

## THE GENERAL IDEAS OF INFANTS AND DEAF-MUTES.<sup>1</sup>

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WE are concerned with children who have not yet learned to speak, and with such alone. In contradistinction to animals, and to deaf-mutes when left to themselves, infancy represents a transitory state of which no upper limit can be fixed, seeing that speech appears progressively. The child forms his baby-vocabulary little by little, and at first imposes it upon others, until such time as he is made to learn the language of his country. We may provisionally neglect this period of transition, studying only the dumb, or monosyllabic and gesture phase.

The problem proposed at the end of the seventeenth century (perhaps before), and dividing the philosophers into two camps, was whether the human individual starts with general terms, or with particulars. At a later time, the question was proposed for the human race as a whole, in reference to the origin of language.

Locke maintained the thesis of the particular: "The ideas that children form of the persons with whom they converse resemble the persons themselves, and can only be particular."

So, too, Condillac, Adam Smith, Dugald Stewart, and the majority of those who represent the so-called sensationalist school.

The thesis of the general was upheld by authors of no less authority, commencing with Leibnitz:

"Children and those who are ill-acquainted with the language they desire to speak, or the matter whereof they discourse, make use of general terms, such as *thing, animal, plant*, in lieu of the proper terms which are wanting to them; and it is certain that all proper or individual names were originally appellative or general."<sup>2</sup>

<sup>1</sup> Translated from the French by Frances A. Welby.

<sup>2</sup> *Nouveaux Essais*, Book III., Chapter I.

The problem cannot be accepted under this form by contemporary psychology. It is equivocal. Its capital error is in applying to the embryonic state of intelligence and of language, formulæ that are appropriate to adult life only—to the growing mind, categories valid for the formed intellect alone. A reference to the physiology of the human embryo will render this more intelligible. Has this embryo, up to three months, a nose or mouth? Is it male or female? etc. Students of the development of intra-uterine life in its first phases are very cautious in propounding these and similar questions in such a manner; they do not admit of definite answers. That which is in the state of development and of incessant becoming, can only be compared remotely with that which is fixed and developed.

The sole permissible formula is this: Intelligence progresses from the indefinite to the definite. If "indefinite" is taken as synonymous with general, it may be said that the particular does not appear at the outset; but neither does the general in any exact sense: the vague would be more appropriate. In other words, no sooner has the intellect progressed beyond the moment of perception and of its immediate reproduction in memory, than the generic image makes its appearance, i. e., a state intermediate between the particular and the general, participating in the nature of the one and of the other—a confused simplification.

Recent works on the psychology of infancy abound in examples of these abstractions and inferior generalisations, which appear very early.<sup>1</sup> A few examples will suffice.

Preyer's child (aged thirty-one weeks) interested itself exclusively in bottles, water-jugs, and other transparent vases with white contents; it had thus seized upon a characteristic mark of one thing that was important to it, to-wit—milk. At a later period it designated these by the syllable *móm*. Taine records an analogous case of a child to whom *mm* and *um*, and then *nim* at first signified the pleasure of seeing its pap, and subsequently everything eatable. We are assisting at the genesis of the sign; the crude sound attached to a group of objects becomes at a later period the sign of those objects, and later still an instrument of substitution. Sigismund showed his son, aged less than one year, and incapable of pronouncing a single word, a stuffed grouse, saying "bird." The child immediately looked across to the other side of the room where there was a stuffed owl. Another child having listened first

<sup>1</sup> Cf. Taine, *L'Intelligence*, Vol. 1., Book 1., Chapter 11., Part 2, Note 1. (Preyer, *Die Seele des Kindes*, Chapter XVI.)

with its right ear, then with its left, to the ticking of a watch, stretched out its arm gleefully towards the clock on the chimney-piece (auditory, not vocal, generic image).

Without multiplying examples known to every one, which give peremptory proof of the existence of abstraction (partial dissociation), and of generalisation, prior to speech, let us rather consider the heterogeneous nature of these generic images, the result of their mode of formation. They are in fact constructed arbitrarily,—as it were by accident, depending partly on the apprehension of gross resemblances, partly, and chiefly, on subjective causes, emotional dispositions, practical interests. More rarely they are based upon essential qualities.

John Stuart Mill affirms that the majority of animals divide everything into two categories: that which is, and that which is not, edible. Whatever we may think of this assertion, we should probably feel much astonishment if we could penetrate and comprehend certain animal generalisations. In the case of children we can do more than assume. Preyer's son employed the interjection *ass* (which he had forged or imitated) first for his wooden horse, mounted on wheels, and covered with hair; next for everything that could be displaced or that moved (carts, animals, his sister, etc.), and that had hair. Taine's little girl (twelve months), who had frequently been shown a copy of an infant Jesus, from Luini, and had been told at the same time, "That is the baby," would in another room, on hearing any one ask her, "Where is the baby?" turn to any of the pictures or engravings, no matter what they were. *Baby* signified to her some general thing: something which she found in common in all these pictures, engravings of landscapes, and figures, i. e., if I do not mistake, some variegated object in a shining frame. Darwin communicated the following observation on one of his grandsons to Romanes:

"The child, who was just beginning to speak, called a duck 'quack,' and, by special association, it also called water 'quack.' By an appreciation of the resemblance of qualities, it next extended the term 'quack' to denote all birds and insects on the one hand, and all fluid substances on the other. Lastly, by a still more delicate appreciation of resemblance, the child eventually called all coins 'quack,' because on the back of a French sou it had once seen the representation of an eagle."<sup>1</sup>

In this case, to which we shall return later, there was a singular mixture of intellectual operations: creation of a word by ono-

<sup>1</sup> Romanes, *Mental Evolution in Man*, p. 283.

matopœia (resemblance) and finally an unbridled extension of analogy.

Such observations might be multiplied. They would only confirm this remark: the generic image varies in one case and another, because the condensation of resemblances of which it is constituted depends often upon a momentary impression, upon most unexpected conditions.

The development of *numeration* in the child takes us to some extent out of the pre-linguistic period; but it is advisable to consider it at this point. In the first place we have to distinguish between what is learnt and what is comprehended. The child may recite a series of numerical words that have been taught to him: but so long as he fails to apply each term of the series correctly to a number of corresponding objects, he does not understand it. For the rest, this comprehension is only acquired slowly and at a somewhat late period.

“The only distinction which the child makes at first is between the simple object and plurality. At eighteen months, he distinguishes between one, two, and several. At the age of three, or a little earlier, he knows one, two, and four ( $2 \times 2$ ). It is not until later that he counts a regular series; one, two, three, four. At this point he is arrested for some time. Hence the Brahmans teach their pupils of the first class to count up to four only; they leave it to the second class to count up to twenty. In European children of average intelligence, the age of six to seven years is required before they can count to ten, and about ten years to count to one hundred. The child can doubtless repeat before this age a numeration which it has been taught, but this is not what constitutes knowledge of numbers; we are speaking of determining number by objects.”<sup>1</sup> B. Pérez states that his personal observations have not furnished any indication contradictory to the assertions of Houzeau. An intelligent child of two and a half was able to count up to nineteen, but had no clear idea of the duration of time represented by three days; it had to be translated as follows: “not to-day but to-morrow, and another to-morrow.”<sup>2</sup>

This brings us back to the question, discussed in the last *Open Court*, of the numeration claimed for animals. Preyer tells us of one of his children that “it was impossible to take away one of his ninepins without its being discovered by the child, while at eighteen months he knew quite well whether one of his ten animals was missing or not.” Yet this fact is no proof that he was able to count

<sup>1</sup> B. Pérez, *op. cit.*, 219.

<sup>2</sup> Houzeau, *op. cit.*, II., 202.

up to nine or ten. To represent to oneself several objects, and to be aware that one of them is absent, and not perceived—is a different thing from the capacity of counting them numerically. If the shelves of a library contain several works that are well known to me, I can see that one is missing without knowing anything about the total number of books upon the shelves. I have a juxtaposition of images (visual or tactile), in which a gap is produced.

For the rest, much light is thrown on this question by Binet's ingenious experiments. Their principal result may be summarised as follows.<sup>1</sup> A little girl of four does not know how to read or count; she has simply learnt a few figures and applies them exactly to one, two, or three objects; above this she gives chance names, say six or twelve, indifferently to four objects. If a group of fifteen counters, and another group of eighteen, of the same size, are thrown down on the table, without arranging them in heaps, she is quick to recognise the most numerous group. The two groups are then modified, adding now to the right, now to the left, but so that the ratio fourteen to eighteen is constant. In six attempts the reply is invariably exact. With the ratio seventeen-eighteen, the reply is correct eight times, wrong once. If, however, the groups are found with counters of unequal diameter, everything is altered. Some (green) measure two and one-half centimetres, others (white) measure four centimetres. Eighteen green counters are put on one side, fourteen white counters on the other. The child then makes a constant error, and takes the latter group to be the more numerous, and the group of fourteen may even be reduced to ten without altering her judgment. It is not until nine that the group of eighteen counters appear the more numerous.

This fact can only be explained by supposing that the child appreciates by *space*, and not by number, by a perception of continuous and not by discontinuous size—a supposition which agrees with other experiments by the same author to the effect that, in the comparison of lines, children can appreciate differences of length. At this intellectual stage, numeration is accordingly very weak, and restricted to the narrowest limits. As soon as these are exceeded, the distribution between minus and plus rests, not upon any real numeration, but upon a difference of mass, felt in consciousness.

In children, *reasoning* prior to speech is, as with animals, practical, but well adapted to its ends. No child, if carefully watched,

<sup>1</sup> Cf. *Revue Philosophique*, July, 1890.

will fail to give proof of it. At seventeen months, Preyer's child, which could not speak a word, finding that it was unable to reach a plaything placed above its reach in a cupboard, looked about to the right and left, found a small travelling trunk, took it, climbed up, and possessed itself of the desired object. If this act be attributed to imitation (although Preyer does not say this), it must be granted that it is in imitation of a particular kind,—in no way comparable with a servile copy, with repetition pure and simple,—and that it contains an element of invention.

In analysing this fact and its numerous analogues, we became aware of the fundamental identity of these simple inferences with those which constitute speculative reasoning: they are of the same character. Take, for instance, a scientific definition, such as that of Boole, which seems at first sight little adapted to this connexion. "Reasoning is the elimination of the middle term in a system that has two terms." Notwithstanding its theoretical aspect, this is rigorously applicable to the cases with which we are occupied. Thus, in the mind of Preyer's child, there is a first term (desire for the plaything), a last term (possession); the remainder is the method, scaffolding, a mean term to be eliminated. The intellectual process in both instances, practical and speculative, is identical; it is a mediate operation, which develops by a series of acts in animals and children, by a series of concepts and words in the adult.

#### DEAF-MUTES.

In studying intellectual development prior to speech, the group of deaf-mutes is sufficiently distinct from those which we have been considering. Animals do not communicate all their secrets, and leave much to be conjectured. Children reveal only a transitory state, a moment in the total evolution. Deaf-mutes (those at least with whom we are dealing) are adults, comparable as such to other men, like them, save in the absence of speech and of what results from it. They have reached a stable mental state. Moreover, those who are instructed at a late period, who learn a language of analytical signs, i. e., who speak with their fingers, or emit the sounds which they read upon the lips of others, are able to disclose their anterior mental state. It is possible to compare the same man with himself, before and after the acquisition of an instrument of analysis. Subjective and objective psychology combine to enlighten us.

The intellectual level of such persons is very low (we shall re-

turn to this): still their inferiority has been exaggerated, especially in the last century, by virtue of the axiom, it is impossible to think without words. Discussion of this antique aphorism is unnecessary; in its rigorous form it finds hardly any advocates of note.<sup>1</sup> Since thought is synonymous with comparing, abstracting, generalising, judging, reasoning, i. e., with transcending in any way the purely sensorial and affective life, the true question is not, Do we think without words? but, To what extent can we think without words? Otherwise expressed, we have to fix the upper limit of the logic of images, which evidently reaches its apogee in adult deaf-mutes. Further, even in this last case, thought without language does not attain its full development. The deaf-mute who is left without special education, and who lives with men who have the use of speech, is in a less favorable situation than if he forms a society with his equals. Gérando, and others after him, remarked that deaf-mutes in their native state communicate easily with one another. He enumerates a long series of ideas, which they express in their mimicry, and gestures, and many of these expressions are identical in all countries.

“Children of about seven years old who have not yet been educated, make use of an astonishing number of gestures and very rapid signs in communicating with each other. *They understand each other naturally with great facility.* . . . . No one teaches them the initial signs, which are, in great part, unaltered imitative movements.”

The study of this spontaneous, natural language is the sole process by which we can penetrate to their psychology, and deter-

<sup>1</sup>Max Müller, however, is an exception. He has not made the smallest concession on this point in any of his works, including the last (*Three Introductory Lectures on the Science of Thought*. Chicago: The Open Court Publishing Co.). He even maintains that a society of deaf mutes would hardly rise above the intellectual level of a chimpanzee. “A man born dumb, notwithstanding his great cerebral mass and his inheritance of strong intellectual instincts, would be capable of few higher intellectual manifestations than an orang or a chimpanzee, if he were confined to the society of dumb associates” (p. 92). This thesis was attacked by thirteen critics, including Romanes, Galton, the Duke of Argyle, etc., but Max Müller meets them all and replies to them without flinching. It must be confessed that the arguments invoked by his correspondents are very unequal in merit. Some are convincing, others not. The Duke of Argyle says happily that “words are necessary to the progress of thought, but not at all to the *act* of thinking.” Ebbels (p. 13, appendix) shows that Max Müller has unduly limited the question by excluding all processes anterior to the formation of concepts; we think in images; the transition from one form to another is imperceptible, and the faculty of abstraction does not appear suddenly along with the signs. On the other hand, we cannot admit as evidence the facts invoked by other correspondents, e. g., chess-players who combine and calculate solely by the aid of visual images; answers to letters, conceived in the first place as a general plan before they are developed in words, etc. It is forgotten that the persons capable of these operations have had long practice in verbal analysis, thereby attaining a high intellectual level. So, in the physical order, the practical gymnast, even when not executing any particular feat, possesses a suppleness and agility of body, due to exercise, which translates itself into all his movements.

mine their mode of thought. Like all other languages, it comprises a vocabulary and a syntax. The vocabulary consists in gestures which designate objects, qualities, acts; these correspond to our substantives and verbs. The syntax consists in the successive order of these gestures and their regular arrangement; it translates the movement of thought and the effort towards analysis.

I. VOCABULARY—Gérando collected about a hundred and fifty signs, created by deaf-mutes living in isolation or with their fellows.<sup>1</sup> A few of these may be cited as examples:

*Child*—Infantile gesture, of taking the breast, or being carried, or rocking in the cradle.

*Ox*—Imitation of the horns, or the heavy tread, or the jaws chewing the cud.

*Dog*—Movement of the head in barking.

*Horse*—Movements of the ears, or two figures riding horse-back on another, etc.

*Bird*—Imitation of the beak with two fingers of the left hand, while the other feeds it; or simulation of flight.

*Bread*—Signs of being hungry, of cutting, and of carrying to the mouth.

*Water*—Exhibition of saliva, imitation of a rower, or of a man pumping; accompanied always by the sign of drinking.

*Letter* (missive)—Gestures of writing and of sealing, or of unsealing and reading.

Monkeys, cocks, various trades (carpenter, shoemaker, etc.) all designated by imitative gestures. For sleep, sickness, health, etc., they employ an appropriate gesture.

For interrogation: expression of two contradictory propositions, and undecided glance towards the person addressed. This is rather a case of syntax than of vocabulary; but a few signs may be further indicated for some notions more abstract than the preceding.

*Large*—Raise the hand and look up.

*Small*—Contrary gestures.

*Bad*—Simulate tasting, and make grimace.

*Number*—Indicate with the help of the fingers; *high numbers*, rapid opening of the hand several times in succession.

<sup>1</sup> *De l'Education des sourds-muets*, 2 vol., 1827. Notwithstanding its somewhat remote date, the book has lost none of its interest in this particular. It must also be remembered that institutions for deaf-mutes are far more numerous now than at the beginning of the century, and that the children are placed in them much earlier. Formerly they were abandoned to themselves or instructed very late; in proportion to their age, they presented better material for the study of their development.



*Buy*—Gesture of counting money, of giving with one hand, and taking with the other.

*Lose*—Pretend to drop an object, and hunt for it in vain.

*Forget*—Pass the hand quickly across the forehead with a shrug of the shoulders.

*Love*—Hold the hand on the heart (universal gesture).

*Hate*—Same gesture with sign of negation.

*Past*—Throw the hand over the shoulder several times in succession.

*Future*—Indicate a distant object with the hand, repeated imitation of lying down in bed and getting up again.

It does not need much reflexion to see that all these signs are *abstractions* as well as imitations. Among the different characters of an object, the deaf-mute chooses one that he imitates by a gesture, and which represents the total object. Herein he proceeds exactly like the man who speaks. The difference is that he fixes the abstract by an attitude of the body instead of by a word. The primitive Aryan who denominated the horse, the sun, the moon, etc., the rapid one, the shining one, the measurer (of months), did not act otherwise; for him also, a chosen characteristic represents the total object. There is a fundamental identity in the two cases; thus justifying what was said above: abstraction is a *necessary* operation of the mind, at least in man; he must abstract, because he must simplify.

The inferiority of these imitative signs consists in their being often vague, with a tendency to the opposite sense; moreover, since they are never detached completely from the object or the act which they figure, and cannot attain to the independence of the word, they are but very imperfect instruments of substitution.

II. SYNTAX—The mere fact of the existence of a syntax in the language of the deaf-mutes proves that they possess a commencement of analysis, i. e., that thought does not remain in the rudimentary state. This point has been carefully studied by different authors: Scott, Taylor, Romanes,<sup>1</sup> who assign to it the following characteristics:

1. It is a syntax of position. There are no "parts of speech," i. e., terms having a fixed linguistic function: substantive, adjective, verb, etc. The terms (gestures) borrow their grammatical value from the place which they occupy in the series, and the relations between the terms are not expressed.

2. It is a fundamental principle that the signs are disposed in

<sup>1</sup> Taylor, *Early History of Mankind*, p. 80. Romanes *Mental Evolution in Man*, Chapter VI

the order of their relative importance, everything superfluous being omitted.

3. The subject is placed before the attribute, the object (complement) before the action, and, most frequently, the modified part before the modifying.

Some examples will serve for the better comprehension of the ordinary procedure of this syntax. To explain the proposition: After running, I went to sleep, the order of gesture would be: to run, me, finished, to sleep.—My father gave me an apple: apple, father, me, give.—The active state is distinguished from the passive by its position: I struck Thomas with a stick; me, Thomas, strike, stick. The Abbé Sicard, on asking a deaf-mute, Who created God? obtained the answer: God created nothing. Though he had no doubt as to the meaning of this inversion, he asked the control question, Who makes shoes? Answer, shoes makes cobbler.

The dry, bare character of this syntax is evident: the terms are juxtaposed without relation; it expresses the strictest necessity only; it is the replica of a sterile, indistinct mode of thought.

Since we are endeavoring by its aid to fix an intellectual level, it is not without interest to compare it with a syntax that is frequent among the weak in intellect. "These do not decline or conjugate; they employ a vague substantive, the infinitive alone, or the past participle. They leave out articles, conjunctions, auxiliary verbs, reject prepositions, employ nouns instead of pronouns. They call themselves "father," "mother," "Charles," and refer to other people by indeterminate substantives, such as man, woman, sister, doctor, etc. They invert the regular order of substantives and adjectives."<sup>1</sup> Although this is a case of mental regression, hence not rigorously comparable with a mind that is sane but little developed, the mental resemblance between the two syntaxes, and especially the absence of all expression of relations, deserves to be signalled, because it cannot be the result of a fortuitous coincidence. It is the work of intellectual inferiority and of relative discontinuity of thought.

There is little to say about *numeration* in deaf-mutes. When untrained, they can count up to ten with the help of their fingers, like many primitive people. Moreover (according to Sicard and Gérando), they make use of notches upon a piece of wood or some other visible mark.

To conclude, their mental feebleness, known since the days of

<sup>1</sup> Kussmaul, *Die Störungen der Sprache*, Chapter xxx.

antiquity by Aristotle, by the Roman law which dispossessed them of part of their civil rights, later on by many philosophers who refused even to concede them memory, arises from their inaptitude to transcend the inferior forms of abstraction and kindred operations. In regard to the events of ordinary life, in the domain of the concrete (admitting, as is not always done, that there are individual varieties, some being intelligent, and others stupid), deaf-mutes are sufficiently apt to seize and to comprehend the practical connexion between complex things.<sup>1</sup> But the world of higher concepts, moral, religious, cosmological, is closed to them. Observations to this effect are abundant, though here again—as must be insisted on—they reveal great individual differences.

Thus, a deaf-mute whose friends had tried to inculcate in him a few religious notions, believed before he came under instruction that the Bible was a book that had been printed in heaven by workmen of Herculean strength. This was the sole interpretation he gave to the gestures of his parents, who endeavored to make him understand that the Bible contains a revelation, coming from an all-powerful God who is in heaven.<sup>2</sup> Another who was taken regularly to church on Sunday, and exhibited exemplary piety, only recognised in this ceremony an act of obedience to the clergy. There are many similar cases on record. Others on the contrary, seek to inquire into, and to penetrate, the nature of things. W. James<sup>3</sup> has published the autobiography of two deaf-mutes who became professors, one at the asylum of Washington, the other in California.

The principal interest attaching to the first is the spontaneous appearance of the moral sense. After stealing small sums of money from the till of a merchant, he accidentally took a gold coin. Although ignorant of its value, he was seized with scruples, feeling “that it was not for a poor man like him, and that he had stolen *too much*.” He got rid of it as best he could, and never began again.

The other biography—from which we make a few brief ex-

<sup>1</sup> Cf. as proof, the story related by Kussmaul (*op. cit.*, VII.): A young deaf-mute was arrested by the police of Prague as a vagabond. He was placed in an institution and questioned by suitable methods, when he made known that his father had a mill with a house and surroundings which he described exactly; that his mother and sister were dead, and his father had remarried; that his step-mother had ill-treated him, and that he had planned an escape which had succeeded. He indicated the direction of the mill to the east of Prague. Inquiries were made, and all these statements were verified.

<sup>2</sup> Romanes, *Mental Evolution*, etc., p. 150.

<sup>3</sup> W. James, *Psychology*, I., 266, for the second observation; *Philosophical Review*, I., No. 6, p. 613 et seq. for the first.

tracts—may be taken as the type of an intelligent and curious deaf-mute. He was not placed in an institution until he was eleven years old. During his childhood he accompanied his father on long expeditions, and his curiosity was aroused as to the origin of things: of animals and vegetables, of the earth, the sun, the moon, the stars (at eight or nine years). He began to understand (from five years) how children were descended from parents, and how animals were propagated. This may have been the origin of the question he put to himself: whence came the first man, first animal, first plant, etc. He supposed at first that primæval man was born from the trunk of a tree, then rejected this hypothesis as absurd, then sought in various directions without finding. He respected the sun and moon, believed that they went under the earth in the West, and traversed a long tunnel to reappear in the East, etc. One day, on hearing violent peals of thunder, he interrogated his brother, who pointed to the sky, and simulated the zigzag of the lightning with his finger; when he concluded for the existence of a celestial giant whose voice was thunder. Puerile as they may be, are these cosmogonic, theological conceptions inferior to those of the aborigines of Oceanica and of the savage regions of South America, who, nevertheless, have a vocal idiom, a rudimentary language?

To sum up. That which dominates among the better gifted, is the creative imagination: it is the culminating point of their intellectual development. Their primitive curiosity does not seem inferior to that of average humanity; but since they cannot get beyond representation by images they lack an instrument of intellectual progress.