

CURIOSITY AND INTEREST.¹

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In the study of the emotions as compared with other activities of the soul, psychology has as yet made little progress. In the older works of the Scotch school and in the Herbartian literature we find elaborate systems of classifying emotions, but of the study of the living emotions in their genesis, development and relation to other psychic factors, little or nothing. Since the publication of the theories of Lange and James, in 1890, we have had abundant discussion of the theories of emotion and some excellent introspective work, especially upon those emotions which have the greatest bodily resonance. In the study of the expression of emotion, Darwin stands almost alone. Experimentally, there have been since 1880 various attempts to study the emotions by observation of changes in blood pressure and circulation. The work of Mosso stands foremost in this field, but the² plethysmograph has not yet added greatly to our knowledge here. A few monographs on special emotions have been published during the last decade, and there is a considerable body of literature on the pathology of the emotions, but the field to be investigated is wide, and as yet the laborers have been few.

In studying the development of the mental attitude which we call curiosity, we are confronted by difficulties of both definition and analysis. In its fully developed form it is sufficiently easy of recognition, but to determine where and when reflex activities become merged into psychic reactions, which may properly be termed stages in the development of curiosity involves us, at once, in the intricacies of the problems of active and passive attention and the development of the will.

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² For summary of plethysmographic studies previous to 1896 see T. E. Shields, *Journal of Experimental Med.*, Vol. I, p. 1, 1896.

The material for the present study was gathered partly in reply to a group of topics contained in a syllabus on "Some Common Traits and Habits," issued in 1895, and partly by a supplementary syllabus of the present year. The data asked for was as follows:

Curiosity, wonders. Prying, spying, inquiring, asking why, what for, or how, persisting in troublesome questions. Describe the first sign of curiosity or wonder in the infant; sample the growth of the instinct by instances up toward maturity, whether manifested toward natural phenomena facts or persons seen, or read of, mechanisms, motives, religious teaching, treatment by parents and teachers, etc. Cases of breaking open toys to see what is inside, or experimenting "to see what it will do." Later promptings to see the world, know life, travel, read, explore, investigate, etc. What excites chief wonder. Secrecy as a provocative of curiosity. Age of culmination of the chief classes of interest. Utilization and dangers.

Curiosity and Interest. I. Give cases of early curiosity or interest shown by infants. State in detail how this was manifested.

II. Give cases of interest or curiosity in children, shown by active observation or experiment.

III. Give instances of destructive curiosity; toys, etc., destroyed to find out how they were made.

IV. Give cases of interest or curiosity shown by asking questions. Give instances of strong desire to travel. Did the interest in these cases extend to reading books of travel, etc.?

Total number of cases of curiosity, 1,227. These were distributed as follows:

I. Observation.

a Early stages of staring, 163 cases.

b Active observation, 108 "

271 " = 22.08 per cent.

II. Experiments, 78 " 6.35 "

III. Questions, 477 " 38.79 "

IV. Inquisitiveness, 69 " 5.62 "

V. Destructive curiosity, 332 " 27.08 "

1,227

To these were added the material furnished by the individual child biographies and records kept by mothers. Helen Keller's "Story of My Life," has also furnished some valuable material, and a few facts for comparison have been gleaned from animal psychology. All the material collected is readily classified into the groups given above, with the addition of a group, which for convenience has been called inquisitiveness, and includes the various forms of aimless and misdirected curiosity, peeking, prying, etc.

Ribot distinguishes three stages of curiosity or primitive craving for knowledge, surprise, wonder and curiosity; the first consisting of mere shock, a disadaptation. The second stage or wonder is distinguished from the first, in that, while surprise is

momentary and fleeting, wonder is stable, and may persist until worn away by familiarity. The third stage or attitude of investigation is that of curiosity proper. But there are indications that a fourth stage, preceding these three, should be recognized in the psychic accompaniment of some early reflexes. Preyer records this first stage of Ribot's as occurring in the fifth week, Mrs. Moore on the 26th day; Mrs. Hall notes it in the fifth week, and Miss Shinn on the 25th day. It is in each case a light reaction, the first active looking as compared with passive staring and is described as accompanied by a "dim rudimentary eagerness." But Miss Shinn also records that at about the end of the second week "the baby's gaze no longer wandered altogether helplessly, but rested with a long, contented gaze on bright surfaces which it happened to encounter. It was not active looking with any power to direct the eyes, but mere staring." In the material collected for this present study, 163 cases of this infant staring are reported, nearly one-half of which occurred under the age of three months. The earlier ones are all of the same type. Some bright or moving object seems to catch and hold the baby's gaze. There is no turning towards the object, no active looking, the eyes in their wandering unco-ordinated moments are simply arrested, and, in many instances, it is stated that there is a "contented" or "pleased" look on the baby's face. Light and darkness are distinguished, and moderate light appears to be for normal children a pleasurable sensation. Prof. Sully¹ suggests in regard to this first passive staring that "it is conceivable that the eyes happening to be co-ordinated opposite some patch of brightness might maintain this attitude under the stimulus of pleasure." Out of the dim, confused, mass of light and shade, something, probably a mere patch of brightness, has detached itself, and the physical mechanism of attention is called into play, a mere reflex, but a reflex whose psychic affective accompaniment, though rudimentary, has in it the germ of future development; the first movement of that intellectual craving which, more than any other endowment, differentiates one man from another in intellectual ability. In this connection a paragraph of Miss Shinn's is so significant that it is here quoted: "It is an important moment that marks the beginning of even a passive power to control the movement of the eyes, and when my grandmother handed down the rule that you should never needlessly interrupt a baby's staring lest you hinder the development of power of attention, she seems to have been psychologically sound."

¹Sully: Extracts from a Father's Diary in *Studies of Childhood*, p. 461.

It is now a recognized principle in the education of defective and feeble-minded children that the training of the motor apparatus of attention is the first and fundamental requisite for reaching the dormant psychic activities. Until a certain degree of muscular co-ordination has been attained, attention cannot be fixed long enough to produce any lasting psychic impressions.

While the infant is acquiring the power to converge the two eyes and move the lid, its eye falls a victim to any patch of light upon which it chances to rest. Often the body, or the eye itself, or more frequently the head, gives an involuntary lurch, and then the object of vision is so lost that it seems to cease to exist. Things that are fixated and drop, or move away, appear to vanish mysteriously, whereas, these same involuntary movements, on the other hand, may bring new objects so suddenly into the narrow field of vision as to cause a distinct shock or start or other impressions of surprise. So purely automatic, and as yet unassociated with touch, are these first optical impressions, that threatening movements toward the eye do not even cause the reflex action of a wink. The light-sense in the human infant is more independent of motor power because of the inability of the new born infant to move much. Could it co-ordinate its retinal impressions with motor innervations, this relatively prolonged independence of vision would not occur.¹ In this respect the condition of the feeble-minded child approximates that of the infant before it has acquired the control of its muscular organism. In studying the material collected by the questionnaire method, careful comparison has been made with the data contained in the few continuous records made by scientific observers. Samples of the questionnaire material are here given, and also a few of the points tabulated for comparison from the individual biographies.

EARLY STAGES OF VISUAL INTEREST.

M., 2 weeks. Looked round the room and often stared at one thing quite a while (not active looking).

M., 6 weeks. Examined his hands, turned his fingers over and over.

M., 5 weeks. "It was noticed that during the latter part of the second week the eyes lost their aimless look, and began to rest upon objects. In the third week, the child looked long and steadily at a bright red waist worn by his aunt, and a week later his eyes were always attracted by the striped ribbon of her hat."

M., 8 weeks. His mother held a bright flower up before him. He opened his eyes and mouth very wide, and bounced up and down.

M., 8 weeks. Lying in his aunt's lap, looked at some flowers, reaching out his hand for them.

¹See note on the Study of Children, *Pedagogical Seminary*. Vol. I, p. 130.

M., 3 mos. Will turn his head and move his eyebrows when he hears a noise.

M., 3 mos. Would look steadily at a bright Japanese parasol fastened to the ceiling. Also seemed to look at the fire.

M., 4 mos. A lady with a bright green bird in her hat leaned over the cradle. He seemed to notice it, and kept looking at it.

M., 5 mos. Seemed much attracted by a red dress.

M., 5 mos. Hearing a door open tried to raise himself. Failing, cried. Was lifted up and laughed. Later was laid down without complaint.

M., 5 mos. Would sit for a long time and watch the light. Would hold out its hands for a hat or veil.

F., 1 m. Stared intently at a patch of sunlight on the wall for several minutes; looked pleased.

F., 5 weeks. Stared at a lighted lamp, and expression changed when it was removed.

F., 3 weeks. Gazed at a white blanket thrown across the foot of the crib for several minutes. There was a different expression on her face, and her eyes were more widely open than usual.

F., 6 weeks. Occasional co-ordination of eyes and apparent fixation of gaze, since second week, always upon some brightly-illuminated surface. In 5th week followed movements of hair brush with the eyes for some time.

It will be noted that with the exception of interest in color there is, for the most part, no greater range of variation than might be expected from individual differences in development. From the 163 cases furnished by the questionnaires, and the six continuous records, the following conclusions have been drawn. The earliest form in which the mechanism of attention develops is in the sight reflex of passive staring, when the baby's gaze is, as it were, caught and held even for a few seconds. This seems to occur in some cases as early as the ninth day, though there are more records of this phenomena from the second week onward. This staring is to be distinguished from the aimless and unco-ordinated movements in which, though the eyes may rest upon or seem to follow an object momentarily, there is no continuous fixation and the co-ordination is purely accidental. The psychic accompaniment of this passive staring is probably the first step by which the baby begins its gropings toward an intellectual life. Whether the stimulus which holds the baby's gaze be pleasure, as Prof. Sully suggests, or whether there may enter into it, at times, a vague rudimentary fear as seems indicated in some of the cases reported, something has stirred in the psychic life and a distinct step toward the unfolding of dormant powers has been made. The next step is taken when the baby really looks and actively directs its gaze toward the interesting object. This commonly happens about the fourth or fifth week, though a few cases are reported in which the active looking has undoubtedly taken place considerably earlier. In these cases, however, the baby seems to have been equally precocious in other re-

spects. From this time onward, for the next three or four months, sight interests predominate in a baby's life. Of the 163 cases of interest occurring before the sixth month, 139 were

	Mere Sensi- bility to Light.	Passive Staring.	Attraction of first real looking gaze by motion.		Interest in color.	Full Accom- modation.
Miss Shinn	1st day	End of 2nd week	25th day	1 month	1 year	8 weeks
Preyer	"	11th day	23rd day	23rd day	23rd day	8 weeks
Tiedemann	"	—	13th day (?)	—	—	—
Mrs. Hall	"	End of 2nd week	28th day	32nd day	3rd week	8 weeks
Darwin	"	9th day	6th week	—	6th week	—
Mrs. Moore	2nd day	—	—	28th day	15th and 20th [day]	—

visual and only 24 auditory. This, however, does not show superior development of the sense of sight over hearing, as undoubtedly the baby hears and shows decided distaste for loud,

harsh or sudden sounds. The development is largely a psychic one, and the baby finds the sense of sight more useful than that of hearing in acquiring knowledge of his surroundings. While the objects which attract attention are varied, as may be seen from a reference to the samples from the returns, they are reducible to a few groups. All bright or moving objects, and anything presenting strong contrast of light and shade, whether in color or black and white, is attractive to a baby.

EXAMPLES OF EARLY VISUAL INTERESTS.

M., 5 weeks. Would lie a long time watching red paper flowers dance in the air. They were hung over his cradle.

F., 2 mos. Much interested in a bright red necktie at which she gazed intently, following it with her eyes when the wearer moved.

F., 3 mos. Gazed at a lighted lamp as if fascinated by it; became restless when turned away from and was quieted by being turned toward it.

F., 3 mos. Followed a bunch of red roses with her eyes, and when they were taken away gazed after them a long time.

M., 3 mos. Much interested in watching his own hands.

F., 3 mos. Sat and stared curiously at her father the first time he kissed her after having shaved off his beard.

M., 4 mos. Very much interested in U. S. flag; reached for it.

F., 4 mos. Appeared quite fascinated by hat with bright red flowers. Was also interested in red ball.

F., 5 mos. Lay quietly for fifteen minutes watching a glass chandelier which glittered.

F., 6 mos. Can almost always be amused with a hand mirror.

F., 6 mos. Interested in faces, especially if spectacles are worn.

M., 13 weeks. Interested in a bright red ribbon, pulled at it, tried to put it into his mouth and played with it for some time.

F., 6 mos. Interested in bright colors and surfaces; likes to listen to the piano.

F., 6 mos. Much interested in looking at strange people; would stop crying to look at a stranger.

M., 6 mos. So absorbed in watching another child of the same age that his attention could not be distracted.

F., 6 mos. Seemed quite excited over a hat with nodding white flowers, reached for it and looked disappointed when the hat was put out of sight.

M., 6 mos. Finds her grandmother's spectacles a fascinating object.

M., 7 mos. Gazed intently at a blue and white silk tie, reached for it and tried to get it into his mouth.

F., 7 mos. Delighted with lighted lamp. Smiles and moves her hands and feet eagerly.

M., 6 mos. Would watch any one who passed him as long as he could. Same child at 9 months would look fixedly at bright flowers.

F., 7 mos. Would lie contentedly watching her carriage parasol. It was lined with green and had a fringe which moved.

Every color except violet was mentioned as attractive, red being mentioned most frequently, but white had almost as many mentions, and the data furnish no positive indication as to whether color, brightness or contrast was the real stimulus. In the list of red objects which proved attractive are a red

lamp, red flowers, red and white necktie, red blanket, red hat and the American flag, but it is to be noted that in nearly every case either bright red was mentioned or contrast was involved, as in the United States flag and red and white necktie, or the object was luminous as the red lamp. The color sense of babies has not yet been experimentally tested and until it has been, inferences drawn from the apparent attractiveness of colored objects in which brightness, contrast, and motion may constitute the whole or a part of the stimulus, have little value. Preyer, it is true, mentions his child's interest and pleasure in a rose-colored curtain on the twenty-third day of its life, as a color interest, but careful and scientific as Preyer's observations usually were, in this case, he made no tests to discover whether any surface of equal illumination would not have proved equally pleasing, and Miss Shinn is correct in saying that there is no *proof* of color discrimination or interest within the first year. Hats with nodding flowers of any color, the glitter of spectacles or the radiance of a lighted lamp, all seem to possess a peculiar fascination for babies, but it is about the human face that interest centers and earliest recognitions cluster. During the first three months it is probable that this interest is due largely to differences in light and shade and to the constant changes produced by motion, recognition by sight being a development of the latter part of third month, according to the observations which can be classed as really scientific.

But though sight interests so largely predominate during the first four or five months of a baby's life the other senses are by no means excluded. Sounds are noticed within the first week of life though oftener as disagreeable than agreeable experiences, the first record of auditory impressions showing that they are often accompanied by a shock which, if not true fear, is, at least, the basis of what later develops into fear. Preyer's baby listened to the tones of a piano with evident pleasure in his eighth week, and Mrs. Moore's boy lay quietly for twenty minutes on the 20th day while some one was singing to him, though it is recorded that on the whole, his first month was characterized by lack of interest in sound. The earliest manifestations of pleasurable interest in sound seem to be chiefly of an inhibitory nature, the child ceasing to cry or lying still when interested in sound. From the 5th month onward there is a marked rise in auditory interests and these are, for the most part, mingled with the development of motor activities; the crackling and tearing of paper becomes an absorbing interest; some children love to touch the piano keys and are better satisfied with their own musical attempts than those of others; the ticking of a watch excites active curiosity as to where the sound comes from. Sight interests do not diminish

but they are supplemented by those of hearing and muscular activities, as the baby begins to co-ordinate things seen, heard, touched, tasted and smelled. Sully (Extracts from a Father's Diary) notes that in the 10th week the sound produced by striking a wine glass excited "an agreeable wonder" though the sound of the piano proved disconcerting. Later the child became fond of it and "evidenced his enjoyment by complete relaxation of the muscles." Inhibitory effects and muscular relaxation are more frequent modes of manifesting pleasure in sound than in sight, where the reaction is often shown by widely opened eyes, movements of the hands and feet, with, later, attempts to grasp the pleasing object, and looks of eagerness and desire. Thus it will be noted that, though muscles and skin sensations including temperature, are those earliest experienced, they do not form the chief centers of interest during the first months of a baby's life; the stage of muscle interest being distinctly later in development than those of sight and, even then, sight interests are not subordinated but co-ordinated with them. This acceleration of sight development beyond that of the senses, which genetically precede it, is undoubtedly due to its greater utility. In the case of hearing, as of sight, the material gathered by the questionnaire has been compared with the continuous records, and examples from both are given. It will be noticed that there is greater variation in the ages at which the different developments occur than in the case of sight. This is, in part, due to the fact that for the first eight weeks, at least, in sight, psychic developments keep pace with certain definite physical factors, which is not the case with hearing, the ability to hear being present from the first week although the psychic development comes later. It is interest in sound, which is later in development, and not the physical ability to hear. Early sensations of sounds are, in many cases, connected with either unpleasurable or negative feeling tones, Light-sensations if not too strong are of a pleasurable kind. while sound frequently causes a shock or kind of rudimentary fear and often occasions crying.

CASES OF EARLY INTEREST IN SOUND.

	Sound first noticed.	First pleasure in sound.	Turning head in direction of sound.
Miss Shinn	3rd day	27th day	3 months.
Preyer	4th day	8th week ²	11th week.
Tiedmann	—	40th day	—
Mrs. Hall	3 hours	6th week	21st week.
Darwin	—	6th week	49th day.
Mrs. Moore	2nd day ¹	20th day	30th day.

¹ The child ceased several times crying when his father whistled.

² On the 11th day the child was quieted by sound of father's voice.

- F., 5 mos. Would always stop crying to listen to music.
 F., 6 mos. Turned her head in direction of sounds.
 F., 6 mos. Interested in music.
 F., 6 mos. Interested in listening to music. (M., 5 mos.) (F., 5 mos.) (M., 10 mos.) (M., 10 mos.) (F., 1 yr.).
 F., 9 mos. Much delighted with organ music.
 F., 7 mos. Always cried to be lifted up when he heard any one talking. As soon as he could see was satisfied.
 F., 1½ yrs. Similar case.
 F., 9 mos. Would always amuse herself if allowed to touch the piano keys. Would clap her hands to the rhythm of music.
 1 yr. At this age he learned to tear paper and this interest continued for several months.
 F., 1 yr. Much interested in a toy that rattled.
 M., 1 yr. Would sit very still and listen intently to watch.
 F., 1 yr. Interested in cornet.
 F., 15 mos. Tried continually to get her rattle open, shook it, listened and then tried again.
 F., 18 mos. Much interested in ticking of clock.
 F., 18 mos. When her cousin clapped her hands, came to her and examined her hands.
 M., 20 mos. Delighted in listening to piano.

After these early stages in the development of visual and auditory interests, interest in seeing things done plays a prominent role in the baby consciousness, and closely associated with it is the desire to do. The stage of active experimenting fills the second half of the first year. It is the period in which the series of sight, auditory, muscular and skin sensations coalesce. Of the child at this age Perez writes: "His activity, doubled now by curiosity and stimulated to the highest pitch by emotional sentiments of all sorts, makes him happier and happier, and seems to him so great a necessity that a quarter of an hour of relative inactivity weighs on him as much as a whole day of ennui on a grown up person." Whatever the development of the baby's time sense may be, Perez is undoubtedly right as to the curiosity and muscular activity which characterize this age. In these months the range of interests is not only greatly increased but individual predilections begin to be apparent. A distinct interest in mechanics is observable in some children as early as the 7th month,—the wheels of a chair or carriage, or the hinges of a door proving a continued source of entertainment. A little later, the problem of a lock and key becomes an absorbing interest, the inserting of the key in the lock and trying to turn it holding the attention for astonishingly long periods. Nature interests, too, are shown in these months; the interest in animals, even when accompanied by a certain degree of fear, being marked. Not only living animals, but animal pictures, and later animal stories, are a source of delight, and the joy of outdoor life is plainly manifested by baby coaxing and pleading in sign language long before the development of speech. In Miss Shinn's little niece this interest in animals was almost a

passion, developed suddenly just at the close of the first half year and was unaccompanied by fear. A large dog, which the baby had seen all her life, suddenly roused her desire and she would pay attention to nothing else. "Day after day, for weeks, the little thing was filled with excitement at the sight of the shaggy Muzhik, moving her arms and body, and crying out with what seemed intensest joy and longing. When he came near her excitement increased and she reached out and caught at him." While this case is more marked than is usual in so young a child, the interest in animals seems common to babies in general and continues as a permanent source of pleasure unless interfered with by rousing the fear instinct, which, though it is of frequent occurrence, soon wears off under normal conditions of familiarity with animals.

The stages by which the child passes from passive to active observation and experiment are very gradual, and not only do the different stages overlap in the course of normal development, but we find the rudimentary stages persisting even to adulthood in the case of the uneducated and undeveloped and, perhaps, occasionally manifested by every one under certain conditions of shock or surprise. The inarticulate surprise, the fixed stare and hanging jaw of the dull-minded youth when brought into new and unaccustomed surroundings are familiar examples of this early manifestation of curiosity persisting beyond its time. Cases of arrested development and imbeciles never outgrow this primitive manifestation. Instead of fully developed, eager, questioning curiosity, there is only the stare of amazement and shock of surprise. This arrest in the development of curiosity is marked in cases of epilepsy and is one of the symptoms of mental degeneration. The patient loses interest in anything new, his attention is hard to gain, and he finally sinks into an apathetic state with "no wants, no desires, no affection," the power of attention completely lost. In the training of the feeble minded, the teacher's chief problem is to rouse interest and curiosity, so that the wandering attention may be held long enough to make a lasting, mental impression.

In the development of normal children, active observation begins to play a prominent part toward the close of the first year. No longer content with merely seeing things, the little investigator desires to touch, taste, smell and handle everything within reach. Curiosity as to the contents of parcels, boxes, bureau drawers, trunks, bags and pocketbooks seems to be universal. Rummaging through closets, drawers, work-baskets or writing desks becomes a delight. The mere fact of a closed space seems to exercise a fascination over the childish mind. So wide spread and deep seated is this curiosity and

interest in whatever is concealed from view, that we must look for its explanation in the phylogenetic rather than the ontogenetic series. We can trace it far back in the animal line, when undoubtedly its utility lay in the food seeking impulse, and it is probable that in primitive man as in animals the impulse to explore unknown cavities, even though exposing the explorer to danger and coming into conflict with instinctive fears was, on the whole, an advantage in the struggle for existence. Sixty-nine cases of this active curiosity in regard to parcels and boxes were described, the ages varying from one to seven years, and the larger number of cases occurring between the ages of four and six. At about the same ages, interest in discovering why the door bell rang is at its height. With some children this becomes temporarily almost a mania and all other interests are sacrificed to running to the door or to some position from which the door can be seen.

Active interest in nature, though unfortunately too often repressed by unfavorable surroundings, develops rapidly after the first year. Children of kindergarten age, three to six, respond readily to any stimulus in this direction whether of plant or animal life. The desire to touch and handle things at this age is so great that we have numerous instances of seeds regularly dug up to watch their growth, flower buds picked or blown open, and the eyes of puppies and kittens rudely exposed to light before the proper time, as well as numerous other attempts to assist nature in ways which, though detrimental to her processes, are, nevertheless, inspired by a genuine though mistaken zeal for finding out her ways. The desire to handle things seems to develop concomitantly with the power of locomotion, and so necessary to the child's development is it that we can but sympathize with the little fellow who, after encountering repeated prohibition, inquired tearfully "What can I touch?" even although the artificial conditions of social environment demand the restraint of this eager spirit of investigation. But, though repression in some directions may be a necessity, good pedagogy demands that some outlet for this instinctive desire, which is at the root of all intellectual advancement, be provided. As an educational experiment, both Mrs. Moore and Mrs. Hogan found that diverting the attention to some object equally as desirable as the forbidden one, proved far more effective than direct prohibition. In the former case, the object was soon forgotten and there was little tendency to recur to it, while direct prohibition seemed to impress it upon the memory, and constant repetition was necessary until the prohibition was sufficiently impressed for eager desire to yield to force of circumstances, though the small investigators were quite incapable of understanding why the

denied object should be unattainable. So wide is the range of interests which come under the classification of active observation, that a complete representation of the material would prove tedious to any save specialists, but a few examples are inserted to show the character of the material and the range of ages included in the present study.

ACTIVE OBSERVATION WITH AID OF OTHER SENSES.

F., 7 mos. Cake basket near her. Upset it apparently out of curiosity.

F., 10 mos. Took great interest in examining the frame of a picture which stood on an easel.

F., 1½ yrs. When taken up by a lady, began to feel of her bracelet and pin, and to smooth the velvet on her dress.

F., 9½ mos. Being put on the floor, crept to the coal scuttle and upset it.

M., 3. Greatly interested in listening to water rushing through a sewer.

F., 4. Came into the room and saw a box which had not been opened. Would not go out to play, and as soon as others left the room tried to open the box. Failing to open it, she knelt down and smelled of it.

M., 4. Visiting; eager to see the bees. Ran down the walk and pounded on the hives. The bees came out and stung him.

M., 5. Saw a garter snake which he tried to catch. Told his mother he had been trying to get a pretty piece of ribbon for her.

M., 6. Looked at and handled everything he could reach in a depot to see what it was made of. Rubbed his hand all over a sign "No smoking."

M., 6. Curiosity easily aroused about books; always wants to "see the inside."

M., 6. Greatly interested in what he saw at a basket factory.

F. Grade III. Got excused from school to see what a toad was doing; ran all the way back to the toad. He was casting his skin.

F., 8; M., 7; M., 9. Climbed trees to see the eggs in birds' nests; rarely destroyed anything.

M., 9. Has a garden which he watches very closely to see when the seeds are sprouting. As soon as they come up, he plants others in their places to see them sprout.

M., 9. Would catch and carefully examine insects.

M., 8. Wanted to be allowed to stay at home from school to watch the plumber.

M., 8. On certain afternoons always went to watch the printing of the paper; also liked to watch the veterinary treat a horse which had a lame knee.

M., 9. Wanted to see the inside of a water pipe. Started to crawl through, but received a bad cut on the head.

M., 9. Took great interest in watching the hoisting of iron girders from the ruins of fire; was unwilling to go home until he had seen the whole process.

M., 10. Much interested in machinery; very careful in observation, and could put simple apparatus together after taking it apart.

F., 11. Delighted in examining an old clock which was given to her for a plaything.

M., 13½. Greatly interested in words; delighted whenever he hears a new one.

F., 12. Delighted if she can be allowed to go into the kitchen and watch cooking processes.

So closely connected with the stage of active observation that they continually become merged in each other is the experimental stage, the earliest forms of which, in obtaining muscular control of the body, Miss Shinn has so well described. These early experiments with muscle and touch sensations are soon extended to the other senses, and though disagreeable sensations and even pain is a result, these serve as guides for, rather than deterrents from, the spirit of investigation. Experiments in touch, taste, and sound become prominent in the second year, and the latter are frequently carried to an extent which proves trying to the nerves of adults. Active experimenting with taste develops somewhat later. According to Mr. Bell's¹ studies, while ability to carry things to the mouth begins in the 4th month, and some tastes are differentiated at this time, and biting develops along with dentition, active experimenting with taste proper begins in the second year. Children from two to four or five years taste everything. One hundred and eighty-two different articles are mentioned in his list of objects tasted, including plants, hay, straw, sticks, seeds, paste, cork, rubber, soap, tar, dirt, worms and insects, in fact anything "that can be carried to the mouth or the mouth to it," quite irrespective of any edible qualities in the objects tasted. Another phase of curiosity in regard to taste is the "teasing to taste," which, according to Mr. Bell, reaches its height between the ages of seven and ten. One hundred and twenty-two different articles are mentioned in Mr. Bell's list, the majority of them edibles in some stage of preparation, but uncooked mixtures and medicines of disagreeable flavor also figure largely in the enumeration. Experimenting with mixtures of both foods and drinks is most frequent between the ages of five and ten, and a year or so later comes the stage of adolescent testing, when the desire to try everything new in a bill of fare, to sample new combinations and flavors appear to be a characteristic of the developmental period.

EXPERIMENTS IN TASTE.

M., 14 mos. Took a bite of soap. Three weeks later made a second trial, after which he gave up soap as a possible addition to his diet.

M., 3. Began to eat "rat poison" to see what it was: Was interrupted just in time.

F., 4. Wanted to taste horse radish, and being refused, tasted it when her mother's back was turned.

F., 4. Very curious about a box of paris green and narrowly escaped poisoning.

¹ Psychology of Foods, Sanford Bell.

F., 4 and M., 4½. Tasted grafting wax but did not like the flavor.

F., 4. Ate a raw potato to see how it tasted.

M., 6. Experimented with different things to see if the pig would eat them.

M., 6. Received an Easter egg; ate it immediately to see how it tasted.

F., 6 and F., 8. "My sister and I used to mix up snow with milk and juices to make new drinks."

F., 6. Ate green grapes to see if they would really make her sick, as she had been told.

M., 6. Tasted tabasco sauce although he had been warned of the effect.

Another phase of experimental curiosity closely associated with experiments in taste is the smoking craze, which is rife among boys from eight to ten years and appears to begin about a year earlier in girls. Mr. Bell gives a list of seventy-one different substances tested as to their smoking qualities by boys and girls of these ages. Bark of various kinds, spices, seeds, leaves, stems, rattan, cork, in fact almost anything that could be smoked and was easily procurable, is to be found in this list. While it is undoubtedly true that imitation plays a large part in this smoking craze, its root lies in the natural desire of growing children to test new sensations for themselves, and even the unpleasant results consequent upon some of the trials do not prevent further experimentation along the same line.

Up to the age of ten or eleven years there seems to be little tendency to specialize in experiments. In the active, healthy child the desire for knowledge is omniverous. He experiments not only with his own sensations but is possessed by a desire to find out how people, animals, and plants will act under certain circumstances. He not only wants to find out what he himself can do, but what others can do, and he wants to know the why of things. His mind is open in every direction and it is the golden age for arousing the interests that may prove to be life long. To repress his activity is to stultify his mind and sympathy with his interests, and an outlet provided for his activity will do more for him at this age than all the codes of discipline ever invented, which fail to recognize that curiosity and activity are normal to his age.

A little consideration of some of the examples, which are usually classified as "naughtiness," will show that they are by no means to be entirely set down to intentional misbehavior on the part of the child and that justice demands an investigation of the child's reason for the act.

F., 2. Active interest in closed boxes or bottles; frequently tasted things in bottles until one day she tasted oil of cloves.

F., 2. Was trying to put her fingers in her baby brother's eyes. Said she wanted to know how they felt. "How do they feel mamma?"

F., 2½. Touched a hot stove to see how it felt.

F., 3. Stuck a pin in her baby sister to see what she would do.

- M., 3. Threw everything at an iron door sill to see if it would break.
 M., 4. Hammered a bell to see what made it ring.
 F., 5. Hid in an unused chamber and remained there several hours because she wanted to find out what the family would do.
 F., 3. Interested in throwing stones, tried to see how far she could throw.
 F., 4 to 5. Experimented with a mouth organ.
 F., 4. Used to scratch pictures of people to see if they had life in them.
 M., 5. Much interested in plants and watching things grow.
 M., 4. Matches were a great temptation. Always wanted to light them.
 M., 4 and M., 5. Always trying to find out what things are made of.
 M., 5. Tried to open the dog's mouth to see what made him bark.
 F., 5. M., 6. Tied a cat's hind legs together to see how she would walk. Several cases of tying up cats' feet in tissue paper.
 F., 6 and 6½. Cut each others hair to see how it would look.
 F., 6. Much interested in gardening, but forces open the flower buds because she can not wait for them to open naturally.
 F., 5. Dug up the radishes every day to see how they were growing.
 F., 5. Seeing tears in her mother's eyes when she was peeling onions: "Mamma, the onions must hurt you. Give me an onion and let me find out where the hurt is."
 M., 5. When in a drug store, opened five boxes of soap while his mother's back was turned.
 M., 6, and F. 5. Put the dog's head in a paper bag to see what he would do. Several cases of similar experiments with cats.
 F., 6. Turned on the gas and said she wanted a fire.
 F., 6. Worked very diligently, and finally succeeded in taking up enough of a carpet to find out what caused a little hump in one place.
 F., 6. Dug up seeds to see how they grew.
 M., 6½. Kept opening the oven door to see the cake baking.
 M., 7. Greatly interested in door springs, and tried to make one.
 F., 7. Interested in hats, used to make many new shapes out of paper. Experimented on everything that could be glued.
 M., 7 and 8. Having seen a steam engine tried to make one.
 F., 8. Dug up a buried canary bird to see how it looked.
 M., 8. Very much interested in a pair of new skates and the way in which they fastened. His next composition was on skating.
 F., 6, and M., 7. Very curious to know how flying felt. Went a high bank and jumped, flapping their arms.

Apparent Cruelty. Under experimental curiosity, are to be classed a large number of cases of apparent cruelty, which are due not to any real impulse toward cruelty but to ignorance and to an impulse, which, when properly directed, is the prototype of scientific investigation. When a child of three endangers the life of her pet kitten by putting it into a tub of water, there is perhaps, scarcely need for the tearful explanation that she wanted "to see if kitty could swim like the swans she saw at the park," to clear her from the charge of cruelty, but the case is not quite so clear when a boy is found cutting off the leg of a live frog. When, however, an investigation reveals the fact that he has heard that certain lizzards reproduce their tails, and wanted to find out whether the frog would "grow a

new leg'' the case seems to be one of a desire for knowledge rather than intentional cruelty. In each of the appended examples there was an apparently wanton infliction of pain, and yet in no one of them was the motive primarily cruelty.

CASES OF APPARENT CRUELTY.

F., 3. Put the kitten's front paws on a very hot stove to see what it would do.

M., 4½ yrs. Broke a little chicken's leg and brought it to his mother to learn how to mend it.

M., 8. Cut a crow's tongue to find out whether it would learn to talk; had been told this was the case.

M., 8 or 9. Shut a squirrel in a dog's kennel to see how long it could live without food. Was much interested in Tanner's fast of forty days, which was the incentive.

M., 6. Cut off a frog's leg to see whether it could hop with one leg. Was not ordinarily a cruel child.

M., 8-12. Broke chickens' legs several times but always set them; became a surgeon.

M., 8. Cut off a frog's leg to see if it would grow again.

M., 6. Was found pulling the legs off a fly; said he wanted to see if the fly could walk on the ceiling without.

M., 8. Dissected a frog to see how it was made (the extent to which this was vivisection is not stated). When reprimanded said: "Well, suppose another frog was hurt, I thought maybe I could fix its wheels if I knew what was in this one."

Moreover, we find numerous instances of children deliberately exposing themselves to pain to satisfy a desire for knowledge, though probably with the same lack of actual realization of pain as in the case of experiments on animals. The child who ate green grapes to see if they really would make her sick, had previously experienced an attack of colic, but the mere memory of pain was not sufficiently vivid to check her desire for experiment. Another child, on being told that iron on a very cold day would burn her tongue, deliberately tried it; and a boy of nine exposed himself to whooping cough "to see how it felt." A little girl of five, on observing tears in her mother's eyes as she was peeling onions, remarked: "Mamma the onions must hurt you; give me an onion and let me find out where the hurt is." Many cases of what, on first thought, appears to be a shocking callousness in children to the sufferings of others, prove upon investigation to be mere inability to appreciate the situation, due to a lack in experience on the child's part of either physical or mental suffering. Most children have, of course, temporary experiences of pain, but childish memories are short, and pain, unless exceptionally sharp or prolonged, is quickly forgotten; so that the average healthy child has very slight appreciation of illness or suffering and exhibitions of sympathy are largely imitative. A child who is habitually cruel is an abnormality and will probably be found to

have other signs of degeneration, but all the cases above quoted have not cruelty, but a desire for knowledge, however misdirected, for their impelling motive.

Questions. The development of the questioning phase of curiosity is coincident with that of language, and among all its manifestations the questions of children hold the most prominent place and furnish the most valuable material for study. Though there is a residue of miscellaneous questions which form an exceedingly interesting group, the larger number can be classified under the following groups. Questions in regard to (a) forces of nature, (b) mechanical forces, (c) origin of life, (d) theology and bible stories, (e) death and heaven, (f) questions which are merely inquisitive. These last form but a small group in comparison with the others, less than five per cent. of the whole. Under the first group of questions, in regard to nature and natural forces, are included questions in regard to the sun, moon, stars, cloud, rain, fog, wind, thunder and lightning, fire, water, animal and plant life. Of four hundred and sixty-five questions asked by children under the age of ten, if questions on the origin of life be included, over one-half were on topics relating to nature and the working of natural forces. Nearly 75% of these questions relate to causation. To the active imagination of the child all the phenomena of nature furnish material for wonderment, and though he often invents explanations for himself, questions of "what" and "why" are well nigh universal. Children under seven show a marked tendency to attribute personality to the working of all unknown agencies. Questions often take the form of "who made it?" and though this is probably largely due to the fact that children's questions in regard to natural causes are answered by the phrase "God makes it," this does not at all interfere with the child's idea of some intervening agency, more within the limits of his comprehension. Many children show by their questions that they attribute sentience to wind, think that the thunder is caused by some one rolling barrels, and that the flowers and trees have a life of their own. Some of the reminiscent papers describe a state of puzzled wonder, often lasting for years, and which obtained little relief from questions, as to how the earth could turn over without tipping people out their beds, and why the water did n't run out of the wells at night. Some children brood silently for years over questions, which they do not themselves originate, but which once put into their minds recur again and again, and when put into articulate form are met only with the unsatisfactory answer: "You are n't old enough to understand it yet." Those who remember their own childish puzzles will also remember the vague feeling of injury which such an answer

roused, which, could the child have put it into words, would have probably been expressed in some such form as "Then you should n't have made me think about it in the first place." And good pedagogy is on the side of the child. The active mind of a child can originate enough questions that are, at least, partially within his comprehension and wholly within his interests, to furnish the basis of a liberal school curriculum without the addition of insoluble puzzles. Fortunately for the child, the natural tendency to accept things as they appear, has a nullifying effect upon this premature instruction in healthy, normal children, but the delicate and neurotic frequently suffer imaginary terrors induced by distorted ideas.

In a recent study of the faults of children¹ it appears that, from the teacher's point of view, the most frequent and troublesome fault in children is inattention and lack of application. Trying enough to the overworked teacher, no doubt, but from the child's point of view, there is something to be said in regard to subjects to which he is required to pay attention. A child's attention is chiefly of the passive or involuntary sort and active or voluntary attention is a later development. It is easy for a child to attend to the things which interest him; but too often he is required to pay attention to things in which he has no interest whatever. Voluntary attention is a much more complex matter, and even in adults, unstable and dependent upon nervous conditions. It is easily fatigued, and to expect a child to continue a voluntary exertion throughout school hours without an appeal to his natural interests is irrational. No study of the span of either voluntary or involuntary attention at different ages has yet been made, though some careful observers have taken occasional notes on its development in individual children. Mrs. Hall records that her child paid attention for eight minutes to the rattling of a box on the 53rd day of his life. The same child, on the 63rd day, was interested for thirty consecutive minutes in the rattling of a purse of coins. Miss Shinn also notes that, more than once in her fifth month, her little niece spent half an hour at a time in gazing out of the window. Voluntary attention is a complex development involving an effort of will and dependent upon the natural or involuntary attention, and the best educational methods demand a study of children's interests, and an adaptation of the school routine to them, so that full advantage may be taken of the simpler and earlier development.

¹Norman Triplett: A Study of the Faults of Children, *Ped. Sem.*, June, 1903.

QUESTIONS IN REGARD TO NATURE.

F., 3½. "What makes the sun shine? Who puts the stars in the sky at night?"

F., 4. "If I put a ball on that hill it rolls down, and what I want to know is how God keeps the moon up in the sky?"

M., 4. Asked about conglomerate rock, how the pebbles came inside. Saw a crab shell; asked what it was, and all about its life and habits.

M., 4½. Asked how the moon got up so high, and said he would n't like to be up on it.

F., 5. "What makes the stars twinkle?"

F., 5. "What do we have a moon for? Why don't it be as bright as the sun? Why don't it be round? How can it be round sometimes? What good is the man? Don't the woman let him go out ever? If I was in the moon could I see you? Why not? Can I go when I die if I want to?"

M., 5. Asked if the man in the moon ever went to sleep; why the sun stood still; what made the stars twinkle; how the dew came on the grass; what made the thunder make such a noise; what made the wheels of the clock go round and what made the pendulum swing.

M., 5. Used to wonder whether the clouds run on the sky or on wheels, and why they did n't fall down.

M., 6½. "How does the man in the moon get anything to eat?" Not waiting for answer. "I guess God must feed him with manna like he did the people in the wilderness."

M., 5. "What makes the fire jump up and down?"

M., 5. "Why does the rain come down? Where does it come from?"

M., 6. Wanted to know what fog was and what made it?

M., 4. "What makes the wind blow? Is some one pushing it along? I should think it would stop when it ran into a house or big tree? Does it know it turns our papers over?"

F., 6. Watching a beam of sunlight: "Why does it stay so narrow? Why is it on this side of the room in the morning and the other at night?"

M., 6. "How can the world turn round and not tip us out of bed? How does the water stay in the wells?"

M., 6. On seeing a windmill for the first time: "Does the wind make the wheel go round? How does the wind make it go round?"

F., 7. "Where does the snow come from? Where does the sun go at night? What makes it thunder and lighten?"

F., 7. Was told that the moon was made of green cheese; and was curious to see if it really was.

F., 7. "What makes the stars shine so bright?"

F., 7. Thunder storm. "What is that, thunder? Oh dear, what good does it do to thunder? Who makes it thunder, any way? I wonder if it thunders in N. Y."

F., 7. Saw plums for the first time. "What are they? Can you eat them? Where did they come from?"

F., 7. "What makes the waves roll in? Where does the water come from?"

F., 7½. "Where do all the worms come from after a shower? Do they rain down?"

F., 8. "What makes the snow? Why is n't it dirty, like dust."

M., 9. Wanted to know where the rain came from, how it got down, and why it didn't rain all the time.

M., 9. "Why is the moon different shapes? Why is it big sometimes and little others?"

M., 11. Looking at the river which was very high: "I wonder what made it so high, it has not rained very much."

M. Having had the new moon pointed out to him, wanted to know where the old moon was.

M. Wished to know what the moon was made of, and if he could get it by walking over it.

F., 9. "What is the end of the world made of? What should I see if I went where the mountains touch the sky? How many stars are there?"

M., 9. "Why don't nuts fall before the frost comes? What does the frost have to do with it anyway?"

Animal Life.

M., 5. Looking at bears: "Mamma, why do they throw so much bread to bears?" "Because they are hungry, and must have something to eat." "Oh, do they get hungry as we do?"

M., 5. On seeing a Manx cat for the first time: "Did a dog bite off her tail in a fight?" "Did the cat want her tail cut off?" "Do you think I can make my cat bobtailed?"

M., 4. On seeing a fur boa: "Who killed kitty? Did kitty cry?"

F., 5. "Why does kitty have fur?"

M., 6. "Do fishes go on land to sleep?"

F., 6. "How do the flies walk upside down?"

F., 7. "Why do a canary's throat feathers ruffle when he sings? How does he do it?"

Nearly twice as many boys as girls, according to the present data, show special interest in mechanics, and the beginning of this interest is shown at a very early age. Mrs. Hogan notes the interest as a persistent one in her boy, at the age of fourteen months, and the five years of the record show that it was continued. Questions are but one phase of the development of this interest, the earlier manifestations being active observation passing into experiment, and very fully developed in the destructive phase of curiosity. Fifty per cent. of the cases of boys' interests and curiosity in all its phases are connected with motion, the desire to find out what makes things go being a powerful incentive to various forms of investigation. Children under three are apt to attribute life to things which have motion, their first experiences being connected with living beings as causal agencies. Many children and animals show fear of mechanical toys, and there is a struggle between this timidity, in the presence of the mysterious and unknown, and curiosity in regard to the moving object. A kitten exhibited, for several weeks, an amusing struggle between evident fear and curiosity whenever a mechanical seal was wound up and turned loose on the carpet. The movements of the seal were somewhat erratic, and the kitten following at what, he probably estimated a safe distance, was occasionally surprised by a sudden turn of the seal, which he invariably avoided by leaping into the air. Whenever the mechanism ran down, he smelled of the toy,

pushed it about with his paws, and occasionally turned it over, always starting back, however, if he happened to set the wheels in motion. Familiarity finally overcame fear, even when the toy was wound up, but it never proved as attractive an object to chase as a ball for which the kitten himself supplied the motor power. This attitude seems also to characterize young children, for a baby's early motor interests are in the things which he himself can do, and disappointed friends and relatives have often found their gifts of mechanical toys a failure, simply because they have too far anticipated the natural development, and the toy has proved either a source of fear or failed to excite special interest. In fact, even at a later period, mechanical toys which are too complicated in construction, or too delicate to bear investigation, which is apt to be clumsy, soon lose their attractiveness, while something that can be taken to pieces and put together by unskilled fingers so that it will "go again," may prove a lasting means of amusement and instruction. Kites and tops are as interesting to the children of the present generation as to their fathers, and to the children of the orient as well as the occident, because there is something for the operator to do as well as to watch, and curiosity as to just how these toys will behave under certain conditions is kept stimulated by occasional failure, and the necessity for finding a reason therefor. The few examples of questions here given suggest a range of interests which could readily be further stimulated and given an educational impulse.

QUESTIONS SHOWING MECHANICAL INTERESTS.

M., 3. "What is inside your watch, auntie, that makes it talk?"

M., 4. Watching the walking beam on a steamer: "What makes that thing go up and down? Is it the man?"

F., 4½. Seeing her mother crocheting lace: "Is that the way the lace on my dress is made?" Being answered in the negative: "Then how was it made?"

M., 7. "What makes the trolley go?" "What does that engine need water for?"

F., 7. Always liked to watch the oiling and cleaning of the carriage. Asked many questions in regard to it.

M., 7. After seeing a pile driver at work, and visiting a fort, overwhelmed the family with questions in regard to them.

M., 7. "How does the steam move engines?"

M., 7. "Why can't you see the messages on the telegraph wire? How do they go?"

F., 7. On seeing an electric car for the first time: "What makes that car go? How can it go without horses?"

M., 7. "Why can some people take pianos apart when others musn't?"

M., 7. "How does pressing the button make the bell ring when it does n't move the wire any?"

M., 7½. Asked "what made the clock run?"

On a ferry boat with his father: "What makes the boat go?"

M., 8. "What do all these people want to ride on the boat for? How

long are we going to stay on the boat? Do you like to ride on the boat?"

M., 8. First time he rode on a train wanted to know "how it went, why it went and how the engine was made."

M., 9. Was very anxious to know how the train run. When he got out wanted to know how the wheels staid on the track. Was told that they were grooved and that kept them on. Ran back quickly just as the train was moving off and called, "Wait a minute till I feel it."

M. Boy on a train. What is that? What are those men doing there? What are they doing it for? What makes it whistle so? How does the train move? What does c o k e spell? What is it? Did I ever see any?

M. Small boy seeing a train. What makes that train go? Why do they ring that bell? Where does that smoke go? Who made that train?

Origin of Life. The questions relating to the origin of life were asked almost entirely by children between the ages of three and eight, the greater number falling between the ages of five and eight. Very few were reported after this age. This fact is significant and has an important bearing on the question of what teaching should be given to children in this fundamental fact of life. That curiosity on this subject develops in both boys and girls before the age of seven, is attested not only by the instances sent in answer to the syllabi, which made no mention of this topic, but asked only for instances of curiosity shown by questions without suggestions as to subject matter, but by the personal testimony of a number of teachers of wide experience, and many thoughtful mothers to whom personal experience has brought home the importance of the question. That there is really a falling off of curiosity at this age is not probable, and the absence of questions indicates either that the child's requests for information have been evaded, and fanciful and unsatisfactory answers have been given until he has become hopeless of obtaining information from the proper sources, or that curiosity has been satisfied by the teaching of other children in crude and garbled form, and the child is ashamed to ask further questions. The testimony of teachers in regard to conversation overheard among children, and a number of answers by adults to the question, "How did your knowledge of the origin of life first come to you?" have shown that not only is this the case, but that in later years the way in which such knowledge has come is bitterly regretted, because the beauty and sacredness which should belong to all thoughts connected with the coming of new life, has, for them, been sullied, and this is felt as a loss and an injury which no later teaching can ever fully repair. A study of the character of the questions at different ages, here inserted, shows in the earliest years the simple, frank curiosity of childhood. Later ones betray very plainly the false notions acquired from un-

satisfactory or untruthful answers, which do not explain that for which the eager mind is groping.

QUESTIONS RELATING TO ORIGIN OF LIFE.

- F., 3½. "Mamma, where did you get me?"
 F., 5. "Where was I when you were a little girl?"
 M., 5. "Where did baby come from? Did God drop baby down from the sky?"
 M., 6. "Was I a speck of dust? Did it have blood in it?"
 F., 7. "How did God send the baby? Did he send an angel down with it? If you had n't been at home, would he have taken it back?"
 M., 7. "Where do doctors get babies from?"
 M., 7. "Who is 'Dame Nature?' Did you know she was going to bring you a baby? How did you know whether it was a boy or a girl?"
 F., 6. "Mamma, where do the chickens get their eggs?"
 F., 7. "How did the expressman know where to leave the baby?"
 M., 7. "Where was I before I was born?"
 M., 7. "Where was I when you went to school?"
 M., 8. "Where do little lambs come from? Do they come out of old stumps?"
 F., 8. "How did you know baby was coming, and get his clothes ready?"
 F., 19. "When I was 12 years old, suspecting that there was to come to our home a little stranger, and imagining that my mother was occasionally engaged in some secret needlework, I determined to satisfy my curiosity by an investigation. Selecting a time when there would surely be no interruption, I went to her room for proof of my suspicions in the shape of tiny garments. My search was successful, and my curiosity satisfied, but my act was discovered later, and I was reprimanded."

Why, on this subject, on which the child most needs wise and adequate teaching, should he be left to acquire information in stealthy fashion from those totally unprepared to gratify his legitimate and natural curiosity in healthful ways. Too often the information comes from newspaper reports of criminal cases, which are read and discussed by children in the fourth and fifth school grades. Could parents realize what it may mean to a child to have his first knowledge of the origin of life associated with sin, shame and secrecy, they would be guarded against it as from deadliest poison. One wise and beautiful mother of my acquaintance, whose example is worthy of universal imitation, adopted the principle of answering truthfully, and to the measure of the child's understanding, all spontaneous questions. In a family of five children, each child has known of the coming of the younger ones, and has been allowed to see the dainty garments prepared for the tiny baby who was coming to be a part of the home. This knowledge has been a beautiful secret, too sacred to be shared with any one but "father and mother," but each child has shared in the loving preparations and joyful anticipation of the baby's coming. To the children in that household no false or wrong

impressions have ever come. They are safeguarded from evil. To them the coming of new life is surrounded, as it should be, with a sacredness and responsibility born of a pure and wisely given knowledge. In pitiful contrast to this is the stealthily acquired, half comprehended, and wholly false-in-feeling knowledge of the majority of children in our public schools. Teachers furnish overwhelming evidence that there are few children over eight years old in the public schools who have not some sort of knowledge of the origin of life, and it is, perhaps, sufficient commentary on the kind of knowledge to add that the children regard the subject as something secret and shameful. Unquestionably the home is the place for this kind of instruction, but unfortunately there are too many fathers and mothers who are either unwilling or unfitted to give it, and the educational expert who can devise some scheme for wise and systematic instruction, adapted to the age of the child, and furnishing it with a safeguard against corrupting influences, will do more for the moral welfare of the community by the prevention of evil than any number of crusades against evils already existent. The power of an idea in a child's life is very great, and false and depraved associations may so corrupt and influence the thought of the child that the baneful influence may linger through life. In regard to the manner of teaching, Miss Sullivan's perplexities with Helen Keller¹ and her solution are suggestive. In August, 1887, less than a year and a half after Miss Sullivan first came to Helen, who was then seven years old,—she wrote the following lines in a letter to a friend: "I do wish things would stop being born! new puppies, new calves and new babies, keep Helen's interest in the why and wherefore of things at white heat. The arrival of a new baby at Ivy Green the other day was the occasion of a fresh outburst of questions about the origin of babies and live things in general. 'Where did Leila get new baby? How did doctor know where to find baby? Did Leila tell doctor to get very small new baby? Where did doctor find Guy and Prince? (puppies) Why is Elizabeth Evelyn's sister? etc. . . . From the beginning *I have made it a practice to answer all Helen's questions to the best of my ability in a way intelligible to her, and at the same time truthfully.*" "Why should I treat these questions differently?" I asked myself. . . . I took Helen and my Botany, "How Plants Grow," up a tree, where we often go to read or study, and I told her in simple words the story of plant life. I reminded her of the corn, beans, and watermelon seed she had planted in the spring, and told her that the tall corn in the garden,

¹Helen Keller: The Story of my Life. New York, 1903.

and the beans and watermelon vines had grown from those seeds. I explained how the earth keeps the seeds warm and moist, until the little leaves are strong enough to push themselves out into the light and air, where they can breathe and grow and bloom, and make more seeds from which other baby plants shall grow. I drew an analogy between plant and animal life, and told her that seeds are eggs as truly as hens' eggs and birds' eggs,—that the mother hen keeps her eggs warm and dry until the little chicks come out. I made her understand that all life comes from an egg. The mother bird lays her eggs in a nest, and keeps them warm until the birdlings are hatched. The mother fish lays her eggs where she knows they will be moist and safe, until it is time for the little fish to come out. I told her that she could call the egg the cradle of life. Then I told her that other animals like the dog and cow, and human beings, do not lay their eggs, but nourish their young in their own bodies. I had no difficulty in making clear to her that if plants and animals did n't produce offspring after their kind, they would soon cease to exist, and everything in the world would soon die. But the function of sex I passed over as lightly as possible. I did, however, try to give her the idea that love is the great continuer of life. The subject was difficult, and my knowledge inadequate, but I am glad I did n't shirk my responsibility; for stumbling, hesitating, and incomplete as my explanation was, it touched deep, responsive chords in the soul of my little pupil, and the readiness with which she comprehended the great facts of physical life confirmed me in the opinion that the child has dormant within him when he comes into the world, all the experience of the race." If, in the case of this child, blind and deaf since she was eighteen months old, and limited in language to the acquisitions of one year, the problem could be brought within her comprehension to the extent shown above, and touch "the deep responsive chords," which in all normal children answer so readily to the skillful touch, there surely need be no fear that such instruction cannot be successfully given to children who are not thus limited. The aim in moral education should be to forestall and prevent evil, rather than to devise means for its cure after it is already existent.

Very young children, if normal, will never fail to be very curious about the advent of a new infant stranger in their family. Here it would seem that certain provisional answers to their inevitable questions are necessary for years too tender either to understand or to respect reserves that society demands. Their questions, however phrased, call for but little in the way of answer, and it would be mere pedantry and affectation to deluge a three year old child with physiological

explanations in detail. It is, however, essential that the myth should be such as to give some impression that the mystery is something sweet and sacred, and if we had a complete collection of answers,—the milkman, the stork, the doctor, the gardener, God, the angels, etc., as bringers of the new baby—we should find very great differences not usually sufficiently recognized and respected. To do this, and to devise a mythic answer that is true to the heart, instincts, and needs of the child in this brief period, is a pedagogical problem still open for solution.

A little later, perhaps at four or five years of age, the curious child can be told of the babe's relation to its mother's body, and this suitably illustrated from the plant world. The mother's body and her functions are far nearer to the child than those of the father, and it is she who should perform this holy pedagogical function, and make it all as natural as possible by well chosen analogies, of which biology now affords such a copious repertory. Interest in the male function normally comes much later, and the devotees of excessive frankness no doubt often do much injury by developing a precocious interest in it. To deal suitably with it is a far more difficult problem, and our failure to solve it is probably seen in the fact that curiosity at about the average age of eight increases in intensity at the same time that it appears from our returns to vanish because it becomes so secret. Probably this is about the age where this curiosity is not only ripe for instruction, but needs it in order to prevent the pollution of the youthful mind by gross images that are outlawed by decency as well as by ethics. Nature seems almost to have provided the average child at this age with a special organ of apperception in this field, and we have here a great and challenging problem to solve. Curiosity is intense, and this constitutes a rare opportunity for parental tact and wisdom. Perhaps, as some have suggested, it is the duty, hard though it often be, for mothers to instruct their daughters, and, as some think, their sons, although it is difficult to see why the father should be exempted from this obligation, unless we assume that the mother is more normal, nearer the race, and essentially purer in heart than the father. Certain it is that these highly sensitized juvenile minds can, by eight years of age, be so told of the modes of fertilizing flowers that some of them will begin to divine analogies with the animal world. The phenomena in the latter probably ought to be taught for the simpler forms first rather than the higher, and the indirect psychic functions of love, and the meaning of marriage, are modes of approach which may give due sacredness and solemnity to this instruction. Another principle is clear, viz., that information should be personal, given on the right

occasion of environment and interest, and that it should be brief and suggestive rather than by dissertations or books that always magnify the topic. The greatest content in the least form is a good law. Much anatomy is unnecessary, and every allusion to the sexual act, if this is necessary, should be set in a background of sentiment and religion, or at least of romance, which will give it a perspective that is true to its ideal and to the interests of the race. The principle of good taste should be strongly evoked to expurgate dirtiness, and the child made to feel an insight so much superior to the information derived from surreptitious sources that it will look down on these as vulgar. It seems a grave pedagogical error, involving no end of calamity, that when interest in sex awakens it should be allowed to develop independently of the ideas of gestation and birth, with which, when it is taught, it should be brought into inseparable unity. In this, as in the theological field, there are generally so many preconceptions to be removed that it is often hard to distinguish pure and unadulterated curiosity from that which is spurious, factitious or distorted.

Religious Curiosity. Closely connected with questions in regard to the origin of life, and frequently mingled with them, are the theological and Biblical puzzles which assail the childish understanding. Over and over again come the questions, "Who is God?" "Who made God?" "Who were God's father and mother?" "Who came before God?" Often these questions take crude and bizarre forms that have an irreverent sound to the older ears, though they are but the efforts of active little brains to bring the incomprehensible within the limits of experience.

That the story of creation, as given in Genesis, should arouse in the mind of a child of four or five, visions of a sort of mud pie process of construction, or that he should picture God as engaged in baking bread in answer to the petitions addressed to him, is but one of the natural results of the literalness of childhood. The child's thought cannot transcend his experience. Nor should he, because of this, be considered as lacking in reverence. His imaginings are certainly no more realistic than those of the early Christian painters who depicted Eve as actually issuing full grown from Adam's side. The little philosopher of five who asked, "Does God make some little boys good and some bad?" was facing a problem which has puzzled the brains of theologians for centuries. Frequently, it is only through some of these occasional questions that we can get a clue to what is passing in the child's mind, for with all their frankness, children are often singularly reticent about

what they think and feel most deeply. To any one who is accustomed to being with children, the following examples will probably seem familiar and suggest a host of similar questions.

M., 4. Shown a picture of the Golden Calf and told that it was worshipped by the people. "Auntie, I wonder if it is all made of gold? Do the people worship it as we worship God? Why do the people worship it?"

M., 4. "Mamma, who is God's mother?"

M., 4. Had been gathering shingles and asked, "Mamma, do they play with shingles up in Heaven?"

M., 4. First visit to the seashore. "Who made the ocean?" "God." "Well, who made God?"

M., 5. "Mamma, what is the sun? Don't you suppose that it is the end of God's cigar?"

M., 5. "Does God make some little boys good and some bad?"

M., 4½. Having been told the story of Christ calling his disciples, asked, "What did they do with the fish?"

F., 5. "If we did n't have any bread would God give it to us?"

M., 6. "Mamma, does Jesus have an oven up in heaven?" On being told no: "Well, then, how does he bake our daily bread?"

M., 6. "When Jesus was a baby did he know as much as God?"

M., 7. After listening to a number of Bible stories: "Well, if God made all those good men and is so good, I'd like to know who made him."

M., 9. Had his curiosity aroused in Sunday School and was not contented till the story of Noah had been told over and over.

Is Ish Armour my brother? What makes him black? Am I black? Why is he white and me black? Had been taught we are all children of Adam and Eve and therefore all brothers.

F., 3½. Used to hearing God spoken of as Jesus. One day her mother spoke of God. "God, who is God?" "Jesus is God." "Oh! is his name God and Jesus too?"

F., 3½. "Did Heavenly Father make your hair? Did Heavenly Father make that hair that you take off?"

F., 7. "Mamma, if I am naughty at night, God can't see me, can he?"

F., 7. "Did God make me? Did he make you? Did he make pigs? Well, then, why did n't he make you a pig?"

F., 9. "If God will keep us, why do we have to pray to him to keep us through the night?"

F., 12. Used to ask how Jonah could come out of a whale's body alive. How Jesus could walk on the sea, etc.

F., ? Asked what God did in Heaven and if he ever took a walk.

F., ? "Mamma, who made you?" "God made me." "Who made me?" "God made you." Sometime passed. "Mamma, where does God have his office? Where does he get so much stuff to make you and me? What did he make us for? How did I get down from Heaven?" Not getting satisfaction she sighed and said, "Does God have an office like other men?"

F., 7. "If God made everything and everything had a beginning when did God begin? Who made God and was there another world like this earth?" But could never see why God did not have a beginning once upon a time.

The crudity of some of these ideas is but a natural stage of development and outgrown at a later period, but some childish misconceptions lead to serious results later, and it is a ques-

tion whether unskillful, even if well meant Sunday School teaching is not responsible for a vast amount of scepticism in later years. The order in which religious truths should be taught, and the form in which they should be presented, is one of the great pedagogical questions which as yet remains unanswered. It is certain that the haphazard teaching which prevails in most Sunday Schools has, to say the best of it, very mixed results. Several attempts have been made with deaf and blind children to guard their early ideas from the misconceptions which beset most children in the course of this theological training, and to await the spontaneous awakening of interest in the great problems of life and death. These attempts have been frustrated as far as their scientific import was concerned, partly by the well meaning but mistaken endeavors of those who did not realize the danger of misconception that might do permanent injury. This happened both in the case of Laura Bridgeman and Helen Keller, though fortunately, especially in the latter case, little harm was done, as the form of attempted instruction was unsuited to her comprehension and made but little impression. But when Helen was eight years old, having then been under Miss Sullivan's care for two years, she asked spontaneously "Where did I come from and where shall I go when I die?" The explanations which she was able to understand at this time did not satisfy her, but two years later the questionings of her active intelligence reached a point where definite religious instruction was demanded and she was placed under the wise care of Phillips Brooks. At that time she was asking such questions as "Who made the real world?" and when it had been explained to her as far as possible, "Who made God? What did God make the new world out of? Where did he get the soil and the water and the first seeds and animals? Where is God? Did you ever see God?" Probably many of these questions would have come at an earlier age had she not been shut in a world of darkness and silence from the time of her illness, in 1881, till the spring of 1887, when Miss Sullivan opened for her the door of communication with the outer world. But to all children, sooner or later, these questionings come, and the questions themselves are the best guide for tracing the course of the child's thought and finding out its needs. The practical character of childish thinking comes out very plainly in the questions on death and Heaven; the question of eating coming up very frequently in this connection.

F., 6. "Mamma, do the angels have nothing but angel's food to eat? What shall we have to eat in Heaven?"

F., 6. "Mamma, where do you go when you die? Will you go with me? Will we both be put in the same box? What will we have to eat?"

Death. The attitude of most children between three and seven, toward death, seems to be chiefly one of curiosity.¹ Occasionally a sensitive child reflects the feeling of those about him, but usually the attitude is one of inquiry. The first experience of death often comes to children in the death of some pet animal, or perhaps from finding the bodies of dead birds or insects. The impression made is not usually a painful one, but curiosity is aroused and numerous questions are asked, and upon the character of the answers given the child's feeling is chiefly dependent.

M., 6. Had an interesting story read to him. In the story the man died. Went away by himself and said over and over to himself, "Why did he die? Why did he die?"

F., 4. Saw a man climb an electric wire pole and asked the lady with whom she was: "Addie, will you go to Heaven whole?"

F., 8. Used to wonder what she was, why she was living, whether life was real or only a dream. At one time half believed that she lived two lives, one by day and one by night. Never had courage to ask anybody about such things. In other matters was always asking Why? and What for?

F., ? Strong curiosity about death. Desired to be dead just to see how it felt.

F., 7. "Why do people die? Why do they put them in the ground? Do they always stay in the ground or do they go somewhere else?"

The child's interest in death is another great opportunity for moral, religious, and even scientific instruction, which has not only never been met but perhaps has never been adequately appreciated. Infant curiosity, as we have seen, often focuses on its physical phenomena, and it seems singular that so often there is, at first, no fear. In many cases the birth of terror can be seen in very young children when they first distinguish a corpse from that of a person in normal sleep. Rarely, indeed, would curiosity as to how it feels to die, prompt the youngest child to seek to experience death, but often in the history of the race, as in children, heaven is made so attractive as to lessen the love of life and even to counterbalance the fear of death. Perhaps the pains of hell have sometimes been necessary to offset the attractions of heaven in the young, when the latter was made too seductive, so that a little sense of danger, stimulated by awakening qualms of conscience, was needful. One thing is certain, and that is, that death, where taught, should first be presented as the natural and necessary end of a long life, so that the prevailing ideas of it in the young should not be derived from instances of premature, accidental, or tragic death. In this respect, and from this standpoint, the ostensive instance of Jesus, who was killed and did not die a

¹Colin A. Scott: *Old Age and Death. Am. Jr. of Psychology*, Vol. VIII, p. 93.

natural death, is often misleading. Death at the end of an ideal old age can be so taught as to make it not only natural, but beautiful and attractive, especially at the age of adolescence, when the first realization of it sometimes haunts the soul with great persistence. Youth is not complete without frankly envisaging the great fact that individual life is limited in time, and that the inevitable hour is for all alike. Death, at this age especially, is a muse of great inspiration and can evoke and sustain high ideals. It may be taught as an examination, test, or moral assay. Immortality is biological, and great stress must be laid upon the fact that the good we do will live after us; that one of the best ways to die is, as the Buddhists say, in thinking on our good deeds; and that the soul must be made so virtuous, and the mind so glorious with great ideas, that God, or the universe, cannot afford to have it perish. They should be taught that the sting of death is to die without leaving the world better. Youth can be appealed to powerfully by the thought of leaving a name, a record, a memory, that will be cherished by those who come after, and later the concept can be made of great practical power that life must be so led that children shall be well born and perpetuate the race in increasing numbers to the remotest generations. If all this is well done, the problem whether the individual consciousness survives in a transcendent world, will lose its difficulties and its dangers, both moral and intellectual, and can be met with frankness and left to the domain of hope and faith, where Jesus placed it, with due care to avoid premature theological subtleties.

Perhaps nothing gives a clearer view of the activity of a child's mind, and its various interests, than a list of miscellaneous questions selected on no other basis than that they show thought and observation. The kaleidoscopic picture thus presented is far more than a list of amusing questions at which we may smile and wonder how such ideas ever entered the child's mind, for it reveals the actual workings of the mind in a way not otherwise obtainable. Some times, all unconsciously, these questions reveal certain facts of the child's environment in an unmistakable way. A list of all the questions asked by a child during a week or a month would probably furnish material for a very fair guess at the child's interests and surroundings.

F., 2½. Asked if black people were made of black dust.

M., 3. "Will the trees all have the same leaves again?"

F., 3½. "Seeds are brown, are n't they, mamma?" "Yes." "But the flowers are n't brown, why are n't they?"

M., 4. "Where does the stocking go when a hole comes in it?"

M., 4. On being shown his baby brother: "What is he good for anyway? Can he play ball?"

F., 4½. "How do the chickens crow?"

F., 5. Wondered why a chair was called a chair and she was called a girl.

- F., 6. "Are there any fairies now? Did you ever see one?"
- F., 6. Wanted to know why the minister flung his arms about so much.
- F., 6. Asked if she was wound up; wanted to know if she would run down?
- M., 5. "Papa, why don't your eyesights get mixed when they cross each other?"
- M., 6. Wanted to know what was inside us to make us laugh.
- M., 5. Playing with the cat: "Why can't Titty Tay talk?"
- M., 5. "Why does my goblet sweat?"
- M., 5. "Shall I be a mamma when I grow up?"
- M., 6. Looked closely at a sweater and asked "Where is the buttons on that coat?"
- M., 7. On being told that George Washington never told a lie asked: "What ailed him? Could n't he talk?"
- M., 6. "Why does n't God read the weather reports and have the weather right?"
- F., 5. "Does a hen ever get nervous? Who was the mother of the first horse that ever lived?"
- F., 6½. "Why do the angels never fall down to earth when there is no floor to heaven?"
- M., 7. "Where is to-morrow?" "What is the highest number you can possibly count?"
- M., 7. "Why does a square piece of wood look round when the lathe is working?"
- F., 7. "Is the tick of the clock round or square?"
- "Why did grandpa wind the big clock? How could his winding it up make it go all the week? Did the Lord make it go?"
- F., 7. "What makes my eyes open and close?"
- M., 8. "What makes the old rooster walk different from the old hen?"
- F., 8. Was eager to know what sleep was and declared she had never been asleep.
- F., 8. "Do dogs ever have the headache?"
- F., 9. Asked a great many questions when her mother was making cake. Next day made some herself successfully.
- F., 12. "Say pa when you sneeze, where does the sneeze go to?"
- M., 12. "How can far off things look near?"
- M. "Why do some people have red hair and some black?"
- F. "What are debts? do we have debts?"

Mere aimless curiosity or inquisitiveness plays but a small part in the incessant questionings of childhood. Every normal child is curious but their reiterated questions, which often seem tiresome to a busy and tired mother, are prompted by a real desire for information; and the child's point of view was well expressed by the little fellow who, when told he must n't ask so many questions, sighed, "But there's so many things I want to know." Of the more than twelve hundred cases of manifestations of curiosity, only 5.62 per cent. came under the classification of mere inquisitiveness, either in the form of questions or illegitimate peeking and prying shown by actions. Under this heading were classified all cases of aimless prying into what could have no objective interest and all attempts to find out, by illegitimate peeking and prying, things intention-

ally concealed or forbidden. In this sense inquisitiveness is not a characteristic of children under five years, and their incessant questioning and investigating is distinctly utilitarian and a developmental process, while inquisitiveness in the specific meaning given above is a perversion of a natural impulse toward a useful end, to what is useless and frequently involves an element of deceit. It is closely connected with defective power of attention, for children whose interests are strong and whose attention is absorbed by these interests are rarely inquisitive in this derogatory meaning of the word. It differs from legitimate curiosity, not in its nature but in its application. The mere fact that anything is concealed or not intended for inspection, appears to act as a strong stimulus to some natures, whether or not the object is in itself interesting. Probably the primitive impulse to investigate whatever is concealed, is the fundamental element here, and the abnormal development is due chiefly to a lack of inhibition and restraint. In both children and adults it is most frequently associated with neurotic tendencies and frequently with a more or less defective physical development. Manifestations of inquisitiveness are too well known to need illustration. Peeking and prying into parcels, closets, trunks; peeking and listening at keyholes, behind doors or other places of concealment; desire to know what every one is talking about; efforts to overhear things not intended for them, questions about private affairs of others are well known characteristics of the Paul Pry order of person, and as this morbid form of curiosity, apparently grows by what it feeds upon, its existence in a child as a marked characteristic should be considered reason for an inquiry into the child's nervous condition. Though occasional exhibitions of this perverted form of curiosity are common enough among normal children, especially before Christmas, when desire to find out what their presents are to be, frequently overcomes the scruples which usually inhibit such manifestations, these occasional lapses, especially where there is a strong temptation from personal interest, are not at all to be considered as symptoms of neuropathic conditions, as in the case of the characteristically inquisitive child.

Echolalia or the constant repetition of the same question, which becomes so wearisome to the one answering, seems also to have a close connection with nervous fatigue. The questions are asked, not for information, but because, under certain conditions of fatigue, it seems as if certain nervous paths of discharge were established and the repetition became almost¹ automatic. Many of these cases of echolalia are reported as occur-

¹ Clouston: *Neuroses of Development*. London, 1891.

ring toward the close of the day, or on long railway journeys, or when the child is "not quite well" and has been kept in the house for that reason.

Random questions, which are sometimes poured out in an incessant stream, without pausing for answer, are also frequently due to fatigue and are often a characteristic of feeble minded children. One child who had sufficient intelligence to act as guide through quite a complicated route of short streets, asked disconnected questions constantly during the walk of about twenty minutes. Sometimes an answer was waited for, but in many cases, the attention wandered to new subject before an answer could be given and the former question was apparently forgotten. The mental condition appeared similar to that of a normal child too fatigued to remember his own questions, but in the one case there is defective development of the nerve cells and in the other the fatigued nerve cells are capable of recuperation. One child of five yrs. after a long railway journey, during which she had become very tired and fretful, responded to the effort to amuse her with the frost on the car window, by asking the same question in regard to it twenty-two times in half an hour, and every one who has tried the experiment knows the difficulty of holding the attention of a tired child for more than a few minutes at a time. The tendency to echolalia is observable in some forms of delirium, where the same question or sentence is repeated over and over, and the cause, as with the tired child, is to be sought in the fatigued cells of the cortex. Children, undoubtedly, sometimes ask questions merely for the sake of talking and not because of any particular desire for information, and should, of course, be checked under such circumstances; yet the boy of six, when asked: "What does makes you so tiresome, to-day?" replied far more aptly than he knew, when he answered. "I'm not tiresome; I'm tired."

Destructiveness as a phase of curiosity, is too frequently misunderstood, and the child's point of view left out of account. The *motive* is overlooked, and, considered only on the side of results, the case is certainly rather bad for the child. Out of the 1,227 cases which furnished the basis for the present study, 332 or 27.08 per cent. involved destruction of property: for the most part toys, or the child's own belongings, but in some cases objects of considerable value. The age at which this overwhelming desire to find out the construction of things reaches its height, is between four and eight. There appears to be little difference between boys and girls in this impulse to investigation, though the objects destroyed differ somewhat. The distribution of cases according to objects destroyed is as follows:

	M.	F.
Musical instruments,	44	+ 22
Clocks and watches,	57	+ 25
Dolls,	12	+ 66
Mechanical toys, etc.,	20	+ 22
Miscellaneous objects, to see what was inside,	21	+ 31
Thermometers,	2	+ 2
Miscellaneous,	12	+ 16
	<hr/>	
	168 + 164 = 332	

As considerable pains has been taken by the observers who answered the syllabus to find out the child's real motive, and cases in which this precaution was wanting have been rejected, the evidence is conclusive that in the 332 cases of which use has been made, wanton destructiveness or carelessness played a very small part. Curiosity as to the cause of sound and motion, and desire to see the inside of things, were the chief motives which influenced the youthful investigators. They wanted to find out "what made the noise," "why dolly opened and shut her eyes," what made the "cow moo," and what was inside tops, marbles, and thermometers, and grief at the loss of some valued toy was aggravated by a keen disappointment at non-success in finding the noise of the drum or the tick of the watch. Cherished dolls were sacrificed to the overwhelming desire to find out what made the eyes move or why pressing the body caused a cry. One child cried bitterly after she had spoiled her doll by poking in its eyes, not because the doll was ruined, but because, as she tearfully explained, "Now I can't ever find out what makes dolly shut her eyes. Won't you buy me another one so I can find out?" Numerically, at the head of the list of objects destroyed, stand clocks and watches, many of them toys, though the list is by no means restricted to these. In the younger children, desire "to find the tick" is the ruling motive, but this develops into the larger interest in motion and the desire to find out what makes the watch go. The injury done is frequently an unexpected result to the child. So keen and widespread is this interest in clocks and watches, even when not exhibited in the destructive form, that the gift of a cheap clock with permission to take it to pieces, affords more pleasure to many children than any number of costly toys whose mechanism cannot be investigated.

Several instances were given in the returns, in which an old clock has proved a source of interest and amusement, and boys of nine to twelve years, after numerous trials, succeeded in putting them together after taking them apart, a feat which certainly has sufficient educational value to compensate for some failures at readjustment. Mechanical toys, more than

any others, seem to have the shortest existence in the hands of bright, active, children, a fact which suggests that toys so constructed as to show principles of motion and elementary physical laws, without involving their own destruction, are an educational need yet to be supplied. Some such, indeed, already exist, but they are far too few and too little known. This destructive form of curiosity, due to normal development of mentally active children, needing guidance, and to be furnished with a proper outlet, but not repressed, is not to be confused with the careless destruction of toys, due to lack of interest, which is unfortunately common in children whose interest and powers of appreciation have been weakened and dissipated by overloading them with toys and diversions until it has bred in them an ennui which has sapped their power of attention, and left them incapable of self entertainment. Healthy children, if allowed to develop under normal conditions, find interests and amusements for themselves, and the child who has been so reared that he wants to be constantly amused, and has no keen desires because they have been too frequently anticipated, has been deprived of one of the rights of childhood. The child who suffers from too many toys is, perhaps, on the whole, more to be pitied than the child who has too few. Destructiveness, when the impelling motive is curiosity, is closely allied to constructiveness, and some of the appended examples mention the transformation which has appeared at a later stage of development.

EXAMPLES OF DESTRUCTIVE CURIOSITY.

- M., 3. Broke his toy gun to find out what made the noise.
 M., 3 yrs. 7 mos. Broke a toy cow "to find the moo." Broke a mechanical toy to find out what made it go.
 M., 4. Pulled a clock to pieces to find out what made it strike. When twelve years old could put a clock together.
 M., 4. Cut open a doll to see if blood would come.
 M., 5. Took a toy watch apart to find out what made the hands move.
 F., 5. Cut her doll's body open "to see what kind of blood it had." Said it was something like sugar.
 F., 6. Broke her doll to see what made it shut its eyes.
 F., 6. Took off the back of the doll's head to see what made its eyes move.
 F., 8. Had a doll, and one day knocked its eye in. Broke the head to find out what had become of the eye and then cried as if her heart would break.
 M., 8. Destroyed a clock, trying to find out what made it go.
 M., 8. Took a clock apart and put it together again, though it never struck properly afterwards. Took a wringer apart and put it together again correctly.
 M., 4. Broke a humming top to see what made the noise.
 M., 12. Took a mechanical toy to pieces to see what made it go. After several attempts succeeded in putting it together again.

M., 6. Disappointed in the result of questions asked about a watch; opened it to see how it was made. Opened fire crackers to see what was inside.

M., 8. Broke a tape measure to find out how the tape was drawn in.

M., 4. Had a toy rooster which crowed; broke it to see what made it crow.

F., 8. Had heard that tortoise shell will not burn but that celluloid will. Collected all the side combs in the house and tested them to find out whether they were tortoise shell.

M., 4. Cut the hair of his sister's doll to see if it would grow again.

M., 8. Dropped a toy engine from third story window so that it would break and he could find out what was inside it.

F., 6, M., 7. Each received a large Easter egg. There was a glass at the end to look through. Both broke their eggs to see what was inside.

M., 6. Took a toy steamboat to pieces to find out what made it go. Tried to put it together again but failed.

M., 7, F., 8. Broke the thermometer by putting it on the stove to see how high the mercury would rise.

M., 5½. Pulled a toy engine apart "to see where the 'choo choo' was."

M., 6. Had a mechanical coach. Tried to open it with a knife and hammer to find out what made it go.

F., 7. Broke marbles to see what the colors were made of.

M., 6. Broke open a toy violin to see where the noise came from.

M., 5. Broke his drum to find the noise.

M., 4½. Had a gong on wheels; made a great effort to see what was inside it. It was iron, and he did not succeed. At last he put it in the road and let a cart go over it.

M., 7. Had a small rubber ball with shot in it. After vainly trying to see what made the noise, took a hatchet and cut it open.

F., 9. Took a music box to pieces; found she could not get it together again.

F., 8. Destroyed a cuckoo clock trying to make the bird come out.

M., 8. Destroyed a toy piano trying to find out how it was made.

F., 5. Had a bank in the form of a frog; took it apart to see what became of the pennies that went into its mouth.

M., 5. Took a mouth organ apart to see what made the noise; broke a toy horn for the same reason.

M., 6 and F., 7. Smashed a large colored glass marble to see what was inside.

M., 7. Smashed a glass paper weight to find out how the little pieces of glass were put inside.

Desire to Travel. The desire for travel seems well nigh universal in the American adolescent, only three in the entire number of those answering this question (482) stating that they had never had this desire. There are but few cases in which this desire developed before the age of ten. The initiative of this desire is found either in stories told by friends who have travelled or in books. Among juvenile books the "Swiss Family Robinson" has the largest number of mentions by both boys and girls, and "Robinson Crusoe" has the largest number of mentions by boys. When this desire for travel is aroused in those who have the migratory instinct strongly developed, there are a few cases of starting out in search of runaway adventure.

These, however, were chiefly children under ten, and nightfall proved a corrective to the spirit of adventure.¹ One case of running away from home at the age of fifteen, was stated to have been inspired by this desire for travel, but, on the whole, the influence seems to have been beneficial. In 40 per cent. of the cases, desire to travel led to interest in reading books of travel and in many cases this led to a love of history and kindred subjects. The influence of a book on the South Sea Islands in determining the career of an imaginative and home-loving child, has been vividly described by Peirre Loti in his "Roman de L'Enfant." But while this desire for knowledge of new people, places, and things is so wide spread, very few of the cases described in detail show indications of an interest sufficiently absorbing to prove a disturbing influence in the ordinary routine of life. Americans, as a nation, are accused of a restless desire for change which is detrimental to the best interests of home life, but the interest in travel, which is one of the phases of curiosity, and most active during the adolescent years, seems to have no necessary connection with the later development of nervous restlessness. It appears, rather, to be an intellectual development belonging to the age when the desire for new experiences of all kinds is characteristic.

In comparative psychology, though statements that certain *animals are curious* abound, no attempt has been made to trace the development of curiosity in either the ontogenetic or phylogenetic series, except, perhaps, by Romanes who essayed to group animals at different levels, according to their psychic development, and to correlate these with the different stages of human development. Romanes places insects and spiders on his third level, and it is in this group that he places the first appearance of curiosity, but he gives as an example of insect curiosity the tendency to fly toward any bright light or shining surface. But there seems to be no sufficient reason for attributing this tendency to any psychic impulse, since it is explainable on a purely physiological basis. Even in the human infant we do not attribute the first turning of the eyes toward light to any psychic impulse, but interpret it as a physiological reflex. On the next higher level, Romanes places fishes; and here, perhaps, we have some ground for attributing a psychological impulse, though Prof. Sanford² considers even this somewhat doubtful. "They may, perhaps, possess the beginnings of Curiosity, if the luring by light is not a physio-

¹ Cf. Truancy as Related to the Migratory Instinct. L. W. Kline, *Ped. Sem.*, Vol. V, p. 381.

² *Psychic Life of Fishes*. E. C. Sanford. *International Quarterly*, Vol. VII, No. 2, 1903.

logical phenomena." Groos quotes Eimer as authority for the statement that some species of lizards are so curious that they may be captured by dangling a noose in front of them. A step higher, and the psychic development becomes unquestionable. We have abundant evidence of curiosity displayed by crows, canaries and parrots, and nightingales.¹ A parrot with which some personal experiments were made, never failed to show curiosity in regard to the ticking of a clock. When placed on the mantel he invariably walked around it, examined it on all sides, stretched his neck to see the top of it, tried to look behind, and showed great excitement whenever he happened to get into a position where the tick was most plainly audible. Lloyd Morgan gives instances of curiosity in chicks, but considers their mental attitude as reducible to a simple "what," rather than "why," which involves more complex psychic factors. Cats, dogs, raccoons, goats, horses, cows and deer, all show curiosity in marked degree, and advantage of this fact is taken in hunting the latter by the method of luring by light. Scheitler calls the dog the most curious of animals, and calls attention to the fact that this trait greatly enhances his value as a watchdog, but most students of animals give the monkey precedence over all others in the development of this trait. Thorndike found that the attention of monkeys was very easily distracted, and considers the attention of animals as working always for immediate, practical associations, and below the grade of the passive attention in human beings, which in its development is closely connected with the acquisition of a stock of free ideas. Groos considers curiosity the only purely intellectual form of playfulness in the animal world, and says, "It is apparently a special form of experimentation, and its psychologic accompaniment is attention, which is indeed a requisite to the exercise of the most important instincts."

In curiosity, attention loses the purely utilitarian function which it has in connection with the cravings of hunger, desire, and the necessity of avoiding danger, and becomes play. Groos ascribes the primary reason for this sort of playfulness to a necessity for mental exercise. But since the new object may always prove advantageous, it also aids in the preservation of the species. In the higher animals, manifestations of curiosity closely resemble those of the child. One of the monkeys, a macacus rhesus, formerly used by M. Kinnaman² in his experiments, showed his curiosity in an unmistakable way when a closed box painted black on the inside, was placed in his cage.

¹Scheitler; Thiersulenkunde, Vol. II, p. 342.

²A. J. Kinnaman: Mental Life of Two Macacus Rhesus Monkeys in Captivity. *Am. Jour. of Psy.* Vol. XIII.

He immediately came to the end of the cage where it was placed, examined it closely, touched it cautiously, and finally picked it up and tried to open it. It came open rather suddenly and he dropped it and started back. His curiosity soon overcame his timidity, however, and he picked it up again, smelted it, bit it, put his hand, and finally his head, into it. In all this the monkey was closely paralleling the stages of curiosity shown by children, though his attention was less concentrated and he was more easily startled than is the case with children.

The larger aspect of interest and curiosity is almost coextensive with the range of educability, but it is believed that this paper marks a decidedly important advanced step toward a larger synthesis that has so long beckoned students of childhood, namely, the determination of intellectual nascent stages. Curiosity is the apparent, now partial, now dominant, motive in many fields where its importance has never been adequately estimated. For instance, Kline¹, and Arnett² have shown that the truancy and runaway motives are, in part, due to curiosity to see the world. Partridge³ has shown that many take their first drink, or, perhaps, even acquire their first experience of intoxication, to see how it tastes or how it feels, respectively. Curiosity is very manifest in the infant stages of acquaintance with its own body.⁴ Dawson⁵ has given us suggestions for the order of development of interest in the personages and events and sentiments of the Bible. Many studies on the development of language and children, show stages of curiosity concerning the form, meaning, or even origin of words. Interesting illustrations of this theme, too, especially as related to association, and causal and other types of reasoning, are shown in the data presented by H. W. Brown.⁶ Studies of suggestibility and the quest of certainty; like those by M. H. Small,⁷ show many outcrops of the same motive. How essentially attention is dominated by interest or curiosity, all the laboratory and other studies of it show. How dangerous is the neglect of natural interest is elsewhere pointed out in the single field of physics.⁸

Important as we deem the results of this study, it is thus

¹ Migratory Impulse, *Am. Jour. of Psy.*, Vol. X, p. 1.

² Origin and Development of Home and The Love of Home, *Ped. Sem.*, Vol. IX, p. 324.

³ The Psychology of Alcohol, *Am. Jour. of Psy.*, Vol. XI, p. 320.

⁴ The Early Sense of Self, G. S. Hall, *Am. Jour. of Psy.*, Vol. IX, p.

351.

⁵ Children's Interest in the Bible, *Ped. Sem.*, Vol. VII, p. 151.

⁶ Thoughts and Reasonings of Children, *Ped. Sem.*, Vol. II, p. 358.

⁷ *Ped. Sem.*, Vol. IV, p. 176, and *Ped. Sem.*, Vol. V, p. 313.

⁸ High School Physics, *Ped. Sem.*, Vol. IX, p. 193.

really only preliminary to a larger presentation of the characteristic outcrops of interest or the desire to know, which, when determined for successive ages and stages, will be the best and surest norm for ascertaining when all such matter can be taught with greatest economy and with most effectiveness, and will also shed great light upon methods of instruction. All this again shows very clearly how far we already are beyond the arid and abstract formulæ of Herbart. It may be that we shall sometime come to reflect that forcing knowledge upon unwilling minds, that are unripe for it, is immoral.

A question uttered, or unexpressed, is a prayer for knowledge. The moment when it arises in the soul should be sacred; almost like that of the hour of visitation of the Holy Ghost to the religious teacher. Not to feed every normal curiosity, the good teacher will consider recreancy to his duty.

Many questions, no doubt, arise, in the average mind but once in an entire lifetime, and if the opportunity which they make is not promptly and effectively utilized, the bud of promise is forever blasted. Perhaps, in the future, education will realize the idea of being guided solely by these chief expressions of psychic need or want. For most of us, there comes for a time, most commonly in very early adolescence, an all-sided, disinterested curiosity, which is the basis of liberal education, but which vanishes later and is succeeded by a second growth of interests which are more and more tinged with utility, professional success, or individual advancement. When such studies as these shall be carried more fully into the later teens, this change from what we may call pure curiosity to that with an alloy of gain or advancement in it, will be more clearly seen. Indeed, few people in any community illustrate up to full maturity what man as man most centrally wants to know. One great purpose of education is to so place and to so environ a few individuals that they shall thus illustrate the deeper tendencies of race advancement, so that their interests shall point as truly as the needle to the goal of human destiny. This, we grant, is a very difficult problem, only partially attainable. Even the child's theological interests, as here illustrated, are more or less factitious, and very different in unknown and non-Christian lands and ages, and due to precocious doctrinal inculcation. They thus rest on a very different foundation, and have a very different culture value from the purely spontaneous interests in the varying phenomena and objects of nature, or even from that in things hidden, or in the mechanical secrets of toys, etc.

I. In summarizing the results of this study it appears that curiosity develops by gradual stages and is a fundamental factor in the development of attention.

II. Four stages of development may be recognized.

1. Passive staring, considered as a reflex with psychic accompaniment; manifested in infants as early as the second week of life.

2. Surprise, usually noted in the second month.

3. Wonder, which is observable about the end of the second month, the time when the accommodation of eye takes place.

4. Interrogation or curiosity proper, which begins to be manifested about the fifth month.

These last three stages are those recognized by Ribot:

III. The chief stimuli of curiosity during the first half year are those of sight. The order in which interest in other sensations develop is hearing, touch and muscle sensations, smell and taste. These do not successively predominate but overlap and sight, the first in order is not subordinated as other interests develop.

IV. Curiosity is manifested by: 1, observation, passive and active; 2, experiments; 3, questions; 4, destructiveness; 5, desire to travel.

V. Aimless curiosity or inquisitiveness is, in normal children, usually a sign of fatigue, and this is also true of echolalia. When chronic, both these manifestations indicate neurotic tendencies associated with defective power of attention and lack of inhibitory control.

VI. Curiosity is the active factor in the development of attention, and lack of it shows either mental deficiency or bad pedagogy.

VII. Animals show the various stages in the development of curiosity and manifest it, by observation as do human beings, experiment and destructiveness, though it is probable, that, except in the higher animals, the full stage of interrogation is never reached.

VIII. This work is provisional and a larger synthesis, with curves for each nascent psychic stage impends.

IX. A few practical suggestions concerning the pedagogical utilization of curiosity concerning death and the origin of life are appended.

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