Looking at the Beginnings: Enquiries about Emergence of Cognition in Evolution

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Introduction

Trying to understand when and how the cognitive phenomena arise in evolution continues being a hard problem of confronting.

One important task is to find the ways in which we will be able to arrive at those explanations that will enable us to understand how living beings put together perceived sensory information as well as how they represent it.

In this presentation, we address some conceptual questions involved in the relationships between sensorial information perceived by brains and its representational capacities.

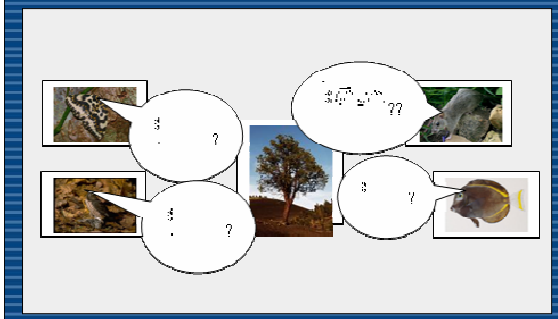
1) Sensorial Information and Representation

Imagine an ordinary situation: a person, walking through a park, begins to clap his hands; suddenly, the birds on the grass around him take off in flight.

"How did the birds perceive these claps?"

Further, if there were another animal in the area, such as a cricket or a mouse, how would it perceive them? Maybe, there are underlying general principles to the so-called neural code:

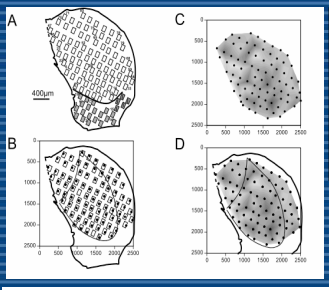
What might the relationship be that is established between the neuronal responses and the sensory signs or signals that these supposedly represent?



How could they perceive the tree?

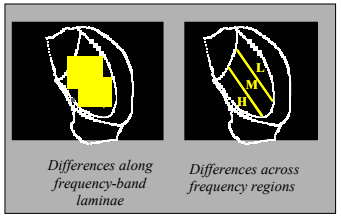
2) The Case of CNIC in Rats

In the Central Nucleus of the Inferior Colliculus (CNIC), every tonotopic organization plane has more than one population of neurons oriented almost transversal to it.

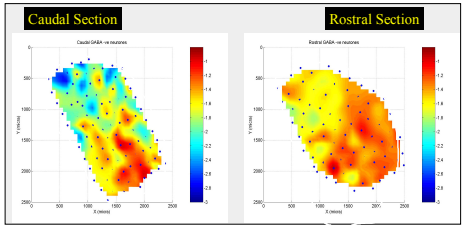


5 cells in each frame were selected for densitometric analysis. All neurons with prominent nucleus. Only cytoplasm was analyzed..

With densitometric quantitative methods it is possible to detect different GABAergic and glycinergic populations of neurons in every plane of isofrequencies oriented almost transversal to it:



Differences along frequency-band laminae — *Differences across frequency regions*



DENSITY GRADIENT GRAPHIC REPRESENTATION METHOD
Codified by colours

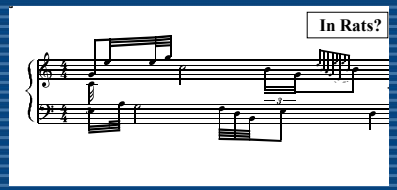
If there is a dynamical organization of a topological kind, then, this generates a ***temporal excitatory flow*?**

We also postulate that these discoveries talk about ***some mental aspects*:**

(1) Presence of certain patterns of auditive information ***decomposed in a dynamical topologic ways***.

(2) Vestiges of a *frozen dynamics structured spatially and temporally.*

(3) The *differential distribution in isotonic segments* permits a control in rhythms and topologic-temporal fires and inhibitions: the **expression of mental rules?**



3) One Approach on Information Notion

(I) Information needed to "spontaneously assemble" the parts of a watch?

(II) Information content for an ant colony to explore strategies for detecting a food's sources?

***…Two uses of information's notion*:**

(I) "We ascribe" a certain information content.

(II) It has more to do with the ***"production of information"*** used by entities, which are adaptive, dynamic systems.

What difference have we found between these two cases?

(I) It might be susceptible to being largely abstracted; used on "a wide-scale basis" to almost anything in the universe.

(II) Exists in the world; the term "information" has a physical reference in reality.

…then,

(I) has its theoretical and applicable legitimacy because of (II)!!

An important consequence:

INFORMATION HAD AN ORIGIN!!

Conclusion

•It is possible that biological information (understood in a wider sense) already carries a certain "**meaning**" (a basic semantic) and is perhaps associated with the molecular processes that generate the biological functions within a network of processes.

•Maybe, the origins of cognition will take us directly to a deepening of the notions of biological information and biological functions as well as to the possible relationships that take place between them.

References

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Acknowledgements

- Graphics in CNIC are courtesy of L.A. Aguilar.