A Genetic View of National Intelligence

by

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1. Introduction.

National intelligence is information intended to assure the national security. Whatever the national security is is politically defined. When national security is well-defined, the development of intelligence can be directed by cohesive, consistent, and effective policy and practice. When the definition of national security is changing or becomes unclear for whatever reason, the information needed to assure it is recognizably unclear and often less valuable.

This discussion proposes a redefinition of national intelligence built upon an evolutionary model to better assure national security. It emphasizes a dynamic view of information and restructuring intelligence functions depending upon their role as information resources to the nation. It also suggests how an open source intelligence (OSI) [2,8,9] activity divorced from classified intelligence activity plays a critical role in this redefinition.

Separation of OSI from classified intelligence is necessary for the betterment of both on theoretical and practical grounds. It allows OSI to integrate with the mainstream of national affairs while supporting classified intelligence as "just another consumer" of OSI products.

This separation improves the focus of classified intelligence activities by relieving them of the need to maintain the majority of their own OSI activities. Some level of OSI activity will need to be retained by existing intelligence agencies, to provide quality assurance, appropriate reformatting, and productive integration of OSI with classified sources.

2. Evolution, information, and organizations.

This section outlines a simplified evolutionary view of information that serves as a model for national intelligence. I leave aside cultural and cognitive factors in the behavior of species and try to draw only a very rough picture of evolution for most plant and

animal species. (For a fuller account of evolution and related topics see [5,6].)

Darwinian evolution can be understood and expressed in terms of information processing. Whether one wants to interpret this reformulation as a metaphor or a more substantive interdisciplinary mapping is not important. What matters is that by changing our perspective upon information to that of biological evolution, useful insights for managing intelligence in the national interest may be gained.

Evolution is concerned with the process of species formation as represented by the actions of individuals, usually in response to environmental stress or opportunity. The characteristic and collective behavior of individuals embodies the species traits. These traits are, for the limited purposes of this discussion, themselves either directly or indirectly controlled by the expression of genetic material during an organism's development and reproductive behavior in the broadest sense (see Note 1).

Species traits include complex systems of biochemistry within cells as well as the particular combinations of cells that compose organ systems. Many complex organ systems and some behaviors of the whole organism function autonomously once they are developed.

The ability of a species to respond successfully to environmental change depends upon the variability of its gene pool. If the species contains members in each generation that are more or less well-adapted to and able to reproduce in the changed environment, the greater the likelihood that the species will survive. If only a few of the species members are able to flourish in the new environment, then either the species becomes extinct, or a new one evolves depending upon how similar these survivors are to their ancestors. From an information processing standpoint, this demonstrates a broadband approach to evolutionary challenges.

In a strictly biological context, genetic material is the medium for the information that uniquely defines a species. Outside that context we need to identify the functional equivalent of genetic material in order to apply an evolutionary model [1,3,4].

In complex non-biological systems the functional equivalent of the medium for genetic material is structured data. Alone, data is as inert as unexpressed genetic material. Given the appropriate software and human energy to process data, the resulting system of man-machine interactions do the same kinds of things as found in the biological expression of genetic material (see Note 2).

As soon as structured data exists particular software and human activities are needed to use it. This is equivalent to the biochemical reactions formed from organic genetic material during development and maintenance of cells. These derived systems and

their behavior and structure become the characteristic traits of the organization.

In organisms, the information in genetic material both directly and indirectly controls activity. The direct expression of genetic material occurs at the cellular level. Once organ and biochemical systems are in place and mature, they tend to be more or less self-regulating kinds of activity, usually only indirectly controlled.

The distinction between activities directly and indirectly controlled by genetic material also may be stated analogously as the difference between background and foreground information processing. Biology tells us that this distinction is not clear-cut, nor apparent in all organisms; some have no ability whatsoever to be and behave other than as they are. However, in higher organisms this kind of distinction is supported by observation.

Background information processing consists of the routine kinds of activities that support the day-to-day events composing and underlying the characteristic traits of the species members. Examples include biological systems that produce the correct organs, skin, coloration, and basic behavior underlying the ordinary morphology and activities of each individual in the species.

Foreground information processing consists of those activities occurring in response to or in anticipation of, unusual events (threats and opportunities) in an organism's life. These include the so-called 'instincts' as well as the novel responses that an organism may be able to make in the face of unusual events.

In the so-called higher organisms, foreground and background systems may interact in complex ways to better respond to environmental (or internal) stress without changing their own abilities. For example, in times of scarcity organisms may learn to vary where and how they search for food and what they eat (foreground activities), but still cannot control their digestive processes (background activities).

In organizations, traits may be described by the activities and structures created to collect and process information. If an organization's primary goal is making widgets, it structures its behavior around the process of widget making and relies upon the information that directs that process. If the information is removed, then the organization collapses. It is common knowledge today that most large organizations change their structure and functions when new information technology is introduced with the ability to collect and retrieve new (structured) data. Far from simply reflecting a kind of dependence upon information, this phenomenon clearly points out that large organizations are defined

to a great extent by the information they process.

To summarize the analogy so far, background information processing consists of all the routine activity in organizations which generate, use, or otherwise rely upon information for its characteristic behavior and structure. Foreground information processing in organizations is generally task specific, mission-oriented, and frequently unique kinds of behavior intended as a response to or an anticipation of environmental stress and opportunities.

3. Redefining national intelligence.

The implication of all this for national intelligence is that a nation, like an organism, requires both kinds of information gathering: background and foreground intelligence.

Background intelligence is more or less equivalent with open source intelligence. It is the continuous shared collection, analysis, and dissemination of information about all facets of the nation and the world. It may be focused upon particular topics not requiring classified means to resolve. When so focused, it may call upon citizens not usually engaged in intelligence activities for their expertise (the citizen analysts [2]).

Foreground intelligence pursues information on a more mission-oriented basis. Its means and content are usually classified, and by definition, not available to open source intelligence activities. Classified intelligence will use the product of open source activities to improve its efficiency and reduce its own overhead.

Keeping OSI information processing as broadband as possible in this context duplicates the variation in the genetic pool of species. For information employed in intelligence this means that at the very least the open source activity should be structured in such a way as to allow novelty to appear and have a reasonable chance of contributing to the accuracy of decision-making.

The concept of making the open source national intelligence process "broadband" is critical to the entire effort. In simplest terms, it is the organizational equivalent of maintaining a robust gene pool. Without this foundation for flexible, creative responses to environmental surprises species become extinct. Nations likewise require flexibility in the face of surprise. Nature long ago abandoned the strategy of creating species that are prepared for all possible eventualities in favor of a two-phase solution to environmental stress: viable species have the ability to adapt and change quickly; and species that aren't as flexible suffer greatly and become extinct.

In practical terms this means that activities such as contingency planning in national intelligence are strategically less important than quick adaptive responses. The best way to assure that kind of responsiveness is to create a national intelligence program with a robust and flexible organizational structure based upon highly efficient electronic networking. This network forms the backbone supporting open source intelligence gathering and dissemination.

The national security is best assured through the "healthy" functioning of both the background and foreground forms of intelligence activity. Lack of clarity or change in political areas will not consequently adversely impact the activities of national intelligence. This helps create a stable continuity of information that minimizes the possibility of the nation and/or its decision and policy makers being caught unaware by developments that are otherwise discernible to some, but not known by those who need to know.

4. Restructuring national intelligence.

When we view national intelligence as the healthy functioning of background and foreground forms of information processing activity it is immediately clear that present intelligence ^Ccommunity should be reconstructed in new directions.

A rationale for the changes listed below is drawn from the comparison of intelligence organizations and organisms. When we apply an evolutionary genetic view to both, as is done here, then certain organizational changes are indicated and ought to be made, if the goal is to make national intelligence activities as much like viable organic species as possible. This goal is reasonable given that nature has provided us with evidence for how viable adaptive systems are constructed during hundreds of millions of years of evolving biological species. It seems prudent to use this knowledge base in the design of our own systems that must cope with a changing, often unpredictable, and sometimes dangerous environment.

Some suggested broad-brush organizational changes to national intelligence include:

- o Remove most unclassified intelligence collection, analysis, and dissemination from within current agencies and cabinet-led departments. Liaison personnel will be retained for quality control and related functions.

- o Create a single unclassified national intelligence organization to conduct all open source intelligence collection. Staff this department with volunteer individuals transferred from other agencies.

- Require all government information gathering agencies and departments to use the open source intelligence department's product as a replacement for (and expansion of) its own prior unclassified activities. Do this in a phased approach.

- Require the new OSI organization to place some of its permanent staff in the offices of its governmental customers to facilitate information exchange and appreciation of customer issues.

- Allow public access to the products of the new OSI organization, and to its processes by means of citizen analyst participation. This should include some subcontracting of information collection followed by public review of the subcontractor's product.

These changes remodel national intelligence along the lines of direct/indirect information processing based upon an efficient background/foreground organizational distinction. They go further and explicitly force national intelligence organizations to more fully integrate with their environment. Far from being an exotic process, better integration of information processing organizations with their environment (with emphasis upon producers and consumers of their product), has become routine for successful service companies in the private sector. (For informal case narratives see, for example [7, 10]).

The goal of these changes is to reduce the economic and strategic cost, thereby increasing the effectiveness of national intelligence. This is accomplished by greatly expanding the equal access of all organs of government to the same basic information.

These changes also help remove the short-term rewards and overall inefficiencies resulting from information hoarding. Defacto information hoarding results when separate agencies conduct their own open source intelligence activities. This is an especially important issue in a highly interconnected world where critical knowledge needed by one organization's decision makers may be unknowingly held in another agency or private enterprise.

These changes also remove the onus of "espionage" from open source intelligence, thus facilitating public cooperation in building accurate national intelligence. It would be extremely difficult for a public OSI activity to be credibly accused of conspiracies against the public well-being.

As an added benefit these changes would relieve the classified intelligence services of having to maintain a mixture of unclassified and classified intelligence. In terms of responding to Freedom of Information Act requests and making more candid

responses to congressional inquiries, this kind of clear information separation presumably would help considerably.

5. Summary.

Evolution of species provides a model of how information functions directly and indirectly to control and shape the behavior of complex systems. The expression of genetic material demonstrates that information is an active agent in the development and continuing activities of these systems.

As a paradigm for intelligence in the national interest, a study of evolution suggests that the separation of open source and classified intelligence in favor of a coupled producer-consumer model is a more efficient and a more robust strategy in a changing world. Separation of these two vital national intelligence functions reduces the inefficiency inherent in redundant and therefore inevitably incomplete and more costly efforts, and it allows classified intelligence efforts to concentrate more of their energies elsewhere.

The key to successfully centralizing open source intelligence and integrating it into existing intelligence organizations resides in open communications between the two. To this end the OSI agency must structure itself to be very responsive to its 'customers' and external producers. Electronic networking and placing OSI employees in consumer locations will facilitate this effort; good will and cooperation must do the rest.

NOTES

1. Genetic material is the physical embodiment of the information needed to instantiate a species member with its characteristic morphology and behavior. Individual differences within species arise, in general, because the genetic material in any given individual is only approximately identical with that of the others with which it is reproductively compatible. Across the species as a whole, variation in genetic material within the reproducing portion of the population is the source of novelty, of change within the species and potential origin of new species.

Each species genetic basis has a degree of variability that can be randomly combined during reproduction to create novel offspring. These individuals may (or may not) be more fit in terms of reproductive advantage compared to other organisms. On average the offspring closely resemble their parents. A few will deviate significantly. Deviations may be neutral, beneficial, or harmful to the individual possessing them with respect to their reproductive success. How the changes effect reproductive success

is a large part of the process of natural selection.

2. The traditional perspective upon information is to regard it as passive, as some sort of quasi-metaphysical "substance" that agents and processes act upon or push around. This is similar to how 18th century science formulated the concept of the "imponderable ether" that some how made possible all kinds of material interactions between objects.

The genetic evolutionary model, however, requires that information be an active force that drives nearly all the other activities with which it comes in contact directly or indirectly. In organizations information in databases, software, and in-house experts constitute the mixture of organizational genetic material and its expression. Expanding the scope of what is meant by "organization" to include a nation increases the importance of this concept without altering its accuracy.

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