itself, and should give the first example of the virtues which it exacts. The individual responsibility of each of its employés, whatever their rank, should be absolute for every undertaking, for every infraction of the prescribed forms. The slightest failing on the part of the state throws trouble into the souls of individuals and authorizes them to revolt. Everywhere, in the bureaus, in the tribunals, in its diplomatic service, it should be impeccable. But so long as war persists, with its perverted ethics, there can be no hope of an absolute transformation of the public mind. The numerous and flagrant mistakes which are sometimes committed in the name of justice and for reasons of state, which authorize everything and anything, have pernicious results.

In the last instance come the efforts of private persons and of associations which are animated by a profound love of humanity—the efforts of practical philanthropists, of philosophers striving to elaborate systems of conduct, and of scientists coldly analyzing the difficulties of the problem.

Here is the place to ask whether in order to give unity to all these efforts, the time is not ripe for

establishing a code of morals concerning certain indispensable points regarding which the whole world is in accord.

We have seen how little man amounts to in time and in space, in the hands of an irresistible nature which crushes him, despite the fact that he has found a way to adapt some of her forces to his needs; how intensely he desires to live as fully and agreeably as possible, while perpetuating his species, although as an individual his foresight reaches hardly beyond his children and grandchildren. We have seen, on the other hand, that society has adopted for its controlling principles not absolute truths, but relative and necessary truths in order to fulfil the end for which it exists, and to enable individuals to live wisely and conformably to their desires; that among the principles of solidarity, liberty, equality, fraternity, and justice, none of them can withstand rigorous examination. Society is a solidarity of interests, and not a physical solidarity; the basis of society is the restriction of liberty; equality does not exist among men nor in the results of their conduct; fraternity is but disguised egoism. In social practice these principles amount to this—solidarity, but psychical only; equality, but only before the law; fraternity, but only as a dream. Yet one of them dominates all the others—justice, a social imitation of relative and individual justice, and the synonym of "giving to every one what is his due." Solidarity, in fact, implies justice; the restriction of liberty implies justice; justice implies equality; without justice there is no fraternity. Justice thus becomes the primal necessity *par excellence*, the postulate* of any system of life in common.

*"Any truth is called a postulate, which although not rigorously demonstrable must yet become practically admitted because of the necessity of its consequences."—Paul Janet, *op. cit.*

Justice is our supreme desire, the ideal of which we dream in spite of all proof to the contrary, that which we say must be, that which we are bound to create and establish in spite of all, and in the face of all, of which we must be convinced, and which must be taken as an article of faith.

It is justice therefore with which the necessary moral code to be enacted must in the first instance be saturated—the commandments of society which are to be prescribed for the family and for the schools, notably for the primary schools.*

But it will be said, this code of morals and these principles, these habits or instincts impressed upon the unconscious ego, consolidated with time and sanctioned by the punishment which the laws prescribe—will they be sufficient to assure in all circumstances the conduct desired? Should there not be sought in the individual organism itself, in its cerebral system, some influence which would act from this side on the unconscious ego and move it in the direction which society deems best—in the direction of what is called the good?

The first influence to be invoked would be the categorical imperative of Kant. And without a thought of this, and by ways which Kant would doubtless have rejected, it is precisely to this idea that we ultimately come. The individual feels with the sentiments and the ideas of his ancestors. These ideas deserve the qualification of innate. He acts with the habits which these ancestors have handed down to him and which education has confirmed. His animal ego reflects what the acquired ego has gained; he no longer

*See Paul Janet, *Éléments de morale pratique. Enseignement secondaire moderne conforme aux programmes officiels de 1891.* Paris, 1897. I take exception to Chapter X only.

knows whether he acts automatically or by his own initiative, and he adopts the good or evil as society wishes.

The second is that expounded by M. Guyau in his different works,* and which I shall paraphrase as follows: Life, which has reached the last stage of its evolution in the organic series, which has arrived at the point where it is aware of itself (consciousness), where it admires itself and everything about it (the æsthetic sense), where it diffuses itself over others (the moral or altruistic social sense), even over ideal beings (the religious sense). "Life, the most extensive and intensive possible, conscious of its fecundity," he says somewhere. "To live the maximum of life," he says again, "in the most varied manner possible, and to cause that life to overflow upon others, is the end and the cause of our acts, and not the pleasure which we derive from them." It is the need of activity inherent in every organ, in every organism, and especially in the brain, of which I have frequently spoken, but the consecration of which, I add in opposition to Guyau, lies in the pleasure which this activity offers of itself. The objection is this: It is a power of expansion, and not a guide to conduct in a determinate sense, useful to all. It is perfect in people like Guyau, a poet and a philosopher, who find happiness in the exercise of their highest intellectual faculties, but it is inefficacious in that other class of persons, and these are the great majority, who place their ideal in satisfactions of a different order. On this theory one can be a villain, a Napoleon, or a Rothschild.

*M. Guyau, *Esquisse d'une morale sans obligation ni sanction*, Paris, 1892; *L'irreligion de l'avenir*, Paris, 1896 (English trans., New York, Henry Holt & Co., 1897); *Vers d'un philosophe*, Paris, 1896, etc.

The third influence is self-respect, human dignity, belief in one's superiority—in a word, pride. Man, recognizing his dependence, proudly submits to what he cannot avoid, and haughtily refuses to accept as judge of his conduct any one but himself. This is stoicism in its general form. It is excellent for inspiring courage and for enduring undeserved adversity, but it is insufficient to arouse that generosity and tolerance which are factors of the conduct desired by society.

The fourth, which is derived from the two preceding, is the will which flows from liberty as it is understood by M. A. Fouillée. I shall recapitulate its main terms: "It is a characteristic of man that he is moved not by purely physical forces or blind instincts, but by ideas." "Ideas are forces which influence our conduct by the very fact of their conception." They are at once the cause and the end. "The evolution of nature can have no preconceived end, in the proper sense of the word, but the evolution of humanity has one, from the fact that humanity actually sets itself an aim, and imposes upon itself an ideal to be realized." "The idea of a society adopting liberty, equality, and fraternity as its end is the highest moral ideal." To will is to be able. "Ideal liberty is a power of indefinite development, the essence of which consists in the power to throw off selfishness and to love, and the progressive realization of which would lead to moral and social union among living beings." I confine myself to two remarks. Liberty implies the power of showing oneself unselfish, but in the same measure the power of considering everything in the light of one's own interests. Ideas, conceived as moving springs of conduct, are precisely those spon-

taneous impulses which I desire to create by education and heredity.

The fifth influence is the enlightened interest of Bentham and John Stuart Mill, by virtue of which the individual through careful reasoning identifies his personal welfare with the welfare of all. It is virtually the end to which the system that I have developed tends, save that I would replace the words "by careful reasoning" by the word "unconsciously." First, intelligence varies. Secondly, intelligence may in many circumstances, and precisely in those in which the unreflecting impulse would be most necessary, come to the conclusion that the interest of the individual is opposed to the social interest. In my system, the individual acts unconsciously in the direction required, for the simple reason that he has the habit of so doing.*

A sixth influence is that physiological property on which we have so often insisted, which is highly developed in the majority of animals, particularly in herbivorous and domestic animals, and not less developed in man in the state of nature before the struggle with his fellow-beings broke forth and had not assumed in society so threatening a form. We are speaking of that species of cerebral sensibility which moves both man and animals to seek the company of their congeners, to derive satisfaction from their mutual relations, to love others, and to desire to be loved by others. It is altruism, of which the first

*I have just read the works of Max Nordau, which uphold the ideal of the solidarity of humanity. It is a good ideal but not a reality. In species, whether animal or human, there is a physical solidarity between the individual and his ascendants, but none at all between the individuals themselves. In a society there is an analogous solidarity between the present generation and the preceding ones, but none between the societies themselves. All that can be accepted in the last case is a solidarity of interest between civilized societies such as exists between individuals in a given society.

stage is kindness and the last devotion; the most powerful physiological impulse next to egoism, although it is only an indirect form of egoism. To love and to be loved, next to eating, drinking, and acting, is the first need of children. It remains intense to the age of puberty, and continues to the day when the individual enters into the arena of serious life. In the old man who has no longer any of the cares of existence, it resumes its rights and spreads over his grandchildren. In the adult, in the moments of respite which the struggle leaves him, it is his repose, refuge, and recompense. How sad life would be without friendships! In the bosom of his family the wife satisfies the needs of the heart rather than those of the senses. The husband, who is less faithful in the second regard, is loyal as to the first. Man undoubtedly domesticated the dog by altruism, and every day we see him creating bonds of attachment to himself in the most different kind of animals by simply asking for reciprocity. Altruism is the first source of sociability, as we have already demonstrated, and it is its consecration under its multiple forms of kindness, indulgence, tolerance, self-denial, sympathy, charity, generosity, devotion. This is the reason why, in spite of all the objections which may be raised to assisting the unfortunate, no voice is ever raised against it, and that there is no difference of opinion except as to the means. It is the only physiological force which can check in the organism itself the impulses of egoism and the many secondary forms which egoism assumes.

To adopt reason as the instrument for combating personal interest, after the fashion of Bentham, is to exaggerate its power. To adopt human vanity, lib-

erty, or fear, is still more exaggerating it. The system of Guyau accords best with that of altruism, for to live in the happiness of others as much as in one's own, to exchange impressions, sentiments, and thoughts, is to live with greater fullness, and to see about one nature in all its smiles and beauties. Justice is a necessary regulator of social life; external equality which society offers is its corollary. The maximum possible liberty is the individual principle that comes next. The last that we add is the principle of fraternity formulated by the Master, "Love ye one another."

With these two elements, altruism as the basis, habits and social instincts as the means, the desired end will be attained. What I ask for, what I wish to see generalized in society, with every one joining to obtain it, is it not precisely what we see has been spontaneously effected in our most honorable families? What, after all, are we, the best of us, individually, if not the product of the virtues which our ancestors have bequeathed to us, despite our tendency to create new habits for ourselves, to wrest ourselves from the bonds of heredity, and to build up in ourselves independent originality? The good instincts which we may have, do we obtain them from the spirit of the century, from the cold reasoning of the day, which analyzes the motives and the effects of all acts, and mathematically calculates its interests? No, we receive them from our predecessors. We are honest, proper, and loving, because our fathers and grandfathers were so. Otherwise, how could the naturalist and the freethinker explain the flagrant contradiction which exists between his conduct and his reasoning? He sees only brute reality, he establishes the sad

truth, he deduces the consequences of it, and yet he is unable to free himself from the most generous aspirations of his altruism. He places friendship in the front rank and practices it. Why? Because the spirit of his ancestors is perpetuated in him, because he is their continuation. Yves Guyot, who professes egoism as the sole principle of individual conduct in society, writes as follows: "When I see a child beaten, and hear it cry, when I see a woman weeping, when I am the witness of suffering, I am divided into two persons. Another ego feels these pains. * * * All my fibers are set in vibration; the old blood of the soldier, the corsair, the hunter, which runs in my veins, seethes within me. * * * My instincts impel me to act." He speaks truly. It is no longer the egoist who is talking, but the altruist by heredity.

The establishing, or re-establishing, of the customs which are best adapted to social happiness and their progressive consolidation by heredity; the ego, without name, acting automatically in the direction which society deems to be the best; the individual shaped by man as he shapes a plant or an animal conformably to the needs of society, justice as the regulator, and love as the ideal—such, in fine, is our system.

Is it necessary to add to this a grain of mysticism—a belief in the absolute, a belief in the individual surviving the body and preserving its memory? Or the transformation of the categorical imperative in the form which we have stated it, into a metaphysical entity? We are not sure that our system would gain by such an addition. It would be a dogma simply. It is true that justice, such as we have seen it in society, deserves in some measure this name, and that liberty is not far from being the same. The essential

thing is to attain the end, the greatest possible happiness. But is not illusion frequently happiness? Is it not often more beautiful and more consoling than reality? Read the heart-breaking pages of Guyau,* dying, but still not abandoning hope. Would it not have been cruel to deprive him of it?

Certainly, but to admit illusion, even in the extremest case, would be tantamount to declaring that truth is insufficient, that there is no remedy whatever, and that human reason culminates in a lamentable failure. But we have not reached this point. Truth, when we look it calmly and stoically in the face, is not so discouraging. Herbert Spencer, who concludes as we do regarding the necessity of developing altruism and certain hereditary habits, is wrong in his expressions of despair at the close of his monumental work. We differ from him in this, that he relies upon the free play of individuals and natural evolution, whereas we believe it indispensable that man should direct his own evolution. We, too, have had our moments of doubt—not regarding the efficacy of our system, but regarding the possibility of realizing it without the intervention of too much authority; but we have taken fresh confidence. We believe unqualifiedly in the great power of heredity, habit, and unconscious impulse over our daily acts. We are convinced that if society so desires it and comports itself properly, it can in a few generations transform sentiments and manners, and adapt them to its needs. The useful instincts have sprung up of themselves in animals. Why may they not, with the assistance of reason, be created in man? Speaking only of France, I have already seen about me for the last ten years,

*Pp. 26–28 of his *Esquisse d'une morale.*

certain indications pointing to renovation; new social classes will achieve success where the old have failed. No doubt there will be storms, good and evil alternations, but in the end evolution, which proceeds only by oscillations and starts, will enter on the right path. Let us not despair. Man is too powerful to fail in reaching the end which he desires. The golden age of humanity is ahead of us, the sun of the twentieth century will be that of truth. "Error is a Penelope who, without wishing to do so, is incessantly unraveling the texture which she has woven. Truth, on the other hand, in the struggle of ideas for life, will sooner or later bear off the victory." (Fouillée.)*

Let us revert, as we near the close, to the question of the functions of the state—first, the essential functions which it cannot possibly cast off, and secondly the facultative functions, including one of the highest importance, that which concerns progress, or more

*The article of Professor Dewey in *The Monist* for April, 1898, and that of Dr. Paul Carus in *The Monist* for April, 1894, on the *Evolution and Ethics* of the late lamented Professor Huxley, have just drawn my attention to Vol. IX of the *Collected Essays* of this author. I was much struck with the identity of my conclusions with those of Professor Huxley, published in 1888, 1893, and 1894. I am not astonished at the fact, however; for, proceeding by the same methods, and with the same facts and in the same spirit, we ought necessarily to have reached the same result. I call attention to some few of his propositions.

"Social progress means a checking of the cosmic process at every step, and the substitution for it of another which may be called the ethical process."

The science of ethics or morals is that of the best conduct for the individual and society. The morally good is what answers best to the general good of the community, all other things being equal.

Social progress is affected, not by self-assertion (my "free expansion of life" in the individual, Guyau's "need of living at the maximum"), but by self-restraint and self-discipline.

"The intelligence which converted the brother of the wolf into a faithful guardian of the flock ought to be able to do something toward curbing the instincts of savagery in civilized man."

Huxley does not formally indicate the ethical process which I set up; namely, the molding of the acquired and unconscious ego to conform to the needs of society; but it follows implicity from numerous passages of his on habits, reflex actions, heredity, etc. We find, in fact, that there is no choice; either we have to abandon ourselves to the *laisser faire*, which is nothing but the cosmic process itself and can only lead to anarchy and the rule of the strongest; or, we must, by taking our stand on the nature of man, *direct* the ethical process, as I have explained.

exactly the best adaptation of things to men and of men to things. It may be summed up as follows:

The state is responsible for the existence of society without and within. To this end it is armed with all powers and uses them as it sees necessary. It is entrusted, further, with its prosperity, present and future, and its guidance is limited here by the laws, which it is as much bound to obey as private persons are. These laws change with the legislature, and the question recurs: What is the scope of power that should be accorded to it? Should they be augmented or curtailed? Should more be given to the state and less to the individual, or conversely? It is here that the difference of opinion of statesmen, economists, and sociologists appears. There are extremists on both sides. On the one hand are the collectivists who wish to lodge every possible power in the state, to revert to the communal or national form of property existing in the majority of primitive societies, to regulate the entire current of life, to give to each according to his needs strictly considered, and not according to his labors—in short, to suppress individual responsibility. On the other side there are the anarchists, who refuse to consider the least restriction of natural liberty, who attack thus the very principles of society, and go so far as to say that wherever three men are assembled there is a tyrant. Neither the one nor the other of these systems deserves to be discussed. It is certain that the time has come, that there are many reforms to be made, that all have not their equal share of the means for administering to their needs and for becoming established in life, but the difficulties cannot be solved by exaggerations which are at downright variance with practice. Between the two extremes are

the advocates of authority who believe in a strong state thoroughly centralized, but a state which grants to the individual sufficient liberty to enable him to move freely in the sphere of his personal affairs; while there are also the radicals who are for decentralization, who would give the maximum of liberty to the individual without going to the extreme of the anarchist, but who are too hasty to be practical.

In the center are the progressivists, whose name is perfect, and who also deserve the name of opportunists, as they are called in France. For us they are the sages of Plato, those who know how to put to use the teachings of social science according as it is developed, those upon whom I would count for directing the social evolution in the direction and by the means which I have sketched.

It is from social science, the most important of the applications of anthropology, of which sociology is a branch, that all light is destined to come. Born of yesterday, it already bears testimony to its sweeping influence. Its programme is clear: to classify the ends in view; to look the difficulties courageously in the face, even where unsurmountable; to establish principles; to seek to reconcile the contradictions which we have instanced between the conceptions and desires of man and the realities of nature; to suffer every progress to come to its maturity; to proceed without prejudice, without theory, with a full knowledge that the absolute good cannot be realized, but only a relative and progressive better. The developments which we have been following in this long work reveal our tendencies at the points where we have not indicated them. For us, the individual, the family, and personal property are the social tripod. For us,

the political formula is as follows: The maximum possible to the individual, the minimum possible to the state, and in the latter the most possible to the local self-government, the least possible but the necessary to the central authorities. If I am not mistaken this is the condition that exists in the United States.

We have reached the conclusion of our long work, which we had entitled "Science and Faith." We have spoken much of the one and very little of the other. The reason is that the two mutually exclude each other. Science is knowledge; faith is belief. Science considers things objectively, and accepts only what is demonstrated by observations *perpendæ et numerandæ*, and by generalizations and inductions which go with it, stopping at agnosticism.* Faith, on the contrary, is subjective, individual, and dependent on cerebral sensibility, as the latter has been constituted by the heredity, education, habits, and temperament of the subject. Orators, who like the celebrated Dominican, Père Didon, seek to demonstrate the compatibility of the truths established by science and the beliefs dictated by faith, only shatter the latter; a faith which is examined and shown to be in accord with facts ceases to be faith. It is quite admissible that in the epoch of humanity in which we live at present, there should be utility in extolling certain articles of faith, as Kant has done. It is quite warrantable that certain philosophical doctrines should be advocated; and one cannot admire too much the sages who thus devote themselves to the mission of

*That is, stopping where the facts abandon us, and not having recourse to a nebulous hypothesis where no positive and objective facts are forthcoming.

work for humanity. I am not far from admitting even that the four or five principles, especially justice, which society takes for its base and ideal, should be converted into articles of faith, but I would have it perfectly understood that the two domains of science and faith are totally different—are two contrary poles.*

*I have been much struck with the religiosity, excessive but perhaps necessary in its excess, of the English and the North Americans, joined to a calculating, free, and well-balanced psychological state, which I appreciate all the more highly because, if I do not deceive myself, it is the same that governs my own ideas. This religiosity was in the main established some centuries ago with the Puritans and the Presbyterians of Scotland. Nevertheless as an anthropologist, I believe that this placid religiosity, which is so different from that of the dark populations, goes back to very remote times and is one of the distinctive traits of the blond races.

THE END.

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