

RULES, PERCEPTION, AND INTELLIGIBILITY¹

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1. *Rule-guided Action*

THE most striking instance of the phenomenon from which we shall start is the ability of small children to use language in accordance with the rules of grammar and idiom of which they are wholly unaware.² 'Perhaps there is', Edward Sapir wrote thirty-five years ago, 'a far-reaching moral in the fact that even a child may speak the most difficult language with idiomatic ease but that it takes an unusually analytical type of mind to define the mere elements of that incredibly subtle linguistic mechanism which is but a plaything in the child's unconscious.'³

The phenomenon is a very comprehensive one and includes all that we call skills. The skill of a craftsman or athlete which in English is described as 'know how' (to carve, to ride a bicycle, to ski, or to tie a knot) belongs to this category. It is characteristic of these skills that we are usually not able to state explicitly (discursively) the manner of acting which is involved. A good example is given in another connexion by M. Friedman and L. J. Savage:

Consider the problem of predicting, before each shot, the direction of travel of a billiard ball hit by an expert billiard player. It would be possible to construct one or more mathematical formulas that would give the directions of travel that would score points and, among these, would indicate the one (or more) that would leave the balls in the best positions. The formulas might, of course, be extremely complicated,

¹ Numbers in footnotes refer to the Bibliography at the end.

² Cf. particularly Michael Polanyi, *Personal Knowledge, Towards a Post-Critical Philosophy*, London, 1959, especially the chapters on 'Skills' and 'Articulation', and see also the penetrating observation in Adam Ferguson, *An Essay on the History of Civil Society*, London, 1766, p. 50.

³ E. Sapir (52, p. 549). Further insight into the nature of grammatical order makes this achievement of children appear even more remarkable, and R. D. Lees was recently moved to observe (32, p. 408) that 'in the case of this typically human and culturally universal phenomenon of speech, the simplest model that we can construct to account for it reveals that a grammar is of the same order as a predictive theory. If we are to account adequately for the indubitable fact that a child by the age of five or six has somehow reconstructed for himself the theory of this language, it would seem that our notions of human learning are due for some considerable sophistication.'

since they would necessarily take account of the location of the balls in relation to one another and of the cushions and of the complicated phenomena induced by 'english'. Nonetheless, it seems not at all unreasonable that excellent predictions would be yielded by the hypothesis that the billiard player made his shots *as if* he knew the formulas, could estimate accurately by eye the angles, etc., describing the location of the balls, could make lightning calculations from the formulas, and could then make the ball travel in the direction indicated by the formulas.¹

(A being endowed with intellectual powers of a higher order would probably describe this by saying that the billiard player acted as if he could think.)

So far as we are able to describe the character of such skills we must do so by stating the rules governing the actions of which the actors will usually be unaware. Unfortunately, modern English usage does not permit generally to employ the verb 'can' (in the sense of the German *können*) to describe all those instances in which an individual merely 'knows how' to do a thing. In the instances so far quoted it will probably be readily granted that the 'know how' consists in the capacity to act according to rules which we may be able to discover but which we need not be able to state in order to obey them.² The problem is, however, of much wider significance than will perhaps be readily conceded. If what is called the *Sprachgefühl* consists in our capacity to follow yet unformulated rules,³ there is no reason why, for example, the sense of justice (the *Rechtsgefühl*) should

¹ M. Friedman and L. J. Savage (8, p. 87).

² Cf. Gilbert Ryle (48) and (49, chapter 2). The almost complete loss of the original connotation of 'can' in English, where it can scarcely any longer be used in the infinitive form, is not only an obstacle to the easy discussion of these problems but also a source of confusion in the international communication of ideas. If a German says 'Ich weiß, wie man Tennis spielt' this does not necessarily imply that he knows how to play tennis, which a German would express by saying 'Ich kann Tennis spielen'. In German the former phrase states the explicit knowledge of the rules of the game and may—if the speaker had made special motion studies—refer to the rules by which the skill of a player can be described, a skill which the speaker who claims to know these rules need not possess. German, in fact, has three terms for the English 'to know': *wissen*, corresponding to 'know that', *kennen*, corresponding to 'be acquainted with', and *können*, corresponding to 'know how'. See the interesting discussion in H. Helmholtz (21, pp. 92 et seq.). The passage is inevitably rendered only imperfectly in the English translation of this work.

³ Cf. F. Kainz (23, p. 343): 'Die Normen, die das Sprachverwenden steuern, das Richtige vom Falschen sondern, bilden in ihrer Gesamtheit das Sprachgefühl.'

not also consist in such a capacity to follow rules which we do not know in the sense that we can state them.¹

From these instances where action is guided by rules (movement patterns, ordering principles, &c.) which the acting person need not explicitly know (be able to specify, discursively to describe, or 'verbalize'),² and where the nervous system appears to act as what may be called a 'movement pattern effector', we must now turn to the corresponding and no less interesting instances where the organism is able to recognize actions conforming to such rules or patterns without being consciously aware of the elements of these patterns, and therefore must be presumed to possess also a kind of 'movement pattern detector'.

2. *Rule-guided Perception*

Again the capacity of the child to understand various meanings of sentences expressed by the appropriate grammatical structure provides the most conspicuous example of the capacity of rule-perception. Rules which we cannot state thus do not govern only our actions. They also govern our perceptions, and particularly our perceptions of other people's actions. The child who speaks grammatically without knowing the rules of grammar not only understands all the shades of meaning expressed by others through following the rules of grammar, but may also be able to correct a grammatical mistake in the speech of others.

This capacity of perceiving rules (or regularity, or patterns) in the action of others is a very general and important phenomenon. It is an instance of *Gestalt* perception, but of a perception of configurations of a peculiar kind. While in the more familiar instances we are able to specify (explicitly or discursively to describe or explicate) the configurations which are recognized as the same, and therefore also are able deliberately to reproduce the stimulus situation which will produce the same perception in different people, all we often know in the instances which belong here and which will be the main subject of this paper is that a particular situation is recognized by different persons as one of a certain kind.

To these classes of structures of events which are 'known by

¹ Cf. L. Wittgenstein (66, p. 185): "'Knowing" it means only: being able to describe it.'

² Since the meaning of many of the terms we shall have to use is somewhat fluid, we shall occasionally resort to the device of cumulating near synonyms which, although not identical in their meaning, by the range of overlap of meaning define more precisely the sense in which we use these terms.

none, and understood by all'¹ belong in the first instance gestures and facial expressions. It is significant that the capacity to respond to signs of which we are not conscious decreases as we move from members of our own culture to those of different cultures, but that in some measure it also exists in our mutual relations to and also between higher animals.² The phenomenon has in recent years received a good deal of attention under the heading of 'physiognomy perception';³ it seems, however, to be of much wider occurrence than this term at first suggests. It guides not only our perception of expression but also our recognition of action as directed or purposive;⁴ and it colours also our perception of non-human and inanimate phenomena. It would lead too far to consider here the important contributions made to the knowledge of these phenomena by ethology, particularly by the studies of birds by O. Heinroth, K. Z. Lorenz, and N. Tinbergen,⁵ though their descriptions of the 'infective' character of certain types of movement and of the 'innate releasing mechanism' as a 'perceptual function' are highly relevant. We shall on the whole have to confine ourselves to the problems in man with an occasional look at other mammals.

3. *Imitation and Identification*

The main difficulty which has to be overcome in accounting for these phenomena is most clearly seen in connexion with the

¹ E. Sapir (52, p. 556): 'In spite of these difficulties of conscious analysis, we respond to gestures with an extreme alertness and, one might almost say, in accordance with an elaborate and secret code that is written nowhere, known by none, and understood by all.' Compare also Goethe's expression 'Ein jeder lebt's, nicht allen ist's bekannt.'

² Wolfgang Köhler (27, p. 307) reports that the chimpanzee 'at once correctly interprets the slightest changes of human expression, whether menacing or friendly'; and H. Hediger (18, p. 282) writes: 'Im Tierreich, namentlich bei den Säugetieren, besteht eine weitverbreitete und überraschend hohe Fähigkeit, menschliche Ausdruckserscheinungen ganz allgemein aufs feinste zu interpretieren.' R. E. Miller and his collaborators (37, p. 158) have shown 'that the effect of fear and/or anxiety can be perceived or discriminated by rhesus monkeys in the facial expression and posture of other monkeys'. For an illustration of the reverse relation, man recognizing the actions of apes as meaningful, see the description of observations of chimpanzees in the wild in A. Kortlandt (30).

³ See H. Werner (63 and 64), F. Heider (19), and now J. Church (7) where, after completing this paper, I found much support for its argument.

⁴ See, particularly, F. G. From (9) and E. Rubin (50), as well as G. W. Allport (2, p. 520), who sums up by saying that 'the key to person perception lies in our attention to what the other is *trying to do*'.

⁵ See 20, 33 and 34, and 58.

phenomenon of imitation. The attention paid to this by psychologists has fluctuated much and after a period of neglect it seems again to become respectable.¹ The aspect which concerns us here probably has not again been stated more clearly since it was first pointed out at the end of the eighteenth century by Dugald Stewart.² It concerns a difficulty which is commonly overlooked because imitation is most frequently discussed in connexion with speech where it is at least plausible to assume that the sounds emitted by an individual are perceived by him as similar to those produced by another.

The position is very different, however, in the case of gestures, postures, gait, and other movements and particularly in that of facial expressions, where the movements of one's own body are perceived in a manner altogether different from that in which the corresponding movements of another person are perceived. Whatever in this respect may be the capacities of the newborn infant,³ there can be no doubt that not only do human beings soon learn to recognize and to imitate complex movement patterns, but also that the various forms of 'infection' which occur in all forms of group life presuppose some such identification of the observed movements of another with one's own movements.⁴ Whether it is the bird which is induced to fly (or preen, scratch, shake itself, &c.) by the sight of other birds doing so, or man induced to yawn or stretch by seeing others doing the same, or the more deliberate imitation practised in mimicry or learning a skill, what happens in all these instances is that an observed movement is directly translated into the corresponding action, often without the observing and imitating individual being aware of the elements of which the action consists or (in

¹ For a survey see N. E. Miller and J. Dollard (36, especially Appendix 2), and cf. also H. F. Harlow (14, p. 443), K. Koffka (28, pp. 307-19), and G. W. Allport (2, chapter 1).

² Dugald Stewart (56, chapter on 'Sympathetic Imitation').

³ For the latest experimental results and the earlier literature on the smiling response of infants see R. Ahrens (1), K. Goldstein (11), H. Plessner (44), and F. J. J. Buytendijk (6).

⁴ Cf. Dugald Stewart (56, p. 139): 'To bestow upon [this theory of imitation] even the shadow of plausibility, it must be supposed further, that the infant has the aid of a mirror, to enable it to know the existence of its own smile, and what sort of appearance these smiles exhibit to the eye . . . this throws no light whatever on the present difficulty till it is further explained by what process the child learns to *identify* what it feels, or is conscious of, in its own countenance, with what it sees on the countenance of others.' (Italics added and original italics omitted.)

the case of man) being able to state what he observes and does.¹

Our capacity to imitate someone's gait, postures, or grimaces certainly does not depend on our capacity to describe these in words. We are frequently unable to do the latter, not merely because we lack the appropriate words but because we are unaware both of the elements of which these patterns are made up and of the manner in which they are related. We may well have a name for the whole,² or sometimes use comparisons with movements of animals ('creeping', 'ferocious') and the like, or describe conduct as expressive of an attribute of character such as 'furtive', 'timid', 'determined', or 'proud'. In one sense we thus know what we observe, but in another sense we do not know what it is that we thus observe.

Imitation is of course only one particularly obvious instance of the many in which we recognize the actions of others as being of a known kind, of a kind, however, which we are able to describe only by stating the 'meaning' which these actions have to us and not by pointing out the elements from which we recognize this meaning. Whenever we conclude that an individual is in a certain mood, or acts deliberately or purposively or effortlessly, seems to expect³ something or to threaten or comfort another, &c., we generally do not know, and would not be able to explain, how we know this. Yet we generally act successfully on the basis of such 'understanding' of the conduct of others.

All these instances raise a problem of 'identification', not in the special psycho-analytical but in the ordinary sense of the term, i.e. in the sense that some movement (or posture, &c.) of our own which is perceived through one sense is recognized as being of the same kind as the movements of other people which we perceive through another sense. Before imitation is possible, identification must be achieved, i.e. the correspondence established between movement patterns which are perceived through different sense modalities.

¹ Cf. P. Schilder (53, p. 244): 'real imitation actions . . . are due to the fact that the visual presentation of the movement of another is apt to evoke the representation of a similar movement of one's own body, which, like all motor representations, tends to realize itself immediately in movements. Many of the imitation movements of children are of this class.'

² G. Kietz (24, p. 1) lists 59 verbs and 67 adjectives which are used in the region of Leipzig to describe distinguishable kinds of gait.

³ Even the author of *A Glossary of some Terms used in the Objective Science of Behavior* (61, s.v. 'expect') finds himself forced to say that 'If one does not "intuitively know" what *expect* means, one is lost.'

4. *The Transfer of Learnt Rules*

The recognition of a correspondence between patterns made up of different sensory elements (whether belonging to the same or to different sense modalities) presupposes a mechanism of sensory pattern transfer, that is, a mechanism for the transfer of the capacity to discern an abstract order or arrangement from one field to another. That such a capacity should exist seems not implausible as a similar transfer of learning in the motor sphere is a well-established fact: skills learnt with one hand are readily transferred to the other, &c.¹ It has recently also been demonstrated that, for example, monkeys trained to respond to differences in simple rhythms of light signals (opening a door on two signals of equal duration and not opening it on two signals of unequal duration) at once transferred this response to the corresponding rhythms of sound signals.² In the field of perception many of the Gestalt phenomena, such as the transposition of a melody, also imply the operation of the same principle. The prevalent views on the nature of perception, however, do not supply us with an adequate account of how such a transfer is brought about.³

Such a mechanism is not difficult to conceive. The main point to keep in mind is that in order that any two different sensory elements ('elementary sense qualities' or more complex percepts) should be capable of taking the same place in a pattern of a certain kind, they must have certain attributes in common. Unless both can vary along some such scale as large : small, strong : weak, of long duration : of short duration, &c., they cannot serve in the same place as constituents of similar patterns. The most important of these common properties of different kinds of sensations which enables them to take the same place in a pattern of a certain kind is their common space-time framework: while visual, tactile, kinesthetic, and auditory sensations may have the same rhythm, and the first three of them also form

¹ A convenient survey of the facts is given by R. S. Woodworth and H. Schlossberg (67, chapter 24), where also instances of the transfer of 'perceptual skills' are given. See also K. S. Lashley (31), a paper full of significant suggestions on our problem.

² L. C. Stepien and others (55, pp. 472-3).

³ In modern discussions of these problems resort is generally had to the somewhat vague conception of the 'schema'. For recent discussions of this see R. C. Oldfield and O. L. Zangwill (42), R. C. Oldfield (41), and M. D. Vernon (60). We shall not use it here as a technical term because by its various uses it has acquired a penumbra of undesirable connotations.

the same spatial patterns, this is not possible for sensations of smell and taste.¹

These common attributes that the separate sensations must possess in order to be capable of forming the same abstract patterns must evidently have some distinct neural correlates (impulses in particular groups of neurons which represent them), because only thus can they in some respect have the same effect on our mental processes and actions: if different sensations lead us to describe them as 'large' or 'intense' or 'long', the impulses corresponding to them must at some stage of the hierarchical order of evaluation (classification)² reach the same pathways. Once, however, we recognize that in order to possess similar attributes the sensations caused by different nerve impulses must have some identical elements among the 'following'³ which determines their quality, the problem of the transfer of a pattern that has been learnt in one sensory field to another presents no serious difficulty.

If a certain order or sequence of sensory elements possessing given attributes has acquired a distinctive significance, this significance will be determined by the classification as equivalent of the neural events standing for those attributes and it will thus automatically apply to them also when they are evoked by other sensations than those in connexion with which the pattern has been learnt in the first instance. Or, to put this differently, sensations which have common attributes will be capable of forming elements of the same pattern and this pattern will be

¹ It is also becoming increasingly clear that even the perception of spatial patterns, which we are inclined to ascribe to the simultaneous occurrence of the sensory elements from which the patterns are made up, rests largely on a process of visual or tactual scanning and on the perception of 'gradients', i.e. on the particular sequence of stimuli being recognized as following a rule. Hence, as K. S. Lashley has pointed out (31, p. 128), 'spatial and temporal order thus appear to be almost completely interchangeable in cerebral action'. It would seem as if the task of the theory of perception were increasingly becoming the discovery of the rules according to which various constellations of physical data are translated into perceptual categories so that a great variety of sets of physical facts are interpreted as the same phenomenal situation. This development traces back to H. Helmholtz's conception of the 'unconscious inference' (21), has been developed particularly by J. C. Gibson (10), and has recently produced the most remarkable results in Ivo Kohler's demonstration (29) of the 'general rules' by which the visual system learns to correct exceedingly complex and variable distortions produced by prismatic spectacles when the eye or the head move.

² For a systematic exposition of the theory underlying this statement see F. A. Hayek (15).

³ See 15, par. 3.34.

recognized as one of the same kind even if it has never been experienced before in connexion with the particular elements, because the otherwise qualitatively different sensations will have among the impulses determining their quality some which uniquely determine the abstract attribute in question; and whenever the capacity of recognizing an abstract rule which the arrangement of these attributes follow has been acquired in one field, the same master mould will apply when the signs for those abstract attributes are evoked by altogether different elements. It is the classification of the structure of relationships between these abstract attributes which constitutes the recognition of the patterns as the same or different.

5. *Behaviour Patterns and Perception Patterns*

In the course of its development¹ any organism will acquire a large repertoire of such perceptual patterns to which it can specifically respond, and among this repertoire of patterns some of the earliest and most firmly embedded will be those due to the proprioceptive (kinesthetic) recording of movement patterns of its own body, movement patterns which in many instances will be guided by innate organization and probably be directed sub-cortically yet reported to and recorded at higher levels. The term 'movement pattern' in this connexion hardly suggests the complexity or variety of the attributes of the movements involved. Not only does it include relative movements of rigid bodies and various bending or elastic movements of flexible bodies, but also continuous and discontinuous, rhythmic and arrhythmic changes of speed, &c. The opening and closing of jaws or beaks or the characteristic movements of limbs are relatively simple instances of such patterns. They can generally be analysed into several separate movements which together produce the pattern in question.

The young animal for which every day begins with the sight of his elders and siblings yawning and stretching, grooming and defecating, scanning the environment, and so on, and who soon learns to recognize these basic schemata as the same as its own innate movement patterns connected with certain moods (or dispositions, or sets), will tend to place into these perceptual categories everything which approximately fits them. These patterns will provide the master moulds (templates, schemata, or *Schablonen*) in terms of which will be perceived many other

¹ The expression 'development' is used to include not only ontogenetic but also phylogenetic processes.

complex phenomena in addition to those from which the patterns are derived. What at first may have originated with an innate and fairly specific movement pattern may thus become a learnt and abstract mould for classifying perceived events. ('Classifying' stands here, of course, for a process of channelling, or switching, or 'gating', of the nervous impulses so as to produce a particular disposition or set.)¹ The effect of perceiving that events occur according to a rule will thus be that another rule is imposed upon the further course of the processes in the nervous system.

The phenomenal (sensory, subjective, or behavioural²) world in which such an organism lives will therefore be built up largely of movement patterns characteristic of its own kind (species or wider group). These will be among the most important categories in terms of which it perceives the world and particularly most forms of life. Our tendency to personify (to interpret in anthropomorphic or animistic terms) the events we observe is probably the result of such an application of schemata which our own bodily movements provide. It is they which make, though not yet intelligible, at least perceivable (comprehensible or meaningful) complexes of events which without such perceptual schemata would have no coherence or character as wholes.

It is not surprising that the explicit evoking of these anthropomorphic interpretations should have become one of the main tools of artistic expression by which the poet or painter can conjure up the character of our experiences in an especially vivid manner. Expressions such as that a thundercloud leans threateningly over us, or that a landscape is peaceful or smiling or sombre or wild, are more than merely metaphors. They describe true attributes of our experiences in the terms in which they occur. This does not mean that these attributes belong to the objective events in any other sense than that we intuitively ascribe them to those events. But they are nevertheless part of the environment as we know it and as it determines our conduct. And, as we shall see, if our perceptions in those instances do not in fact help us to understand nature, the fact that sometimes those patterns we read (or project) into nature are all that we know and all that determines our action makes it an essential datum in our efforts to explain the results of human interaction.

The conception that we often perceive patterns without being aware of (or even without perceiving at all) the elements of which they are made up conflicts with the deeply ingrained belief that

¹ See 15, chapter iii.

² In contrast to objective, physical, scientific, &c. See 15, para. 1.10.

all recognition of 'abstract' forms is 'derived' from our prior perception of the 'concrete': the assumption that we must first perceive particulars in all their richness and detail before we learn to abstract from them those features which they have in common with other experiences. But, although there exists some clinical evidence that the abstract is often dependent on the functioning of higher nervous centres and that the capacity to form abstract conceptions may be lost while more concrete images are still retained, this is clearly not always so.¹ Nor would it prove that the concrete is chronologically prior. It is at least highly probable that we often perceive only highly abstract features, that is, an order of stimuli which individually are not perceived at all or at least are not identified.²

6. *Specifiable and Non-specifiable Patterns*

The fact that we sometimes perceive patterns which we are unable to specify has often been noticed, but it has scarcely yet been given its proper place in our general conception of our relations to the outside world. It will therefore be useful to contrast it explicitly with the two more familiar ways in which patterns play a role in the interpretation of our surroundings. The instance which is familiar to everybody is that of the sensory perception of patterns, such as geometrical figures, which we can also explicitly describe. That the ability intuitively to perceive and the ability discursively to describe a pattern are not the same thing, however, has become evident in the course of the advance of science which has increasingly led to the interpretation of nature in terms of patterns which can be constructed by our intellect but not intuitively pictured (such as patterns in multidimensional space). Mathematics and logic are largely occupied with the making of new patterns which our perception does not show us but which later may or may not be found to describe relations between observable elements.³

In the third case, the one which interests us here, the relation is the reverse: our senses recognize (or better: 'project', or 'read into' the world) patterns which we are in fact not able dis-

¹ Cf. Roger W. Brown (3, pp. 264-98), and (15, paras. 6.33-6.43).

² Cf. J. Church (7, p. 111): 'It is perfectly possible to see something well enough to sense that it is something dangerous or something attractive but not well enough to know what it is.'

³ Cf. F. A. Hayek (17).

⁴ Compare Goethe's remark that 'Das Wort bemüht sich nur umsonst, Gestalten schöpferisch aufzubauen'. See also E. H. Gombrich (12, pp. 103-5 and 307-13) and particularly his observation (p. 307) that 'it almost looks as if the eye knew of meanings of which the mind knows nothing'.

cursively to describe¹ and perhaps may never be able to specify. That there exist instances where we do recognize such patterns intuitively long before we can describe them the instance of language alone sufficiently demonstrates. But once the existence of some such cases is demonstrated, we must be prepared to discover that they are more numerous and significant than we are immediately aware of. Whether in all such instances we shall, even in principle, be able explicitly to describe the structures which our senses spontaneously treat as instances of the same pattern we shall have to consider at the end of this paper.

The fact that we recognize patterns which we cannot specify does, of course, not mean that such perceptions can legitimately serve as elements of scientific explanation (though they may provide the 'intuitions' which usually precede the conceptual formulation).¹ But, though such perceptions do not provide a scientific explanation, they not only raise a problem for explanation; we must also take into account in explaining the effects of men's actions that they are guided by such perceptions. We shall have to return to this problem later. At this stage it should merely be pointed out that it is entirely consistent, on the one hand, to deny that 'wholes' which are intuitively perceived by the scientist may legitimately figure in his explanations and, on the other, to insist that the perception of such wholes by the persons whose interactions are the object of investigation must form a datum for scientific analysis. We shall find that perceptions of this sort, which the radical behaviourists wish to disregard because the corresponding stimuli cannot be defined in 'physical terms', are among the chief data on which our explanations of the relations between men must be built.²

¹ It is a different matter that in medical and other diagnoses 'physiognomy perception' plays a very important role as a guide to practice. Even here, however, it cannot directly enter theory. On its role cf. M. Polanyi (45). See on these problems also H. Klüver (25, pp. 7-9) and K. Z. Lorenz (34, p. 176) who suggests that 'no important scientific fact has ever been "proved" that has not previously been simply and immediately seen by intuitive Gestalt perception'.

² It is difficult to say how far such perceptions of non-specifiable patterns fit the usual conception of 'sense data', 'data of observation', 'perceptual data', 'empirical ultimates', or 'objective facts', and perhaps even whether we can still speak of perception by the senses or should rather speak of perception by the mind. It would seem as if the whole phenomenon we are considering could not be fitted into the sensualist philosophy from which those conceptions derive. It is clearly not true, as is implied in those terms, that all we experience we must also be in a position to describe. Though we may have a name for such un-specifiable perceptions which our fellows understand, we should have no way of explaining what they are to a person who does not

In a certain sense it is generally true that the requirement that the terms in which an explanation runs must be fully specifiable applies only to the theory (the general formula or the abstract pattern) and not to the particular data which must be inserted in place of the blanks to make it applicable to particular instances. So far as the recognition of the particular conditions is concerned to which a theoretical statement is applicable, we always have to rely on interpersonal agreement, whether the conditions are defined in terms of sensory qualities such as 'green' or 'bitter', or in terms of point coincidences, as is the case where we measure. In these familiar instances this raises in general no difficulty, not only because agreement between different observers is very high, but also because we know how to create the conditions in which different persons will experience the same perceptions. The physical circumstances which produce these sensations can be deliberately manipulated and generally assigned to defined space-time regions which are for the observer 'filled' with the sensory quality in question. We will also find in general that what appears as alike to different people will also have the same effects on other objects; and we regard it as a rather surprising exception if what appears as alike to us acts differently on other objects, or if what appears different to us acts alike on other objects.¹ Yet we can experiment with the stimuli to which such perceptions are due, and though in the last resort the applicability of our theoretical model also rests on agreement on sense perceptions, we can push these, as it were, as far back as we wish.

The situation is different where we cannot specify the structures of elements which people in fact treat as the same pattern and call by the same name. Though in one sense people know in those instances what they perceive, in another they do not know what it is that they thus perceive. While all observers may in fact agree that a person is happy, or acts deliberately or clumsily, or expects something, &c., they cannot for persons who do not know what these terms mean provide an 'ostensive' definition because they cannot point to those parts of the observed environment from which they recognize those attributes.

The intelligibility of communications intended to be understood (or the comprehension of their meaning) on the basis of the perception of the rules which they follow is merely the most already in some sense perceive the same complexes of events of which we cannot further explain what they have in common.

¹ See 15, paras. 1.6-1.21 and 14, pp. 18-24.

conspicuous instance of a phenomenon of much wider occurrence. What we perceive in watching other people, and in some measure also in watching other living things,¹ is not so much particular movements but a purpose or mood or attitude (disposition or set) which we recognize from we do not know what. It is from such perceptions that we derive most of the information which makes the conduct of others intelligible to us. What we recognize as purposive conduct is conduct following a rule with which we are acquainted but which we need not explicitly know. Similarly, that an approach of another person is friendly or hostile, that he is playing a game or willing to sell us some commodity or intends to make love, we recognize without knowing what we recognize it from. In general, we do not know in those instances what psychologists call the 'clues' (or 'cues') from which men recognize what to them is the significant aspect of the situation; and in most instances there will in fact be no specific clues in the sense of single events but merely a pattern of a certain kind which has a meaning to them.

7. *The Multiple Chain of Rules*

We have called the phenomena we are discussing 'rule perception' (though 'regularity perception' would perhaps be more exact).² That expression has the advantage over such terms as 'pattern perception' and the like that it more strongly suggests that such perceptions may be of any degree of generality or abstractness, that it clearly includes temporal as well as spatial orders, and that it is compatible with the fact that the rules to which it refers interact in a complex structure. It is also helpful in bringing out the connexion between the rules governing perception and the rules governing action.³

No attempt will be made here to define 'rule'. It should be noted, however, that in describing the rules on which a system acts, at least some of these rules will have to be given the form of imperatives or norms, i.e. the form 'if *A*, then do *B*', though once

¹ If the vitalists find causal explanations of the phenomena of life so unsatisfactory, it is probably because such explanations do not fully account for those features by which we intuitively recognize something as living.

² Cf. O. G. Selfridge (54, p. 345): 'A pattern is equivalent to a set of rules for recognizing it'; and (p. 346): 'By pattern recognition is meant classifying patterns into learnt categories.'

³ The crucial significance of the concept of rule in this connexion was brought home to me by reading T. S. Szasz (57) and R. S. Peters (43) which helped me to bring together various strands of thought starting from different origins.

a framework of such imperatives has been established, within it indicative rules such as 'if *A*, then *B*' may be used to determine the premisses of the imperative rules. But while all the indicative rules could be restated as imperative rules (namely in the form 'if *A*, then do as if *B*'), the reverse is not true.

The unconscious rules which govern our action are often represented as 'customs' or 'habits'. These terms are somewhat misleading because they are usually understood to refer to very specific or particular actions. The rules of which we are speaking, however, generally control or circumscribe only certain aspects of concrete actions by providing a general schema which is then adapted to the particular circumstances. They will often merely determine or limit the range of possibilities within which the choice is made consciously.¹ By eliminating certain kinds of action altogether and providing certain routine ways of achieving the object, they merely restrict the alternatives on which a conscious choice is required. The moral rules, for example, which have become part of a man's nature will mean that certain conceivable choices will not appear at all among the possibilities between which he chooses. Thus even decisions which have been carefully considered will in part be determined by rules of which the acting person is not aware. Like scientific laws,² the rules which guide an individual's action are better seen as determining what he will not do rather than what he will do.

The relations between rules of perception and rules of action are complex. So far as the perception of actions of other individuals is concerned we have seen that in the first instance the perceiving individual's own action patterns provide the master moulds by which the action patterns of other individuals are recognized. But recognizing an action pattern as one of a class determines merely that it has the same meaning as others of the same class, but not yet what that meaning is. The latter rests on the further pattern of action, or set of rules, which in response to the recognition of a pattern as one of a certain kind the organism imposes upon its own further activities.³ Every

¹ Cf. G. Humphrey (22, esp. p. 255) who distinguishes with respect to habits between the fixed strategy and the variable tactics.

² Cf. K. R. Popper (46).

³ I presume that it is this circular connexion between action patterns and perception patterns which V. von Weizsäcker has in mind in speaking of the *Gestaltkreis* (65). In this connexion it should be mentioned that, apart from the Gestalt theorists, those who have given most attention to the phenomena discussed here were mainly students influenced by phenomenologist and

perception of a rule in the external events as well as every single perceived event or any need arising out of the internal processes of the organism, thus adds to or modifies the set of rules governing its further responses to new stimuli. It is the total of such activated rules (or conditions imposed upon further action) which constitutes what is called the 'set' (disposition) of the organism at any particular moment; and the significance of newly received signals consists in the manner in which they modify this complex of rules.¹

The complexity of the arrangement in which these rules may be superimposed and interrelated is difficult briefly to indicate. We must assume that there exists not only on the perceptual side a hierarchy of superimposed classes of classes, &c., but that similarly also on the motor side not merely dispositions to act according to a rule but dispositions to change dispositions and so on will operate in sometimes long chains. Indeed, in view of the interconnexions between the sensory and the motor elements on all levels, it becomes impossible clearly to distinguish between an ascending (sensory) and descending (motor) branch of the process; we should conceive of this process rather as one continuous stream in which the connexion between any group of stimuli and any group of responses is effected by many arcs of different length, with the longer ones not only controlling the results of the shorter ones but in turn being controlled by the ongoing processes in the higher centres through which they pass. The first step in the successive classification of the stimuli must thus be seen as at the same time the first step in a successive imposition of rules on action, and the final specification of a particular action as the last step of many chains of successive classifications of stimuli according to the rules to which their arrangement correspond.²

It would seem to follow from this that the meaning (connotation, intension) of a symbol or concept will normally be a rule

existentialist conceptions, though I find myself unable to accept their philosophical interpretations. See particularly F. J. J. Buytendijk (5), M. Merleau-Ponty (35), and H. Plessner (44). Cf. also 15, paras. 4.45-4.63 and 5.63-5.75.

¹ That the arrival of additional modifiers of an action that may already be sufficiently determined by other circumstances does not lead to over-determination presupposes an organization more complex than that represented, for example, by a system of simultaneous equations, something in which a 'normal' (general purpose or routine) instruction can be superseded by another containing more specific information.

² Cf. 15, paras. 4.45-4.63 and 5.63-5.75.

imposed on further mental processes which itself need not be conscious or specifiable. This would imply that such a concept need not be accompanied by an image or have an external 'referent': it merely puts into operation a rule which the organism possesses. This rule imposed upon the further processes must, of course, not be confused with the rule by which the symbol or action having the meaning is recognized. We must also not expect to find any simple correspondence between the structure of any system of symbols and the structure of meaning: what we have to deal with is a set of relations between two systems of rules. A great part of the current philosophies of 'symbolism' seem in this respect to be barking up the wrong tree—not to speak of the paradox of a 'theory of communication' which believes that it can account for communication while disregarding meaning or the process of understanding.

8. Γνωσις τοῦ ὁμοίου τῶ ὁμοίῳ

We still have to consider more closely the role which the perception of the meaning of other people's action must play in the scientific explanation of the interaction of men. The problem which arises here is known in the discussion of the methodology of the social science as that of *Verstehen* (understanding). We have seen that this understanding of the meaning of actions is of the same kind as the understanding of communications (i.e. of action intended to be understood). It includes what the eighteenth-century authors described as sympathy and what has more recently been discussed under the heading of 'empathy' (*Einfühlung*). Since we shall be concerned chiefly with the use of these perceptions as data for the theoretical social sciences, we shall concentrate on what is sometimes called rational understanding (or rational reconstruction), that is, on the instances where we recognize that the persons in whose actions we are interested base their decisions on the meaning of what they perceive. The theoretical social sciences do not treat the whole of a person's actions as an unspecifiable and unexplainable whole but, in their efforts to account for the unintended consequences of individual actions, endeavour to reconstruct the individual's reasoning from the data which to him are provided by the recognition of the action of others as meaningful wholes. We shall indicate this limitation by speaking of *intelligibility* and of *comprehending the meaning* of human action rather than of understanding.¹

¹ See L. von Mises (38 and 39), who distinguishes between *Begreifen* and *Verstehen*, though I prefer to render his *Begreifen* by 'comprehension' rather than his own English term 'conception'. To the first of his works cited I owe

The chief question we shall have to consider is that of what, and how much, we must have in common with other people in order to find their actions intelligible or meaningful. We have seen that our capacity to recognize action as following rules and having meaning rests on ourselves already being equipped with these rules. This 'knowledge by acquaintance' presupposes therefore that some of the rules in terms of which we perceive and act are the same as those by which the conduct of those whose actions we interpret is guided.

The contention that intelligibility of human action presupposes a certain likeness between actor and the interpreter of his actions has led to the misunderstanding that this means that, for example, 'only a war-like historian can tackle a Genghis Khan or a Hitler'.¹ This, of course, is not implied in the contention. We need not be wholly alike or even have a similar character with those whose communications or other actions we find intelligible, but we must be made up of the same ingredients, however different the mixture may be in the particular instances. The requirement of likeness is of the same kind as in the case of understanding language, although in the latter case the specificity of languages to particular cultures adds an extra requirement which is not needed for the interpretation of the meaning of many other actions. One need clearly not be frequently or even ever violently angry to be familiar with the rage pattern or to recognize and interpret a choleric temper.² Nor need one be at all like Hitler to understand his reasoning in a way one cannot understand the mental processes of an imbecile. Nor does one have to like the same things as another to know what 'liking' means.³ Intelligibility is certainly a matter

also the quotation from Empedocles used as the heading of this section, which is derived from Aristotle, *Metaphysics*, ii. 4, 1000^b5. A careful analysis of the whole problem of *Verstehen* which deserves to be better known will be found in H. Gomperz (13).

¹ J. W. N. Watkins (62, p. 740).

² Cf. R. Redfield (47): 'The anthropologist demonstrates the existence of human nature whenever he finds out what an exotic people are thinking and feeling. He can do this only by supposing that they have in common with him certain acquired propensities of attitude; these are human nature. To be able to find out what it is that a Zuni Indian is ashamed of, one must first know what it is to be ashamed.'

³ Cf. H. Klüver (26, p. 286): 'It should be realized that "emotional" or "affective" qualities may become visible as "physiognomic" properties without emotional states or events occurring in the observer or the observed object. We may see, for instance, "sadness" or "aggressiveness" in a face without being emotionally affected.'

of degree and it is a commonplace that people who are more alike also understand each other better. Yet this does not alter the fact that even in the limiting case of the restricted understanding which occurs between men and higher animals, and still more in the understanding between men of different cultural backgrounds or character, intelligibility of communications and other acts rests on a partial similarity of mental structure.

It is true that there is no systematic procedure by which we are able to decide in a particular instance whether our comprehension of the meaning of the action of others is correct, and also that for this reason we can never be certain of this sort of fact. But of this those who guide their action by physiognomic perceptions are generally also aware, and the degree of confidence they attach to their knowledge of the meaning of another man's action is as much a datum by which they orient themselves as the meaning itself, and must therefore in the same manner enter our scientific account of the effects of the interactions of many men.

9. *Supra-conscious Rules and the Explanation of Mind*

So far our argument has rested solely on the uncontestable assumption that we are not in fact able to specify all the rules which govern our perceptions and actions. We still have to consider the question whether it is conceivable that we should ever be in a position discursively to describe all (or at least any one) of these rules, or whether mental activity must always be guided by some rules which we are in principle not able to specify.

If it should turn out that it is basically impossible to state or communicate all the rules which govern our actions, including our communications and explicit statements, this would imply an inherent limitation of our possible explicit knowledge and, in particular, the impossibility of ever fully explaining a mind of the complexity of our own. Yet, though I am not able to supply a strict proof, this seems to me indeed to follow from our considerations.

If everything we can express (state, communicate) is intelligible to others only because their mental structure is governed by the same rules as ours, it would seem that these rules themselves can never be communicated. This seems to imply that in one sense we always know not only more than we can deliberately state but also more than we can be aware of or deliberately test; and that much that we successfully do depends on pre-suppositions which are outside the range of what we can either

state or reflect upon. This application to all conscious thought of what seems obviously true of verbal statements seems to follow from the fact that such thought must, if we are not to be led into an infinite regress, be assumed to be directed by rules which in turn cannot be conscious—by a supra-conscious¹ mechanism which operates upon the contents of consciousness but which cannot itself be conscious.²

The main difficulty of admitting the existence of such supra-conscious processes is probably our habit of regarding conscious thought and explicit statements as in some sense the highest level of mental functions. While we are clearly often not aware of mental processes because they have not yet risen to the level of consciousness but proceed on what are (both physiologically and psychologically) lower levels, there is no reason why the conscious level should be the highest level, and many grounds which make it probable that, in order to be conscious, processes must be guided by a supra-conscious order which cannot be the object of its own representations. Mental events may thus be unconscious and uncommunicable because they proceed on too high a level as well as because they proceed on too low a level.

To put this differently: if 'to have meaning' is to have a place in an order which we share with other people, this order itself cannot have meaning because it cannot have a place in itself. A point may have a distinct place in a network of lines which differentiates it from all other points in that network; and, similarly, a complex structure of relationships may be distinguished from all other similar structures by a place in a more comprehensive structure which gives each element of the first structure and its relations a distinct 'place'. But the distinguishing character of such an order could never be defined by its place

¹ Or better, perhaps, 'meta-conscious', since the problem is essentially the same as those which have given rise to meta-mathematics, meta-languages, and meta-legal rules.

² Twenty years ago I suggested (14, p. 48) that it would seem that any mechanism of classification would always have to possess a degree of complexity greater than any one of the different objects it classifies, and if this is correct it would follow that it is impossible that our brain should ever be able to produce a complete explanation of the particular ways in which it classifies stimuli (as distinguished from a mere explanation of the principle); and ten years later I attempted to state the argument more fully (15, paras. 8.66–8.68). It now seems to me as if this would follow from what I understand to be Georg Cantor's theorem in the theory of sets according to which in any system of classification there are always more classes than things to be classified, which presumably implies that no system of classes can contain itself. But I do not feel competent to attempt such a proof.

in itself and a mechanism possessing such an order, though it may be able to indicate meaning by reference to such a place, can never by its action so reproduce the set of relations which defines this place as to distinguish it from another such set of relations.

It is important not to confuse the contention that any such system must always act on some rules which it cannot communicate with the contention that there are particular rules which no such system could ever state. All the former contention means is that there will always be some rules governing a mind which that mind in its then prevailing state cannot communicate, and that, if it ever were to acquire the capacity of communicating these rules, this would presuppose that it had acquired further higher rules which make the communication of the former possible but which themselves will still be incommunicable.

To those familiar with the celebrated theorem due to Kurt Gödel it will probably be obvious that these conclusions are closely related to those Gödel has shown to prevail in formalized arithmetical systems.¹ It would thus appear that Gödel's theorem is but a special case of a more general principle applying to all conscious and particularly all rational processes, namely the principle that among their determinants there must always be some rules which cannot be stated or even be conscious. At least all we can talk about and probably all we can consciously think about presupposes the existence of a framework which determines its meaning, i.e. a system of rules which operate us but which we can neither state nor form an image of and which we can merely evoke in others in so far as they already possess them.

It would lead too far if we were here to attempt an examination of the processes by which the manipulation of rules of which we are conscious may lead to the building up of further meta-conscious rules, in terms of which we may then be able explicitly to formulate rules of which we were formerly unconscious. It seems probable that much of the mysterious powers of scientific creativity are due to processes of this sort which involve a restructuring of the supra-conscious matrix in which our conscious thought moves.

We must be content here with providing a framework within which the problem of meaning (intelligibility, significance, understanding) can be meaningfully discussed. To pursue it further would demand the construction of a formal model of a causal system capable not only of recognizing rules in the

¹ See E. Nagel and J. R. Newman (40) for a semi-popular exposition.

observed events and responding to them according to another set of rules, different from, yet related to the former, but also able to communicate its perceptions and actions to another system of the same sort, and the demonstration that two such communicating systems must be governed by a common set of rules which cannot be communicated between them. This, however, is a task which would exceed not only the scope of this paper but also the powers of its author.

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