Herbert Spencer

The Evolution of Society

Selections from Herbert Spencer's "Principles of Sociology"

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CHAPTER 1

WHAT IS A SOCIETY?

This question has to be asked and answered at the outset. Until we have decided whether or not to regard a society as an entity, and until we have decided whether, if regarded as an entity, a society is to be classed as absolutely unlike all other entities or as like some others, our conception of the subject matter before us remains vague.

It may be said that a society is but a collective name for a number of individuals. Carrying the controversy between nominalism and realism into another sphere, a nominalist might affirm that just as there exist only the members of a species while the species considered apart from them has no existence, so the units of a society alone exist, while the existence of the society is but verbal. Instancing a lecturer's audience as an aggregate which by disappearing at the close of the lecture proves itself to be not a thing but only a certain arrangement of persons, he might argue that the like holds of the citizens forming a nation.

But without disputing the other steps of his argument, the last step may be denied. The arrangement, temporary in the one case, is permanent in the other; and it is the permanence of the relations among component parts which constitutes the individuality of a whole as distinguished from the individualities of its parts. A mass broken into fragments ceases to be a thing, while conversely, the stones, bricks, and wood, previously separate, become the thing called a house if connected in fixed ways.

Thus we consistently regard a society as an entity because, though formed of discrete units, a certain concreteness in the aggregate of them is implied by the general persistence of the arrangements among them throughout the area occupied. And it is this trait which yields our idea of a society. . . .

But now, regarding a society as a thing, what kind of thing must we call it? It seems totally unlike every object with which our senses acquaint us. Any likeness it may possibly have to other objects cannot be manifest to perception, but can be discerned only by reason. If the constant relations among its parts make it an entity, the question arises whether these constant relations among its parts are akin to the constant relations among the parts of other entities. Between a society and anything else, the only conceivable resemblance must be one due to *parallelism of principle in the arrangement of components.*

There are two great classes of aggregates with which the social aggregate may be compared – the inorganic and the organic. Are the attributes of a society in any way like those of a non-living body – or are they in any way like those of a living body? or are they entirely unlike those of both?

The first of these questions needs only to be asked to be answered in the negative. A whole of which the parts are alive, cannot, in its general characters, be like lifeless wholes. The second question, not to be thus promptly answered, is to be answered in the affirmative. The reasons for asserting that the permanent relations among the parts of a society are analogous to the permanent relations among the parts of a living body we have now to consider.

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CHAPTER 2

A SOCIETY IS AN ORGANISM

When we say that growth is common to social aggregates and organic aggregates we do not thus entirely exclude community with inorganic aggregates. Some of these, as crystals, grow in a visible manner, and all of them, on the hypothesis of evolution, have arisen by integration at some time or other. Nevertheless, compared with things we call inanimate, living bodies and societies so conspicuously exhibit augmentation of mass that we may fairly regard this as characterizing them both. Many organisms grow throughout their lives and the rest grow throughout considerable parts of their lives. Social growth usually continues either up to times when the societies divide or up to times when they are overwhelmed.

Here, then, is the first trait by which societies ally themselves with the organic world and substantially distinguish themselves from the inorganic world.

It is also a character of social bodies, as of living bodies, that while they increase in size they increase in structure. Like a low animal, the embryo of a high one has few distinguishable parts, but while it is acquiring greater mass, its parts multiply and differentiate. It is thus with a society. At first the unlikenesses among its groups of units are inconspicuous in number and degree, but as population augments, divisions and subdivisions become more numerous and more decided. Further, in the social organism as in the individual organism, differentiations cease only with that completion of the type which marks maturity and precedes decay.

Though in inorganic aggregates also, as in the entire solar system and in each of its members, structural differentiations accompany the integrations, yet these are so relatively slow and so relatively simple, that they may be disregarded. The multiplication of contrasted parts in bodies politic and in living bodies is so great that it substantially constitutes another common character which marks them off from inorganic bodies.

This community will be more fully appreciated on observing that progressive differentiation of structures is accompanied by progressive differentiation of functions.

The divisions, primary, secondary, and tertiary, which arise in a developing animal, do not assume their major and minor unlikenesses to no purpose. Along with diversities in their shapes and compositions go diver-

sities in the actions they perform: they grow into unlike organs having unlike duties. Assuming the entire function of absorbing nutriment at the same time that it takes on its structural characters, the alimentary system becomes gradually marked off into contrasted portions, each of which has a special function forming part of the general function. A limb, instrumental to locomotion or prehension, acquires divisions and subdivisions which perform their leading and their subsidiary shares in this office.

So is it with the parts into which a society divides. A dominant class arising does not simply become unlike the rest, but assumes control over the rest; when this class separates into the more and the less dominant, these again begin to discharge distinct parts of the entire control. With the classes whose actions are controlled it is the same. The various groups into which they fall have various occupations: each of such groups also, within itself, acquiring minor contrasts of parts along with minor contrasts of duties.

And here we see more clearly how the two classes of things we are comparing distinguish themselves from things of other classes, for such differences of structure as slowly arise in inorganic aggregates are not accompanied by what we can fairly call differences of function.

Why in a body politic and in a living body these unlike actions of unlike parts are properly regarded by us as functions, while we cannot so regard the unlike actions of unlike parts in an inorganic body, we shall perceive on turning to the next and most distinctive common trait.

Evolution establishes in them both, not differences simply, but definitely connected differences — differences such that each makes the others possible. The parts of an inorganic aggregate are so related that one may change greatly without appreciably affecting the rest. It is otherwise with the parts of an organic aggregate or of a social aggregate. In either of these, the changes in the parts are mutually determined, and the changed actions of the parts are mutually dependent. In both, too, this mutuality increases as the evolution advances. The lowest type of animal is all stomach, all respiratory surface, all limb. Development of a type having appendages by which to move about or lay hold of food can take place only if these appendages, losing power to absorb nutriment directly from surrounding bodies, are supplied with nutriment by parts which retain the power of absorption. A respiratory surface to which the circulating fluids are brought to be aerated can be formed only on condition that the concomitant loss of ability to supply itself with materials for repair and growth is made good by the development of a structure bringing these materials.

Similarly in a society. What we call with perfect propriety its organization, necessarily implies traits of the same kind. While rudimentary, a society is all warrior, all hunter, all hut-builder, all tool-maker: every part

fulfils for itself all needs. Progress to a stage characterized by a permanent army can go on only as there arise arrangements for supplying that army with food, clothes, and munitions of war by the rest. If here the population occupies itself solely with agriculture and there with mining—if these manufacture goods while those distribute them—it must be on condition that in exchange for a special kind of service rendered by each part to other parts, these other parts severally give due proportions of their services.

This division of labor, first dwelt on by political economists as a social phenomenon, and thereupon recognized by biologists as a phenomenon of living bodies, which they called the "physiological division of labor," is that which in the society, as in the animal, makes it a living whole. Scarcely can I emphasize enough the truth that in respect of this fundamental trait a social organism and an individual organism are entirely alike. When we see that in a mammal arresting the lungs quickly brings the heart to a stand, that if the stomach fails absolutely in its office all other parts by-and-by cease to act, that paralysis of its limbs entails on the body at large death from want of food or inability to escape, that loss of even such small organs as the eyes deprives the rest of a service essential to their preservation, we cannot but admit that mutual dependence of parts is an essential characteristic. And when, in a society, we see that the workers in iron stop if the miners do not supply materials, that makers of clothes cannot carry on their business in the absence of those who spin and weave textile fabrics, that the manufacturing community will cease to act unless the food-producing and food-distributing agencies are acting, that the controlling powers, governments, bureaus, judicial officers, police, must fail to keep order when the necessaries of life are not supplied to them by the parts kept in order, we are obliged to say that this mutual dependence of parts is similarly rigorous. Unlike as the two kinds of aggregate otherwise are, they are alike in respect of this fundamental character, and the characters implied by it.

How the combined actions of mutually dependent parts constitute life of the whole, and how there hence results a parallelism between social life and animal life, we see still more clearly on learning that the life of every visible organism is constituted by the lives of units too minute to be seen by the unaided eye.

An undeniable illustration is furnished by the strange order *Myxomycetes*. The spores or germs produced by one of these forms become ciliated monads which, after a time of active locomotion, change into shapes like those of amoebae, move about, take in nutriment, grow, multiply by fission. Then these amoeba-form individuals swarm together, begin to coalesce into groups, and these groups to coalesce with one another, making a mass

sometimes barely visible, sometimes as big as the hand. This *plasmodium*, irregular, mostly reticulated, and in substance gelatinous, itself exhibits movements of its parts like those of a gigantic rhizopod, creeping slowly over surfaces of decaying matters, and even up the stems of plants. Here, then, union of many minute living individuals to form a relatively vast aggregate in which their individualities are apparently lost but the life of which results from combination of their lives, is demonstrable. . . .

The relation between the lives of the units and the life of the aggregate has a further character common to the two cases. By a catastrophe the life of the aggregate may be destroyed without immediately destroying the lives of all its units, while, on the other hand, if no catastrophe abridges it, the life of the aggregate is far longer than the lives of its units.

In a cold-blooded animal, ciliated cells perform their motions with perfect regularity long after the creature they are part of has become motionless. Muscular fibers retain their power of contracting under stimulation. The cells of secreting organs go on pouring out their product if blood is artificially supplied to them. And the components of an entire organ, as the heart, continue their cooperation for many hours after its detachment.

Similarly, arrest of those commercial activities, governmental coordinations, etc., which constitute the corporate life of a nation may be caused, say by an inroad of barbarians, without immediately stopping the actions of all the units. Certain classes of these, especially the widely diffused ones engaged in food-production, may long survive and carry on their individual occupations.

On the other hand, the minute living elements composing a developed animal severally evolve, play their parts, decay, and are replaced, while the animal as a whole continues. In the deep layer of the skin, cells are formed by fission which, as they enlarge, are thrust outwards, and, becoming flattened to form the epidermis, eventually exfoliate, while the younger ones beneath take their places. Liver-cells, growing by imbibition of matters from which they separate the bile, presently die, and their vacant seats are occupied by another generation. Even bone, though so dense and seemingly inert, is permeated by blood vessels carrying materials to replace old components by new ones. And the replacement, rapid in some tissues and in others slow, goes on at such rate that during the continued existence of the entire body each portion of it has been many times over produced and destroyed.

Thus it is also with a society and its units. Integrity of the whole as of each large division is perennially maintained, notwithstanding the deaths of component citizens. The fabric of living persons which, in a manufacturing town, produces some commodity for national use, remains after a century as large a fabric, though all the masters and workers who a century

ago composed it have long since disappeared. Even with minor parts of this industrial structure the like holds. A firm that dates from past generations, still carrying on business in the name of its founder, has had all its members and employees changed one by one, perhaps several times over, while the firm has continued to occupy the same place and to maintain like relations with buyers and sellers. Throughout we find this. Governing bodies, general and local, ecclesiastical corporations, armies, institutions of all orders down to guilds, clubs, philanthropic associations, etc., show us a continuity of life exceeding that of the persons constituting them. Nay, more. As part of the same law, we see that the existence of the society at large exceeds in duration that of some of the compound parts. Private unions, local public bodies, secondary national institutions, towns carrying on special industries, may decay, while the nation, maintaining its integrity, evolves in mass and structure.

In both cases, too, the mutually dependent functions of the various divisions, being severally made up of the actions of many units, it results that these units dying one by one, are replaced without the function in which they share being sensibly affected. In a muscle, each sarcous element wearing out in its turn, is removed and a substitution made while the rest carry on their combined contractions as usual; the retirement of a public official or death of a shopman, perturbs inappreciably the business of the department, or activity of the industry, in which he had a share.

Hence arises in the social organism, as in the individual organism, a life of the whole quite unlike the lives of the units, though it is a life produced by them.

From these likenesses between the social organism and the individual organism we must now turn to an extreme unlikeness. The parts of an animal form a concrete whole, but the parts of a society form a whole which is discrete. While the living units composing the one are bound together in close contact, the living units composing the other are free, are not in contact, and are more or less widely dispersed. How, then, can there be any parallelism? . . .

Though coherence among its parts is a prerequisite to that cooperation by which the life of an individual organism is carried on, and though the members of a social organism, not forming a concrete whole, cannot maintain cooperation by means of physical influences directly propagated from part to part, yet they can and do maintain cooperation by another agency. Not in contact, they nevertheless affect one another through intervening spaces, both by emotional language and by the language, oral and written, of the intellect. For carrying on mutually dependent actions it is requisite that impulses, adjusted in their kinds, amounts, and times, shall be con-

veyed from part to part. This requisite is fulfilled in living bodies by molecular waves that are indefinitely diffused in low types and in high types are carried along definite channels (the function of which has been significantly called *internuncial*). It is fulfilled in societies by the signs of feelings and thoughts conveyed from person to person, at first in vague ways and only through short distances, but afterwards more definitely and through greater distances. That is to say, the internuncial function, not achievable by stimuli physically transferred, is nevertheless achieved by language—emotional and intellectual.

That mutual dependence of parts which constitutes organization is thus effectually established. Though discrete instead of concrete, the social aggregate is rendered a living whole. . . .

Summary

Let us now . . . sum up the reasons for regarding a society as an organism.

It undergoes continuous growth. As it grows, its parts become unlike: it exhibits increase of structure. The unlike parts simultaneously assume activities of unlike kinds. These activities are not simply different, but their differences are so related as to make one another possible. The reciprocal aid thus given causes mutual dependence of the parts. And the mutually dependent parts, living by and for one another, form an aggregate constituted on the same general principle as is an individual organism. The analogy of a society to an organism becomes still clearer on learning that every organism of appreciable size is a society, and on further learning that in both, the lives of the units continue for some time if the life of the aggregate is suddenly arrested, while if the aggregate is not destroyed by violence, its life greatly exceeds in duration the lives of its units. Though the two are contrasted as respectively discrete and concrete, and though there results a difference in the ends subserved by the organization, there does not result a difference in the laws of the organization: the required mutual influences of the parts, not transmissible in a direct way, being, in a society, transmitted in an indirect way.

Having thus considered in their most general forms the reasons for regarding a society as an organism, we are prepared for following out the comparison in detail.

CHAPTER 3

SOCIAL GROWTH

Societies, like living bodies, begin as germs – originate from masses which are extremely minute in comparison with the masses some of them eventually reach. That out of small wandering hordes have arisen the largest societies, is a conclusion not to be contested. The implements of prehistoric peoples, ruder even than existing savages use, imply absence of those arts by which alone great aggregations of men are made possible. Religious ceremonies that survived among ancient historic races pointed back to a time when the progenitors of those races had flint knives, and got fire by rubbing together pieces of wood, and must have lived in such small clusters as are alone possible before the rise of agriculture.

The implication is that by integrations, direct and indirect, there have in course of time been produced social aggregates a million times in size the aggregates which alone existed in the remote past. Here, then, is a growth reminding us, by its degree, of growth in living bodies.

Between this trait of organic evolution and the answering trait of super-organic evolution, there is a further parallelism: the growths in aggregates of different classes are extremely various in their amounts.

Glancing over the entire assemblage of animal types, we see that the members of one large class, the *Protozoa*, rarely increase beyond the microscopic size with which every higher animal begins. Among the multitudinous kinds of *Coelenterata*, the masses range from that of the small hydra to that of the large medusa. The annulose and molluscous types respectively show us immense contrasts between their superior and inferior members. And the vertebrate animals, much larger on the average than the rest, display among themselves enormous differences.

Kindred unlikenesses of size strike us when we contemplate the entire assemblage of human societies. Scattered over many regions there are minute hordes – still extant samples of the primordial type of society. We have Wood Veddas living sometimes in pairs, and only now and then assembling; we have Bushmen wandering about in families, and forming larger groups but occasionally; we have Fuegians clustered by the dozen or the score. Tribes of Australians, of Tasmanians, of Andamanese, are variable within the limits of perhaps twenty to fifty. And similarly, if the region is inhospitable, as with the Eskimos, or if the arts of life are undeveloped, as with the Digger Indians, or if adjacent higher races are

obstacles to growth, as with Indian Hill tribes like the Juangs, this limitation to primitive size continues. Where a fruitful soil affords much food, and where a more settled life, leading to agriculture, again increases the supply of food, we meet with larger social aggregates: instance those in the Polynesian Islands and in many parts of Africa. Here a hundred or two, here several thousands, here many thousands, are held together more or less completely as one mass. And then in the highest societies, instead of partially aggregated thousands, we have completely aggregated millions.

The growths of individual and social organisms are allied in another respect. In each case size augments by two processes which go on sometimes separately, sometimes together. There is increase by simple multiplication of units, causing enlargement of the group; there is increase by union of groups, and again by union of groups of groups. The first parallelism is too simple to need illustration but the facts which show us the second must be set forth.

Organic integration, treated of at length in the *Principles of Biology*, §§ 180–211, must be here summarized to make the comparison intelligible. . . . The smallest animal, like the smallest plant, is essentially a minute group of living molecules. There are many forms and stages showing us the clustering of such smallest animals. Sometimes, as in the compound *Vorticellae* and in the sponges, their individualities are scarcely at all masked; but as evolution of the composite aggregate advances, the individualities of the component aggregates become less distinct. In some *Coelenterata*, though they retain considerable independence, which they show by moving about like amoebae when separated, they have their individualities mainly merged in that of the aggregate formed of them: instance the common hydra. Tertiary aggregates similarly result from the massing of secondary ones. . . .

Social growth proceeds by an analogous compounding and recompounding. The primitive social group, like the primitive group of living molecules with which organic evolution begins, never attains any considerable size by simple increase. Where, as among Fuegians, the supplies of wild food yielded by an inclement habitat will not enable more than a score or so to live in the same place – where, as among Andamanese, limited to a strip of shore backed by impenetrable bush, forty is about the number of individuals who can find prey without going too far from their temporary abode [Mouat 1863, p. 300] – where, as among Bushmen, wandering over barren tracts, small hordes are alone possible and even families "are sometimes obliged to separate, since the same spot will not afford sufficient sustenance for all" [Lichtenstein 1812–15, II, 194], we have extreme instances of the limitation of simple groups, and the formation of migrating groups when the limit is passed.

Even in tolerably productive habitats, fission of the groups is eventually necessitated in a kindred manner. Spreading as its number increases, a primitive tribe presently reaches a diffusion at which its parts become incoherent, and it then gradually separates into tribes that become distinct as fast as their continually diverging dialects pass into different languages. Often nothing further happens than repetition of this. Conflicts of tribes, dwindlings or extinctions of some, growths and spontaneous divisions of others, continue.

The formation of a larger society results only by the joining of such smaller societies, which occurs without obliterating the divisions previously caused by separations. This process may be seen now going on among uncivilized races, as it once went on among the ancestors of the civilized races. Instead of absolute independence of small hordes, such as the lowest savages show us, more advanced savages show us slight cohesions among larger hordes. In North America each of the three great tribes of Comanches consists of various bands having such feeble combination only as results from the personal character of the great chief [Schoolcraft 1853–56, I, 260; Bollaert 1850, II, 267]. So of the Dakotas there are, according to Burton [1861, p. 116], seven principal bands, each including minor bands, numbering altogether, according to Catlin, forty-two [1876, I, 209]. And in like manner the five Iroquois nations had severally eight tribes.

Closer unions of these slightly coherent original groups arise under favorable conditions, but they only now and then become permanent. A common form of the process is that described by Mason as occurring among the Karens [1868, p. 130]. "Each village, with its scant domain, is an independent state, and every chief a prince; but now and then a little Napoleon arises, who subdues a kingdom to himself, and builds up an empire. The dynasties, however, last only with the controlling mind." The like happens in Africa. Livingstone says, "Formerly all the Maganja were united under the government of their great Chief, Undi; . . . but after Undi's death it fell to pieces. . . . This has been the inevitable fate of every African Empire from time immemorial" [ref. lost].

Only occasionally does there result a compound social aggregate that endures for a considerable period, as Dahomey or as Ashanti, which is "an assemblage of states owing a kind of feudal obedience to the sovereign" [Beecham 1841, p. 86]. The histories of Madagascar and of sundry Polynesian islands also display these transitory compound groups, out of which at length come in some cases permanent ones. During the earliest times of the extinct civilized races, like stages were passed through. In the words of Maspero, Egypt was "divided at first into a great number of tribes, which at several points simultaneously began to establish small independent states, every one of which had its laws and its worship" [1878, p. 18]. The compound groups of Greeks first formed were those minor ones result-

ing from the subjugation of weaker towns by stronger neighboring towns. And in northern Europe during pagan days the numerous German tribes, each with its cantonal divisions, illustrated this second stage of aggregation.

After such compound societies are consolidated, repetition of the process on a larger scale produces doubly compound societies which, usually cohering but feebly, become in some cases quite coherent. Maspero infers that the Egyptian nomes described above as resulting from integrations of tribes, coalesced into the two great principalities, Upper Egypt and Lower Egypt, which were eventually united, the small states becoming provinces. The boasting records of Mesopotamian kings similarly show us this union of unions going on. So, too, in Greece the integration at first occurring locally, began afterwards to combine the minor societies into two confederacies. During Roman days there arose for defensive purposes federations of tribes which eventually consolidated, and subsequently these were compounded into still larger aggregates. Before and after the Christian era, the like happened throughout Northern Europe. Then after a period of vague and varying combinations, there came, in later times, as is well illustrated by French history, a massing of small feudal territories into provinces, and a subsequent massing of these into kingdoms.

So that in both organic and superorganic growths we see a process of compounding and recompounding carried to various stages. In both cases, after some consolidation of the smallest aggregates there comes the process of forming larger aggregates by union of them; in both cases repetition of this process makes secondary aggregates into tertiary ones.

Organic growth and superorganic growth have yet another analogy. As above said, increase by multiplication of individuals in a group and increase by union of groups may go on simultaneously, and it does this in both cases.

The original clusters, animal and social, are not only small, but they lack density. Creatures of low types occupy large spaces considering the small quantities of animal substance they contain, and low-type societies spread over areas that are wide relatively to the numbers of their component individuals. But as integration in animals is shown by concentration as well as by increase of bulk, so that social integration which results from the clustering of clusters is joined with augmentation of the number contained by each cluster. If we contrast the sprinklings in regions inhabited by wild tribes with the crowds filling equal regions in Europe or if we contrast the density of population in England under the Heptarchy with its present density, we see that besides the growth produced by union of groups there has gone on interstitial growth. Just as the higher animal has become not only larger than the lower but more solid, so, too, has the higher society.

Social growth, then, equally with the growth of a living body, shows

us the fundamental trait of evolution under a twofold aspect. Integration is displayed both in the formation of a larger mass and in the progress of such mass towards that coherence due to closeness of parts.

It is proper to add, however, that there is a model of social growth to which organic growth affords no parallel – that caused by the migration of units from one society to another. Among many primitive groups and a few developed ones this is a considerable factor but, generally, its effect bears so small a ratio to the effects of growth by increase of population and coalescence of groups that it does not much qualify the analogy.

CHAPTER 4

SOCIAL STRUCTURES

In societies, as in living bodies, increase of mass is habitually accompanied by increase of structure. Along with that integration which is the primary trait of evolution, both exhibit in high degrees the secondary trait, differentiation.

The association of these two characters in animals was described in the *Principles of Biology*, § 44. Excluding certain low kinds of them whose activities are little above those of plants, we recognized the general law that large aggregates have high organizations. The qualifications of this law which go along with differences of medium, of habitat, of type, are numerous but when made they leave intact the truth that for carrying on the combined life of an extensive mass, involved arrangements are required.

So, too, is it with societies. As we progress from small groups to larger, from simple groups to compound groups, from compound groups to doubly compound ones, the unlikenesses of parts increase. The social aggregate, homogeneous when minute, habitually gains in heterogeneity along with each increment of growth, and to reach great size must acquire great complexity. Let us glance at the leading stages.

Naturally in a state like that of the Cayaguas or Wood-Indians of South America, so little social that "one family lives at a distance from another," social organization is impossible and even where there is some slight association of families, organization does not arise while they are few and wandering [Southey 1810–19, II, 373]. Groups of Eskimos, of Australians, of Bushmen, of Fuegians, are without even that primary contrast of parts implied by settled chieftainship. Their members are subject to no control but such as is temporarily acquired by the stronger, or more cunning, or more experienced; not even a permanent nucleus is present. Habitually where larger simple groups exist, we find some kind of head. Though not a uniform rule (for, as we shall hereafter see, the genesis of a controlling agency depends on the nature of the social activities), this is a general rule. The headless clusters, wholly ungoverned, are incoherent, and separate before they acquire considerable sizes; but along with maintenance of an aggregate approaching to, or exceeding, a hundred, we ordinarily find a simple or compound ruling agency — one or more men claiming and exercising authority that is natural, or supernatural, or both. This is the first social differentiation.

Soon after it there frequently comes another, tending to form a division between regulative and operative parts. In the lowest tribes this is rudely represented only by the contrast in status between the sexes: the men, having unchecked control, carry on such external activities as the tribe shows us, chiefly in war, while the women are made drudges who perform the less skilled parts of the process of sustentation. But that tribal growth, and establishment of chieftainship, which gives military superiority, presently causes enlargement of the operative part by adding captives to it. This begins unobtrusively. While in battle the men are killed, and often afterwards eaten, the noncombatants are enslaved. Patagonians, for example, make slaves of women and children taken in war [Fitzroy 1839, II, 166]. Later, and especially when cannibalism ceases, comes the enslavement of male captives, whence results, in some cases, an operative part clearly marked off from the regulative part. Among the Chinooks, "slaves do all the laborious work" [Ross 1849, p. 92]. We read that the Beluchi, avoiding the hard labor of cultivation, impose it on the Jutts, the ancient inhabitants whom they have subjugated [Postans 1848, p. 112]. Beecham says it is usual on the Gold Coast to make the slaves clear the ground for cultivation [1841, p. 136]. And among the Felatahs "slaves are numerous: the males are employed in weaving, collecting wood or grass, or on any other kind of work; some of the women are engaged in spinning . . . in preparing the yarn for the loom, others in pounding and grinding corn, etc" [Denham, *et al.* 1828, II, 94].

Along with that increase of mass caused by union of primary social aggregates into a secondary one, a further unlikeness of parts arises. The holding together of the compound cluster implies a head of the whole as well as heads of the parts, and a differentiation analogous to that which originally produced a chief, now produces a chief of chiefs. Sometimes the combination is made for defense against a common foe, and sometimes it results from conquest by one tribe of the rest. In this last case the predominant tribe, in maintaining its supremacy, develops more highly its military character, thus becoming unlike the others.

After such clusters of clusters have been so consolidated that their united powers can be wielded by one governing agency, there come alliances with, or subjugations of, other clusters of clusters, ending from time to time in coalescence. When this happens there results still greater complexity in the governing agency, with its king, local rulers, and petty chiefs; and at the same time, there arise more marked divisions of classes — military, priestly, slave, etc. Clearly, then, complication of structure accompanies increase of mass.

This increase of heterogeneity, which in both classes of aggregates goes along with growth, presents another trait in common. Beyond unlikenesses of parts due to development of the coordinating agencies, there presently

follow unlikenesses among the agencies coordinated – the organs of alimentation, etc., in the one case, and the industrial structures in the other.

When animal-aggregates of the lowest order unite to form one of a higher order, and when, again, these secondary aggregates are compounded into tertiary aggregates, each component is at first similar to the other components, but in the course of evolution dissimilarities arise and become more and more decided. Among the *Coelenterata* the stages are clearly indicated. From the sides of a common hydra, bud out young ones which, when fully developed, separate from their parent. In the compound hydroids the young polyps produced in like manner remain permanently attached and, themselves repeating the process, presently form a branched aggregate. When the members of the compound group lead similar and almost independent lives, as in various rooted genera, they remain similar, save those of them which become reproductive organs. But in the floating and swimming clusters, formed by a kindred process, the differently conditioned members become different, while assuming different functions.

It is thus with the minor social groups combined into a major social group. Each tribe originally had within itself such feebly marked industrial divisions as sufficed for its low kind of life, and these were like those of each other tribe. But union facilitates exchange of commodities and if, as mostly happens, the component tribes severally occupy localities favorable to unlike kinds of production, unlike occupations are initiated, and there result unlikenesses of industrial structures. Even between tribes not united, as those of Australia, barter of products furnished by their respective habitats goes on so long as war does not hinder. And evidently when there is reached such a stage of integration as in Madagascar, or as in the chief Negro states of Africa, the internal peace that follows subordination to one government makes commercial intercourse easy. The like parts being permanently held together, mutual dependence becomes possible and along with growing mutual dependence the parts grow unlike.

The advance of organization which thus follows the advance of aggregation, alike in individual organisms and in social organisms, conforms in both cases to the same general law: differentiations proceed from the more general to the more special. First broad and simple contrasts of parts, then within each of the parts primarily contrasted, changes which make unlike divisions of them, then within each of these unlike divisions, minor unlikenesses, and so on continually.

The successive stages in the development of a vertebrate column illustrate this law in animals. At the outset an elongated depression of the blastoderm, called the "primitive groove," represents the entire cerebro-spinal axis; as yet there are no marks of vertebrae, nor even a contrast between the part which is to become head and the part which is to become backbone. Presently the ridges bounding this groove, growing up and

folding over more rapidly at the anterior end, which at the same time widens, begin to make the skull distinguishable from the spine, and the commencement of segmentation in the spinal part, while the cephalic part remains unsegmented, strengthens the contrast. Within each of these main divisions minor divisions soon arise. The rudimentary cranium, bending forward, simultaneously acquires three dilatations indicating the contained nervous centers, while the segmentation of the spinal column, spreading to its ends, produces an almost-uniform series of "proto-vertebrae." At first these proto-vertebrae not only differ very little from one another, but each is relatively simple – a quadrate mass. Gradually this almost-uniform series falls into unlike divisions – the cervical group, the dorsal group, the lumbar group; and while the series of vertebrae is thus becoming specialized in its different regions, each vertebra is changing from that general form which it at first had in common with the rest, to the more special form eventually distinguishing it from the rest. Throughout the embryo there are, at the same time, going on kindred processes which, first making each large part unlike all other large parts, then make the parts of that part unlike one another.

During social evolution analogous metamorphoses may everywhere be traced. The rise of the structure exercising religious control will serve as an example. In simple tribes, and in clusters of tribes during their early stages of aggregation, we find men who are at once sorcerers, priests, diviners, exorcists, doctors – men who deal with supposed supernatural beings in all the various possible ways: propitiating them, seeking knowledge and aid from them, commanding them, subduing them. Along with advance in social integration, there come both differences of function and differences of rank. In Tanna "there are rain makers . . . and a host of other 'sacred men'" [Turner 1861, p. 89]; in Fiji there are not only priests, but seers [Williams and Calvert 1858, I, 229]; among the Hawaiian Islanders there are diviners as well as priests [Ellis 1826, p. 118], among the New Zealanders, Thomson distinguishes between priests and sorcerers [1859, I, 116]; and among the Kaffirs, besides diviners and rain makers, there are two classes of doctors who respectively rely on supernatural and on natural agents in curing their patients [Backhouse 1844, p. 230].

More advanced societies, as those of ancient America, show us still greater multiformity of this once-uniform group. In Mexico, for example, the medical class, descending from a class of sorcerers who dealt antagonistically with the supernatural agents supposed to cause disease, were distinct from the priests, whose dealings with supernatural agents were propitiatory. Further, the sacerdotal class included several kinds, dividing the religious offices among them – sacrificers, diviners, singers, composers of hymns, instructors of youth; and then there were also gradations of ranks in each [Clavigero 1787, I, 272].

This progress from general to special in priesthoods, has, in the higher nations, led to such marked distinctions that the original kinships are forgotten. The priest–astrologers of ancient races were initiators of the scientific class, now variously specialized; from the priest-doctors of old have come the medical class with its chief division and minor divisions; while within the clerical class proper, have arisen not only various ranks from pope down to acolyte, but various kinds of functionaries – dean, priest, deacon, chorister, as well as others classed as curates and chaplains. Similarly if we trace the genesis of any industrial structure, as that which from primitive blacksmiths who smelt their own iron as well as make implements from it, brings us to our iron-manufacturing districts, where preparation of the metal is separated into smelting, refining, puddling, rolling, and where turning this metal into implements is divided into various businesses.

The transformation here illustrated is, indeed, an aspect of that transformation of the homogeneous into the heterogeneous which everywhere characterizes evolution; but the truth to be noted is that it characterizes the evolution of individual organisms and of social organisms in especially high degrees.

Closer study of the facts shows us another striking parallelism. Organs in animals and organs in societies have internal arrangements framed on the same principle.

Differing from one another as the viscera of a living creature do in many respects, they have several traits in common. Each viscus contains appliances for conveying nutriment to its parts, for bringing it materials on which to operate, for carrying away the product, for draining off waste matters, as also for regulating its activity. Though liver and kidneys are unlike in their general appearances and minute structures, as well as in the offices they fulfil, the one as much as the other has a system of arteries, a system of veins, a system of lymphatics – has branched channels through which its excretions escape, and nerves for exciting and checking it. In large measure the like is true of those higher organs which, instead of elaborating and purifying and distributing the blood, aid the general life by carrying on external actions – the nervous and muscular organs. These, too, have their ducts for bringing prepared materials, ducts for drafting off vitiated materials, ducts for carrying away effete matters; as also their controlling nerve cells and fibers. So that, along with the many marked differences of structure, there are these marked communities of structure.

It is the same in a society. The clustered citizens forming an organ which produces some commodity for national use, or which otherwise satisfies national wants, has within it subservient structures substantially like those of each other organ carrying on each other function. Be it a cotton-weaving district or a district where cutlery is made, it has a set of agencies which

bring the raw material, and a set of agencies which collect and send away the manufactured articles; it has an apparatus of major and minor channels through which the necessaries of life are drafted out of the general stocks circulating through the kingdom, and brought home to the local workers and those who direct them; it has appliances, postal and other, for bringing those impulses by which the industry of the place is excited or checked; it has local controlling powers, political and ecclesiastical, by which order is maintained and healthful action furthered. So, too, when, from a district which secretes certain goods we turn to a seaport which absorbs and sends out goods, we find the distributing and restraining agencies are mostly the same. Even where the social organ, instead of carrying on a material activity, has, like a university, the office of preparing certain classes of units for social functions of particular kinds, this general type of structure is repeated: the appliances for local sustentation and regulation, differing in some respects, are similar in essentials – there are like classes of distributors, like classes for civil control, and a specially-developed class for ecclesiastical control.

On observing that this community of structure among social organs, like the community of structure among organs in a living body, necessarily accompanies mutual dependence, we shall see even more clearly than hitherto how great is the likeness of nature between individual organization and social organization.

One more structural analogy must be named. The formation of organs in a living body proceeds in ways which we may distinguish as primary, secondary, and tertiary, and, paralleling them, there are primary, secondary, and tertiary ways in which social organs are formed. We will look at each of the three parallelisms by itself.

In animals of low types, bile is secreted, not by a liver, but by separate cells imbedded in the wall of the intestine at one part. These cells individually perform their function of separating certain matters from the blood, and individually pour out what they separate. No organ, strictly so-called, exists, but only a number of units not yet aggregated into an organ.

This is analogous to the incipient form of an industrial structure in a society. At first each worker carries on his occupation alone, and himself disposes of the product to consumers. The arrangement still extant in our villages, where the cobbler at his own fireside makes and sells boots, and where the blacksmith single-handed does what iron-work is needed by his neighbors, exemplifies the primitive type of every producing structure. Among savages slight differentiations arise from individual aptitudes. Even of the degraded Fuegians, Fitzroy tells us that "one becomes an adept with the spear; another with the sling; another with a bow and arrow" [1839, II, 186]. As like differences of skill among members of primi-

tive tribes cause some to become makers of special things, it results that necessarily the industrial organ begins as a social unit. Where, as among the Shasta Indians of California, arrow-making is a distinct profession, it is clear that manipulative superiority being the cause of the differentiation, the worker is at first single [Bancroft 1875–76, I, 343]. And during subsequent periods of growth, even in small settled communities, this type continues. The statement that among the Coast Negroes "the most ingenious man in the village is usually the blacksmith, joiner, architect, and weaver" [Winterbottom 1803, I, 89], while it shows us artisan functions in an undifferentiated stage, also shows us how completely individual is the artisan structure; the implication being that as the society grows, it is by the addition of more such individuals, severally carrying on their occupations independently, that the additional demand is met.

By two simultaneous changes an incipient secreting organ in an animal reaches that higher structure with which our next comparison may be made. The cells pass from a scattered cluster into a compact cluster, and they severally become compound. In place of a single cell elaborating and emitting its special product we now have a small elongated sac containing a family of cells, and this, through an opening at one end, gives exit to their products. At the same time there is formed an integrated group of such follicles, each containing secreting units and having its separate orifice of discharge.

To this type of individual organ we find, in semi-civilized societies, a type of social organ closely corresponding. In one of these settled and growing communities the demands upon individual workers, now more specialized in their occupations, have become unceasing, and each worker, occasionally pressed by work, makes helpers of his children. This practice, beginning incidentally, establishes itself, and eventually it grows into an imperative custom that each man shall bring up his boys to his own trade. Illustrations of this stage are numerous. Skilled occupation, "like every other calling and office in Peru, always descended from father to son. The division of castes, in this particular, was as precise as that which existed in Egypt or Hindostan" [Prescott 1847, I, 138]. In Mexico, too, "the sons in general learned the trades of their fathers, and embraced their professions" [Clavigero 1787, I, 338]. The like was true of the industrial structures of European nations in early times. By the Theodosian code a Roman youth "was compelled to follow the employment of his father . . . and the suitor who sought the hand of the daughter could only obtain his bride by becoming wedded to the calling of her family" [Palgrave, F. 1832, I, 332].

In medieval France handicrafts were inherited, and the old English periods were characterized by a like usage. Branching of the family through generations into a number of kindred families carrying on the

same occupation, produced the germ of the guild, and the related families who monopolized each industry formed a cluster habitually occupying the same quarter. Hence the still extant names of many streets in English towns — "Fellmonger, Horsemonger, and Fleshmonger, Shoewright and Shieldwright, Turner and Salter Streets" [Kemble 1849, II, 340), a segregation like that which still persists in Oriental bazaars.

And now, on observing how one of these industrial quarters was composed of many allied families, each containing sons working under direction of a father, who while sharing in the work sold the produce, and who, if the family and business were large, became mainly a channel taking in raw material and giving out the manufactured article, we see that there existed an analogy to the kind of glandular organ described above, which consists of a number of adjacent cell-containing follicles having separate mouths.

A third stage of the analogy may be traced. Along with that increase of a glandular organ necessitated by the more active functions of a more developed animal there goes a change of structure consequent on augmentation of bulk. If the follicles multiply while their ducts have all to be brought to one spot, it results that their orifices, increasingly numerous, occupy a larger area of the wall of the cavity which receives the discharge, and if lateral extension of this area is negatived by the functional requirements, it results that the needful area is gained by formation of a caecum. Further need of the same kind leads to secondary caeca diverging from this main caecum, which hence becomes, in part, a duct. Thus is at length evolved a large viscus, such as a liver, having a single main duct with ramifying branches running throughout its mass.

Now we rise from the above-described kind of industrial organ by parallel stages to a higher kind. There is no sudden leap from the household type to the factory type, but a gradual transition. The first step is shown us in those rules of trade guilds under which, to the members of the family, might be added an apprentice (possibly at first a relation) who, as Brentano [1870, pp. 129–30] says, "became a member of the family of his master, who instructed him in his trade, and who, like a father, had to watch over his morals, as well as his work;" practically an adopted son. This modification having been established, there followed the employing of apprentices who had changed into journeymen. With development of this modified household group the master grew into a seller of goods made, not by his own family only, but by others and, as his business enlarged, necessarily ceased to be a worker, and became wholly a distributor — a channel through which went out the products, not of a few sons, but of many unrelated artisans. This led the way to establishments in which the employed far outnumber the members of the family, until at length, with the use of mechanical power, came the factory — a series of rooms, each

containing a crowd of producing units, and sending its tributary stream of product to join other streams before reaching the single place of exit. Finally, in greatly developed industrial organs, we see many factories clustered in the same town, and others in adjacent towns, to and from which, along branching roads, come the raw materials and go the bales of cloth, calico, etc.

There are instances in which a new industry passes through these stages in the course of a few generations, as happened with the stocking-manufacture. In the Midland counties, fifty years ago, the rattle and burr of a solitary stocking-frame came from a roadside cottage every here and there; the single worker made and sold his product. Presently arose workshops in which several such looms might be heard going: there was the father and his sons, with perhaps a journeyman. At length grew up the large building containing many looms driven by a steam engine; and finally many such large buildings in the same town.

These structural analogies reach a final phase that is still more striking. In both cases there is a contrast between the original mode of development and a substituted later mode.

In the general course of organic evolution from low types to high, there have been passed through by insensible modifications all the stages above described; but now, in the individual evolution of an organism of high type, these stages are greatly abridged, and an organ is produced by a comparatively direct process. Thus the liver of a mammalian embryo is formed by the accumulation of numerous cells, which presently grow into a mass projecting from the wall of the intestine, while simultaneously there dips down into it a caecum from the intestine. Transformation of this caecum into the hepatic duct takes place at the same time that within the mass of cells there arise minor ducts, connected with this main duct and there meanwhile go on other changes which, during evolution of the organ through successively higher types, came one after another.

In the formation of industrial organs the like happens. Now that the factory system is well-established – now that it has become ingrained in the social constitution – we see direct assumptions of it in all industries for which its fitness has been shown. If at one place the discovery of ore prompts the setting up of iron-works, or at another a special kind of water facilitates brewing, there is no passing through the early stages of single worker, family, clustered families, and so on, but there is a sudden drafting of materials and men to the spot, followed by formation of a producing structure on the advanced type. Nay, not one large establishment only is thus evolved after the direct manner, but a cluster of large establishments. At Barrow-in-Furness we see a town with its iron works, its importing and exporting businesses, its extensive docks and means of communication, all

in the space of a few years framed after that type which it has taken centuries to develop through successive modifications.

An allied but even more marked change in the evolutionary process is also common to both cases. Just as in the embryo of a high animal various organs have their important parts laid down out of their original order, in anticipation, as it were, so, with the body at large, it happens that entire organs which, during the serial genesis of the type, came comparatively late, come in the evolving individual comparatively soon. This, which Prof. Haeckel has called heterochrony, is shown us in the early marking out of the brain in a mammalian embryo, though in the lowest vertebrate animal no brain ever exists; or, again, in the segmentation of the spinal column before any alimentary system is formed, though, in a proto-vertebrate, even when its alimentary system is completed, there are but feeble signs of segmentation.

The analogous change of order in social evolution is shown us by new societies which inherit the confirmed habits of old ones. Instance the United States, where a town in the far west, laid down in its streets and plots, has its hotel, church, post-office, built while there are but few houses, and where a railway is run through the wilderness in anticipation of settlements. Or instance Australia, where a few years after the huts of gold diggers begin to cluster round new mines there is established a printing-office and journal, though, in the mother-country, centuries passed before a town of like size developed a like agency.

CHAPTER 5

SOCIAL FUNCTIONS

Changes of structures cannot occur without changes of functions. Much that was said in the last chapter might, therefore, be said here with substituted terms. Indeed, as in societies many changes of structure are more indicated by changes of function than directly seen, it may be said that these last have been already described by implication.

There are, however, certain functional traits not manifestly implied by traits of structure. To these a few pages must be devoted.

If organization consists in such a construction of the whole that its parts can carry on mutually dependent actions, then in proportion as organization is high there must go a dependence of each part upon the rest so great that separation is fatal; and conversely. This truth is equally well shown in the individual organism and in the social organism.

The lowest animal-aggregates are so constituted that each portion, similar to every other in appearance, carries on similar actions, and here spontaneous or artificial separation interferes scarcely at all with the life of either separated portion. When the faintly differentiated speck of protoplasm forming a rhizopod is accidently divided, each division goes on as before. So, too, is it with those aggregates of the second order in which the components remain substantially alike. The ciliated monads clothing the horny fibers of a living sponge need one another's aid so little that, when the sponge is cut in two, each half carries on its processes without interruption. Even where some unlikeness has arisen among the units, as in the familiar polyp, the perturbation caused by division is but temporary: the two or more portions resulting need only a little time for the units to rearrange themselves into fit forms before resuming their ordinary simple actions.

The like happens for the like reason with the lowest social aggregates. A headless wandering group of primitive men divides without any inconvenience. Each man, at once warrior, hunter, and maker of his own weapons, hut, etc., with a squaw who has in every case the like drudgeries to carry on, needs concert with his fellows only in war and to some extent in the chase, and, except for fighting, concert with half the tribe is as good as concert with the whole. Even where the slight differentiation implied by chieftainship exists, little inconvenience results from voluntary or enforced separation. Either before or after a part of the tribe migrates, some man becomes head, and such low social life as is possible recommences.

With highly organized aggregates of either kind it is very different. We cannot cut a mammal in two without causing immediate death. Twisting off the head of a fowl is fatal. Not even a reptile, though it may survive the loss of its tail, can live when its body is divided. And among annulose creatures it similarly happens that though in some inferior genera bisection does not kill either half, it kills both in an insect, an arachnid, or a crustacean.

If in high societies the effect of mutilation is less than in high animals, still it is great. Middlesex separated from its surroundings would in a few days have all its social processes stopped by lack of supplies. Cut off the cotton-district from Liverpool and other ports and there would come arrest of its industry followed by mortality of its people. Let a division be made between the coal-mining populations and adjacent populations which smelt metals or make broadcloth by machinery, and both, forthwith dying socially by arrest of their actions, would begin to die individually. Though when a civilized society is so divided that part of it is left without a central controlling agency it may presently evolve one, yet there is meanwhile much risk of dissolution, and before reorganization is efficient, a long period of disorder and weakness must be passed through.

So that the consensus of functions becomes closer as evolution advances. In low aggregates, both individual and social, the actions of the parts are but little dependent on one another, whereas in developed aggregates of both kinds that combination of actions which constitutes the life of the whole makes possible the component actions which constitute the lives of the parts.

Another corollary, manifest a priori and proved a posteriori, must be named. Where parts are little differentiated they can readily perform one another's functions, but where much differentiated they can perform one another's functions very imperfectly, or not at all.

Again the common polyp furnishes a clear illustration. One of these sack-shaped creatures admits of being turned inside out, so that the skin becomes stomach and the stomach becomes skin, each thereupon beginning to do the work of the other. The higher we rise in the scale of organization the less practicable do we find such exchanges. Still, to some extent, substitutions of functions remain possible in highly developed creatures. Even in man the skin shows a trace of its original absorptive power, now monopolized by the alimentary canal: it takes into the system certain small amounts of matter rubbed on to it. Such vicarious actions are, however, most manifest between parts having functions that are still allied. If, for instance, the bile-excreting function of the liver is impeded, other excretory organs, the kidneys and the skin, become channels through which bile is got rid of. If a cancer in the esophagus prevents swallowing, the arrested food, dilating the esophagus, forms a pouch in which imperfect

digestion is set up. But these small abilities of the differentiated parts to discharge one another's duties are not displayed where they have diverged more widely. Though mucous membrane, continuous with skin at various orifices, will, if everted, assume to a considerable extent the characters and powers of skin, yet serous membrane will not; nor can bone or muscle undertake, for any of the viscera, portions of their functions if they fail.

In social organisms, low and high, we find these relatively great and relatively small powers of substitution. Of course, where each member of the tribe repeats every other in his mode of life, there are no unlike functions to be exchanged; and where there has arisen only that small differentiation implied by the barter of weapons for other articles, between one member of the tribe skilled in weapon-making and others less skilled, the destruction of this specially-skilled member entails no great evil, since the rest can severally do for themselves that which he did for them, though not quite so well. Even in settled societies of considerable sizes we find the like holds to a great degree. Of the ancient Mexicans, Zurita says, "Every Indian knows all handicrafts which do not require great skill or delicate instruments" [1840, p. 183], and in Peru each man "was expected to be acquainted with the various handicrafts essential to domestic comfort" [Prescott 1847, I, 138]: the parts of the societies were so slightly differentiated in their occupations that assumption of one another's occupations remained practicable.

But in societies like our own, specialized industrially and otherwise in high degrees, the actions of one part which fails in its function cannot be assumed by other parts. Even the relatively unskilled farm laborers, were they to strike, would have their duties very inadequately performed by the urban population; and our iron manufactures would be stopped if their trained artisans, refusing to work, had to be replaced by peasants or hands from cotton factories. Still less could the higher functions, legislative, judicial, etc., be effectually performed by coal miners and navvies.

Evidently the same reason for this contrast holds in the two cases. In proportion as the units forming any part of an individual organism are limited to one kind of action, as that of absorbing, or secreting, or contracting, or conveying an impulse, and become adapted to that action, they lose adaptation to other actions; and in the social organism the discipline required for effectually discharging a special duty causes unfitness for discharging special duties widely unlike it.

Beyond these two chief functional analogies between individual organisms and social organisms, that when they are little evolved, division or mutilation causes small inconvenience, but when they are much evolved it causes great perturbation or death, and that in low types of either kind the parts can assume one another's functions, but cannot in high types,

sundry consequent functional analogies might be enlarged on did space permit.

There is the truth that in both kinds of organisms the vitality increases as fast as the functions become specialized. In either case, before there exist structures severally adapted for the unlike actions, these are ill-performed and in the absence of developed appliances for furthering it, the utilization of one another's services is but slight. But along with advance of organization, every part, more limited in its office, performs its office better; the means of exchanging benefits become greater; each aids all, and all aid each with increasing efficiency; and the total activity we call life, individual or national, augments.

Much, too, remains to be said about the parallelism between the changes by which the functions become specialized, but this, along with other parallelisms, will best be seen on following out, as we will now do, the evolution of the several great systems of organs, individual and social, considering their respective structural and functional traits together.

CHAPTER 6

SYSTEMS OF ORGANS

The hypothesis of evolution implies a truth which was established independently of it – the truth that all animals, however unlike they finally become, begin their developments in like ways. The first structural changes, once passed through in common by divergent types, are repeated in the early changes undergone by every new individual of each type. Admitting some exceptions, chiefly among parasites, this is recognized as a general law.

This common method of development among individual organisms we may expect to find paralleled by some common method among social organisms, and our expectation will be verified.

In *First Principles* (§§ 149–152) and in the *Principles of Biology* (§§ 287–289) were described the primary organic differentiations which arise in correspondence with the primary contrast of conditions among the parts, as outer and inner. Neglecting earlier stages, let us pass to those which show us the resulting systems of organs in their simple forms.

The aggregated units composing the lowest coelenterate animal have become so arranged that there is an outer layer of them directly exposed to the surrounding medium with its inhabitants, and an inner layer lining the digestive cavity directly exposed only to the food. From units of the outer layer are formed those tentacles by which small creatures are caught, and those thread-cells, as they are called, whence are ejected minute weapons against invading larger creatures, while by units of the inner layer is poured out the solvent which prepares the food for that absorption afterwards effected by them, both for their own sustentation and for the sustentation of the rest. Here we have in its first stage the fundamental distinction which pervades the animal kingdom, between the external parts which deal with environing existences – earth, air, prey, enemies – and the internal parts which utilize for the benefit of the entire body the nutritious substances which the external parts have secured. . . .

Early stages which are in principle analogous, occur in the evolution of social organisms. When from low tribes entirely undifferentiated we pass to tribes next above them, we find classes of masters and slaves – masters who, as warriors, carry on the offensive and defensive activities and thus especially stand in relations to environing agencies, and slaves who carry on inner activities for the general sustentation, primarily of their masters and secondarily of themselves. Of course this contrast is at first vague.

Where the tribe subsists mainly on wild animals, its dominant men, being hunters as well as warriors, take a large share in procuring food, and such few captives as are made by war become men who discharge the less skilled and more laborious parts of the process of sustentation. But along with establishment of the agricultural state the differentiation grows more appreciable. Though members of the dominant class, superintending the labor of their slaves in the fields, sometimes join in it, yet the subject class is habitually the one immediately in contact with the food supply, and the dominant class, more remote from the food supply, is becoming directive only, with respect to internal actions, while it is both executive and directive with respect to external actions, offensive and defensive.

A society thus composed of two strata in contact, complicates by the rise of grades within each stratum. For small tribes the structure just described suffices, but where there are formed aggregates of tribes, necessarily having more-developed governmental and militant agencies, with accompanying more-developed industrial agencies supporting them, the higher and lower strata severally begin to differentiate internally. The superior class, besides minor distinctions which arise locally, originates everywhere a supplementary class of personal adherents who are mostly also warriors, while the inferior class begins to separate into bond and free. Various of the Malayo-Polynesian societies show us this stage. Among the East Africans, the Congo people, the Coast Negroes, the Inland Negroes, we find the same general subdivision — the king with his relatives, the class of chiefs, the common people, the slaves, of which the first two with their immediate dependents carry on the corporate actions of the society, and the second two those actions of a relatively-separate order which yield it all the necessaries of life.

In both individual and social organisms, after the outer and inner systems have been marked off from one another, there begins to arise a third system, lying between the two and facilitating their cooperation. Mutual dependence of the primarily-contrasted parts implies intermediation, and in proportion as they develop, the apparatus for exchanging products and influences must develop too. This we find it does.

In the low coelenterate animal first described, consisting of inner and outer layers with intervening protoplasm, the nutritive matter which members of the inner layer have absorbed from prey caught by members of the outer layer is transmitted almost directly to these members of the outer layer. Not so, however, in the superior type. Between the double-layered body wall and the double-layered alimentary cavity there is now a partially separate perivisceral sac, and this serves as a reservoir for the digested matters from which the surrounding tissues take up their shares of prepared food. Here we have the rudiment of a distributing system. Higher in the

animal series, as in *Mollusca*, this perivisceral sac, quite shut off, has ramifications running throughout the body, carrying nutriment to its chief organs, and in the central part of the sac is a contractile tube which, by its occasional pulses, causes irregular movements in the nutritive fluid. Further advances are shown by the lengthening and branching of this tube, until, dividing and subdividing, it becomes a set of blood vessels, while its central part becomes a heart. As this change progresses, the nutriment taken up by the alimentary structures is better distributed by these vascular structures to the outer and inner organs in proportion to their needs. Evidently this distributing system must arise between the two pre-existing systems, and it necessarily ramifies in proportion as the parts to which it carries materials become more remote, more numerous, and severally more complex.

The like happens in societies. The lowest types have no distributing systems — no roads or traders exist. The two original classes are in contact. Any slaves possessed by a member of the dominant class stand in such direct relation to him that the transfer of products takes place without intervening persons; and each family being self-sufficing, there need [be] no agents through whom to effect exchanges of products between families. Even after these two primary divisions become partially subdivided, we find that so long as the social aggregate is a congeries of tribes severally carrying on within themselves the needful productive activities, a distributing system is scarcely traceable; occasional assemblings for barter alone occur. But as fast as consolidation of such tribes makes possible the localization of industries, there begins to show itself an appliance for transferring commodities consisting now of single hawkers, now of traveling companies of traders, and growing with the formation of roads into an organized system of wholesale and retail distribution which spreads everywhere.

There are, then, parallelisms between these three great systems in the two kinds of organisms. Moreover, they arise in the social organism in the same order as in the individual organism and for the same reasons.

A society lives by appropriating matters from the earth — the mineral matters used for buildings, fuel, etc., the vegetal matters raised on its surface for food and clothing, the animal matters elaborated from these with or without human regulation; and the lowest social stratum is the one through which such matters are taken up and delivered to agents who pass them into the general current of commodities, the higher part of this lowest stratum being that which, in workshops and factories, elaborates some of these materials before they go to consumers. Clearly, then, the classes engaged in manual occupations play the same part in the function of social sustentation as is played by the components of the alimentary organs in the sustentation of a living body.

No less certain is it that the entire class of men engaged in buying and selling commodities of all kinds, on large and small scales, and in sending them along gradually-formed channels to all districts, towns, and individuals, so enabling them to make good the waste caused by action, is, along with those channels, fulfilling an office essentially like that fulfilled in a living body by the vascular system, which, to every structure and every unit of it, brings a current of nutritive matters proportionate to its activity. And it is equally manifest that while in the living body, the brain, the organs of sense, and the limbs guided by them, distant in position from the alimentary surfaces, are fed through the tortuous channels of the vascular system, so the controlling parts of a society, most remote from the operative parts, have brought to them through courses of distribution often extremely indirect, the needful supplies of consumable articles.

That the order of evolution is necessarily the same in the two cases is just as clear. In a creature which is both very small and very inactive, like a hydra, direct passage of nutriment from the inner layer to the outer layer by absorption suffices. But in proportion as the outer structures, becoming more active, expend more, simple absorption from adjacent tissues no longer meets the resulting waste and in proportion as the mass becomes larger, and the parts which prepare nutriment consequently more remote from the parts which consume it, there arises the need for a means of transfer. Until the two original systems have been marked off from one another, this tertiary system has no function; and when the two original systems arise, they cannot develop far without corresponding development of this tertiary system.

In the evolution of the social organism we see the like. Where there exist only a class of masters and a class of slaves, in direct contact, an appliance for transferring products has no place; but a larger society having classes exercising various regulative functions, and localities devoted to different industries, not only affords a place for a transferring system, but can grow and complicate only on condition that this transferring system makes proportionate advances. . . .

CHAPTER 7

THE REGULATING SYSTEM

When observing how the great systems of organs, individual and social, are originally marked off from one another, we recognized the truth that the inner and outer parts become respectively adapted to those functions which their respective positions necessitate — the one having to deal with environing actions and agents, the other having to use internally placed materials. . . . We have now to see how the evolution of the structures carrying on outer actions is determined by the characters of things existing around.

Stated in a more concrete form, the general fact to be here set forth is that while the alimentary systems of animals and the industrial systems of societies are developed into fitness for dealing with the substances, organic and inorganic, used for sustentation, the regulating and expending systems (nervo-motor in the one, and governmental-military in the other) are developed into fitness for dealing with surrounding organisms, individual or social — other animals to be caught or escaped from, hostile societies to be conquered or resisted. In both cases that organization which fits the aggregate for acting as a whole in conflict with other aggregates, indirectly results from the carrying on of conflicts with other aggregates.

To be slow of speed is to be caught by an enemy; to be wanting in swiftness is to fail in catching prey, death being in either case the result. Sharp sight saves the herbivorous animal from a distant carnivore, and is an essential aid to the eagle's successful swoop on a creature far below. Obviously it is the same with quickness of hearing and delicacy of scent; the same with all improvements of limbs that increase the power, the agility, the accuracy of movements; the same with all appliances for attack and defense — claws, teeth, horns, etc. And equally true must it be that each advance in that nervous system which, using the information coming through the senses, excites and guides these external organs, becomes established by giving an advantage to its possessor in presence of prey, enemies and competitors. On glancing up from low types of animals having but rudimentary eyes and small powers of motion, to high types of animals having wide vision, considerable intelligence, and great activity, it becomes undeniable that where loss of life is entailed on the first of these defects, life is preserved in the last by these superiorities. The implication, then, is that successive improvements of the organs of sense and motion, and of the internal coordinating apparatus which uses them, have indir-

ectly resulted from the antagonisms and competitions of organisms with one another.

A parallel truth is disclosed on watching how there evolves the regulating system of a political aggregate, and how there are developed those appliances for offense and defense put in action by it. Everywhere the wars between societies originate governmental structures, and are causes of all such improvements in those structures as increase the efficiency of corporate action against environing societies. Observe, first, the conditions under which there is an absence of this agency furthering combination, and then observe the conditions under which this agency begins to show itself.

Where food is scarce, diffusion great, and cooperation consequently hindered, there is no established chieftainship. The Fuegians, the Cayaguas or Wood-Indians of South America, the Jungle-Veddas of Ceylon, the Bushmen of South Africa, are instances. They do not form unions for defense, and have no recognized authorities: personal predominance of a temporary kind, such as tends to arise in every group, being the only approach to it. So of the Eskimos, necessarily much scattered, Hearne says, "they live in a state of perfect freedom; no one apparently claiming the superiority over, or acknowledging the least subordination to, another" [1795, p. 161], joined with which fact stands the fact that they do not know what war means. In like manner where barrenness of territory negatives anything more than occasional assemblings, as with the Chippewyans, there is nothing like chieftainship beyond the effect due to character, and this is very small. . . .

But it is not only in cases like these that governmental coordination is absent. It is absent also among tribes which are settled and considerably more advanced, provided they are not given to war. Among such Papuans as the Arafuras and the Dalrymple Islanders, there are but nominal chiefs, the people living "in such peace and brotherly love with one another" that they need no control but the decisions of their elders [Kolff 1840, p. 161]. The Todas, too, wholly without military organization, and described as peaceable, mild, friendly, have no political headships [Marshall 1873, pp. 41–5; Shortt 1868, p. 241] . . .

Now observe how the headless state is changed and political coordination initiated. Edwards says the Caribs in time of peace admitted no supremacy but, he adds, "in war, experience had taught them that subordination was as requisite as courage" [1801–19, I, 49]. So, too, describing the confederations of tribes among the Caribs, Humboldt compares them with "those warlike hordes who see no advantage in the ties of society but for common defence" [1852–53, III, 89]. Of the Creeks, whose subordination to authority is but slight, Schoolcraft says, "it would be difficult, if not impossible, to impress on the community at large the necessity of any social

compact, that should be binding upon it longer than common danger threatened them" [1853–56, V, 279]. Again, Bonwick says: "Chieftains undoubtedly did exist among the Tasmanians, though they were neither hereditary nor elective. They were, nevertheless, recognized, especially in time of war, as leaders of the tribes. . . . After the cessation of hostilities they retired . . . to the quietude of everyday forest life" [1870, p. 81].

In other cases we find a permanent change produced. Kotzebue says the Kamchadals "acknowledged no chief" [1830, II, 13], while another statement is that the principal authority was that of "the old men, or those who were remarkable for their bravery" [Krasheninnikov 1764, p. 175]. And then it is remarked that these statements refer to the time before the Russian conquest — before there has been combined opposition to an enemy. This development of simple headship in a tribe by conflict with other tribes we find advancing into compound headship along with larger antagonisms of race with race. Of the Patagonians Falkner tells us that though the tribes "are at continual variance among themselves, yet they often join together against the Spaniards" [1774, p. 123]. It was the same with the North American Indians. The confederacy of the six nations, which cohered under a settled system of cooperation, resulted from a war with the English. Stages in the genesis of a compound controlling agency by conflict with other societies are shown us by the Polynesians. In Samoa eight or ten village communities, which are in other respects independent,

> "unite by common consent, and form a district, or state, for mutual protection. . . . When war is threatened by another district, no single village can act alone; . . . Some of these districts or states have their king; others cannot agree on the choice of one; . . . there is no such thing as a king, or even a district, whose power extends all over the group." Yet in case of war, they sometimes combine in twos or three [Turner 1861, pp. 287, 291].

Early histories of the civilized similarly show us how union of smaller social aggregates for offensive or defensive purposes, necessitating coordination of their actions, tends to initiate a central coordinating agency. Instance the Hebrew monarchy: the previously-separate tribes of Israelites became a nation subordinate to Saul and David during wars with the Moabites, Ammonites, Edomites and Philistines. Instance the case of the Greeks: the growth of the Athenian hegemony into mastership, and the organization, political and naval, which accompanied it, was a concomitant of the continued activity of the confederacy against external enemies. Instance in later times the development of governments among Teutonic peoples. At the beginning of the Christian era there were only chieftainships of separate tribes and, during wars, temporary greater chieftainships of allied forces. Between the first and the fifth centuries the federations made to resist or invade the Roman empire did not evolve permanent heads, but in the fifth century the prolonged military activities of these federations