

# AN ASPECT OF THE PROBLEM OF PERCEPTION

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## ABSTRACT

In this paper an attempt has been made to trace the development of perception in the evolutionary trend; the approach has been mathematical. An experimental programme inquiring into the origination of perception has been described and the specific problems have been enumerated.

### 1. THEORETICAL FRAMEWORK

1. In the early stages of evolution cognition is general, and is a function of the entire organism. But in course of evolutionary progress, in view of greater adaptation for survival, differentiation of functions set in and consequently distinct organs were evolved to discharge specialised functions. Thus the optical apparatus came into being for clarity in vision, that is to say, in order to cognise certain details of the environment; and the sound-character of the world is cognised through auditory mechanism. In man this process of specialisation has reached a very high order so much so that he is able to cognise the 'meaning' aspect of environment. He can not only *sense* the details as all other animals do, but can *perceive* also. *Perception is a highly specialised form of cognition.*

All cognition involves two particulars: (1) the object ( $O$ ) belonging to the environment; and (2) sensation ( $s$ ) thereof, as a function of the organism. Thus it is an interaction between the environment and the organism. Sensation is consequent on stimulation or the elementary propensity of irritability which plants share in common with animals; and therefore it must have basic correlates in the objective world. Symbolise this basic correlate as  $O$  and the process of sensation as  $s$ . Early cognition ( $C$ ) is thus describable as  $C = f(s, O)$ . In higher animals this simple interaction between  $s$ ,  $O$  is improved by the factor of mind ( $m$ ). Thus cognition in higher animals ( $C_h$ ) would be:

$$C_h = f(s, O, m).$$

Cognition in higher animals is more simply perception ( $P$ ); the function of mind endows meaning on sensation and is thus a more effective cognition than earlier ones. If perception is taken as a constant factor in all cognition, then its role in the lower animals must be characterised as:

$$P = S \text{ or } \delta(P, S) = 0 \text{ (zero).}$$

The course of evolution however widens the distance between  $s$  and  $O$ ,  $\delta(s, O) > 0$  in continuous order. Although thus the possibility of  $\delta(s, O) = \infty$  may be visualised, it is improper to construe any cognition without involving both  $S$  and  $O$ . Even in instances of artistic intuition and apparently incoherent dreams, it is possible to trace their basic sensory correlates. Nevertheless it is a fact that there is a gradual movement towards abstraction from the concrete, when sensation passes through perception and reaches conception; there is decidedly a greater play of the factor of  $m$ , but it is indispensable that  $s$  and  $O$  operate to some degree at least. The  $\delta(mSO)$  will indeed be  $> 0$ , but it cannot reach  $\infty$ . Indeed, such intuitional perception might be described as

$$f(M, S, O)$$

2. The purpose of cognition is to apprehend reality so that the organism may appropriately respond to environmental stimuli. It is therefore that all cognition has a truth-function. In the lower order of evolution

$$\text{because } \delta(s, O) = 0 \text{ [or } f(S, O) = 1]$$

the truth-function of perception is unity.  $t(P) = 1$ . But in later stages, as  $\delta(s, O) > 0$  in continuous order, it is to be expected that  $t(P) < 1$  until finally in case of  $\delta(s, O) = \infty$  (?),  $t(P) = 0$ . In the intermediary stages between 0 and 1, there is scope for error.

$$t(P) = 1 \text{ is absolute truth (T);}$$

$$t(P) = 0 \text{ is absolute error (E).}$$

Ordinarily, however, in actual life  $T$  and  $E$  never occur, but different degrees of  $T$  and  $E$  (i.e., relative truth  $t$  and error  $e$ ). In this context, the introduction of  $m$  is said to be the conditioning factor. Because  $P = f(m, s, O)$ , and

$$T(P) = \{\delta(M, S, O) = 0\}$$

in instances of error, we have to consider the following alternatives:

$$\delta(m, s) > 0$$

$$\delta(m, O) > 0$$

$$\text{or } \delta(s, O) > 0$$

Thus the error function of perception is contingent on an improper function of  $m$ ,  $s$  or  $O$  or all of them, or any combinations of them. At this stage experiments could be planned to find out the relative importance of these factors in conditioning the error-function of perception.

3. It is possible that the pattern or order or sequence of these three factors ( $m$ ,  $s$  and  $O$ ) contributes to the truth or error-function of perception. If the object comes first, then its sensation and then its cognition by mind, the truth value

will be very great; if there is no incoherence or distance betwixt them, it might be unity (1).

$$\{f(O, s, m) \mid \delta(O, s, m) = 0\} = T(P) \text{ Read } | \text{ as "such that" or "having the property of"}$$

If, however, the order is precisely reversed, the truth value is zero.

$$\{f(m, s, O) \mid \delta(m, s, O) = 1\} = E(P)$$

Thus, for all relative truth and error values, we get,

$$\{f(O, s, m) \mid \delta(O, s, m) > 0\} = t(P)$$

and  $\{f(m, s, O) \mid \delta(m, s, O) < 1\} = e(P)$

4. The three stages of perception during the course of evolution may be described as follows: the dominant factor is indicated by the large characteristic, the basic correlate is indicated at the lower position and the accompaniment or consequent in the power position.

Stage (1) ( $O^{s,m}$ )

Stage (2) ( $S_o^m$ )

Stage (3) ( $M_{o,s}$ )

As  $m$  predominates in the process of perception, scope for symbolism increases; the importance of the part played by "meaning" is also brought to the foreground so that the response now is on a superior plane of abstraction or intelligence, as when a poet sees some incident and writes a lyric about it. The three stages noted above are only aspects of a continuous process, and all the three find their expression in varying degrees in various circumstances in our daily life.

#### EXPERIMENTAL PROGRAMME

1. To inquire into the process of the origination of perception, a series of experiments have been planned. The following are accepted as facts, for giving us the necessary foundation for experimentation:

(a) Stimulation of sense organs, neural activity, and motor apparatus of the body are essential for all perception.

(b) Perception is something distinct from sensation;

(c) Perception is characterised by the possession of 'meaning';

(d) There are errors in perception (e.g., illusion) which can be studied;

(e) Perception in the infant is different from perception in the mature adult;

(f) Perception is at various levels.

The first three facts already suggest that perception may be looked upon as meaningful sensation, and that sensation is inevitable for perception. The fourth fact suggests that perception is not a finalised fixed adjustment, but has a developmental process; it gradually becomes more and more refined and fruitful. As regards the sixth fact, we shall note the following levels:

Perception of:

- (1) Visual form in two dimensions; lines, contours and objects,
- (2) a three-dimensional world: distance and depth,
- (3) objective colour, size, shape, etc.
- (4) visual notion and locomotion,
- (5) meaning and symbols,
- and (6) social perception.

At each of these levels, several experiments have been planned. The general rationale of all these is a systematic variation of the stimulus within the ambit of the *threshold* below which perception is not possible and the *limit* beyond which perception does not gain in form or content. Besides the appropriate responses that are called for, the subjects are also requested to furnish introspective reports as elaborately as possible.

2. The specific problems are:

(a) to trace the origin of 'perception' in the sensation-perception continuum, and (b) to determine the exact nature of the meaning-function of perception.

3. The material that has been employed is a set of visual illusion and reversible perspective figures. In each instance, the finished figure is systematically broken into several stages, and at each stage the subject is required to observe and introspect as to *what* he perceives in the presented form. The stage where occurs the greatest disparity between the objectively given data and the perceived form is analysed with reference to other stages and with a view to get at the contributory factors for the creation of the illusion or indecision in form (in reversible perspective figures). This will give us an important index as to how perception takes place.