

YOUTH

ITS EDUCATION, REGIMEN, AND HYGIENE

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PREFACE

I have often been asked to select and epitomize the practical and especially the pedagogical conclusions of my large volumes on Adolescence, published in 1904, in such form that they may be available at a minimum cost to parents, teachers, reading circles, normal schools, and college classes, by whom even the larger volumes have been often used. This, with the coöperation of the publishers and with the valuable aid of Superintendent C.N. Kendall of Indianapolis, I have tried to do, following in the main the original text, with only such minor changes and additions as were necessary to bring the topics up to date, and adding a new chapter on moral and religions education. For the scientific justification of my educational conclusions I must, of course, refer to the larger volumes. The last chapter is not in "Adolescence," but is revised from a paper printed elsewhere. I am indebted to Dr. Theodore L. Smith of Clark University for verification of all references, proof-reading, and many minor changes.

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CHAPTER I

PRE-ADOLESCENCE

Introduction: Characterization of the age from eight to twelve—The era of recapitulating the stages of primitive human development—Life close to nature—The age also for drill, habituation, memory, work and regermination—Adolescence superposed upon this stage of life, but very distinct from it.

The years from about eight to twelve constitute a unique period of human life. The acute stage of teething is passing, the brain has acquired nearly its adult size and weight, health is almost at its best, activity is greater and more varied than it ever was before or ever will be again, and there is peculiar endurance, vitality, and resistance to fatigue. The child develops a life of its own outside the home circle, and its natural interests are never so independent of adult influence. Perception is very acute, and there is great immunity to exposure, danger, accident, as well as to temptation. Reason, true morality, religion, sympathy, love, and esthetic enjoyment are but very slightly developed.

Everything, in short, suggests that this period may represent in the individual what was once for a very protracted and relatively stationary period an age of maturity in the remote ancestors of our race, when the young of our species, who were perhaps pygmoid, shifted for themselves independently of further parental aid. The qualities developed during pre-adolescence are, in the evolutionary history of the race, far older than hereditary traits of body and mind which develop later and which may be compared to a new and higher story built upon our primal nature. Heredity is so far both more stable and more secure. The elements of personality are few, but are well organised on a simple, effective plan. The momentum of these traits inherited from our indefinitely remote ancestors is great, and they are

often clearly distinguishable from those to be added later. Thus the boy is father of the man in a new sense, in that his qualities are indefinitely older and existed, well compacted, untold ages before the more distinctly human attributes were developed. Indeed there are a few faint indications of an earlier age node, at about the age of six, as if amid the instabilities of health we could detect signs that this may have been the age of puberty in remote ages of the past. I have also given reasons that lead me to the conclusion that, despite its dominance, the function of sexual maturity and procreative power is peculiarly mobile up and down the age-line independently of many of the qualities usually so closely associated with it, so that much that sex created in the phylum now precedes it in the individual.

Rousseau would leave prepubescent years to nature and to these primal hereditary impulses and allow the fundamental traits of savagery their fling till twelve. Biological psychology finds many and cogent reasons to confirm this view *if only a proper environment could be provided*. The child revels in savagery; and if its tribal, predatory, hunting, fishing, fighting, roving, idle, playing proclivities could be indulged in the country and under conditions that now, alas! seem hopelessly ideal, they could conceivably be so organized and directed as to be far more truly humanistic and liberal than all that the best modern school can provide. Rudimentary organs of the soul, now suppressed, perverted, or delayed, to crop out in menacing forms later, would be developed in their season so that we should be immune to them in maturer years, on the principle of the Aristotelian catharsis for which I have tried to suggest a far broader application than the Stagirite could see in his day.

These inborn and more or less savage instincts can and should be allowed some scope. The deep and strong cravings in the individual for those primitive experiences and occupations in which his ancestors became skilful through the pressure of necessity should not be ignored, but can and should be, at least partially, satisfied in a vicarious way, by tales from literature, history, and tradition which present the crude and primitive virtues of the heroes of the world's childhood. In this way, aided by his vivid visual imagination, the child may enter upon his heritage from the past, live out each stage of life to its fullest and realize in himself all its manifold tendencies. Echoes only of the vaster, richer life of the remote past of the race they must

remain, but just these are the murmurings of the only muse that can save from the omnipresent dangers of precocity. Thus we not only rescue from the danger of loss, but utilize for further psychic growth the results of the higher heredity, which are the most precious and potential things on earth. So, too, in our urbanized hothouse life, that tends to ripen everything before its time, we must teach nature, although the very phrase is ominous. But we must not, in so doing, wean still more from, but perpetually incite to visit, field, forest, hill, shore, the water, flowers, animals, the true homes of childhood in this wild, undomesticated stage from which modern conditions have kidnapped and transported him. Books and reading are distasteful, for the very soul and body cry out for a more active, objective life, and to know nature and man at first hand. These two staples, stories and nature, by these informal methods of the home and the environment, constitute fundamental education.

But now another remove from nature seems to be made necessary by the manifold knowledges and skills of our highly complex civilization. We should transplant the human sapling, I concede reluctantly, as early as eight, but not before, to the schoolhouse with its imperfect lighting, ventilation, temperature. We must shut out nature and open books. The child must sit on unhygienic benches and work the tiny muscles that wag the tongue and pen, and let all the others, which constitute nearly half its weight, decay. Even if it be prematurely, he must be subjected to special disciplines and be apprenticed to the higher qualities of adulthood; for he is not only a product of nature, but a candidate for a highly developed humanity. To many, if not most, of the influences here there can be at first but little inner response. Insight, understanding, interest, sentiment, are for the most part only nascent; and most that pertains to the true kingdom of mature manhood is embryonic. The wisest requirements seem to the child more or less alien, arbitrary, heteronomous, artificial, falsetto. There is much passivity, often active resistance and evasion, and perhaps spasms of obstinacy, to it all. But the senses are keen and alert, reactions immediate and vigorous; and the memory is quick, sure and lasting; and ideas of space, time, and physical causation, and of many a moral and social licit and non-licit, are rapidly unfolding. Never again will there be such susceptibility to drill and discipline, such plasticity to habituation, or such ready adjustment to new conditions. It is the age of external and mechanical

training. Reading, writing, drawing, manual training, musical technic, foreign tongues and their pronunciations, the manipulation of numbers and of geometrical elements, and many kinds of skill have now their golden hour; and if it passes unimproved, all these can never be acquired later without a heavy handicap of disadvantage and loss. These necessities may be hard for the health of body, sense, mind, as well as for morals; and pedagogic art consists in breaking the child into them betimes as intensely and as quickly as possible with minimal strain and with the least amount of explanation or coquetting for natural interest, and in calling medicine confectionery. This is not teaching in its true sense so much as it is drill, inculcation, and regimentation. The method should be mechanical, repetitive, authoritative, dogmatic. The automatic powers are now at their very apex, and they can do and bear more than our degenerate pedagogy knows or dreams of. Here we have something to learn from the schoolmasters of the past back to the middle ages, and even from the ancients. The greatest stress, with short periods and few hours, incessant insistence, incitement, and little reliance upon interest, reason or work done without the presence of the teacher, should be the guiding principles for pressure in these essentially formal and, to the child, contentless elements of knowledge. These should be sharply distinguished from the indigenous, evoking, and more truly educational factors described in the last paragraph, which are meaty, content-full, and relatively formless as to time of day, method, spirit, and perhaps environment and personnel of teacher, and possibly somewhat in season of the year, almost as sharply as work differs from play, or perhaps as the virility of man that loves to command a phalanx, be a martinet and drill-master, differs from femininity which excels in persuasion, sympathetic insight, story-telling, and in the tact that discerns and utilizes spontaneous interests in the young.

Adolescence is a new birth, for the higher and more completely human traits are now born. The qualities of body and soul that now emerge are far newer. The child comes from and harks back to a remoter past; the adolescent is neo-atavistic, and in him the later acquisitions of the race slowly become prepotent. Development is less gradual and more saltatory, suggestive of some ancient period of storm and stress when old moorings were broken and a higher level attained. The annual rate of growth in height, weight, and strength is

increased and often doubled, and even more. Important functions, previously non-existent, arise. Growth of parts and organs loses its former proportions, some permanently and some for a season. Some of these are still growing in old age and others are soon arrested and atrophy. The old measures of dimensions become obsolete, and old harmonies are broken. The range of individual differences and average errors in all physical measurements and all psychic tests increases. Some linger long in the childish stage and advance late or slowly, while others push on with a sudden outburst of impulsion to early maturity. Bones and muscles lead all other tissues, as if they vied with each other; and there is frequent flabbiness or tension as one or the other leads. Nature arms youth for conflict with all the resources at her command—speed, power of shoulder, biceps, back, leg, jaw—strengthens and enlarges skull, thorax, hips, makes man aggressive and prepares woman's frame for maternity.

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CHAPTER II

THE MUSCLES AND MOTOR POWERS IN GENERAL

Muscles as organs of the will, of character and even of thought—The muscular virtues—Fundamental and accessory muscles and functions—The development of the mind and of the upright position—Small muscles as organs of thought—School lays too much stress upon these—Chorea—vast numbers of automatic movements in children—Great variety of spontaneous activities—Poise, control and spurtiness—Pen and tongue wagging—Sedentary school life vs free out-of-door activities—Modern decay of muscles, especially in girls—Plasticity of motor habits at puberty.

The muscles are by weight about forty-three per cent. of the average adult male human body. They expend a large fraction of all the kinetic energy of the adult body, which a recent estimate places as high as one-fifth. The cortical centers for the voluntary muscles extend over most of the lateral psychic zones of the brain, so that their culture is brain building. In a sense they are organs of digestion, for which function they play a very important rôle. Muscles are in a most

intimate and peculiar sense the organs of the will. They have built all the roads, cities, and machines in the world, written all the books, spoken all the words, and, in fact, done everything that man has accomplished with matter. If they are undeveloped or grow relaxed and flabby, the dreadful chasm between good intentions and their execution is liable to appear and widen. Character might be in a sense defined as a plexus of motor habits. To call conduct three-fourths of life, with Matthew Arnold; to describe man as one-third intellect and two-thirds will, with Schopenhauer; to urge that man is what he does or that he is the sum of his movements, with F.W. Robertson; that character is simply muscle habits, with Maudsley; that the age of art is now slowly superseding the age of science, and that the artist will drive out with the professor, with the anonymous author of "Rembrandt als Erzicher";[1] that history is consciously willed movements, with Bluntschli; or that we could form no conception of force or energy in the world but for our own muscular effort; to hold that most thought involves change of muscle tension as more or less integral to it—all this shows how we have modified the antique Ciceronian conception *vivere est cogitari*, [To live is to think] to *vivere est velle*, [To live is to will] and gives us a new sense of the importance of muscular development and regimen.[2]

Modern psychology thus sees in muscles organs of expression for all efferent processes. Beyond all their demonstrable functions, every change of attention and of psychic states generally plays upon them unconsciously, modifying their tension in subtle ways so that they may be called organs of thought and feeling as well as of will, in which some now see the true Kantian thing-in-itself the real substance of the world, in the anthropomorphism of force. Habits even determine the deeper strata of belief; thought is repressed action; and deeds, not words, are the language of complete men. The motor areas are closely related and largely identical with the psychic, and muscle culture develops brain-centers as nothing else yet demonstrably does. Muscles are the vehicles of habituation, imitation, obedience, character, and even of manners and customs. For the young, motor education is cardinal, and is now coming to due recognition; and, for all, education is incomplete without a motor side. Skill, endurance, and perseverance may almost be called muscular virtues; and fatigue, velleity, caprice, *ennui*, restlessness, lack of control and poise, muscular faults.

To understand the momentous changes of motor functions that characterize adolescence we must consider other than the measurable aspects of the subject. Perhaps the best scale on which to measure all normal growth of muscle structure and functions is found in the progress from fundamental to accessory. The former designates the muscles and movements of the trunk and large joints, neck, back, hips, shoulders, knees, and elbows, sometimes called central, and which in general man has in common with the higher and larger animals. Their activities are few, mostly simultaneous, alternating and rhythmic, as of the legs in walking, and predominate in hard-working men and women with little culture or intelligence, and often in idiots. The latter or accessory movements are those of the hand, tongue, face, and articulatory organs, and these may be connected into a long and greatly diversified series, as those used in writing, talking, piano-playing. They are represented by smaller and more numerous muscles, whose functions develop later in life and represent a higher standpoint of evolution. These smaller muscles for finer movements come into function later and are chiefly associated with psychic activity, which plays upon them by incessantly changing their tensions, if not causing actual movement. It is these that are so liable to disorder in the many automatisms and choreic tics we see in school children, especially if excited or fatigued. General paralysis usually begins in the higher levels by breaking these down, so that the first symptom of its insidious and never interrupted progress is inability to execute the more exact and delicate movements of tongue or hand, or both. Starting with the latest evolutionary level, it is a devolution that may work downward till very many of the fundamental activities are lost before death.

Nothing better illustrates this distinction than the difference between the fore foot of animals and the human hand. The first begins as a fin or paddle or is armed with a hoof, and is used solely for locomotion. Some carnivora with claws use the fore limb also for holding well as tearing, and others for digging. Arboreal life seems to have almost created the simian hand and to have wrought a revolution in the form and use of the forearm and its accessory organs, the fingers. Apes and other tree-climbing creatures must not only adjust their prehensile organ to a wide variety of distances and sizes of branches, but must use the hands more or less freely for picking, transporting, and eating fruit; and this has probably been a prime factor in lifting

man to the erect position, without which human intelligence as we know it could have hardly been possible. "When we attempt to measure the gap between man and the lower animals in terms of the form of movement, the wonder is no less great than when we use the term of mentality." [3] The degree of approximation to human intelligence in anthropoid animals follows very closely the degree of approximation to human movements.

The gradual acquirement of the erect position by the human infant admirably repeats this long phylogenetic evolution. [4] At first the limbs are of almost no use in locomotion, but the fundamental trunk muscles with those that move the large joints are more or less spasmodically active. Then comes creeping, with use of the hip muscles, while all below the knee is useless, as also are the fingers. Slowly the leg and foot are degraded to locomotion, slowly the great toe becomes more limited in its action, the thumb increases in flexibility and strength of opposition, and the fingers grow more mobile and controllable. As the body slowly assumes the vertical attitude, the form of the chest changes till its greatest diameter is transverse instead of from front to back. The shoulder-blades are less parallel than in quadrupeds, and spread out till they approximate the same plane. This gives the arm freedom of movement laterally, so that it can be rotated one hundred and eighty degrees in man as contrasted to one hundred degrees in apes, thus giving man the command of almost any point within a sphere of which the two arms are radii. The power of grasping was partly developed from and partly added to the old locomotor function of the fore limbs; the jerky aimless automatism, as well as the slow rhythmic flexion and extension of the fingers and hand, movements which are perhaps survivals of arboreal or of even earlier aquatic life, are coordinated; and the bilateral and simultaneous rhythmic movements of the heavier muscles are supplemented by the more finely adjusted and specialized activities which as the end of the growth period is approached are determined less by heredity and more by environment. In a sense, a child or a man is the sum total of his movements or tendencies to move; and nature and instinct chiefly determine the basal, and education the accessory parts of our activities.

The entire accessory system is thus of vital importance for the

development of all of the arts of expression. These smaller muscles might almost be called organs of thought. Their tension is modified with the faintest change of soul, such as is seen in accent, inflection, facial expressions, handwriting, and many forms of so-called mind-reading, which, in fact, is always muscle-reading. The day-laborer of low intelligence, with a practical vocabulary of not over five hundred words, who can hardly move each of his fingers without moving others or all of them, who can not move his brows or corrugate his forehead at will, and whose inflection is very monotonous, illustrates a condition of arrest or atrophy of this later, finer, accessory system of muscles. On the other hand, the child, precocious in any or all of these later respects, is very liable to be undeveloped in the larger and more fundamental parts and functions. The full unfoldment of each is, in fact, an inexorable condition precedent for the normal development to full and abiding maturity of the higher and more refined muscularity, just as conversely the awkwardness and clumsiness of adolescence mark a temporary loss of balance in the opposite direction. If this general conception be correct, then nature does not finish the basis of her pyramid in the way Ross, Mercier, and others have assumed, but lays a part of the foundation and, after carrying it to an apex, normally goes back and adds to the foundation to carry up the apex still higher and, if prevented from so doing, expends her energy in building the apex up at a sharper angle till instability results. School and kindergarten often lay a disproportionate strain on the tiny accessory muscles, weighing altogether but a few ounces, that wag the tongue, move the pen, and do fine work requiring accuracy. But still at this stage prolonged work requiring great accuracy is irksome and brings dangers homologous to those caused by too much fine work in the kindergarten before the first adjustment of large to small muscles, which lasts until adolescence, is established. Then disproportion between function and growth often causes symptoms of chorea. The chief danger is arrest of the development and control of the smaller muscles. Many occupations and forms of athletics, on the contrary, place the stress mainly upon groups of fundamental muscles to the neglect of finer motor possibilities. Some who excel in heavy athletics no doubt coarsen their motor reactions, become not only inexact and heavy but unresponsive to finer stimuli, as if the large muscles were hypertrophied and the small ones arrested. On the other hand, many young men, and probably more young women, expend too little of their available active energy upon basal and

massive muscle work, and cultivate too much, and above all too early, the delicate responsive work. This is, perhaps, the best physiological characterization of precocity and issues in excessive nervous and muscular irritability. The great influx of muscular vigor that unfolds during adolescent years and which was originally not only necessary to successful propagation, but expressive of virility, seems to be a very plastic quantity, so that motor regimen and exercise at this stage is probably more important and all-conditioning for mentality, sexuality, and health than at any other period of life. Intensity, and for a time a spurty diathesis, is as instinctive and desirable as are the copious minor automatisms which spontaneously give the alphabet out of which complex and finer motor series are later spelled by the conscious will. Mercier and others have pointed out that, as most skilled labor, so school work and modern activities in civilized life generally lay premature and disproportionate strains upon those kinds of movement requiring exactness. Stress upon basal movements is not only compensating but is of higher therapeutic value against the disorders of the accessory system; it constitutes the best core or prophylactic for fidgets and tense states, and directly develops poise, control, and psycho-physical equilibrium. Even when contractions reach choreic intensity the best treatment is to throw activities down the scale that measures the difference between primary and secondary movements and to make the former predominate.

The number of movements, the frequency with which they are repeated, their diversity, the number of combinations, and their total kinetic quantum in young children, whether we consider movements of the body as a whole, fundamental movements of large limbs, or finer accessory motions, is amazing. Nearly every external stimulus is answered by a motor response. Dresslar[5] observed a thirteen months' old baby for four hours, and found, to follow Preyer's classification, impulsive or spontaneous, reflex, instinctive, imitative, inhibitive, expressive, and even deliberative movements, with marked satisfaction in rhythm, attempts to do almost anything which appealed to him, and almost inexhaustible efferent resources. A friend has tried to record every word uttered by a four-year-old girl during a portion of a day, and finds nothing less than verbigerations. A teacher noted the activities of a fourteen-year-old boy during the study time of a single school day[6], with similar results.

Lindley[7] studied 897 common motor automatisms in children, which he divided into 92 classes: 45 in the region of the head, 20 in the feet and legs, 19 in the hands and fingers. Arranged in the order of frequency with which each was found, the list stood as follows: fingers, feet, lips, tongue, head, body, hands, mouth, eyes, jaws, legs, forehead, face, arms, ears. In the last five alone adolescents exceeded children, the latter excelling the former most in those of head, mouth, legs, and tongue, in this order. The writer believes that there are many more automatisms than appeared in his returns.

School life, especially in the lower grades, is a rich field for the study of these activities. They are familiar, as licking things, clicking with the tongue, grinding the teeth, scratching, tapping, twirling a lock of hair or chewing it, biting the nails (Bérillon's onychophagia), shrugging, corrugating, pulling buttons or twisting garments, strings, etc., twirling pencils, thumbs, rotating, nodding and shaking the head, squinting and winking, swaying, pouting and grimacing, scraping the floor, rubbing hands, stroking, patting, flicking the fingers, wagging, snapping the fingers, muffling, squinting, picking the face, interlacing the fingers, cracking the joints, finger plays, biting and nibbling, trotting the leg, sucking things, etc.

The average number of automatisms per 100 persons Smith found to be in children 176, in adolescents 110. Swaying is chiefly with children; playing and drumming with the fingers is more common among adolescents; the movements of fingers and feet decline little with age, and those of eyes and forehead increase, which is significant for the development of attention. Girls excel greatly in swaying, and also, although less, in finger automatism; and boys lead in movements of tongue, feet, and hands. Such movements increase, with too much sitting, intensity of effort, such as to fix attention, and vary with the nature of the activity willed, but involve few muscles directly used in a given task. They increase up the kindergarten grades and fall off rapidly in the primary grades; are greater with tasks requiring fine and exact movements than with those involving large movements. Automatisms are often a sign of the difficulty of tasks. The restlessness that they often express is one of the commonest signs of fatigue. They are mostly in the accessory muscles, while those of the fundamental muscles (body, legs, and arms) disappear rapidly with age; those of eye, brow, and jaw show

greatest increase with age, but their frequency in general declines with growing maturity, although there is increased frequency of certain specialized contractions, which indicate the gradual settling of expression in the face.

Often such movements pass over by insensible gradation into the morbid automatism of chorea, and in yet lower levels of decay we see them in the aimless picking and plucking movements of the fingers of the sick. In idiots[8] arrest of higher powers often goes with hypertrophy of these movements, as seen in head-beaters (as if, just as nature impels those partially blind to rub the eyes for "light-hunger," so it prompts the feeble-minded to strike the head for cerebrations), rockers, rackers, shakers, biters, etc. Movements often pass to fixed attitudes and postures of limbs or body, disturbing the normal balance between flexors and extensors, the significance of which as nerve signs or exponents of habitual brain states and tensions Warner has so admirably shown.

Abundance and vigor of automatic movements are desirable, and even a considerable degree of restlessness is a good sign in young children. Many of what are now often called nerve signs and even choreic symptoms, the fidgetiness in school on cloudy days and often after a vacation, the motor superfluities of awkwardness, embarrassment, extreme effort, excitement, fatigue, sleepiness, etc., are simply the forms in which we receive the full momentum of heredity and mark a natural richness of the raw material of intellect, feeling, and especially of will. Hence they must be abundant. All parts should act in all possible ways at first and untrammelled by the activity of all other parts and functions. Some of these activities are more essential for growth in size than are later and more conscious movements. Here as everywhere the rule holds that powers themselves must be unfolded before the ability to check or even to use them can develop. All movements arising from spontaneous activity of nerve cells or centers must be made in order even to avoid the atrophy of disease. Not only so, but this purer kind of innateness must often be helped out to some extent in some children by stimulating reflexes; a rich and wide repertory of sensation must be made familiar; more or less and very guarded, watched and limited experiences of hunger, thirst, cold, heat, tastes, sounds, smells, colors, brightnesses, tactile irritations, and perhaps even occasional

tickling and pain to play off the vastly complex function of laughing, crying, etc., may in some cases be judicious. Conscious and unconscious imitation or repetition of every sort of copy may also help to establish the immediate and low-level connection between afferent and efferent processes that brings the organism into direct *rapport* and harmony with the whole world of sense. Perhaps the more rankly and independently they are developed to full functional integrity, each in its season, if we only knew that season, the better. Premature control by higher centers, or coördination into higher compounds of habits and ordered serial activities, is repressive and wasteful, and the mature will of which they are components, or which must at least domesticate them, is stronger and more forcible if this serial stage is not unduly abridged.

But, secondly, many, if not most, of these activities when developed a little, group after group, as they arise, must be controlled, checked, and organized into higher and often more serial compounds. The inhibiting functions are at first hard. In trying to sit still the child sets its teeth, holds the breath, clenches its fists and perhaps makes every muscle tense with a great effort that very soon exhausts. This repressive function is probably not worked from special nervous centers, nor can we speak with confidence of collisions with "sums of arrest" in a sense analogous to that of Herbart, or of stimuli that normally cause catabolic molecular processes in the cell, being mysteriously diverted to produce increased instability or anabolic lability in the sense of Wundt's *Mechanik der Nerven*. The concept now suggested by many facts is that inhibition is irradiation or long circuiting to higher and more complex brain areas, so that the energy, whether spontaneous or reflex, is diverted to be used elsewhere. These combinations are of a higher order, more remote from reflex action, and modified by some Jacksonian third level.[9] Action is now not from independent centers, but these are slowly associated, so that excitation may flow off from one point to any other and any reaction may result from any stimulus.

The more unified the brain the less it suffers from localization, and the lower is the level to which any one function can exhaust the whole. The tendency of each group of cells to discharge or overflow into those of lower tension than themselves increases as correspondence in time and space widens. The more one of a number of activities

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