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the weary and heavy laden; telling them to be content with their lot, and consider the lilies how they grow, to beg from door to door, and seek comfort by the silencing of the passions; and it met with a success unknown to any other faith. It passed through the usual fiery ordeals of faith, and was long scouted at by Jew and Gentile, Christian and Pagan, but especially by kings and nobles and captains of armies, like those of Alexander in 330-325 B.C. This was, however, as before stated, some 500 years before our Canonical Gospels were written, or rather known to be written, according to history and the great historical inquiry of the author of *Supernatural Religion*.

The *savans* of Alexander found Buddhism strongly in the ascendant from India to the Oxus and the Kaspian, and with a powerful proselytising agency then advancing westward. Restless Sramans, monks, priests and peripatetic mendicants, had never ceased to wander over half of Asia to proclaim their great master's message from the time of his Nirvana, about 500 B.C., and the caves and cells of the Bamian Pass, and those on the Cophes, Oxus and Hori-Rud had re-echoed to their chants and teaching long before Greeks entered Ariana. The Grecian invasion would greatly facilitate the progress of the Buddhist missionaries, and they had ample time between, say 300 B.C. and 150 A.C., to fulfill their gospel mandate, that "all must preach what the master taught—that who so hides his faith shall be struck with blindness." Thus diligent Sramans had long sought every lone pass in wild mountains or river gorges, where they knew armies or travelers must pass and rest, in order "to compass their proselytes," and the wider to disseminate their faith in all lands. They urged on king and peasant, the robber and murderer, that the world was but a passing show in which they should try to assuage the miseries of their fellows; that they should ponder less upon their gods and more on a gospel of duty; and though this had little immediate effect, and on some never had any, yet it commended itself to good men, and lightened the burdens of the weary.

THOUGHT WITHOUT WORDS.

The following correspondence between Mr. F. Galton, Mr. George Romanes, the Duke of Argyll, etc., and Professor Max Müller on "Thought Without Words," is reprinted from *Nature* after careful revision:

I. LETTER FROM MR. F. GALTON, F.R.S.

May 12, 1887.

The recent work of Prof. Max Müller contains theories on the descent of man which are entirely based on the assertion that not even the most rudimentary processes of true thought can be carried on without words. From this he argues that as man is the only truly speaking animal the constitution of his mind is separated from that of brutes by a wide gulf, which no process of evolution that advanced by small steps could possibly stride over. Now, if a single instance can be substantiated of a man thinking without words, all this anthropological theory, which includes the more ambitious part of his work, will necessarily collapse.

I maintain that such instances exist, and the first that I shall mention, and which I will describe, at length, is my own. Let me say that I am accustomed to introspection, and have practised it seriously, and that what I state now is not random talk but the result of frequent observation. It happens that I take pleasure in mechanical contrivances: the simpler of these are thought out by me absolutely without the use of any mental words. Suppose something does not fit: I examine it, go to my tools, pick out the right ones, and set to work and repair the defect, often without a single word crossing my mind. I can easily go through such a process in imagination, and inhibit any mental word from presenting itself. It is well known at billiards that some persons play much more "with their heads" than others. I am but an indifferent player; still, when I do play, I think out the best stroke as well as I can, but not in words. I hold the cue with nascent and anticipatory gesture, and follow the probable course of the ball from cushion to cushion with my eye before I make the stroke, but I say nothing whatever to myself. At chess, which I also play indifferently, I usually calculate my moves, but not more than one or two stages ahead, by eye alone.

Formerly, I practised fencing, in which, as in billiards, the "head" counts for much. Though I do not fence now, I can mentally place myself in a fencing position, and then I am intent and mentally mute. I do not see how I could have used mental words, because they take me as long to form as it does to speak or to hear them, and much longer than it takes to read them by eye (which I never do in imagination). There is no time in fencing for such a process. Again, I have many recollections of scrambles in wild places, one of which is still vivid, of crossing a broad torrent from stone to stone, over some of which the angry-looking water was washing. I was intellectually wearied when I got to the other side, from the constant care and intentness with which it had been necessary to exercise the judgment. During the crossing, I am sure, for similar reasons to those already given, that I was mentally mute. It may be objected that no true thought is exercised in the act of picking one's way, as a goat could do that, and much better than a man. I grant this as regards the goat, but deny the inference, because picking the way under difficult conditions does, I am convinced, greatly strain the attention and judgment. In simple algebra, I never used mental words. Latterly, for example, I had some common arithmetic series to sum, and worked them out not by the use of the formula, but by the process through which the formula is calculated, and that without the necessity of any mental word. Let us suppose the question was, how many strokes were struck by a clock in twelve hours (not counting the half-hours), then I should have written 1, 2 . . . ; and below it, 12, 11, . . . ; then 2 13 × 12, then 13 × 6 = 78. Addition, as De Morgan somewhere insisted, is far more swiftly done by the eye alone: the tendency to use mental words should be withstood. In simple geometry I always work with actual or mental lines; in fact, I fail to arrive at the full conviction that a problem is fairly taken in by me, unless I have contrived somehow to disembarrass it of words.

Prof. Max Müller says that no one can think of a dog without mentally using the word dog, or its equivalent in some other language, and he offers this as a crucial test of the truth of his theory. It utterly fails with me. On thinking of a dog, the name at once disappears, and I find myself mentally in that same expectant attitude in which I should be if I were told that a dog was in an obscure part of the room or just coming round the corner. I have no clear visual image of a dog, but the sense of an ill-defined spot that might shape itself into any specified form of dog, and that might jump, fawn, snarl, bark, or do anything else that a dog might do, but nothing else. I address myself in preparation for any act of the sort, just as when

standing before an antagonist in fencing I am ready to meet any thrust or feint, but exclude from my anticipation every movement that falls without the province of fair fencing.

He gives another test of a more advanced mental process, namely, that of thinking of the phrase "*cogito, ergo sum*," without words. I addressed myself to the task at a time when I was not in a mood for introspection, and was bungling over it when I insensibly lapsed into thinking, not for the first time, whether the statement was true. After a little, I surprised myself hard at thought in my usual way—that is, without a word passing through my mind. I was alternately placing myself mentally in the attitude of thinking, and then in that of being, and of watching how much was common to the two processes.

It is a serious drawback to me in writing, and still more in explaining myself, that I do not so easily think in words as otherwise. It often happens that after being hard at work, and having arrived at results that are perfectly clear and satisfactory to myself, when I try to express them in language I feel that I must begin by putting myself upon quite another intellectual plane. I have to translate my thoughts into a language that does not run very evenly with them. I therefore waste a vast deal of time in seeking for appropriate words and phrases, and am conscious, when required to speak on a sudden, of being often very obscure through mere verbal maladroitness, and not through want of clearness of perception. This is one of the small annoyances of my life. I may add that often while engaged in thinking out something I catch an accompaniment of nonsense words, just as the notes of a song might accompany thought. Also, that *after* I have made a mental step, the appropriate word frequently follows as an echo; as a rule, it does not accompany it.

Lastly, I frequently employ nonsense words as temporary symbols, as the logical x and y of ordinary thought, which is a practice that, as may well be conceived, does not conduce to clearness of exposition. So much for my own experiences, which I hold to be fatal to that claim of an invariable dependence between thoughts and words which Prof. Max Müller postulates as the ground of his anthropological theories.

As regards the habits of others, at the time when I was inquiring into the statistics of mental imagery, I obtained some answers to the following effect: "I depend so much upon mental pictures that I think if I were to lose the power of seeing them I should not be able to think at all." There is an admirable little book published last year or the year before by Binet, *Sur le Raisonnement*, which is clear and solid, and deserves careful reading two or three times over. It contains pathological cases in which the very contingency of losing the power of seeing mental pictures just alluded to has taken place. The book shows the important part played by visual and motile as well as audile, imaginations in the act of reasoning. This and much recent literature on the subject seems wholly unknown by Prof. Max Müller, who has fallen into the common error of writers not long since, but which I hoped had now become obsolete, of believing that the minds of everyone else are like one's own. His aptitudes and linguistic pursuits are likely to render him peculiarly dependent on words, and the other literary philosophers whom he quotes in partial confirmation of his extreme views are likely for the same cause, but in a less degree, to have been similarly dependent. Before a just knowledge can be attained concerning any faculty of the human race we must inquire into its distribution among all sorts and conditions of men, and on a large scale, and not among those persons alone who belong to a highly specialized literary class.

I have inquired myself so far as opportunities admitted, and arrived at a result that contradicts the fundamental proposition in the book before us, having ascertained, to my own satisfaction

at least, that in a relatively small number of persons true thought is habitually carried on without the use of mental or spoken words.

FRANCIS GALTON.

II. LETTER FROM THE DUKE OF ARGYLL.

ARGYLL LODGE, KENSINGTON, May 12, 1887.

I do not see that Prof. Max Müller's theory of the inseparability of thought from language, whether true or erroneous, has any important bearing on the origin of man, whether by evolution or otherwise. It is a question at all events to be studied by itself, and to be tested by such experiments as we can make by introspection, or by such facts as can be ascertained by outward observation.

My own opinion is strongly in favor of the conclusion urged by Mr. F. Galton. It seems to me quite certain that we can and do constantly think of things without thinking of any sound, or word, as designating them. Language seems to me to be necessary to the *progress of thought*, but not at all necessary to the mere *act of thinking*. "It is a product of thought; an expression of it;" a vehicle for the communication of it; a channel for the conveyance of it; and an embodiment which is essential to its growth and continuity. But it seems to me to be altogether erroneous to represent it as any inseparable part of cogitation. Monkeys and dogs are without true thought not because they are speechless; but they are speechless because they have no abstract ideas, and no true reasoning powers. In parrots the power of mere articulation exists sometimes in wonderful perfection. But parrots are no cleverer than many other birds which have no such power.

Man's vocal organs are correlated with his brain. Both are equally mysterious because they are co-operative, and yet separable, parts of one "plan."

ARGYLL.

III. LETTER FROM MR. HYDE CLARKE.

32 ST. GEORGE'S SQUARE, S. W., May 12, 1887.

Having much of the same experience as Mr. Galton, I nevertheless prefer dealing with a larger group of facts. I have often referred to the mutes of the seraglio at Constantinople, who cannot be charged with thinking in words. They have their own sign conversation among themselves, and which has no necessary reference to words. Even the names of individuals are suppressed among themselves, though they sometimes use lip reading to an outsider to make him understand a name. Any one having a knowledge of sign language is aware that it is independent of words. The tenses of verbs, etc., are supplied by gestures.

The mutes are not deficient in intelligence. They take a great interest in politics, and have the earliest news. It is true this is obtained by hearing, though they are supposed to be deaf-mutes, but among themselves everything is transmitted by signs.

HYDE CLARKE.

IV. LETTER FROM MR. MELLARD READE.

I think that all who are engaged in mechanical work and planning will fully indorse what Mr. Francis Galton says as to thought being unaccompanied by words in the mental processes gone through. Having been all my life since school-days engaged in the practice of architecture and civil engineering, I can assure Prof. Max Müller that designing and invention are done entirely by mental pictures. It is, I find, the same with original geological thought—words are only an incumbrance. For the conveyance and accumulation of knowledge some sort of symbols are required, but it appears to me that spoken language or written words are not absolutely necessary, as other means of representing ideas could be contrived. In fact, words are in many cases so cumbersome that other methods *have* been devised for imparting knowledge. In mechanics the graphic method, for instance.

T. MELLARD READE.

V. LETTER FROM S. F. M. Q.

On reading Mr. Galton's letter, I cannot help asking how Prof. Max Müller would account for early processes of thought in a deaf-mute: does he deny them? S. F. M. Q.

VI. LETTER FROM PROF. MAX MÜLLER.

ALL SOULS' COLLEGE, OXFORD, May 15, 1887.

DEAR MR. GALTON—I have to thank you for sending me the letter which you published in *Nature*, and in which you discuss the fundamental principle of my recent book on the *Science of Thought*, the identity of language and reason. Yours is the kind of criticism I like—honest, straightforward, to the point. I shall try to answer your criticism in the same spirit.

You say, and you say rightly, that if a single instance could be produced of a man reasoning without words, my whole system of philosophy would collapse: and you go on to say that you yourself are such an instance—that you can reason without words.

So can I, and I have said so in several passages of my book. But what I call reasoning without words is no more than reasoning without pronouncing words. With you it seems to mean reasoning without possessing words. What I call, with Leibniz, symbolic, abbreviated, or hushed language, what savages call "speaking in the stomach," presupposes the former existence of words. What you call thinking without words seems to be intended for the thinking of beings, whether men or animals, that possess as yet no words for what they are thinking.

Now let us try to understand one another—that is to say, let us define the words we are using. We both use thinking in the sense of reasoning. But thinking has been used by Descartes and other philosophers in a much wider sense also, so as to include sensation, passions and intuitive judgments, which clearly require no words for their realization. It is necessary, therefore, to define what we mean by thinking before we try to find out whether we can think without words. In my book on the *Science of Thought* I define thinking as addition and subtraction. That definition may be right or wrong, but every writer has the right—nay, the duty, I should say—to explain in what sense he intends to use certain technical terms. Though nowadays this is considered rather pedantic, I performed that duty on the very first page of my book, and it seems somewhat strange that a reviewer in the *Academy* should accuse me of not having defined what I mean by thinking, for most reviewers look at least at the first page of a work which is given them to review.

Now, the cases which you mention of wordless thought are not thought at all in my sense of the word. I grant that animals do a great deal of work by intuition, and that we do the same—nay, that we often do that kind of work far more quickly and far more perfectly than by reasoning. You say, for instance, that you take pleasure in mechanical contrivances, and if something does not fit you examine it, go to your tools, pick out the right one, set to work and repair the defect often without a single word crossing your mind. No doubt you can do that. So can the beaver and the bee. But neither the beaver nor the bee would say what you say, namely, that in doing this "you inhibit any mental word from presenting itself." What does that mean if not that the mental words are there, the most complicated thought-words, such as *tool*, *defect*, *fit*, are there? only you do not pronounce them, as little as you pronounce "two shillings and sixpence" when you pay a cabman half-a-crown.

The same applies to what you say about billiards and fencing. Neither cannoning nor fencing is thinking. The serpent coiling itself and springing forward and shooting out its fangs does neither think nor speak. It sees, it feels, it acts; and, as I stated on p. 8 of my book, that kind of instantaneous and thoughtless action is often far more successful than the slow results of reasoning. Well do I remember when I was passing through my drill as a volunteer, and sometimes had to think what was right and what was

left, being told by our sergeant, "Them gentlemen as thinks will never do any good." I am not sure that what we call genius may not often be a manifestation of our purely animal nature—a sudden tiger's spring rather than *une longue patience*.

It is different, however, with chess. A chess-player may be very silent, but he deals all the time with thought-words or word-thoughts. How could it be otherwise? What would be the use of all his foresight, of all his intuitive combination, if he did not manipulate with king, queen, knights and castles? and what are all these but names, most artificial names, too, real agglomerates of ever so many carefully embedded facts or observations?

An animal may build like the beaver, shoot like the serpent, fence like the cat, climb like the goat: but no animal can play chess, and why? Because it has no words, and therefore no thoughts for what we call king, queen and knights, names and concepts which we combine and separate according to their contents—that is, according to what we ourselves or our ancestors have put into them.

You say, again, that in algebra, the most complicated phase of thought, we do not use words. Nay, you go on to say that in algebra "the tendency to use mental words should be withstood." No doubt it should. The player on the pianoforte should likewise withstand the tendency of saying, now comes C, now comes D, now comes E, before touching the keys. But how could there be a tendency to use words, or, as you say in another place, "to embarrass ourselves of words," if the words were not there? In algebra we are dealing not only with words but with words of words, and it is the highest excellence of language if it can thus abbreviate itself more and more. If we had to pronounce every word we are thinking our progress would be extremely slow. As it is, we can go through a whole train of thought without uttering a single word, because we have signs not only for single thoughts but for whole chains of thoughts. And yet, if we watch ourselves, it is very curious that we can often feel the vocal chords and the muscles of the mouth moving as if we were speaking; nay, we know that during efforts of intense thought a word will sometimes break out against our will; it may be, as you say, a nonsense word, yet a word which for some reason or other could not be inhibited from presenting itself.

You say you have sometimes great difficulty in finding appropriate words for your thoughts. Who has not? But does that prove that thoughts can exist without words? Quite the contrary. Thoughts for which we cannot find appropriate words are thoughts expressed as yet by inappropriate, very often by very general, words. You see a thing and you do not know what it is, and therefore are at a loss how to call it. There are people who call everything "that thing"—in French "*chose*"—because they are lazy thinkers and, therefore, clumsy speakers. But even "thing" and "*chose*" are names. The more we distinguish, the better we can name. A good speaker and thinker will not say "that thing," "that person," "that man," "that soldier," "that officer," but he will say at once "that lieutenant-general of fusiliers." He can name appropriately because he knows correctly, but he knows nothing correctly or vaguely except in a string of names from officer down to thing. Embryonic thought which never comes to the birth is not thought at all, but only the material out of which thought may spring. Nor can infant thought, which cannot speak as yet, be called living thought, though the promise of thought is in it. The true life of thought begins when it is named, and has been received by baptism into the congregation of living words.

You say that "after you have made a mental step the appropriate word frequently follows as an echo: as a rule, it does not accompany it." I know very well what you mean. But only ask yourself what mental step you have made and you will see you stand on words: more or less perfect and appropriate, true: but

nevertheless, always words. You blame me for having ignored your labors, which were intended to show that the minds of every one are not like one's own. You know that I took a great deal of interest in your researches. They represented to me what I should venture to call the dialectology of thought. But dialects of thought do not affect the fundamental principles of thinking; and the identity of language and reason can hardly be treated as a matter of idiosyncrasy.

You also blame me for not having read a recent book by Monsieur Binet. Dear Mr. Galton, as I grow older I find it the most difficult problem in the world what new books we may safely leave unread. Think of the number of old books which it is not safe to leave unread; and yet, when I tell my friends that in order to speak the *lingua franca* of philosophy they ought, at least, to read Kant, they shrug their shoulders and say they have no time, or, *horribile dictu*, that Kant is obsolete. I have, however, ordered Binet, and shall hereafter quote him as an authority. But who is an authority in these days of anarchy? I quoted the two greatest authorities in Germany and England in support of my statement that the genealogical descent of man from any other known animal was as yet *unproven*, and I am told by my reviewer in the *Academy* that such statements "deserve to be passed over in respectful silence." If such descent were proved it would make no difference whatever to the science of thought. Man would remain to me what he always has been, the perfect animal; the animal would remain the stunted man. But why waste our thoughts on things that may be or may not be? One fact remains: animals have no language. If, then, man cannot think—or, better, cannot reason—without language, I think we are right in contending that animals do not reason as man reasons, though for all we know they may be all the better for it.

Yours very truly,

Francis Galton, Esq., F.R.S.

F. MAX MÜLLER.

(THIS CORRESPONDENCE TO BE CONCLUDED IN NEXT ISSUE.)

CORRESPONDENCE.

THE ETHICAL MOVEMENT IN ENGLAND.

To the Editors:

In these days an increasing number of people in England feel ready to say with Emerson's devout friend, "On Sundays, it seems wicked to go to church." For if they go to church their moral nature is shocked by the wholly conventional morality which is preached there. Respectability rather than goodness seems to be valued there. There is an absence of reality and enthusiasm in the affair: dull mediocrity in the pulpit addressing itself to genteel decorum in the pew. Ruskin once said that he had heard about two thousand sermons, and never in one of them a hint as to the conflict between God and mammon. How could there be? The preacher is, nine times out of ten, the paid servant of mammon who would be likely to dismiss him speedily if he preached unpleasant truths. Now, the old theological heaven having lost its attractions and the old theological hell its terrors, and both having become as unreal to all intelligent people as Tartarus or the Elysian Fields; it follows necessarily that for any true teacher of men nothing is left but the dealing with the evils of actual life, the preaching of a higher social ideal, and the imperious command to men to leave all and follow that ideal. For reasons which I gave in a previous paper I am convinced that, in most cases, a Protestant preacher cannot, *ipso facto*, satisfy these ethical demands of our time. And as there are others who hold the same view, it has come to pass that the ethical movement in America has attracted some attention in this country; with the result that last year an Ethical Society was founded in London, which has just issued its first report.

I think the first impetus to the ethical movement here was given by my friend Mr. J. Graham Brooks, of Brockton, Mass., when he was in England upwards of two years ago. Mr. Brooks made the name and writings of Mr. Salter, of Chicago, well known in a small circle in London; and I also did my best to circulate the lectures, copies of which Mr. Salter was good enough to send me from time to time, and which contained, in my judgment, the kind of teaching best adapted to the society of our own time.

The little Ethical Society which has been established in London is a small affair with modest pretensions. It has about thirty members, a very small income, and no local habitation. Its most active members are young men who have accepted in its main principles the philosophy of the late Thomas H. Green, of Oxford, and some of whom were actually his pupils. This philosophy, setting before each one of us the development of a good will as the thing to be aimed at, declares that this good will can only be realized in a social life of self-conscious persons. Man's life, though a part of nature, is not merely natural; and hence Darwinism, or any other merely naturalistic scheme of thought can furnish no ethical basis for human action. For we act in the light of an ideal; and our action is ethical or non-ethical according as it helps or hinders the realizing of that ideal. And that ideal itself is an ideal for all; coöperation among men is, therefore, needful for its attainment. These, as I understand, are Green's main ethical principles; and though the Ethical Society acknowledges as such no special master, yet, as a matter of fact, most of its members accept this philosophy which, as being anti-individualistic, is eminently in accord with the social tendencies of our time.

The Ethical Society thus states its principles: "The members of this society agree in believing that the moral and religious life of man is capable of a rational justification and explanation. They believe that there is at present great need (a) for the exposition of the actual principles of social morality, generally acknowledged though imperfectly analyzed in current language, (b) for presentation of the ideal of human progress, and (c) for the teaching of a reasoned out doctrine on the whole subject." The prospectus further states that it will be "the duty of the society to use every endeavor to arouse the community at large to the importance of testing every social, political and educational question, by moral and religious principles." The members also propose to "organize systematic ethical instruction" by lectures at workingmen's clubs, coöperative societies, and in connection with the movement for the extension of university teaching.

During the past winter a series of lectures under the auspices of the society was given at Toynbee Hall, the University settlement in the east of London. These lectures were given by different persons, but there was a general unity in the teaching presented. Among the subjects were "Society as Organic," "Conscience," "The Kingdom of Heaven upon Earth." These lectures were attended by audiences varying from forty or fifty to one hundred persons, a portion of whom were workingmen. At the close of the lecture any person is permitted to put a question on the subject under consideration, and a short discussion is invited. By this means difficult points are cleared up and vital questions more thoroughly pressed home. It is expected and hoped that next winter a lecture may be given every Sunday and that the work of the infant society may be somewhat extended. By this opportunity thus afforded for moral culture, it is hoped that those who feel the wickedness of going to church and who have consequently nothing to do on Sundays, may have some kind of spiritual nutriment offered in place of orthodoxy's barren husks.

While thus stating briefly the avowed aims of the Ethical Society and the ideas under which it has been constituted, I must add that I doubt whether, on its present lines, it will fill anything

nation enters upon the scene of the world's history, it is already full-grown;"* and Mariette Bey states that "From the earliest times Egyptian civilization was complete."† But this hardly helps us. Though the latter of the authors just named takes us back to 5,004 years B.C., we are no nearer a solution of the enigma of this people's beginnings. Whether this civilization was wholly a product of Egyptian soil, or whether, on the contrary, it was imported in pre-historic times, with some great influx of peoples from abroad, it is impossible in the present state of historical research, to determine. The probabilities are that the Egyptians were an Aryan off-shoot from some primeval race whose history is lost in the night of time, and that from that race they inherited their knowledge of the arts and the occult forces of nature. However that may be, when first we encounter the Egyptians we are brought face to face with the direct evidences of their learning and skill.

It is proper to state at this point that the question of the derivation and duration of Egyptian civilization has been entered into for the sole purpose of showing that the claim of this people to a high antiquity and an exact and elaborate science, is by no means preposterous, as I shall endeavor to show.

Upon the very threshold of their history—under Menes the first king—we find them in full possession of the practical sciences of hydrostatics and hydraulic engineering and mechanical construction. Already had they turned the course of the Nile, and reared the city of Memphis with its gigantic temples and palace. We learn that even at this early day there were from thirty to forty colleges of the priests who studied the occult sciences and practical magic. (And here let us stop a moment and examine this word "Magic," which has been so long degraded from its ancient meaning. As originally employed it signified the attainment of wisdom, and command over the hidden powers of nature. Therefore a magician was one versed in the secret knowledge, and an initiate into the arcane mysteries. In other words *he was the scientist of his time*. In this sense only are those two terms, magic and magician here used).

The cities of Memphis, Heliopolis, Thebes and later Saïs, became the great centers of Egyptian learning. Their splendid temples formed the nuclei around which clustered schools, universities, observatories and priestly habitations.

There were many different orders of the priests, ranging from the simple scribe to the high-priest himself; but it was only those of the highest degree who were permitted to become the repositories of that occult lore which had come down from the remotest ages. In the silence and obscurity of the lowest crypts of the temples these priestly sages conducted their secret

ceremonies and magical operations, and hither, doubtless, were brought the candidates for initiation into the greater mysteries.

Among the branches of learning pursued by them were mathematics, astronomy, astrology, metallurgy, chemistry and alchemy, all of which bore an occult aspect.

(TO BE CONTINUED.)

THOUGHT WITHOUT WORDS.

The following correspondence between Mr. F. Galton, Mr. George Romanes, Mr. J. J. Murphy, etc., and Professor Max Müller on "Thought Without Words," is reprinted from *Nature* after careful revision:

VII. LETTER FROM MR. F. GALTON, F.R.S.

42 RUTLAND GATE, S. W., May 15, 1887.

DEAR PROFESSOR—Thank you much for your full letter. I have not yet sent it on to *Nature* because it would have been too late for this week's issue, and more especially because I thought you might like to reserve your reply, not only until you had seen my own answer to what you have said in it, but also until others should have written, and possibly also until you had looked at Binet, and some of the writers he quotes. So I send you very briefly my answer, but the letter shall go to *Nature* if you send me a post-card to send it.

In my reply, or in any future amplification of what is already written, I should emphasize what was said about fencing, etc., *with the head*, distinguishing it from intuitive actions (due, as I and others hold, to inherited or personal habit).

The inhibition of words in the cases mentioned was, I should explain, analogous to this:—There are streets improvements in progress hereabouts. I set myself to think, by mental picture only, whether the pulling down of a certain tobacconist's shop (i. e. its *subtraction* from the row of houses in which it stands) would afford a good opening for a needed thoroughfare. Now, on first perceiving the image, it was associated with a mental perception of the *smell* of the shop. I inhibited that mental smell because it had nothing to do with what I wanted to think out. So words often arise in my own mind merely through association with what I am thinking about; they are *not* the things that my mind is dealing with; they are superfluous and they are embarrassments, so I inhibit them.

I have not yet inquired, but will do so, whether deaf-mutes who had never learnt words or any symbols for them, had ever been taught dominoes, or possibly even chess. I myself cannot conceive that the names—king, queen, etc.—are of any help in calculating a single move in advance. For the effect of many moves I use them mentally to record the steps gained, but for nothing else. I have reason to believe that not a few first-rate chess-players calculate by their mental eye only.

In speaking of modern mental literature, pray do not think me so conceited as to refer to my own writings only. I value modern above ancient literature on this subject, even if the modern writers are far smaller men than the older ones, because they have two engines of research which the others wanted:—

(1) Inductive inquiry, ethnological and other. The older authorities had no vivid conception of the different qualities of men's minds. They thought that a careful examination of their own minds sufficed for laying down laws that were generally applicable to humanity.

(2) They had no adequate notion of the importance of mental pathology. When by a blow, or by a disease, or, as they now say, by hypnotism, a whole province of mental faculties can be

* Tiele. *Egyptian Religion*, p. 6.

† Mariette Bey. *Hist. Ancienne D'Égypte*, p. 19.

abolished, and the working of what remains can be carefully studied, it is now found that as good a clue to the anatomy of the mind may be obtained as men who study mangled limbs, or who systematically dissect, may obtain of the anatomy of the body.

I add nothing about the advantage to modern inquirers due to their possession of Darwinian facts and theories, because we do not rate them in the same way.

Very truly yours,

FRANCIS GALTON.

Professor Max Müller.

VIII. LETTER FROM PROF. MAX MÜLLER.

OXFORD, May 19, 1887.

MY DEAR MR. GALTON—If you think my letter worth publishing in *Nature*, I have no objection, though it contains no more than what anybody may read in my *Science of Thought*.

Nothing proves to my mind the dependence of thought on language so much as the difficulty we have in making others understand our thoughts by means of words. Take the instance you mention of a shop being pulled down in your street, and suggesting to you the desirability of opening a new street. There are races, or, at all events, there have been, who had no name or concept of shop. Still, if they saw your shop, they would call it a *house*, a *building*, a *cave*, a *hole*, or, as you suggest, a chamber of smells and horrors, but at all events a *thing*. Now, all these are names. Even *thing* is a name. Take away these names, and all definite thought goes; take away the name *thing*, and thought goes altogether. When I say word, I do not mean *flatus vocis*, I always mean word as inseparable from concept, thought-word or word-thought.

It is quite possible that you may *teach* deaf-and-dumb people dominoes; but deaf-and-dumb people, left to themselves, do not invent dominoes, and that makes a great difference. Even so simple a game as dominoes, would be impossible without names and their underlying concepts. Dominoes are not mere blocks of wood; they signify something. This becomes much clearer in chess. You cannot move king, or queen, or knight as mere dolls. In chess, each one of these figures can be moved according to its name and concept only. Otherwise chess would be a chaotic scramble, not an intelligent game. If you once see what I mean by names, namely that by which a thing becomes *notum* or known, I expect you will say, "Of course we all admit that without a name we cannot really know anything."

I wonder you do not see that in all my writings I have been an evolutionist or Darwinian *par sang*. What is language but a constant becoming? What is thought but an *Ewiges Werden*?

Everything in language begins by a personal habit, and then becomes inherited; but what we students of language try to discover is the first beginning of each personal habit, the origin of every thought, and the origin of every word. For that purpose ethnological researches are of the highest importance to us, and you will find that Kant, the cleverest dissector of abstract thought, was at the same time the most careful student of ethnology, the most accurate observer of concrete thought in its endless variety. With all my admiration for modern writers, I am in this sense also a Darwinian that I prefer the rudimentary stages of philosophic thought to its later developments, not to say its decadence. I have learnt more from Plato than from Comte. But I have ordered Binet all the same, and when I have read him I shall tell you what I think of him.

Yours very truly,

F. MAX MÜLLER.

IX. LETTER FROM MR. GEORGE J. ROMANES, F. R. S.

June 4, 1887.

There appears to be some ambiguity about this matter as discussed in the correspondence which has recently taken place in

your columns. In the first instance Mr. Galton understood Professor Max Müller to have argued that in no individual human mind can any process of thought be ever conducted without the mental rehearsal of words, or the *verbum mentale* of the Schoolmen. Now, although this is the view which certainly appears to pervade the Professor's work on "The Science of Thought," there is one passage in that work, and several passages in his subsequent correspondence with Mr. Galton, which express quite a different view—namely, that when a definite structure of conceptual ideation has been built up by the aid of words, it may afterward persist independently of such aid; the scaffolding was required for the original construction of the edifice, but not for its subsequent stability. That these two views are widely different may be shown by taking any one of the illustrations from the *Nature* correspondence. In answer to Mr. Galton, Professor Max Müller says: "It is quite possible that you may *teach* deaf-and-dumb people dominoes; but deaf-and-dumb people, left to themselves, do not *invent* dominoes, and that makes a great difference. Even so simple a game as dominoes would be impossible without names and their underlying concepts." Now, assuredly it does "make a great difference" whether we are supporting the view that dominoes could not be *played* without names underlying concepts, or the view that without such means dominoes could not have been *invented*. That there cannot be concepts without names is a well-recognized doctrine of psychology, and that dominoes could not have been invented in the absence of certain simple concepts relating to number no one could well dispute. But when the game has been invented, there is no need to fall back upon names and concepts as a preliminary to each move, or for the player to predicate to himself before each move that the number he lays down corresponds with the number to which he joins it. The late Dr. Carpenter assured me that he had personally investigated the case of a performing dog which was exhibited many years ago as a domino-player, and had fully satisfied himself that the animal's skill in this respect was genuine—i. e., not dependent on any code of signals from the showman. This, therefore, is a better case than that of the deaf-mute, in order to show that dominoes can be played by means of sensuous association alone. But my point now is that two distinct questions have been raised in your columns, and that the ambiguity to which I have referred appears to have arisen from a failure to distinguish between them. Every living psychologist will doubtless agree with Professor Max Müller where he appears to say nothing more than that if there had never been any names there could never have been any concepts; but this is a widely different thing from saying what he elsewhere appears to say—i. e., that without the mental rehearsal of words there cannot be performed in any case a process of distinctively human thought. The first of these two widely different questions may be dismissed as one concerning which no difference of opinion is likely to arise. Touching the second, if the Professor does not mean what I have said he appears in some places to say, it is a pity that he should attempt to defend such a position as that chess, for instance, cannot be played unless the player "deals all the time with thought-words and word thoughts." For the original learning of the game it was necessary that the powers of the various pieces should have been explained to him by means of words; but when this knowledge was thus gained it was no longer needful that before making any particular move he should mentally state the powers of all the pieces concerned, or predicate to himself the various possibilities which the move might involve. All these things he does by his specially-formed associations alone, just as does a draught-player, who is concerned with a much simpler order of relations; in neither case is any demand made upon the *verbum mentale*.

Again, if the Professor does not mean to uphold the view that in no case can there be distinctively human thought without

the *immediate and direct* assistance of words, it is a mistake in him to represent "the dependence of thought on language" as absolute.* The full powers of conceptual ideation which belong to any individual man may or may not all have been due to words as used by his ancestors, his contemporaries and himself. But, however this may be, that these powers, when once attained, may afterward continue operative without the use of words is not a matter of mere opinion based on one's own personal introspection, which no opponent can verify; it is a matter of objectively demonstrable fact, which no opponent can gainsay. For when a man is suddenly afflicted with aphasia he does not forthwith become as the thoughtless brute; he has lost all trace of words, but his reason may remain unimpaired.

GEORGE J. ROMANES.

X. LETTER FROM MR. J. J. MURPHY.

BELFAST, June 19, 1887.

I have postponed offering you any remarks on Professor Max Müller's "Science of Thought" until I had read the book through.

I think Professor Müller is on the whole right, that language is necessary to thought, and is related to thought very much as organization to life. The question discussed by some of your correspondents, whether it is possible in particular cases to think without language, appears to me of little importance. I can believe that it is possible to think without words when the subjects of thought are visible things and their combinations, as in inventing machinery; but the intellectual power that invents machinery has been matured by the use of language.

But Professor Müller has not answered, nor has he asked, the question, on what property or power of thought the production of language depends. He has shown most clearly the important truth that all names are abstract—that to invent a name which denotes an indefinite number of objects is a result of abstraction. But on what does the power of abstraction depend? I believe it depends on the power of directing thought at will. Professor Müller lays stress on the distinction between percepts and concepts, though he thinks they are inseparable. I am inclined to differ from him, and to think that animals perceive as vividly as we do, but have only a rudimentary power of conception and thought. I think the power of directing thought at will is the distinctively human power, on which the power of forming concepts and language depends.

JOSEPH JOHN MURPHY.

XI. LETTER FROM MR. ARTHUR EBBELS.

CHAPHAN, June 6, 1887.

After reading the correspondence published in *Nature* (Vol. XXXVI, pp. 28, 52 and 100) on this subject, it has occurred to me that the difficulties anthropologists find in Professor Max Müller's theory are connected chiefly with his peculiar definitions.

In his letters to Mr. Galton, Professor Müller narrows the domain of his theory to a considerable extent. By defining thought as the faculty of "addition and subtraction," and by taking language as composed of "word-thoughts" or "thought-words," Professor Müller excludes from his theory all those processes which are preliminary to the formation of concepts. Thus narrowed, I do not see that his doctrine in any way touches the wider question, whether reasoning, as generally understood, is independent of language. If we keep to the terms of this theory, thoughts and words are undoubtedly inseparable. But this does not in the least imply that *all thought* is impossible without words.

When we enlarge the scope of our terms it is at once evident

* E. g.—"I hope I have thus answered everything that has been or that can possibly be adduced against what I call the fundamental tenet that the science of language, and what ought to become the fundamental tenet of the science of thought, namely, that language and thought, though distinguishable, are inseparable, that no one truly thinks who does not speak, and that no one truly speaks who does not think."—"Science of Thought," pp. 63-64.

that thoughts and words are not inseparable. It is all very well to join together "thought-word" and "word-thought." Yet the thought is something quite distinct from the *mere sound* which stands as a word for it. A concept is formed from sensations. Our thoughts are occupied with what we see, and feel, and hear, and this primarily. Thus it is that, in the wider sense of thinking, we can *think in pictures*. This is the mental experience which Professor Tyndall so highly prizes. He likes to picture an imaginary process, not in words, not even by keeping words in the background, but in a mental presentation of the things themselves as they would affect his senses. Surely, then, if the mind can attend to its own reproduction of former sensations, and even form new arrangements of sensations for itself quite irrespective of word-signs, as Mr. Galton and most other thinkers have experienced, it is evident that thought and language are not inseparable.

All this is, of course, somewhat apart from Professor Müller's restricted theory. But the question follows, how from these wider thoughts do we become possessed of the faculty of abstraction? Does not the one shade imperceptibly into the other? Professor Müller answers no, and here I think he is at fault. It is at this point that anthropologists part company with him. If he be right, how do people learn? According to his theory new thoughts when they arise start into being under some general concept. I do not deny that they are placed under some general concept, but it seems to me that something entirely independent of the general concept has, for convenience, been placed under it, and this something must be called a *thought*. No doubt the thought is at first vague and indefinite, and only when it becomes definite does it require a name. But here one can plainly trace the genesis of a thought, and the adaptation of a word as a symbol for it. The new concept and its sign do not arise simultaneously. There are two distinct growths, not one only, as Professor Müller's theory presupposes. The connection may be subtle and close, but the two elements can be easily separated. It avails nothing to say that until the thought is placed under a concept it is not a thought. This is a mere question of definition, not of actual fact.

I would point out one other consideration. If Professor Müller's theory were true for all kinds of thinking, development would be impossible. If man could not think without language, and could not have language without thinking, he would never have had either, except by a miracle. And scientific men will not accept the alternative. We can conceive shadowy thoughts gradually shaping to themselves a language for expression, and we can understand how each would improve the other, until by constant interaction a higher process of thought was introduced. But we cannot conceive the sudden appearance of the faculty of abstraction together with its ready-made signs or words.

I have often wished that Professor Müller would state distinctly how his theory accounts for the very first beginnings of language. I have not been able to discover any explanation of this point in his "Lectures on the Science of Language."

ARTHUR EBBELS.

XII. LETTER FROM MRS. A. GRENFELL.

As poets have extraordinary inklings and *aperçus* on the most abstruse scientific questions, Wordsworth's opinion on this matter (quoted by De Quincy) is worth considering: Language is not the "dress" of thought, it is the "incarnation." This is Shelley's *aperçu* of Darwinism. Man exists "but in the future and the past; being, not what he is, but what he has been and shall be."

How to "distil working ideas from the obscurest poems"—to use Lord Acton's words—is one of the secrets of genius.

A. GRENFELL.

[The conclusion of this correspondence has to be deferred to our next issue. Ed.]

We disinter the mummies which have rested undisturbed since the pyramids were built—and examine the still perfect features, and the long hair, and the very teeth filled with gold ages ago by Egyptian dentists—and we view with amazement the bandages 1,000 yards in length in which these forms are swathed—and then we are obliged to confess that modern surgery can not equal the bandaging, and modern medical art, and modern chemistry are masters of no means by which a human body may be preserved for 5,000 years.

When we have undisputed evidence as to their achievements in *these* directions, is it the part of wisdom to deny that they *may* have possessed *other* arts and *other* sciences, which we are unable to equal or approximate?

It has been asserted that the Egyptian priests were frauds and charlatans—deceivers of the people, wily tricksters, and the vicious worshippers of many Gods. In the first place, none were admitted to the priesthood save such as were especially fitted by their purity of life and holiness of aspiration. The ordeals through which candidates were obliged to pass were very severe, their lives sometimes being exposed to great danger. The priests were humble and self-denying and remarkable for simplicity and abstinence. Plutarch* speaks of them as “giving themselves up wholly to study and meditation, hearing and teaching those truths which regard the divine nature.” They took great care to preserve from profanation their secret rites, and excluded all who were considered unfit to participate in solemn ceremonies. Clement† says they were confined to those “who from their worth, learning and station were deemed worthy of so great a privilege.” Nor was there *motive*, either for gain or reputation. All the great priests, scholars and sages could be, if they so desired, supported by the State—ample accommodation being provided for them within the temple precincts, where in quiet, ease and retirement, they could pursue their deep researches and subtle experiments.

They were worshippers of one only God, whose very name was so sacred it was—according to Herodotus—unlawful to utter; and their various divinities but personified some form of the divine attributes. Interblended and inter-dependent we find Egyptian science and religion. To understand the one we cannot remain ignorant of the other. To the Egyptian his religion was everything. He regarded his abode upon earth as but a short journey upon the pathway of eternal life. To the future which stretched before him he turned with hope and longing. He did not believe that when his short life closed, physical existence was ended. Again and again, his religion taught, he would return to earth, to work out in higher forms his spiritual salvation.

* Wilkinson. *Manners and Customs*, Vol. III. p. 54.

† *Ibid.*, Vol. III. p. 389.

(This doctrine of re-incarnation, often called transmigration or metempsychosis, has been generally grossly misunderstood by writers who have attempted to explain it). With this belief was connected the doctrine of the “cycle of necessity.” Can our Egyptologists say what this cycle was? or what it signified? and can they further tell what the winged scarabaei of Egypt symbolized? which are found by the hundreds in the tombs of Thebes! They cannot, I fear, tell us these things any more than they can explain the septenary composition of man, or his triune character; any more than they can interpret the “unpronounceable” *name*, which Herodotus dared not disclose!

Their code of ethics was singularly pure and exalted. They believed not only in the negative virtues, but the positive also; and, “A moral life, a life of holiness and beneficence, was conceived of as being a matter of solemn obligation to the Deity himself.” The highest principles alone were inculcated; and always in the heart of the Egyptian priest were treasured the words of his great example—the noble prince and moralist—Ptah-hotep; “Mind thee of the day when thou too shalt start for the land to which one goeth to return not thence; good for thee will have been a good life; therefore be just and hate iniquity; for he who doeth what is *right* shall triumph!”

Have modern scholars a surer guide to honor and uprightness, than the old Egyptian Magist?

Have we any right to utter words of censure or condemnation?

Egypt is dead. Her priests have passed away, and buried with them in the recesses of impenetrable tombs, lie her wisdom, her magic, and her glory. Her greatest of *all* foresaw her dread eclipse, and time has but verified the dark prophetic words of the mighty Hermes: “O, Egypt, Egypt, of thy religion there will be left remaining nothing but uncertain tales, which will be believed no more by posterity—words graven on stone and telling of thy piety!”

THOUGHT WITHOUT WORDS.

The conclusion of correspondence between Mr. Arthur Nicols, et al., and Professor Max Müller on “Thought Without Words,” reprinted from *Nature* after careful revision:

XIII. LETTER FROM MR. ARTHUR NICOLS.

WATFORD, June 3, 1887.

The interesting discussion between Mr. Francis Galton and Prof. Max Müller on this subject will doubtless raise many questions in the minds of those who have paid some attention to the habits of animals. I have been asking myself whether, if Prof. Max Müller is right in his conclusion—“Of course we all admit that without a name we cannot really know anything” (an *utterable* name, I presume), and “one fact remains, animals have no language”—animals must not, therefore, be held by him incapable of knowing anything. This would bring us to the question

whether animals *know* in the same manner as men, or in some other manner which men do not understand. Now, I think—at least it is as strong a conviction as I am capable of entertaining—that animals not only know, but deal with the materials of knowledge—facts—in a manner quite indistinguishable from the manner in which I mentally handle them myself. Thus, I place an animal in circumstances which are quite unfamiliar to it, and from which it is urgently pressed to escape. There are two, or perhaps three, courses open to it: one being, to my mind, patently the most advantageous. It tries all of them, and selects that which I should have chosen myself, though it is *much longer* in coming to its conclusion. Here the animal has the same facts as the man to deal with, and, after consideration and examination, its judgment precisely corresponds with the man's. I cannot, then, find it possible to deny that the mental operations are identical in *kind*; but that they are not so in *degree* can be demonstrated by my importing into the situation an element foreign to the experience of the animal, when its failure is certain. It makes no difference whether the animal is under stress, or acting voluntarily. It may frequently be found to choose the method which most recommends itself to the man's judgment. Every student of animals is familiar with numbers of such cases. Indeed they are constantly being recorded in the columns of *Nature*, and abound in all accepted works on animal intelligence. I am quite prepared to admit that where there are two or more courses open to it the animal will occasionally select that which presents the greatest difficulties and labor most assiduously to overcome them, sometimes trying the remaining courses and returning to that which it first chose. Darwin gives a good example of the honey-bee (*Origin of Species*, p. 225, edition 1872). But no one will be surprised at imperfect judgment or vacillation of will in an animal, when such are common among men.

Prof. Max Müller lays down the very distinct proposition that "animals have no language." I suppose *utterable* language is meant. Is this so? That their sign-language is both extensive and exact (and even understood to some extent as between widely different species) most naturalists, I apprehend, will entertain no doubt. But has any species an utterable language? What is to be the test of this? First there is the whole gamut of vocal expressions—which even we understand—conveying the ideas of *pain*, *pleasure*, *anger*, *warning*. What sportsman who has stalked extremely shy animals does not know the moment a bird or animal utters a certain note that he is discovered? If Prof. Max Müller will not admit this to be *language*, I for one, must ask him what it is. It conveys to others a distinct idea, in general if not in special terms, and seems to me quite equivalent to "Oh dear!" "This is nice" (expressed, I believe, in some African language by the reduplicated form *num-num*, the letter *n* having the same value as in the Spanish *mañana*), "Leave off," "Look out," "Come here," etc. Those who have heard animals calling to one another, particularly at night, and have carefully noted the modulations of their voices (why should there be modulations unless they have a definite value), will find it very hard to accept Prof. Max Müller's conclusion that "animals have no language." Every female mammal endowed with any kind of voice has the power of saying "Come here, my child," and it is an interesting fact beyond question that the knowledge of this call is feebly or not at all inherited, but must be impressed upon the young individual by experience. Further, the young brought up by an alien foster-mother pay no attention to the "Come here, my child," of the alien species. The clucking of the hen meets with no response from the ducklings she has reared, even when she paces frantically by the side of the pond imploring them not to commit suicide. But let us creep up under the banks of a sedgy pool at about this time of year. There swims a wild duck surrounded by her brood, dashing here and there at the rising *Phryganids*. Now let the frightful face of man

peer through the sedges. A sharp "quack" from the duck, and her brood dive like stones, or plunge into the reeds. She, at least, knows what to say to them.

The already inordinate length of this letter precludes me from offering any instances of the communication of *specific* intelligence by means of the vocal organs of animals. I think it probable that we far underrate the vocabulary of animals from deficient attention—and, I speak for myself, stupidity. Possibly Prof. Max Müller has not yet examined "Sally," the black chimpanzee. If not, he would surely be much interested. She is by no means garrulous, but in spite of her poor vocal capacity, if he should still consider that she "cannot really know anything" on that account, I must have completely misinterpreted his letter to Mr. Gaiton.

ARTHUR NICOLS.

XIV. LETTER FROM PROF. MAX MÜLLER.

THE MOLT, SALCOMBE, JULY 4, 1887.

As I found that you had already admitted no less than thirteen letters on my recent work, *Science of Thought*, I hesitated for some time whether I ought to ask you to admit another communication on a subject which can be of interest to a very limited number of the readers of *Nature* only. I have, indeed, from the very beginning of my philological labors, claimed for the science of language a place among the physical sciences, and, in one sense, I do the same for the science of thought. Nature that does not include human nature in all its various manifestations would seem to me like St. Peter's without its cupola. But this plea of mine has not as yet been generally admitted. The visible material frame of man, his sense-organs and their functions, his nerves and his brain, all this has been recognized as the rightful domain of physical science. But beyond this physical science was not to go. There was the old line of separation, a line drawn by mediæval students between man, on one side, and his works, on the other; between the sense-organs and their perceptions: between the brain and its outcome, or, as it has sometimes been called, its secretion—namely, thought. To attempt to obliterate that line between physical science, on one side, and moral science, as it used to be called, on the other, was represented as mere confusion of thought. Still, here as elsewhere, a perception of higher unity does not necessarily imply an ignoring of useful distinctions. To me it has always seemed that man's nature can never be fully understood except as one and indivisible. His highest and most abstract thoughts appear to me inseparable from the lowest material impacts made upon his bodily frame. And "if nothing was ever in the intellect except what was first in the senses," barring, of course, the intellect itself, it follows that we shall never understand the working of the intellect, unless we first try to understand the senses, their organs, their functions, and in the end their products. For practical purposes, no doubt, we may, nay we ought, to separate the two. Thus, in my own special subject, it is well to separate the treatment of phonetics and acoustics from higher linguistic researches. We may call phonetics and acoustics the ground floor, linguistics, the first story. But as every building is one—the ground floor purposeless without the first story, the first story a mere castle in the air without the ground floor—the science of man also is one, and would according to my opinion, be imperfect unless it included psychology in the widest meaning of that term, as well as physiology: unless it claimed the science of language and of thought, no less than the science of the voice, the ear, the nerves, and the brain, as its obedient vassals. It was, therefore, a real satisfaction to me that it should have been *Nature* where the questions raised in my *Science of Thought* excited the first interest, provoking strong opposition, and eliciting distinct approval, and I venture to crave your permission on that ground, if on no other, for replying once more to the various arguments which some of your most eminent contributors have brought forward against the

fundamental tenet of my work, the inseparableness of language and reason.

Many of my critics write as if they had never heard before of the identity of language and reason. They call such a theory a paradox, unconscious, it would seem, of the fact that to the great majority of mankind all philosophy is a paradox, and unaware likewise, that the same opinion has been held by some of the greatest philosophers of antiquity, of the middle ages, and of modern times. I have not invented that paradox. All I have done or attempted to do is that, while other philosophers have derived their arguments in support of it from mere theory, I have taken mine from facts, namely the facts supplied by the science of language.

Some of my critics again seem to have sniffed something heterodox in this identity of language and reason, forgetting that philosophy was never meant to be either orthodox or heterodox in the theological sense of those words, and unaware likewise, as it would seem, that this opinion has been held and defended by some of the most orthodox and some of the most heterodox of modern writers. I shall mention two names only, Cardinal Newman and M. Taine. Cardinal Newman in his *Grammar of Assent* (p. 8), where he tries to define ratiocination or reasoning, begins by carefully separating from ratiocination, as I have done, all that is purely sensuous or emotional, the promptings of experience, common sense, genius, and all the rest, restricting "thought" to what can be or has been expressed in words. He then proceeds: "Let then our symbols be words; let all thought be arrested and embodied in words. Let language have a monopoly of thought; and thought go for only so much as it can show itself to be worth in language. Let every prompting of the intellect be ignored, every *momentum* of argument be disowned which is unprovided with an equivalent wording, as its ticket for sharing in the common search after truth. Let the authority of actions, common sense, experience, genius, go for nothing. Ratiocination thus restricted and put into grooves, is what I have called *Inference*, and the science which is its regulating principle, is *Logic*."

M. Taine pronounces quite as explicitly in favor of the theory that reasoning, if properly restricted and defined, takes place by means of words only, and cannot take place in any other way. In his work, *De l'Intelligence* (1870), after distinguishing between *proper* and *common* names, he shows that a common name is at the same time *general* and *abstract* (Vol. I. p. 25), and that these general and abstract names are really what we mean by general and abstract ideas. "Partout ce que nous appelons une idée générale née d'ensemble, n'est qu'un nom: non pas le simple son qui vibre dans l'air et ébranle notre oreille, ou l'assemblage de lettres qui noircissent le papier et frappent nos yeux, non pas même ces lettres aperçues mentalement, ou ce son mentalement prononcé, mais ce son ou ces lettres doués, lorsque nous les apercevons ou imaginons, d'une propriété double, la propriété d'éveiller en nous les images des individus qui appartiennent à une certaine classe de ces individus seulement, et la propriété de renaître toutes les fois qu'un individu de cette même classe et seulement quand un individu de cette même classe se présente à notre mémoire ou à notre expérience."

"Ce ne sont pas les objets épais ni les objets idéaux que nous pensons,—mais les caractères abstraits qui sont leurs générateurs: ce ne sont pas les caractères abstraits que nous pensons, mais les noms communs qui leur correspondent!"

I may divide the letters published hitherto in *Nature* into three classes, unanswerable, answered and to be answered.

I class as unanswerable such letters as that of the Duke of Argyll. His Grace simply expresses his opinion, without assigning any reasons. I do not deny that to myself personally, and to many of your readers, it is of great importance to know what position a man of the Duke's wide experience and independence

of thought takes with regard to the fundamental principle of all philosophy, the identity of language and thought, or even on a merely subsidiary question, such as the genealogical descent of man from any known or unknown kind of animal. But I must wait till the Duke controverts either the linguistic facts, or the philosophical lessons which I have read in them, before I can meet fact by fact, and argument by argument. I only note, as a very significant admission, one sentence of his letter, in which the Duke says: "Language seems to me to be necessary to the *progress of thought*, but not at all necessary to the mere act of thinking." This sentence may possibly concede all that I have been contending for, as we shall see by and by.

I class as letters that have been answered the very instructive communications from Mr. F. Galton, to which I replied in *Nature* of June 2 (p. 101), as well as several notes contributed by correspondents who evidently had read my book either very rapidly, or not at all.

Thus, Hyde Clarke tells us that the mutes at Constantinople, and the deaf-mutes in general, communicate by signs, and not by words—the very fact on which I had laid great stress in several parts of my book. In the sign-language of the American Indians, in the hieroglyphic inscriptions of Egypt, and in Chinese and other languages which were originally written ideographically, we have irrefragable evidence that other signs, besides vocal signs or vocables, can be used for embodying thought. This, as I tried to show, confirms, and does not invalidate, my theory that we cannot think without words, if only it is remembered that words are the most usual and the most perfect, but by no means the only possible signs.

Another correspondent, "S. F. M. Q.," asks how I account for the early processes of thought in a deaf-mute. If he had looked at page 63 of my book, he would have found my answer. Following Professor Huxley, I hold that deaf-mutes would be capable of few higher intellectual manifestations than an orang or chimpanzee, if they were confined to the society of dumb associates.

But, though holding this opinion, I do not venture to say that deaf-mutes, if left to themselves, may not act rationally, as little as I should take upon myself to assert that animals may not act rationally. I prefer indeed, as I have often said, to remain a perfect agnostic with regard to the inner life of animals, and, for that, of deaf-mutes also. But I should not contradict anybody who imagines that he has discovered traces of the highest intellectual and moral activity in deaf-mutes or animals. I read with the deepest interest the letter which Mr. Arthur Nicols addressed to you. I accept all he says about the sagacity of animals, and if I differ from him at all, I do so because I have even greater faith in animals than he has. I do not think, for instance, that animals, as he says, are much longer in arriving at a conclusion than we are. Their conclusions, so far as I have been able to watch them, seem to me far more rapid than our own, and almost instantaneous. Nor should I quarrel with Mr. Nicols if he likes to call the vocal expressions of pain, pleasure, anger, or warning, uttered by animals, language. It is a perfectly legitimate metaphor to call every kind of communication language. We may speak of the language of the eyes, and even of the eloquence of silence. But Mr. Nicols would probably be equally ready to admit that there is a difference between shouting "Oh!" and saying "I am surprised." An animal may say "Oh!" but it cannot say "I am surprised;" and it seems to me necessary, for the purpose of accurate reasoning, to be able to distinguish in our terminology between these two kinds of communication. On this point, too, I have so fully dwelt in my book that I ought not to encumber your pages by mere extracts.

I now come to the letters of Mr. Ebbels and Mr. Mellard Read. They both seem to imagine that, because I deny the possibility of conceptual thought without language, I deny the

possibility of every kind of thought without words. This objection, too, they will find so fully answered in my book, that I need not add anything here. I warned my readers again and again against the promiscuous use of the word "thought." I pointed out (p. 29) how, according to Descartes, any kind of inward activity, whether sensation, pain, pleasure, dreaming, or willing, may be called thought; but I stated on the very first page that, like Hobbes, I use thinking in the restricted sense of adding and subtracting. We do many things, perhaps our best things, without addition or subtraction. We have, as I pointed out on page 20, sensations and percepts, as well as concepts and names. For ordinary purposes we should be perfectly correct in saying that we can "think in pictures." This, however, is more accurately called imagination, because we are then dealing with images, presentations (*Vorstellungen*), or, as I prefer to call them, percepts and not yet with concepts and names. Whether in man and particularly in the present stage of his intellectual life, imagination is possible without a slight admixture of conceptual thought and language, is a moot point; that it is possible in animals, more particularly in Sally, the black chimpanzee at the Zoölogical Gardens, I should be reluctant either to deny or to affirm. All I stand up for is that, if we use such words as thought, we ought to define them. Definition is the only panacea for all our philosophical misery, and I am utterly unable to enter into Mr. Ebbels's state of mind when he says: "This is a mere question of definition, not of actual fact."

When Mr. Ebbels adds that we cannot conceive the sudden appearance of the faculty of abstraction together with its ready-made signs or words, except by a miracle, he betrays at once that he has not read my last book, the very object of which is to show that we require no miracle at all, but that all which seemed miraculous in language is perfectly natural and intelligible. And if he adds that he has not been able to discover in my earlier works any account of the first beginnings of language, he has evidently overlooked the fact that in my lectures on the science of language I distinctly declined to commit myself to any theory on the origin of language, while the whole of my last book is devoted to the solution of that problem. My solution may be right or wrong, but it certainly does not appeal to any miraculous interference for the explanation of language and thought.

There now remain two letters only that have really to be answered, because they touch on some very important points, points which it is manifest I ought to have placed in a clearer light in my book. One is by Mr. Murphy, the other by Mr. Romanes. Both have evidently read my book and read it carefully; and if they have not quite clearly seen the drift of my argument, I am afraid the fault is mine and not theirs. I am quite aware that my *Science of Thought* is not an easy book to read and to understand. I warned my readers in the preface that they must not expect a popular book, nor a work systematically built up and complete in all its parts. My book was written, as I said, for myself and for a few friends who knew beforehand the points which I wished to establish, and who would not expect me, for the mere sake of completeness, to repeat what was familiar to them and could easily be found elsewhere. I felt certain that I should be understood by them, if I only indicated what I meant; nor did it ever enter into my mind to attempt to teach them, or to convince them against their will. I wrote as if in harmony with my readers, and moving on with them on a road which we had long recognized as the only safe one, and which I hoped that others also would follow, if they could once be made to see whence it started and whither it tended.

Mr. Murphy is one of those who agree with me that language is necessary to thought, and that, though it may be possible to think without words when the subjects of thought are visible things and their combinations, as in inventing machinery, the intellectual power that invents machinery has been matured by

the use of language. Here Mr. Murphy comes very near to the remark made by the Duke of Argyll, that language seems necessary to the *progress of thought*, but not at all necessary to the mere act of thinking, whatever that may mean. But Mr. Murphy, while accepting my two positions—that thought is impossible without words, and that all words were in their origin abstract—blames me for not having explained more fully on what the power of abstraction really depends. So much has lately been written on abstraction, that I did not think it necessary to do more than indicate to which side I inclined. I quoted the opinions of Aristotle, Bacon, Locke, Berkeley and Mill, and as for myself I stated in one short sentence that I should ascribe the power of abstraction, not so much to an effort of our will, or to our intellectual strength, but rather to our intellectual weakness. In forming abstractions our weakness seems to me our strength. Even in our first sensations it is impossible for us to take in the whole of every impression, and in our first perceptions we cannot but drop a great deal of what is contained in our sensations. In this sense we learn to abstract, whether we like it or not; and though afterwards abstraction may proceed from an effort of the will, I still hold, as I said on page 4, that though *attention* can be said to be at the root of all our knowledge, the power of abstraction may in the beginning not be very far removed from the weakness of distraction. If I had wished to write a practical text-book of the science of thought, I ought no doubt to have given more prominence to this view of the origin of abstraction, but as often in my book, so here too, I thought *sapienti sat*.

I now come to Mr. Romanes, to whom I feel truly grateful for the intrepid spirit with which he has waded through my book. One has no right in these days to expect many such readers, but one feels all the more grateful if one does find them. Mr. Romanes was at home in the whole subject, and with him what I endeavored to prove by linguistic evidence—namely, that concepts are altogether impossible without names—formed part of the very A B C of his psychological creed. He is indeed almost too sanguine when he says that concerning this truth no difference of opinion is likely to arise. The columns of *Nature* and the opinions quoted in my book tell a different tale. But for all that I am as strongly convinced as he can be that no one who has once understood the true nature of words and concepts can possibly hold a different opinion from that which he holds as well as I.

It seems, therefore, all the more strange to me that Mr. Romanes should have suspected me of holding the opinion that we cannot think without pronouncing or silently rehearsing our thought-words. It is difficult to guard against misapprehensions which one can hardly realize. Without appealing, as he does, to sudden aphasia, how could I hold pronunciation necessary for thought when I am perfectly silent while I am writing and while I am reading? How could I believe in the necessity of a silent rehearsing of words when one such word as "therefore" may imply hundreds of words or pages, the rehearsing of which would require hours and days? Surely, as our memory enables us to see without eyes and to hear without ears, the same persistence of force allows us to speak without uttering words. Only, as we cannot remember or imagine without having first seen or heard something to remember, neither can we inwardly speak without having first named something that we can remember. There is an algebra of language far more wonderful than the algebra of mathematics. Mr. Romanes calls that algebra "ideation," a dangerous word, unless we first define its meaning and lay bare its substance. I call the same process addition and subtraction of half-vanished words, or, to use Hegel's terminology, *aufgehobene Worte*; and I still hold, as I said in my book, that it would be difficult to invent a better expression for thinking than that of the lowest barbarians, "speaking in the stomach." *Thinking* is nothing but speaking *minus* words. We do not begin with thinking

or *ideation*, and then proceed to speaking, but we begin with naming, and then by a constant process of addition and subtraction, of widening and abbreviating, we arrive at what I call thought. Everybody admits that we cannot count that is to say, add and subtract—unless we have first framed our numerals. Why should people hesitate to admit that we cannot possibly think, unless we have first formed our words? Did the Duke of Argyll mean this when he said that language seemed to him necessary for *the progress of thought*, but not at all for the mere act of thinking? How words are framed, the science of language has taught us; how they are reduced to mere shadows, to signs of signs, apparently to mere nothings, the science of thought will have to explain far more fully than I have been able to do. Mr. Romanes remarks that it is a pity that I should attempt to defend such a position as that chess cannot be played unless the player "deals all the time with thought-words and word-thoughts." I pity myself indeed that my language should be liable to such misapprehension. I thought that to move a "castle" according to the character and the rules originally assigned to it was to deal with a word-thought or thought word. What is "castle" in chess, if not a word-thought or thought-word? I did not use the verb "to deal" in the sense of pronouncing, or rehearsing, or defining, but of handling or moving according to understood rules. That this dealing might become a mere habit I pointed out myself, and tried to illustrate by the even more wonderful playing of music. But however automatic and almost unconscious such habits may become, we have only to make a wrong move with the "castle" and at once our antagonist will appeal to the original meaning of that thought-word and remind us that we can move it in one direction only, but not in another. In the same manner, when Mr. Romanes takes me to task because I said that "no one truly thinks who does not speak, and that no one truly speaks who does not think," he had only to lay the accent on *truly*, and he would have understood what I meant—namely, that in the true sense of these words, as defined by myself, no one thinks who does not directly or indirectly speak, and that no one can be said to speak who does not at the same time think. We cannot be too charitable in the interpretation of language, and I often feel that I must claim that charity more than most writers in English. Still, I am always glad if such opponents as Mr. Romanes or Mr. F. Galton give me an opportunity of explaining more fully what I mean. We shall thus, I believe, arrive at the conviction that men who honestly care for truth, and for the progress of truth, must in the end arrive at the same conclusions, though they may express them each in his own dialect. That is the true meaning of the old dialectic process, to reason out things by words more and more adequate to their purpose. In that sense it is true also that no truth is entirely new, and that all we can aim at in philosophy is to find new and better expressions for old truths. The poet, as Mrs. A. Grenfell has pointed out in her letter to *Nature* (June 23, p. 173), often perceives and imagines what others have not yet conceived or named. In that sense I gladly call myself the interpreter of Wordsworth's prophecy, that "the word is not the dress of thought, but its very incarnation."

F. MAX MÜLLER.

CORRESPONDENCE.

AN ARGUMENT FOR WOMAN SUFFRAGE.

To the Editors:

The movement is based on the fact that women are not sufficiently represented by men. If they were, there would be no agitation. And men are even less unfit for representing children than for representing women. The child and the man differ much more than the child and the woman, in character, in average

state of opinion (for instance about religion) and in amount of home life. Most children have much more to do with the mother than the father, as well as much more in common. The women who are not mothers usually have something to do with children as aunts, sisters, or teachers. The fact that the female bird and the young are alike in plumage is not without a parallel in our race: and neither is the fact that it is the female who stays by the nest. When we consider how much children gain by a government good enough to make the schools what they should be, and how much they lose by a government bad enough to let civil war, famine, or pestilence break out, we must admit that their interests need as full a representation as possible. And this cannot be given unless women vote.

F. M. HOLLAND.

RELIGION AND ITS CORRELATIONS.

To the Editors:

Religion, wisdom, science and knowledge are things that should harmonize with each other; but to make one a basis for the other as when we speak of a scientific basis for religion, does not appear to be a correct use of terms. Religion as I understand it (after a half-century investigation of the constitution of man) is a fundamental element of human nature—a reverent love, which relates to all that is good and great—but not to the great alone, as many misconceive it. The stern spirit of the warrior recognizes and adores power alone, and recognizes in the infinite mystery of the universe only power and arbitrary will. This is the conception embodied in churches which arose in barbaric ages. A more perfect manhood recognizes happiness, benevolence and beauty as well as power. Hence to the normal man and woman there is an ample sphere and gratification for their reverence, love and admiration, in the world of nature and humanity, as they are continually around us, whether we look or not, beyond the apparent to the ultimate occult power.

He who does not so look is commonly called an atheist, yet the fact that he is more interested in the visible realities of which he can have some understanding than in the invisible causes which he thinks no one can understand, does not render him any less a religious man if his emotional faculties are fully and normally developed. Indeed many of them who have been called atheists were more truly religious than their bigoted opponents, who, without true religion (without either reverence or love), tyrannize fiercely over their fellows, and blindly believed in an infinite tyrant whose very existence true religion makes us unwilling to admit. Who can doubt that Voltaire and Hume had a fuller and purer religious nature than the majority of the churchmen of their time?

With this view, to which I think the disciples of Comte should not object, and which would harmonize with the sentiments of Mill, religion is an element of character highly congenial with and promotive of the study of nature and attainment of all truth—but absolutely rebellious against the harsh spirit which has been organized in the so-called Christian church, which has inherited its spirit from Constantine and Athanasius.

Now comes the question upon which modern thinkers divide. Does this loving and reverent study of the universe—of man and all that surrounds him—lead to the recognition of a grand, invisible and almost inconceivable power behind or within its phenomena? Does not the fact that force is invisible and almost inconceivable as to its basis or origin, and that all moving powers of every kind, as well as all intelligence or organizing guidance, is invisible, intangible and inaccessible to all our faculties except reason, lead toward the opinion that the grand aggregate of power and guiding capacity should be recognized as possessing the attributes which appear in universal nature—an incalculable amount of energy, of stability, and of benevolent organizing wisdom? If the quality of producing good is called benevolence or love in