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A table of contents for *Journal of the Transactions of the Victoria Institute* can be found here:

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JOURNAL OF
THE TRANSACTIONS
OF
The Victoria Institute,
OR
Philosophical Society of Great Britain.

EDITED BY THE HONORARY SECRETARY,
CAPTAIN FRANCIS W. H. PETRIE, F.G.S., &c.

VOL. XXIII.



LONDON :

(Published by the Institute).

INDIA : W. THACKER & Co. UNITED STATES : G. T. PUTNAM'S SONS, N.Y.

AUSTRALIA AND NEW ZEALAND : G. ROBERTSON & Co., LIM.

CANADA : DAWSON BROS., *Montreal*.

S. AFRICA : JUTA & Co., *Cape Town*.

PARIS : GALIGNANI.

1890.

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ORDINARY MEETING.*

THE PRESIDENT, SIR GEORGE G. STOKES, BART., M.P., P.R.S.,
IN THE CHAIR.

The Minutes of the last Meeting were read and confirmed.

The following Paper was then read by Mr. W. Johnson, in the Author's unavoidable absence in Ireland.

THE FACTORS OF EVOLUTION IN LANGUAGE.

By JOSEPH JOHN MURPHY, ESQ.

A VERY able friend of mine, now departed, on being told of the title of my book *Habit and Intelligence*, said, "Ought it not to be 'Intelligence and Habit' ? Intelligence is the originating, and habit the perpetuating agency." From a truly philosophical point of view, my friend was right.

" But we upon a wintry clime
Have fallen—on this iron time
Of doubts, debates, distractions, fears."

Although the knowledge of the laws and forces of nature which is embodied in our physical, chemical, and biological science; and the knowledge of the processes of evolution, which is contained in our geological science and our theory of vital development; are true gifts of God, yet for the present generation, to whom they are comparatively new, they appear to have the effect of obscuring the highest intellectual as well as spiritual truth. In the science of organic life, an attempt is made to explain the evidence of

* February 4, 1889.

organizing intelligence as a mere semblance and illusion, due to the unintelligent agency of natural selection among spontaneous unguided variations; and in the science of mind a similar attempt is made to resolve mental intelligence into a resultant from unintelligent elements, put together and moulded into form by the unintelligent agency of the association of ideas. Consequently, when, in opposition to this phase of opinion, I endeavoured to vindicate the old truth of the existence of intellectual and spiritual principles discernible in nature and in mind, though derived from a source transcending nature, I was compelled to begin by inquiring how much can be accounted for by unintelligent agencies, and especially by the laws of habit and variation; and then to make intelligence,—both organizing intelligence and mental intelligence,—appear as a residual ultimate fact, which must be recognised as the explanation of phenomena which are inexplicable without it.

Habit is defined, for my purpose, with the utmost possible generality; including, in the organic sphere, the law of heredity; and in the mental sphere, memory, or the perpetuation of impressions in consciousness, with the laws of the association of ideas. To give a full account of my conclusions as to the relation between habit and intelligence, would be to give an abstract of a great part of my book on the subject: and this would be neither desirable nor admissible on the present occasion. What I purpose to do is to show how the relation between intelligence, as the originating factor, and habit, as the perpetuating factor, exists in language as well as in the evolution of living individuals and species; and how this relation bears on the principles expounded in Prof. Max Müller's recent work on the Science of Thought.

It is scarcely a metaphor to call language an organism. The definition of organization is, that the parts of the organism are all in functional relation with each other; and the words of a sentence are thus functionally related. But there are living species, such as those of the genera *Gromia* and *Amœba*, to which we do not refuse the name of organisms, in which, nevertheless, the most powerful microscopes show no trace of structure or organization, and the perfect independence of the life of their every part makes it almost certain that they really have neither, although they show their living nature in motion, nutrition, growth, and reproduction. These, however, are the lowest kinds of living beings; in all but the very lowest, the living forces of the organism construct an organized body, consisting, according to our definition, of functionally distinct parts; and the increasing efficiency of

the vital functions, in the ascending scale of organic nature, is due to the increasing development of this organization. To mention one of the most striking instances; the efficiency of the power of vision is altogether due to the development of the optical and nervous organization of the visual organs. Life constructs the organism to be the means of its action; life is the cause of organization, and not its effect.

Moreover, it has been made known by microscopic research that minute masses of unorganized though living matter, or protoplasm, are to be found in the highest organisms; this, in its general properties, appears to resemble the gelatinous substance called sarcode, which constitutes the entire bodies of the lowest structureless organisms. Not only is this protoplasm living, but life appears to depend upon it; and it appears highly probable that every particle of the organized structure of the body has been in the form of protoplasm before being converted into organized tissue.* The relation of protoplasm to tissue is consequently somewhat like that of a solution to the crystals which are formed from it; and Prof. Cope has advanced the opinion that the protoplasm is the seat of the organizing intelligence, and, to use his own expression, is itself intelligent.† This, probably, does not admit of proof; but, fantastic as it may seem at first sight, I believe that the more it is examined the more probable it will appear.

The relation of language to thought is parallel with the relation of organization to life. It is no longer necessary to insist on the truth that language is not conventional, but is a natural product of man's thought when acting in society. Prof. Max Müller admirably remarks that "language is not outside thought, but is the outside of thought."‡ The evolutions of thought and of language act and re-act on each other. As he elsewhere remarks,§ "The growth of reason and language may be said to be coral-like,—nay, even more simultaneous than the growth of corals. Each shell is the product of life, and becomes in turn the support of new life; in the same manner, each word is the work of

* See Beale's edition of Todd & Bowman's *Physiology*. "Germinal matter" is Beale's name for protoplasm.

† See the essay "Consciousness in Evolution" in his volume, *The Origin of the Fittest*. He thinks protoplasm is not only intelligent, but conscious; but my belief is that its intelligence is unconscious.

‡ *Science of Thought*, p. 215. The author has written "the mind" where I quote "thought."

§ *Ibid.*, p. 298.

reason, but becomes in turn a new link in the growth of reason."

As organization is necessary to any high development of life, so is language necessary to any high development of thought. But it is an exaggeration to say, with Prof. Max Müller, that thought cannot exist without language. As life precedes organization and produces it, so thought precedes language and produces it. We often have a thought in the mind for an appreciable time,—sometimes a long time,—before we succeed, to use an expressive colloquialism, in "getting it into shape" by formulating it in words. Tennyson's lines describing the conversation of intellectually sympathizing friends,—

"When thought leaped out to answer thought
Ere thought could wed itself with speech,"

represents a common experience. And it is a familiar truth, that those whose judgment is the soundest are not always those who state most easily and clearly the reasons for their judgment in words. To deny this power of thought to be partly independent of language, appears no less untrue to fact than it would be, on the other hand, to deny that language is necessary to any elaborate train of thought.

Prof. Max Müller has done injustice to his subject of the Science of Thought, by refusing to take into the scope of the science the minds of animals. It must be freely granted that no light whatever is thrown on the psychology of the conscious mind of man by those wonderful instincts which guide the actions of insects towards ends whereof we cannot believe that they have any consciousness; such as, to mention the best known instance, the instinct that guides the bee to build its cells in that hexagonal form which stores the most honey with the least expenditure of wax; or the still more wonderful instinct that directs the larva of the *Saturnia Pavonia minor*, or Emperor moth, so to construct its cocoon as to be protected against pressure from without, yet able easily to open the cocoon and escape when the time comes for its final transformation.* Such instincts as these are rather to be classed with the formative intelligence which constructs the organism, than with the conscious intelligence of the mind of man and of the higher animals. But no conscious intelligence ought to be excluded from the Science of Thought. Prof. Max Müller justifies the exclusion of animal intelligence from his science by saying that we know it only by analogy

* Autenrieth, quoted by Müller, p. 13.

(p. 125). This is quite true ; but it is equally true that it is only by analogy we know, or can know, anything of the minds of other men, or whether they have minds at all:—it is only by the analogy of other men's forms, features, and actions with my own that I know myself not to be

“Unter Larven die einzige fühlende Brust,”

the only sentient being in a world of masks.

But before he finally dismisses the subject of the intelligence of animals, by a fortunate inconsistency he quotes an instance which most clearly shows the nature and the limitations of the lowest conscious intelligence:—

“A pike, which swallowed all small fishes which were put into his aquarium, was separated from them by a frame of glass, so that whenever he tried to pounce on them he struck his gills against the glass, and sometimes so violently that he remained lying on his back as though dead. He recovered, however, and repeated his onslaughts till they became rarer and rarer, and at last, after three months, ceased altogether. After having been thus in solitary confinement for six months, the frame of glass was removed from the aquarium, so that the pike could again roam about freely among the other fishes. He at once swam towards them, but he never touched any one of them, but always halted at a respectful distance of about an inch, and was satisfied to share with the rest the meat that was thrown into the aquarium. He had therefore been trained so as not to attack the other fishes which he knew as inhabitants of the same tank. As soon, however, as a strange fish was thrown into the aquarium, the pike in nowise respected him, but swallowed him at once.” *

Here is reasoning, with its result in action, just as we practise it ourselves. The pike, having tried to eat his companions, got badly hurt in the attempt, and left it off. The reasoning was sound in substance, and—only the pike did not know it—was syllogistic in form; the major premise of the syllogism was the truth of the uniformity of nature; or, to put it into simpler words, that what has happened once will probably happen again under the same circumstances. This, as Mill has remarked, is the major premise of all reasoning whatever respecting the world that surrounds us; and, though it cannot be doubted, it does not admit of proof. The belief in it is an instinct, common to all animals whose actions are guided by sensation. Prof. Max Müller quotes the saying of Mill, that “not only the burned child, but the burned dog

* Professor Möbius, quoted by Prof. Max Müller, p. 11.

dreads the fire"; and we see the same instinct in Prof. Möbius's pike. It is impossible to doubt that the instinct is fundamentally the same in all,—fishes, dogs, children, and men.

But this, in animals and young children, is only what Mill calls reasoning from particulars to particulars. Indeed, this pike, although he happened to be right as to fact, was almost ludicrously narrow in its generalization, when he ventured to eat those individuals among his companions which were not associated in his memory with a blow on the head. A dog or a child would probably have generalized more widely and more rapidly. But although in such a case as this there is reasoning, and a first step in generalization, it is all done without self-consciousness. There is consciousness of the objects of perception, perhaps we may say of the objects of thought, but not of thought itself; and the "universal major premise" of the uniformity of nature guides action without itself coming into consciousness. Reasoning, self-consciousness, and language arise with the power of consciously forming general propositions; and these powers appear to be the characteristically human ones. This is Mill's account of the origin of the reasoning faculty, and, as a mere description of fact, it seems perfectly sound. It occurs in his *Logic*, and logic requires only a description of the reasoning process; but the Science of Thought should at least attempt to give an account of its genesis. But Prof. Max Müller does not attempt this; indeed, by dismissing all questions of animal psychology almost as soon as he has begun his work, he has virtually refused to make any such attempt.

He begins by distinguishing four stages in the evolution of thought,—namely, Sensations, Percepts, Concepts,* and Names; but he says that these four, though distinguishable in thought, are inseparable in fact. It must be observed that by sensations he means perceived or recognised sensations only, though he admits the existence of what by some are called unperceived sensations, but by him only impressions.† But even with this limitation, it surely cannot be sustained that these four stages in thinking are inseparable from each other. It is quite true that there can be no names without concepts, nor concepts without percepts, nor percepts without sensations. But there are sensations

* *Percepts* and *concepts* are distinguished from *perception* and *conception* as the product of the process from the process itself; e. g., as thought from thinking.

† *Science of Thought*, p. 3.

without percepts (unless sensation and perception are so defined as to make them synonymous); there are percepts without concepts; and, though it may be that definitely-formed concepts are impossible without names for them, yet, as I have already remarked, it is a fact of common experience that thought often anticipates language, and attains to results which we cannot always perfectly express in language.

Prof. Max Müller says that he was an evolutionist before Darwin, because every student of the formation of language is necessarily an evolutionist. This is quite true; yet by refusing to study mind in its manifestations in animals, and by studying it only in one of its highest manifestations and products, namely in the languages of the Aryan race of mankind, he has abandoned the position of an evolutionist, and gone back to one resembling that of a physiologist who should insist on studying the bodily frame of man only, without any light from the lower orders of the animal creation.

By Prof. Max Müller's own admission, however, the enumeration of terms in the above series,—Sensations, Percepts, Concepts, and Names,—is incomplete. Between Perception, which is a power enjoyed, almost certainly, by all animals that have the sense of sight, and probably by many that have only the sense of touch; and Conception, which in its full development involves thought and language; there is an intermediate term in mental development, for which no name has yet come into general use. Generalization is the best I can think of, but it must be understood that scientific generalization is not meant; only such generalization as can be spontaneously effected in the mind of any animal endowed with visual perception and memory of its perceptions. When many similar impressions are made on the sense and leave their traces on the memory, similar impressions tend to combine and form a generalized image, like Mr. Galton's composite photographs, in which what is common to the several impressions on the sense is preserved, while what is special to each is lost or forgotten.* To the formation of such a generalized mental image, it is as needful to forget what is unimportant in the visual perception as to remember what is important. I suppose this must be what Prof. Max Müller means when he says† that "Obliviscence is often more important than Memory." He recognises‡ the process just described, but, I think,

* See Morell's *Psychology* (Longman, 1862): a work which is less known than it deserves.

† *Science of Thought*, p. 20.

‡ *Ibid.*, pp. 45+, 501.

fails to see its importance. It can scarcely be doubted that the higher animals have such generalized ideas of the classes of objects surrounding them which are of the most importance to their lives;—that a wolf, for instance, has a generalised idea of sheep, and a cat of mice.

This is a purely spontaneous process; and probably animals never get beyond it. The next stage in the evolution of thought, and the distinctively human one, occurs when, by the self-directed energy of the mind, actions are ideally separated from their agents, and qualities from their substances. Thus, to the merely animal intelligence, fire is probably only an object of perception; but the human intelligence forms concepts of the act of burning and the quality of brightness; and these concepts demand and receive names. The work before us is an account of this process. The great service which Prof. Max Müller in this work has done to science, consists in enforcing and illustrating the truth, which, as he points out, was insisted on by Locke, "that words were never the signs of things, but that in their origin they were always the signs of concepts; that language begins where abstraction begins; and that the reason why animals have no language is that they do not possess the power of abstraction" (p. 295). The entire work, in fact, consists of illustrations of this truth from the facts of language.

It is a familiar doctrine this, that the faculty of language is the distinctively human power. But the special character of man's mental activity itself requires to be accounted for. What is that in the mind of man which makes the production of language possible and inevitable? Prof. Max Müller, following Locke, in the passage just quoted, says it is the power of abstraction; and no doubt he is right. But is this reducible to anything still more elementary? I think it is. He makes* the luminous suggestion, without appearing fully aware of its importance, that the mental actions of animals differ from ours as impulse differs from will; and I believe that the root of man's superiority consists, not in any heightening of the spontaneous instinctive intelligence which he has in common with other animals, but in acquiring the power of directing thought at will.

The root of Consciousness is sensation. The root of Will is muscular action. Intelligence has no corresponding root, but the first manifestations of Intelligence that we meet in

* *Science of Thought*, p. 593.

the ascending scale of life, like those of insects already mentioned, are unconscious. The full development of mind, as found in man, consists in the union and interpenetration of these three elements,—namely, Consciousness, Intelligence, and Will. But among animals, especially among the higher domestic animals, there is much development of mind which is not merely unconscious and instinctive, but evidently conscious. Many dogs manifest a degree of mental power which probably marks the highest that can be attained by any being without the faculty of abstraction and language, and astonishes us by its near approach to our own. It is altogether misleading to lump together all the mental powers of animals under the name of instincts. It not only explains nothing, but it suggests what is certainly untrue,—namely, that the most intelligent actions of the highest animals inferior to man are performed like those of many insects, without the guidance of conscious purpose. These remarks may be scarcely relevant, yet I think it worth while to make them, because the intelligence of animals is so mysterious and difficult a subject, that there is a great temptation for systematic writers to set it aside and pass it by, as Prof. Max Müller for the most part has done.

The conclusions at which we have aimed are the following :—

1. The stages in the evolution of thought are not simultaneous, but, as in all evolution, successive. They are thus enumerated :—

Sensation.

Perception.

Formation of generalized mental images.

Abstraction with conception.

The last is the distinctively human power. It depends on the power of directing thought at will, and its result and product is language.

2. Language is related to thought as organization is to the bodily life. Organization is the result of life, and language of thought; organization reacts on life, heightening its efficiency, and language on thought, heightening its efficiency. But organization does not exist at the origin of life, nor language at the origin of thought. As in vital evolution there are two factors; on the one hand, the organizing intelligence which produces organic adaptation and guides evolution, and, on the other hand, hereditary habit or the principle of permanence, in virtue of which organisms on the whole resemble their parents;—so in language there are two factors;

on the one hand, mental intelligence; and on the other, habit acting in memory, whereby the knowledge of words and grammatical forms is preserved.

The present essay is partly controversial, and I have been compelled to dwell on those parts of the subject where I cannot agree with Prof. Max Müller. But I wish to conclude with a tribute of gratitude for the great ability and wonderful knowledge with which, in this as well as in his former works, he has expounded the new and most interesting science of Language. Like all science, it is certain to make progress; and I hope and believe that he, or his successors, will hereafter not confine their researches to comparative etymology, or the origin and derivation of words, but go on to lay the foundation of a science of comparative syntax, giving the origin and *rationale* of grammatical forms, and showing how the principles of the logical intelligence have embodied themselves in the grammatical structure of different languages. It is, perhaps, too much to hope that we shall ever know anything with certainty about the origin either of language or of life; but this does not prevent the study of language, like that of life, from having the profoundest interest and charm of its own; though I cannot agree with Prof. Max Müller that it will ever absorb or supersede either Psychology or Philosophy. But I am convinced that the science of Language, in so far as it bears at all on the nature of Thought, will tend to confirm the fundamental truth which Prof. Max Müller has learned from Kant, and which I regard as of the very highest importance,—that Intelligence is an independent endowment, not resolvable into any unintelligent element whatever.

The PRESIDENT (Sir G. G. Stokes, Bart., P.R.S.).—I will now ask you to return thanks to the author of the paper.

Captain F. PETRIE, F.G.S. (Hon. Sec.).—In regard to this paper the following communication has been received from Professor Max Müller, who says:—"I have read Mr. Murphy's remarks with great interest; they are thoughtful and useful."

COMMUNICATION:—I. The author says, page 240, half-way down,—
 "To deny this power of thought to be partly independent of language, appears no less untrue to fact than it would be, on the other hand, to deny that language is necessary to any elaborate train of thought."

This criticism is just when we take thought, *cogitare*, in the wide sense in which Descartes uses it. "Qu'est-ce qu'une chose qui pense? C'est une chose qui doute, qui entend, qui conçoit, qui affirme, qui nie, qui veut, qui ne veut pas, qui imagine aussi, et qui sent" (*Méditations*, ed. Cousin, vol. i., p. 253). But why should we not distinguish real thought, *logos*, from perception and imagination? Perception and imagination are very valuable, they are the *sine qua non* of actual thought,—at least, with human beings. But why not keep them apart from thought, which deals, not with perception and images only, but with conceptual words?

II. Page 242.—From "It occurs" to end of paragraph.

I do not assert or deny anything about the intelligence of animals. I am simply an Agnostic. It is different with the minds of other men, for I know them, not by analogy only, but by the communication of language. To judge from Plutarch, Ælianus, and others, animals must have been much cleverer in ancient times than they are now.

III. Page 243, first seven lines.

I admitted the possibility of percepts without conceptual names, because Mr. Galton asserted that he possessed some specimens of such concepts, and I did not like to contradict his inner consciousness. But, for myself, I deny their possibility. We have only to try to become conscious of any percept,—ask ourselves what we perceive,—and we can only answer by a conceptual name. Helmholtz has come to the same conclusion.

IV. Page 243, last twelve lines.

I look upon the composite photographs, or receipts, as Mr. Romanes calls them, as spurious metaphors. I should like to see a composite photograph of a blood-hound, greyhound, dachshund, and spaniel. No mind ever harboured such a monster.

The meeting was then adjourned.

THE AUTHOR IN REPLY.

In reply to Prof. Max Müller's last remark, I do not think such a concept as that of the species dog, including such unlike varieties as the greyhound and the spaniel, can have been formed by any process like the formation of composite photographs; it must have

been formed by the voluntary and conscious activity of the mind in comparing. But the impression of a single familiar word on the memory,—which, I think, is properly called a concept,—does appear to consist of the impressions made on the mind by the countless number of times it has been heard, which impressions have coalesced into one by a process comparable to the formation of a composite photograph, without any higher mental activity than is implied in all remembered sensation.