When no prepared behavior algorithm is in memory, the system tries to create one with the help of intellectual activity (one of the varieties of mental activity). This condition signifies that either the organism needs something principally new, that is, a similar pattern has never before arisen in the system's brain, or the situation in the habitat is an unusual one for which the system has no behavior experience. The second case is more significant. What is new in the current state of the habitat cannot be used by behavior algorithms available in memory. This occurs because the new situations are not foreseen by the algorithms, and an uncertainty arises in the system; that is, the system does not know how to behave in the new situation. Moreover, the system's attention is focused on this "essentially new" thing, and the system enters into a stable mental state, such as an interest in investigating the new thing, which in essence is one of the manifestations of the information need. *Information for the system is everything that decreases uncertainty during the development of a behavior algorithm.* An arising need initiates the algorithms and methods of investigating the new thing that are available in the system's memory. In this way, the system begins to act in the direction of investigating the new, in the direction of increasing knowledge. The accumulation of knowledge, that is, the system's ability to foresee the effect of the new, is carried over from one new thing to another until the algorithm necessary to achieve the goal is finally formed.

The preceding process is one of the main processes to provide for the system's functioning. However, the system's survival depends not only on the timely and full supply of matter and energy. Obviously, the habitat was not created expressly for people, and in addition to what we need, it provides that which we do not need at all. More than that, it provides that which immediately threatens the system's life—it provides danger in the form of birds of prey, poisonous animals and plants, and natural calamities, for example. Acquired dangers also exists, such as crime or intense traffic. For this reason the system constantly needs information about the habitat. It wants to know what can be expected from the environment; in other words, we talk about the historically formed constant need for information about the state of the external environment.

The existence of this need is well illustrated by an experiment carried out by biologists. A "rat zone" was created for a particular group of rats, based on conditions under which the needs of living rats that are known to biologists were completely satisfied. In each case by setting up the dimensions and the structure of the living space and a means for feeding, the experimenters investigated specific characteristics in natural conditions. In one corner of the space in which the rats lived, a track was made that led to a completely empty chamber by means of a narrow and winding corridor. Neither the corridor nor the chamber were lit. Moreover, the corridor was equipped with a number of effects to frighten the rats. In spite of the availability of all necessities, particular individuals showed an interest in inspecting the track but, as a rule, upon encountering the frightening effects, they gave up. Only a few—in spite of clear indications

of fear, such as squeaking and defecating or stopping and backing up—got to the chamber, inspected it, and returned. After this, they showed no more interest in this track.

It is clear that curiosity—the information need—is not developed to the same degree in each rat, not all proved to be prepared to take a risk for the sake of satisfying the information need, but as the unknown territory became known, what to expect from it became familiar.

In the process of satisfying this organic need, the organism accumulates knowledge about surmounting various dangers, and in a number of cases the system lays out standard behavior algorithms worked out as a result of frequent application. For example, when crossing the street we usually look both ways, and when we are certain that no danger exists, we begin our motion. We do this automatically, as if unconsciously, but having turned our head we attentively look to see whether an automobile is on the street. Note that a primordial set of knowledge produced by a species is built into the system genetically. This was corroborated by the following experiment. The shadow of a vulture was shown to incubated chicks hatching out of eggs, and the chicks ran around in panic. However, the shadow of a dove did not cause any panic because they "knew" that a dove's shadow did not carry information about danger.

Thus, even a brief consideration of the basic mechanisms of survival shows rather clearly how insufficiencies of matter and energy on the one hand, and the desire to survive in the habitat on the other, are transformed into an information need. In fact, the strive to survive is permeated with the need for information, a constant hunt for it. It was mentioned previously that after the interoceptors send signals to the brain (an unconscious information process), conscious information activity immediately begins. In fact, any purposeful actions, any conscious behavior or activity, are possible only as reactions to needs and only on the basis of available information. The more information the system has, the more chances it has to survive.

Note that *something* is information for a system only when the system takes it as information, as a *something* that eliminates uncertainty from the behavior algorithm. The system itself imparts to this *something* the property "to be information." Because the satisfaction of an information need itself comes from and has meaning only within the framework of a concrete information need for a concrete system, it is possible to speak about the subjective character of the perception of the product, which depends on the total set of patterns in the system's memory and on the concrete needs of the system. Obviously, information for a given system can be something that will never be information for other systems, and that which is information for other systems may never be information for a given system.

Because we mentioned the notion of information (later we will devote a separate section to it), we should point out the duality of this notion as encountered in practice. This duality could be illustrated by the following example.