Evolutionary Emergence of Early-Peptide-Synthesizing RNA Machines by Means of Hierarchical Sociogenesis of tRNA-Riboorganisms

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1 Introduction

DNA information of organisms makes well-made biomachines such as animal body, bee society (= bee super-organism), and intracellular genetic apparatus, which seem to have most plausibly emerged by hierarchical kin sociogenesis of lower-level individuals (which are unicell animals, bee individuals, and tRNA ribo-organisms, respectively) [1]. Both bee super-organism and animal body are considered to be altruistic society consisting of fertile queen individuals (queen bees, germ line unicell organisms) and worker individuals (worker bee, somatic line unicell organisms), where altruistic behaviors of the latter to the former are obviously observed. In the emergence of protein-synthesizing and genetic machine, early RNA replicator ribo-organisms would have evolved to be early tRNA ribo-organisms whose life cycle consists of tRNA-phase and tDNA-phase. Such early tRNA individuals would have associated together to make a kin tRNA society in which some of them would have altruistically behaved to other tRNAs, and have begun to behave as earliest mRNAs (and also as rRNAs) (as has been discussed in "poly-tRNA theory". See [1].). Accordingly, mRNA/mDNAs and rRNA/rDNAs (and also M1 RNA and other RNAs) are worker-tRNAs, and contemporary tRNAs are queen-like tRNAs. Thus, contemporary genetic and protein-synthesizing machine is also like a hierarchical society consisting of queen-tRNAs and worker-tRNA ribo-organisms.

2 From kin sociogenesis to the genesis of self-learning neural-network machine

Why could such hierarchical societies have evolved to be well-made machines? A possible answer could be that hierarchical (altruistic) behavioral and DNA-information-flow networks could make a self-learning neural-network machine [2] whose network consists of (1) DNA input from the (queen of) previous generation to queens and workers of the present generation, (2) altruistic behavioral flow from workers to queens, where the flow is equivalent to DNA flow (because altruism increases final DNA-output from queens to the next generation, and the queen DNAs share a great portion of DNA sequences with workers of this kin society), (3) the final DNA-output from queen to the next generation via gametes (ovum, etc.), and (4) various Informations from circumstancing environment and from self system could also be inputted mostly to workers, and could effect worker's altruistic behaviors. Therefore, the DNA-flows (3) and (1) make a feedback DNA-flow from "queen" (of the previous generation) to "workers", or else, from "queen-niche" to "worker-niches", and moreover, this feedback might be somewhat like "teacher-information" for this possible neural network. Another important feedback would be "manipulation by the previous generation" exemplified by the suppressive effect of queen-bee's (maternal) substance to worker's fertility and by maternal bicoid-mRNA effect on early cell differentiation in Drosophila. These features (1)-(4) would most plausibly make the kin societies a

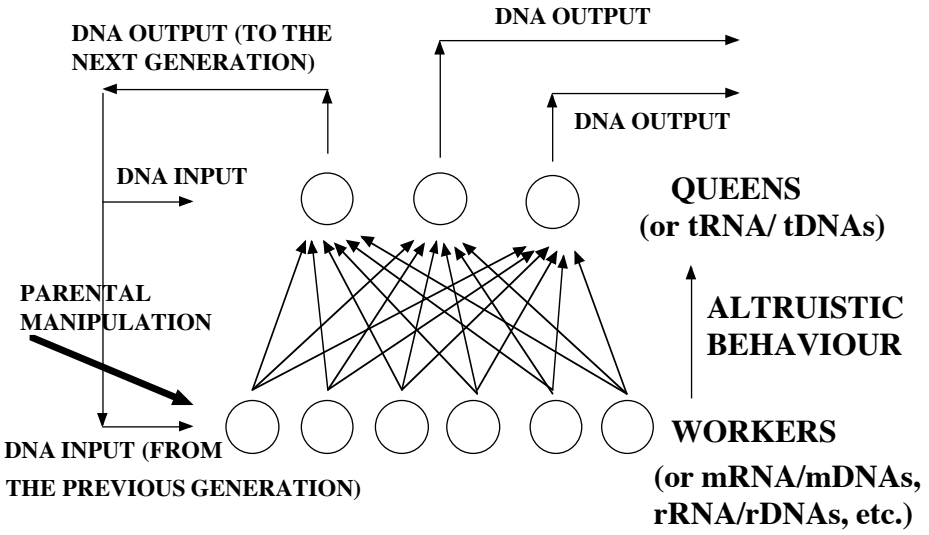

Figure 1: A possible self-learning neural network consisting of behavioral and DNA-information-flow networks in simplified queen-worker-type hierarchical kin society. Workers are unfertile and closely kin to queens in bee eusociety (= bee super-organism), aphid eusociety, and germ-line/somatic-line eusociety (= animal body = super-organism comprising unicell animals). In genetic apparatus, tRNA ribo-organisms are queen individuals whose life cycle consists of tRNA-phase and tDNA-phase. Other RNA's (and their DNA-phases) are workers evolved from tRNAs. All of these hierarchical societies have evolved to be well-made machines possessing their respective semeiotic system.

self-learning neural-network machine capable of self-improving and evolutionary bio-machinogenesis. Furthermore, in every of these altruistic societies, mature semeiotic systems are observed ; synaptic signs between sensory and motor neurons, dance-language synapsis between "sensory bee" and "motor bee" [1], triplet codon rules between anticodon (sensory organ or "image" or "signifian" in de Sausseur's terminology) and amino-acid specificity ("concept" or "signifie"). Thus, mature semeiotic systems must have played important roles in evolutionary bio-machinogenesis. Such semeiotic systems are characteristic cultures of the respective hierarchical societies, which well coincides with de Sausseur's theory that semeiosis is a cultural phenomenon of society. Language system in human society seem to have evolved by a very similar logic. Therefore almost identical common logic of semeiogenesis would underlie the evolution of different semeiotic systems such as human language, bee dance language, neuronal synaptic signs, and genetic codon systems. In conclusion, genetic codon system is a cultural phenomenon of intracellular tRNA ribo-organismic society, and mRNA-encoded proteins are cultural products (machines) of the society. An early form of thus made early genetic machine is essentially the peptide-synthesizing RNA machine predicted by the poly-tRNA theory [1].

References

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