

For the conference: 'Click-on-knowledge 2011: Web-based knowledge and Contemporary Scholarship, May 11th - 13th 2011.'

MISAPPREHENSIONS AROUND 'KNOWLEDGE'

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THE GREAT SCIENTIFIC CALAMITY

'Knowledge' and 'memory' denote nothing

I am pleased to have been invited to address this conference. To me the only possible response to this invitation is to talk of what I consider the greatest scientific calamity of the last several centuries, to wit, *the decay of psychology in the Twentieth Century*.

I consider present day psychology to be a ruin: the result of a hundred years of philosophical misconceptions. First fifty years of behaviorism, then fifty years of cognitivism.

One result of this is that there is no valid understanding of mental life to be found in any modern literature. Prominent issues of this which are relevant to the present conference is the current talk of *knowledge* as a kind of something, and of *memory* as a mental container.

The trouble about memory and knowledge is that as soon as you try to really understand them you are lost. Take the standard handbooks, say the *Oxford Encyclopedia of Psychology* from year 2000. In this there are seven articles about *memory*. They just talk confusion, empty twaddle, about these issues. It is highly relevant to this conference how such poor stuff is produced by a highly reputable publisher, with authors and editors of the highest academic distinction.

The fallacies around *knowledge* have a century long philosophical past. They are central for example in Kant's *Critique of Pure Reason* from 1781. In its very first lines of the Introduction this says:

1. The difference between pure and empirical knowledge

That all our knowledge begins with experience there can be no doubt. For how is it possible that the faculty of knowledge should be awakened into exercise otherwise than by means of objects which affect our senses, and partly of themselves produce representations, partly rouse our powers of understanding into activity, to compare, to connect, or to separate these, and so to convert the raw material of our sense impressions into a knowledge of objects, which is called experience?

Presented as the very first opening of an elaborate treatise of philosophy this passage is remarkable by its lack of clarity. It centres around a few key terms and phrases: 'knowledge', 'experience', 'faculty of knowledge', 'representations of objects', 'powers of understanding', but gives no clue to what these terms are supposed to denote. No examples are given, neither of an item of knowledge, nor of a representation of an object. The first sentence claims that 'all our knowledge begins with experience', but what this means becomes obscure by the last sentence that talks about 'knowledge of objects, which is called experience'. The form of the whole paragraph clearly suggests that what is stated is obviously valid. This is entirely misleading. In reality the paragraph presents merely a confused, highly dubious hypothesis about what happens when 'objects affect our senses'.

Even more fantastic about the present calamity is the fact that one hundred years ago there was no problem. As a result of a splendid scientific development since about 1850, William James in his *Principles of Psychology* from 1890 was able to present a perfectly clear description of mental life. But that is unknown to present day psychologists. So let us start from what James says relating to the key word of this conference: *knowledge*.

WILLIAM JAMES ON THE RELATION OF KNOWING

Knowing by acquaintance and knowing-about

William James in his *Principles of Psychology* wrote as a scientist. This means that throughout he is concerned with empirical data and with establishing descriptions of phenomena. He mostly avoids using the word ‘knowledge’. Instead he talks of *the relation of knowing*. He writes (Vol. I p. 216):

‘The relation of minds to other objects are either relations to *other minds*, or to *material things*. ... The mind’s relations to other objects than the brain are *cognitive and emotional* relations exclusively, so far as we know. ... All that it *can do directly* is to know other things, misknow or ignore them ...

(I p. 221) *There are two kinds of knowledge* broadly and practically distinguishable: we may call them respectively *knowledge of acquaintance* and *knowledge-about*. Most languages express the distinction; thus *γινῶναι, εἰδέναι; noscere, scire; kennen, wissen; connaître, savoir*. I am acquainted with many people and things, which I know very little about, except their presence in the places where I have met them. I know the color blue when I see it, and the flavor of a pear when I taste it; I know an inch when I move my finger through it; a second of time, when I feel it pass; an effort of attention when I notice it; but *about* the inner nature of these facts or what makes them what they are, I can say nothing at all. I cannot impart acquaintance with them to any one who has not already made it himself. I cannot *describe* them, make a blind man guess what blue is like, define to a child a syllogism, or tell a philosopher in just what respect distance is just what it is, and differs from other forms of relation. At most, I can say to my friends, Go to certain places and act in certain ways, and these objects will probably come. All the elementary natures of the world, its highest genera, the simple qualities of matter and mind, together with the kinds of relation that subsist between them, must either not be known at all, or known in this dumb way of acquaintance without *knowledge-about*. In minds able to speak at all there is, it is true, some knowledge about everything. Things can at least be classed, and the times of their appearance told. But in general, the less we analyze a thing, and the fewer of its relations we perceive, the less we know about it and the more our familiarity with it is of the acquaintance-type. The two types of knowledge are, therefore, as the human mind practically exerts them, relative terms. That is, the same thought of a thing may be called knowledge-about it in comparison with a simpler thought, or acquaintance with it in comparison with a thought of it that is more articulate and explicit still.

(I p. 222) ... What we are only acquainted with is only *present* to our minds; we *have* it, or the idea of it. But when we know about it, we do more than merely have it; we *seem*, as we think over its relations, to subject it to a sort of *treatment* and to *operate* upon it with our thought. The words feeling and thought give voice to the antithesis. Through feeling we become acquainted with things, but only by our thoughts do we know about them. Feelings are the germ and starting point of cognition, thoughts the developed tree.

Although not said explicitly by James, since any knowing relation involves one particular person, it is obvious that any knowing by acquaintance and any knowing about are matters of individual persons.

Knowing in the stream of thought

James’s explanation of the relation of knowing continues in his description of the stream of thought and its properties. He writes (I p. 271):

Human thought appears to deal with objects independent of itself; that is, it is cognitive, or possesses the function of knowing ... The reason why we all believe that the objects of our thoughts have a duplicate existence outside, is that there are *many* human thoughts, each with the same objects, as we cannot help supposing. The judgment that *my* thought has the same object as *his* thought is what makes the psychologist call my thought cognitive of an outer reality. The judgment that my own past thought and my own present thought are of the same object is what makes *me* take the object out of either and project it by a sort of triangulation into an independent position, from which it may *appear* to both. *Sameness* in a multiplicity of object appearances is thus the basis of our belief in realities outside of thought.

(I p. 275) ... We have been using the word Object. Something *must now be said about the proper use of the term Object in Psychology*.

In popular parlance the word object is commonly taken without reference to the act of knowledge, and treated as synonymous with individual subject of existence. Thus if anyone ask what is the mind’s object when you say ‘Columbus discovered America in 1492’, most people will reply ‘Columbus’, or ‘America’, or, at most, ‘the discovery of America’. ... But the *Object* of your thought is really its entire content or deliverance, neither more nor less. ... The object of my thought in the previous sentence, for

example, is strictly speaking neither Columbus, nor America, nor its discovery. It is nothing short of the entire sentence, 'Columbus-discovered-America-in-1492'. And if we wish to speak of it substantively, we must make a substantive of it by writing it out thus with hyphens between all its words. Nothing but this can possibly name its delicate idiosyncrasy. And if we wish to feel that idiosyncrasy we must reproduce the thought as it was uttered, with every word fringed and the whole sentence bathed in that original halo of obscure relations, which, like a horizon, then spread about its meaning. ...

The next point to make clear is that, however complex the object may be, the thought of it is one undivided state of consciousness. ...

(I p. 278) ...There is no manifold of coexisting ideas; the notion of such a thing is a chimera. Whatever things are thought in relation are thought from *the outset in a unity, in a single pulse of subjectivity, a single psychosis, feeling, or state of mind.* ...

Thus as explained by James, the elementary experience generated in perception is not a question of a recognition of the core of the thing perceived, but one of the experience of the thing as embedded in the fringe of its relations.

Knowing by acquaintance and the sense of sameness

In a later chapter James describes the experience of knowing by acquaintance in more detail (I p. 459):

In Chapter VIII, p. I 221, the distinction was drawn between two kinds of knowledge of things, bare acquaintance with them and knowledge about them. The possibility of two such knowledges depends on a fundamental psychical peculiarity which may be entitled '*the principle of constancy of the mind's meanings*', and which may be thus expressed: 'The same matters can be thought of in successive portions of the mental stream, and some of these portions can know that they mean the same matters which the other portions meant'. One might put it otherwise by saying that 'the mind can always intend, and know when it intends, to think of the Same'.

This sense of sameness is the very keel and backbone of our thinking.

James uses the words 'concept' and 'conception' in describing what a person may be acquainted with. Here the words 'acquaintance' and 'acquaint' will be used instead. With this substitution James writes (I p. 461):

We may acquaint realities supposed to be extra-mental, as steam-engine; fictions, as mermaid; or mere *entia rationis*, like difference or nonentity. But whatever we do acquaint, our acquainting is of that and nothing else—nothing else, that is, instead of that, though it may be of much else in addition to that. Each act of acquainting results from our attention singling out some one part of the mass of matter for thought which the world presents, and holding fast to it, without confusion. ...

Each acquainting thus eternally remains what it is, and never can become another. The mind may change its states, and its meanings, at different times; may drop one acquainting and take up another, but the dropped acquainting can in no intelligible sense be said to change into its successor. The paper, a moment ago white, I may now see to have been scorched black. But my acquainting 'white' does not change into my acquainting 'black'. ... Thus, amid the flux of opinions and of physical things, the world of acquaintings, or things intended to be thought about, stands stiff and immutable, like Plato's Realm of Ideas.

Some acquaintings are of things, some of events, some of qualities. Any fact, be it thing, event, or quality, may be acquainted sufficiently for purposes of identification, if only it be singled out and marked so as to separate it from other things. Simply calling it 'this' or 'that' will suffice. ...

Attention

James explains *attention*, the selective activity of the stream of thought (I p. 283):

The last peculiarity of consciousness to which attention is to be drawn in this first rough description of its stream is that *It is always interested more in one part of its object than in another, and welcomes and rejects, or chooses, all the while it thinks.*

The phenomenon of selective attention and of deliberative will are of course patent examples of this choosing activity. But few of us are aware how incessantly it is at work in operations not ordinarily called by these names. Accentuation and Emphasis are present in every perception we have. We find it quite impossible to disperse our attention impartially over a number of impressions. ... We actually ignore most of the things before us. ... But what are things? Nothing, as we shall abundantly see, but special

groups of sensible qualities, which happen practically or æsthetically to interest us, to which we therefore give substantive names, and which we exalt to this exclusive status of independence and dignity ...

(I p. 286) That [selective] industry goes on to deal with the things thus given in perception. A man's empirical thought depends on the things he has experienced, but what these shall be is to a large extent determined by his habits of attention. ...

Habits and neural plasticity

The explanation of attention brings in the central issue of *habits*. James writes (I p. 104):

When we look at living creatures from an outward point of view, one of the first things that strike us is that they are bundles of habits. ... *the phenomena of habit in living beings are due to the plasticity‡ of the organic materials of which their bodies are composed.* ‡Note: In the sense above explained, which applies to inner structure as well as to outer form.'

The neural embodiment of mental functions

James's explanation of habit brings into focus the question of the *neural embodiment* of mental functions such as the relation of knowing. Neural embodiment is a prominent theme of James's presentation from the very beginning. He writes (I p. 14):

... Let us now look a little more closely at the brain and at the ways in which its states may be supposed to condition those of the mind.

THE FROG'S NERVE-CENTRES. Both the minute anatomy and the detailed physiology of the brain are achievements of the present generation ...

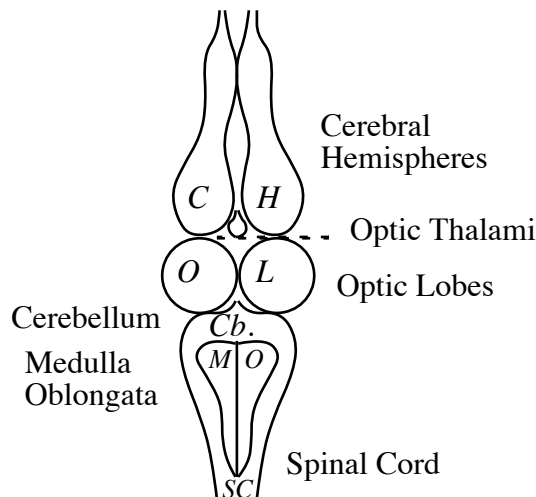


Fig. 1 The frog's nerve-centres

The best way to enter the subject will be to take a lower creature, like a frog, and study by the vivisectional method the functions of his different nerve-centres. The frog's nerve-centres are figured in the accompanying diagram (Fig. 1), which needs no further explanation. I will first proceed to state what happens when various amounts of the anterior parts are removed, in different frogs, in the way in which an ordinary student removes them; that is, with no extreme precautions as to the purity of the operation. We shall in this way reach a very simple conception of the functions of the various centres, involving the strongest possible contrast between the cerebral hemispheres and the lower lobes.

James continues on pages 15 to 18 to present detailed descriptions of the movements observed in frogs whose nervous system has been modified by a section at one of several points between the parts shown in Fig. 1. He continues [I 18]:

Such are the phenomena commonly observed, and such the impressions which one naturally receives. Certain general conclusions follow irresistibly. First of all the following:

The acts of all the centres involve the use of the same muscles. ... [I 19]

The same muscle, then, is repeatedly represented at different heights; and at each it enters into a different combination with other muscles to co-operate in some special form of concerted movement. At each height the movement is discharged by some particular form of sensorial stimulus. ... [I 20]

GENERAL NOTION OF HEMISPHERES. All these facts lead us, when we think about them, to some such explanatory conception as this: *The lower centres act from present sensational stimuli alone; the hemispheres act from perceptions and considerations*, the sensations which they may receive serving only as suggesters of these. But what are perceptions but sensations grouped together? and what are considerations but expectations, in the fancy, of sensations which will be felt one way or another according as action takes this course or that? ... and the difference between the *hemisphereless animal and the whole one* may be concisely expressed by saying that the *one obeys absent, the other only present, objects*.

The hemispheres would then seem to be *the seat of memory*. Vestiges of past experience must in some way be stored up in them, and must, when aroused by present stimuli, first appear as representations of distant goods and evils; and then must discharge into the appropriate motor channels for warding off the evil and securing the benefits of the good. If we liken the nervous currents to electric currents, we can compare the nervous system, *C*, below the hemispheres to a direct circuit from sense-organ to muscle along the line *S...C...M* of Fig. 2. The hemisphere, *H*, adds the long circuit or loop-line through which the current may pass when for any reason the direct line is not used. ... [I 23]

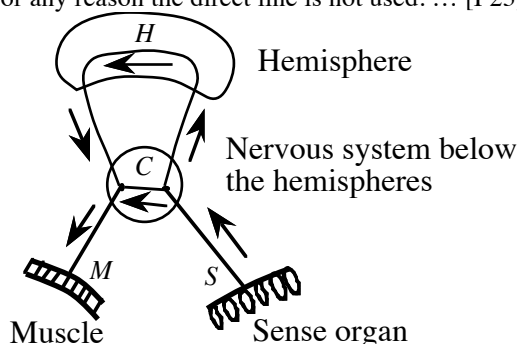


Fig. 2 Circuits of the nervous system

In the 'loop-line' along which the memories and ideas of the distant are supposed to lie, the action, so far as it is a physical process, must be interpreted after the type of the action in the lower centres. If regarded here as a reflex process, it must be reflex there as well. The current in both places runs out into muscles only after it has first run in; but whilst the path by which it runs out is determined in the lower centres by reflections few and fixed amongst the cell-arrangements, in the hemispheres the reflections are many and instable. This, it will be seen, is only a difference of degree and not of kind, and does not change the reflex type. The conception of all action as conforming to this type is the fundamental conception of modern nerve-physiology. So much for our general preliminary conception of the nerve-centres! Let us define it more distinctly before we see how well physiological observation will bear it out in detail.

THE EDUCATION OF THE HEMISPHERES. Nerve-currents run in through sense-organs, and whilst provoking reflex acts in the lower centres, they arouse ideas in the hemispheres, which either permit the reflexes in question, check them, or substitute others for them. All ideas being in the last resort reminiscences, the question to answer is: *How can processes become organized in the hemispheres which correspond to reminiscences in the mind?*

The neural embodiment of habits of movements

Elsewhere James approaches the question of the neural embodiment of habits of movements (I p. 114):

... habit diminishes the conscious attention with which our acts are performed.

One may state this abstractly thus: If an act require for its execution a chain, *A, B, C, D, E, F, G*, etc., of successive nervous events, then in the first performances of the action the conscious will must choose each of these events from a number of wrong alternatives that tend to present themselves; but habit soon brings it about that each event calls up its own appropriate successor without any alternative offering itself, and without any reference to the conscious will, until at last the whole chain, *A, B, C, D, E, F, G*, rattles itself off as soon as *A* occurs, just as if *A* and the rest of the chain were fused into a continuous stream. ... [I 115]

These results may be expressed as follows:

In action grown habitual, what instigates each new muscular contraction to take place in its appointed order is not a thought or perception, but the *sensation occasioned by the muscular contraction just finished*. A strictly voluntary act has to be guided by idea, perception, and volition, throughout its whole course. In habitual action, mere sensation is a sufficient guide, and the upper regions of brain and mind are set comparatively free. Fig. 3 will make the matter clear:

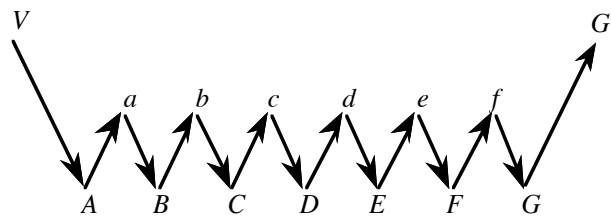


Fig. 3 Habitual chain of muscular contractions and sensations

Let *A, B, C, D, E, F, G* represent an habitual chain of muscular contractions, and let *a, b, c, d, e, f* stand for the respective sensations which these contractions excite in us when they are successively performed. Such sensations will usually be of the muscles, skin, or joints of the parts moved, but they may also be effects of the movement upon the eye or the ear. Through them, and through them alone, we are made aware whether the contraction has or has not occurred. When the series, *A, B, C, D, E, F, G*, is being learned, each of these sensations becomes the object of a separate perception by the mind. By it we test each movement, to see if it be right before advancing to the next. We hesitate, compare, choose, revoke, reject, etc., by intellectual means; and the order by which the next movement is discharged is an express order from the ideational centres after this deliberation has been gone through.

In habitual action, on the contrary, the only impulse which the centres of idea or perception need send down is the initial impulse, the command to *start*. This is represented in the diagram by *V*; it may be a thought of the first movement or of the last result, or a mere perception of some of the habitual conditions of the chain, the presence, e.g., of the keyboard near the hand.

The neural embodiment of habit formation

In a deliberate attempt to establish the neural embodiment of habit formation James describes how the education of the hemispheres may take place by what he calls ‘the Meynert scheme’, proposed by Theodor Meynert in 1874. He concludes, however, [I 26]:

All this, as a mere scheme, is so clear and so concordant with the general look of the facts as almost to impose itself on our belief; but it is anything but clear in detail.

Later, on pages I 72-80, James takes up the Meynert scheme again, discussing certain modifications of it. But as his final words on his discussion of the education of the hemispheres he says [I 81]:

The elementary properties of nerve-tissue on which the brain-functions depend are far from being satisfactorily made out. ... Let us therefore relegate the subject of the *intimate* workings of the brain to the physiology of the future

THE SYNAPSE STATE THEORY OF MENTAL LIFE

Synapses as the seats of habit

This was the background when in 2003, while writing an *Anatomy of human mental life* I became aware of the components of the neural system discovered by Sherrington around year 1900 and called *synapses* (Fig. 4). As described by Sherrington each synapse is a connection between two neurons which will transmit excitations, but only to a certain degree which depends on the state of conductivity of the synapse. Moreover, the conductivity of each synapse changes in a plastic way, such that every time the synapse conducts an excitation it becomes more conductive.

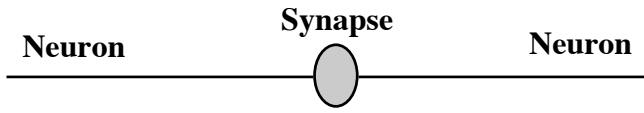


Fig. 4 Sherrington's synapse connection

It occurred to me that the synapses might be the seats of habit in the organisms. In the following years I pursued this idea in a number of studies, until 2008 when I published the study *The neural embodiment of mental life by the synapse-state theory*. In this study the top part of Fig. 2, taken from James, is expanded into a neural network shown in Fig. 5.

The neural structure of the hemispheres

The structure of the neural network of the hemispheres according to the synapse-state theory is shown in Fig. 5.

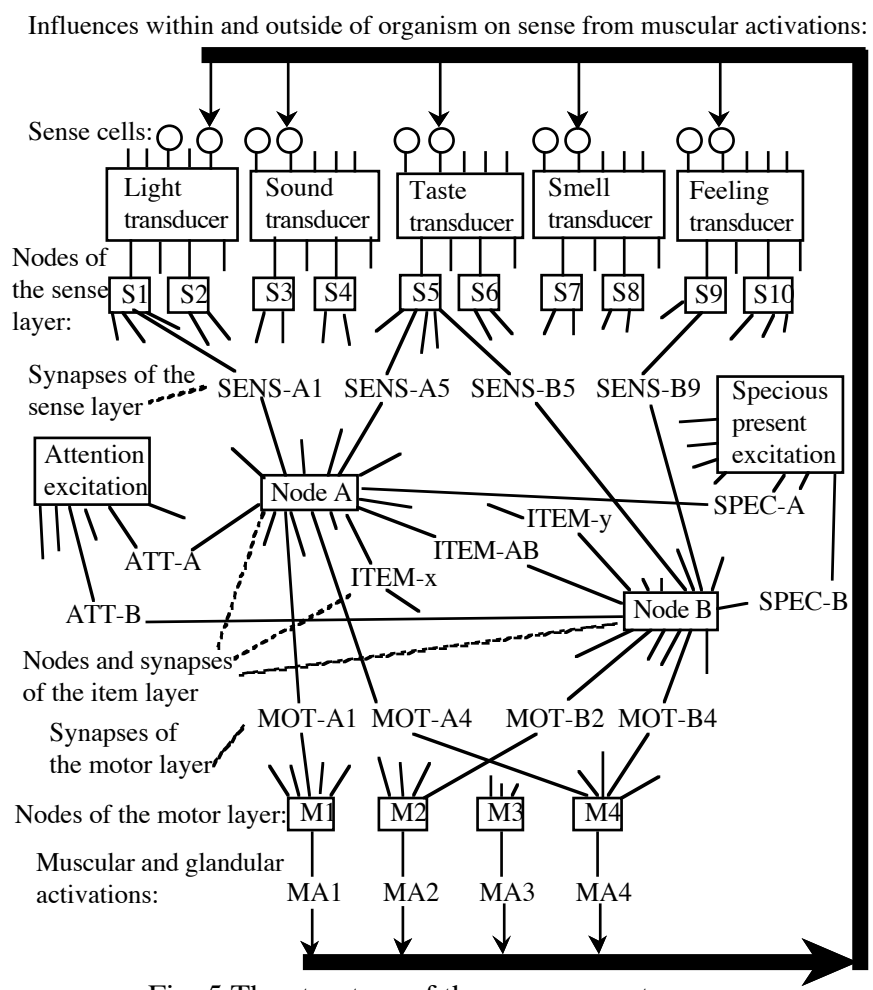


Fig. 5 The structure of the nervous system

The network consists of neurons, synapses, and nodes. The part of the network shown at the centre of the figure, the item layer, consists of a large number of nodes, each pair of nodes being connected by a neuron path passing through one synapse. The figure shows just two such nodes, Node A and Node B, with their connection through the synapse ITEM-AB. The sense layer, shown at the top of the figure, consists of a number of sense nodes, shown as S1, S2, ... S10, each sense node receiving excitations from one of the sense transducers and being connected through neurons and synapses to every node of the item layer. The motor layer, shown at the bottom of the figure, consists of a number of motor nodes, M1, M2, ... M4, each motor node being connected to one muscle or gland, shown as MA1, ... MA4, and through

neurons and synapses to every node of the item layer, shown as MOT-A1, ..., MOT-B4. Each node of the item layer is connected to two sources of excitations, the Attention excitation and the Specious present excitation. The connections come through synapses of the attention layer, ATT-A and ATT-B, shown to the left, and through synapses of the specious present layer, SPEC-A and SPEC-A, shown to the right.

The excitations in the neural network originate in the sense transducers and the attention and specious present excitation sources. The excitations along neurons leading into a node of the item layer combine by summation and are then distributed into other neurons leading through synapses into other nodes.

Neural excitation pattern of the stream of thought

The synapses of the attention and specious present layers may release strong excitations into the nodes of the item layer to which they are connected. Such an excitation is released when the node is already excited from other sources, and the excitation is added to these other excitations. These strong excitations are of short duration, that from an attention synapse falling off within a second or two, that from a specious present synapse falling off gradually within less that a minute. The effect of this is explained most simply by a consideration of the typical pattern of excitations at any moment as shown in Fig. 6.

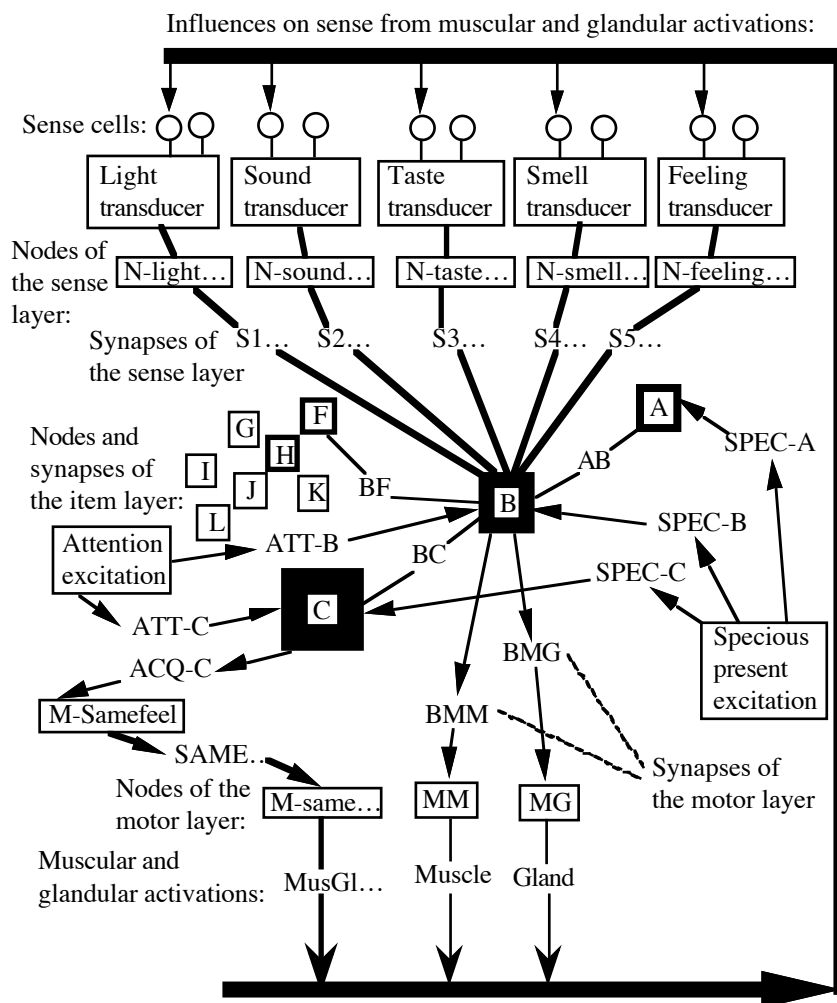


Fig. 6 Momentary excitation pattern

The nodes of the item layer excited at the moment are shown as A, B, C, ... J, K, L, the relative strengths of excitation being shown by the thickness of the frame around each node. The node C is most strongly excited. This node is where the *attention* is at the moment. The

nodes A and B have been the centres of attention a few seconds earlier. The strong excitations of the nodes A, B, and C, come through the synapses ATT-C, ATT-B, SPEC-A, SPEC-B, and SPEC-C.

Owing to the falling off of the excitations from the attention and specious present synapses the excitation pattern will be in constant change, embodying the stream of thought.

Neural structure of the relation of knowing

The place of *knowing by acquaintance* and *knowing about* within this neural structure is shown by an example in Fig. 7. This shows some of the nodes and synapses in the neural system of a person who is acquainted with Audrey Hepburn and knows certain things about her, such that she was an actress who performed the part of Natasha in the movie film War and Peace and also performed in the movie film Roman Holiday. Each of the items *Natasha*, movie film *War and Peace*, movie film *Roman Holiday*, and *actress*, must also be know by acquaintance by the person, and so are found in the form of nodes. The synapses connecting these nodes, such as SI-AH1, SI-AH2, SI-AH3, and SI-AH4, will be in states of conductivity, embodying the way these items are associated with Audrey Hepburn in the person's thought. These states of conductivity of certain synapses have resulted from the person's thinking of the connected items at the same time. Thus for example whenever the person thinks simultaneously of Audrey Hepburn and the movie film *War and Peace* the synapse SI-AH3 will receive excitations from both of its connected neurons simultaneously, and so will have its conductivity increased, in a plastic manner. Here we see the mechanism of habit formation.

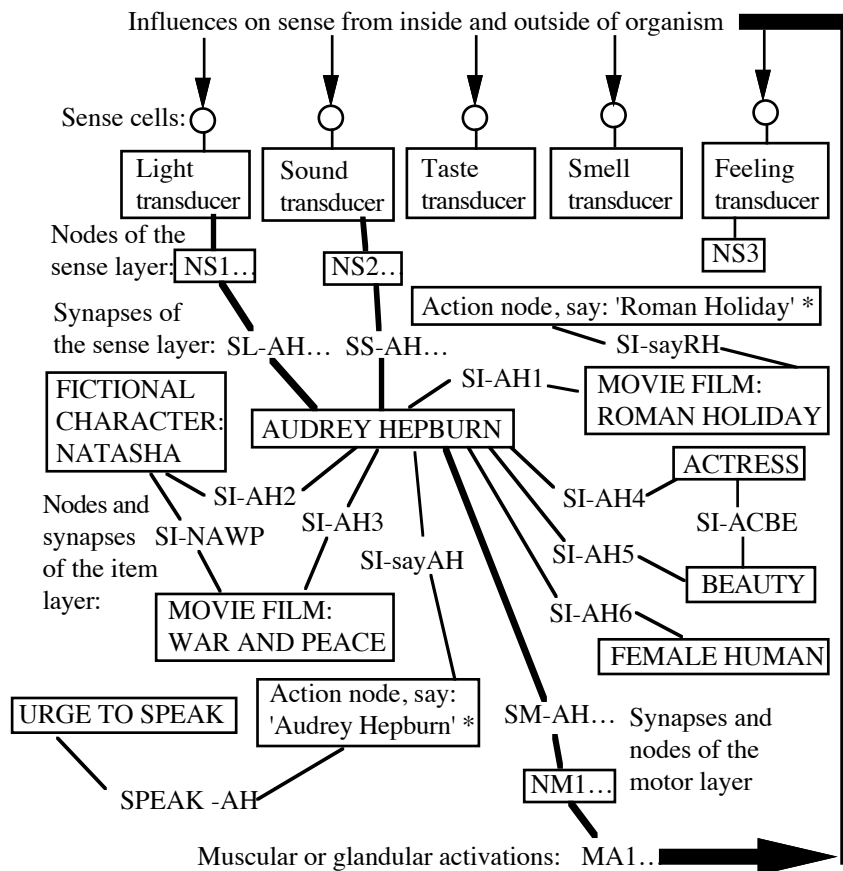


Fig. 7 Subject aggregate: AUDREY HEPBURN

The identification of the node AUDREY HEPBURN with the person's being acquainted with Audrey Hepburn is embodied in the states of conductivity of a number of additional synapses.

Some of these synapses effect that the person when exposed to certain sensations will have the node AUDREY HEPBURN excited. Thus the set of synapses denoted SL-AH... by their states of conductivity will effect that when the person is exposed to certain light impressions, either from pictures showing Audrey Hepburn's appearance or from script representations of her name, will have the node AUDREY HEPBURN strongly excited. Similarly the set of synapses denoted SS-AH... by their states of conductivity will effect that when the person is exposed to certain sound impressions, such as those produced by someone pronouncing the name 'Audrey Hepburn', will produce excitations of the node AUDREY HEPBURN.

Neural structure of action sequence

The state of the synapse SI-sayAH will have the effect that when the person is in a state of thinking about Audrey Hepburn and at the same time has the urge to speak, what is articulated is the sound of pronouncing the four syllables of 'Au-drey-Hep-burn'. The urge to speak is embodied in an excitation of the node URGE TO SPEAK. The pronunciation of 'Audrey Hepburn' requires four separate nodes of the item layer, as shown in Fig. 8, of which only one is shown in Fig. 7. When 'Action node, say 'Audrey Hepburn'*' is excited it will, through the set of synapses shown in Fig. 8 as SMAu... excite the set of nodes of the motor layer shown as NMAu..., which will activate the muscles of the speech organs shown as MAu... that effect the pronunciation of 'Au'. As indicated in the figure by the thick arrow, the excitation of these muscles will be sensed by sense cells, that through the Feeling transducer will excite a set of nodes of the sense layer shown as NSAu... The excitations of these nodes will through a set of synapses shown as SSAu... be transmitted into the node 'drey-' and will thereby through the synapses SMDrey... and the nodes NMDrey... excite the muscles Mdrey... that produce the articulation of the sound 'drey'. And so the action continues in a similar manner with the pronunciation of the sounds Hep- and burn, each syllable being released by sense cells excited by activation of the muscles that produce the articulation of the previous syllable.

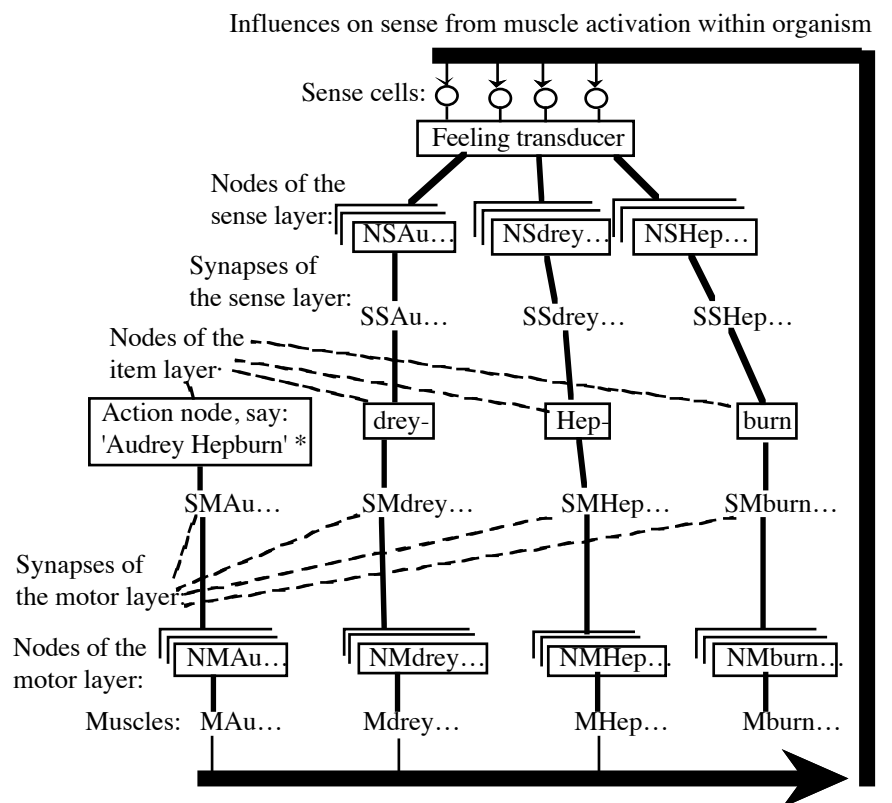


Fig. 8 Muscular action aggregate for pronouncing 'Au-drey-Hep-burn'

The whole process of pronouncing ‘Audrey Hepburn’ is typical of the execution of well trained, habitual, bodily movements, that mostly happen as series of submovements that follow each other in a particular order. This neural mechanism was explicitly described by William James, as illustrated by Fig. 3 shown above.

Neural embodiment of recall

In summary it will be seen that the entire neural pattern establishing knowing something by acquaintance and knowing about that something is a matter of the conductivity states of a certain number of synapses. These conductivity states have been established by training. They embody certain habits in the individual, such as the habit that certain sense impressions turn the person’s attention toward a particular something known by acquaintance, and the habit to speak a particular sound when the attention is directed towards that particular something. It may be noted that by this explanation a person’s knowing something has nothing to do with some representation being held in the person’s brain. When a person at a particular moment ‘has forgotten X’, as it is expressed, the case is more aptly expressed by saying that the person is momentarily unable to recall, that is, bring to attention, that X. Recalling a certain X which is not present to the person’s sense is a matter of the person giving attention to other things, B, C, ... Q, that are associated with X in the person’s mind. In such a situation B, C, ... Q, act as clues to X. This explanation of recall is confirmed by the fact that it quite commonly happens that a person who at some moment fails to recall some X, at some later moment *will* recall that X. It is just a matter of how many clues the person manages to attend to.

CONCLUSIONS

Cognitivism: a dead end

In conclusion the discussion shows that the idea of knowledge as something held in a memory container—the core idea of cognitivism— is invalid. It has been pursued energetically for fifty years, and has yielded no insight into mental life. The present conference on ‘Click-on-knowledge’ would serve a really important service if it could state clearly and loudly that cognitivism, with its talk about knowledge held in a memory, is a dead end, to be eliminated from scientific discussions the sooner the better.

Click on descriptions

As a further conclusion, since 'knowledge' denotes nothing clearly, it makes no sense to discuss such a topic as Click-on-knowledge. What one may click on are descriptions. A description is something that to some persons who understand it in a particular way conveys some properties of something. Descriptions are important. All scientific activity is concerned with establishing descriptions. This I have discussed in some detail in part 4 of my book *Knowing and the Mystique of Logic and Rules*.

ACKNOWLEDGEMENT

For constructive advice on the formulation of this presentation I am greatly indebted to Erik Frøkjær.

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