

INDIVIDUALITY OF THOUGHT

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Introduction

IN a previous paper¹ I suggested that two important qualities of thought are commonly overlooked, namely: (i) its historical character, (ii) its individual distinctiveness. In the present paper I propose to consider in more detail the second of these qualities.

In the psychological study of thought we are not concerned with the logical, moral or social quality of the final product of thinking, but primarily with its mode of development and operation. It is not the business of the psychologist to classify the "ripe apples" of thought. Nor does historical or causal analysis of the end-product of thought provide any criterion of its value. We may enquire, as Piaget² has done, whether there are laws governing the changing structures of thought through different stages from birth to maturity, or we may study particular ideas or systems of ideas and trace their origin and manner of growth. It is this second problem which I wish here to discuss.

Since there can be no thoughts without a thinker, thinking must be taken to mean some *person-thinking*. The form of one's thought, the sort of explanation or suggestion that occurs to a person's mind, the specific hypothesis he entertains or feels moved to explore, and the amount of effort he exerts, must, we may assume, be characteristic of him as an individual with a distinctive life history. For the psychologist, everything a person says or does must be seen as an item in a context, the context of personal history and present situation.³ In seeking

¹ J. Cohen, "Ontogenesis of Thought", *Psychiatry*, vol. xv (1952), pp. 27-31.

² J. Piaget, *The Psychology of Intelligence* (London, 1950).

³ E. Mayo, *The Psychology of Pierre Janet* (London, 1951), p. 21.

an illustration we are reminded of an incident recorded by Plutarch in his *Life of Alexander*. King Darius had offered Alexander ten thousand talents and certain territories as ransom for prisoners of war. Parmenio, the friend of Alexander, advised his master: "If I were Alexander I would accept the offer", to which Alexander replied: "So would I if I were Parmenio." Plutarch tells us that Longinus described Alexander's reply as something great and sublime.

It need not be denied that one stage in the development of many theories and inventions is often a collaborative effort. But this is usually during the early phases. It is comparatively rare for a notable discovery to be the joint product of two or more investigators working together. This may be partly due, as W. B. Cannon¹ has suggested, to the strong individualism which often marks the expert investigator. Those instances in which two minds have independently made the same original contribution to science or announced the same theory as, for instance, Darwin and Wallace, illustrate the infrequent situation in which a common climate of thought is at least as important a factor as biographical distinctiveness. It is perhaps possible for productive thinking to occur in groups of people working as a unit,² but the final act of discovery is bound to be an individual achievement.

Is Individuality susceptible of Scientific Study?

It may be said that the personal and individual character of thought, being unique, is of no concern to a scientific psychology the task of which is to establish statistical laws which presuppose repeatable events. This view seems to me to be based on a false antithesis. The point at issue has been debated at least since Windelband³ attempted to distinguish between generalizing (nomothetic) and individualizing (idiographic) sciences. Among the protagonists of the possibility of a true idiographic

¹ W. B. Cannon, *The Way of an Investigator* (New York, 1945), p. 14.

² J. Cohen, "Social Thinking", *Acta Psychol.*, vol. ix (Hague, 1953), pp. 146-58.

³ W. Windelband, *Geschichte und Naturwissenschaft* (Strasbourg, 1904) (republished in *Präjudien*, Tübingen, 1907).

science of psychology Lewin¹ and G. W. Allport² have been specially prominent. Lewin's solution was designed to bridge the gap between descriptions of individual events and the formulation of general principles. He denied that frequency had anything to do with "lawfulness". Allport, on the other hand, distinguished between actuarial and psychological laws. Psychological causation, he declared, is always personal, never actuarial. Let us take an example of the kind considered by Allport. Suppose that for twenty consecutive years 70 per cent. of the children in the top class of a primary class have won scholarships. Provided the conditions remain much the same, we can predict with confidence that in the twenty-first year about 70 per cent. will again succeed. As Allport correctly states, it does not follow that each child has a 70 per cent. chance of success. If we knew all the relevant influences affecting a given child, we should be able to make a perfect prediction. But we should still presumably arrive at the figure of 70 per cent. There is no incompatibility therefore between personal causation and actuarial prediction.

The antithesis seems to disappear if we accept the view of Reichenbach³ that statistical laws are simply general forms of causal laws, which are themselves special instances of perfect correlation. "Necessary" must be taken to mean "always". We need not therefore segregate psychology from other disciplines on the alleged ground that it is only concerned with unique events; any one physical event for that matter is unique and in this respect does not differ from personal or historical events. Nor need we say that psychology should be restricted to nomothetic studies. The logic of explanation is the same for individualizing and generalizing sciences alike and consists in showing that the nature of the event is such that general relationships could, in principle, be established.

¹ K. Lewin, "Field Theory and Learning," *Forty-first Year Book, National Society for the Study of Education* (Chicago, 1942), pp. 215-42.

² G. W. Allport, "The Use of Personal Documents in Psychological Science", *Bull. Soc. Sci. Res. Council*, no. 49 (New York, 1942).

³ H. Reichenbach, "Probability Methods in Social Science", in D. Lerner and H. D. Lasswell (Eds.), *The Policy Sciences* (Stanford, 1951).

Personal Elements in Philosophical and Scientific Thought

Common sense tells us that a man's personality is reflected in the kind of philosophy he creates. Fichte¹ accepted the common-sense view when he wrote: "The kind of philosophy a man chooses depends upon the kind of man he is. For a philosophic system is no piece of dead furniture one can acquire and discard at will. It is animated with the spirit of the man who possesses it." Gasset² expressed a similar view in speaking of those historians of philosophy who describe systems of thought as though they had emanated from the minds of "Unknown Philosophers", anonymous and abstract creatures outside time and space: "into the phrase 'Kant's philosophy' Kant enters not in the concrete rôle of the person who did the philosophizing but as an adventitious name connected with a philosophy. Yet the true and real philosophy of Kant is inseparable from the man."

Cassirer,³ however, takes a different view. He argues that the individuality of a philosopher does not impress its stamp on his ideas, and he supports this statement by referring to the profound mutual understanding that existed between Kant and Rousseau, who seemed to be poles apart in temperament as well as in social rank. Kant, the stern and Spartan thinker, dreading change of any kind contrasts hugely with Rousseau who could write only in the intoxication of passion and wanderlust. But in the case of *scientific* discovery he concedes elsewhere⁴ that it "bears the stamp of the individual mind of its author. In it we find not merely a new objective aspect of things but also an individual attitude of mind and even a personal style." But while this is of psychological interest it has no systematic relevance. Furthermore, "in the objective content of science these individual features are *forgotten and effaced*, for one of the principal aims of scientific thought is the elimination of all

¹ J. G. Fichte, *Sämtliche Werke*, vol. i, p. 434 (quoted by E. Cassirer in *The Problem of Knowledge* (New Haven, 1950).

² J. Ortega y Gasset, *Concord & Liberty* (New York, 1946), pp. 97-8.

³ E. Cassirer, *Rousseau, Kant, Goethe* (Princeton, 1945), p. 55.

⁴ E. Cassirer, *Essay on Man* (Yale, 1945), p. 228.

personal and anthropomorphic ideas" (my italics). The expression "forgotten and effaced" is perhaps misleading. Individual features may be irrelevant when we come to evaluate the content of science but they constitute in themselves a legitimate subject for scientific study the results of which will provide a different content. The psychology of thought cannot afford to forget and efface the personal factors which lead to the discovery of impersonal content.

Consider, for example, the discovery of "imaginary quantities" in mathematics. As I have elsewhere suggested¹ this illustrates in striking fashion the personal distinctiveness of ideas even in the realm of number. For centuries the apparent absurdity of the expression $x = \sqrt{-1}$ prevented its use by Hindu and Arab mathematicians as a root of the equation $x^2 + 1 = 0$. It was not until the year 1545 that someone bold enough appeared who had the intellectual courage to face this situation. This was the Italian mathematician Cardan, who deliberately committed the absurdity. We are indebted to Hadamard² for reminding us that Cardan was a man of strange and wild temperament. Far from forgetting and effacing this fact it is of the greatest interest for us if we wish to know why Cardan and not anyone else discovered "imaginary quantities", which, indeed, bear the mark of his personal style and character. The fact that imaginaries now constitute part of the objective content of mathematical science does not debar the study of their psychological origin from qualifying as a legitimate subject of scientific enquiry.

The same relationship between a man's ideas and his character is illustrated in the life of Jeremy Bentham, and here the relationship is expressed not simply in one idea but in his entire life's work. We are told³ that Bentham was never interested in real problems of life. What he worried about was rather the "mechanism of living" and "his reforms were a series of political gadgets". This acquires a new meaning when we

¹ See footnote 1, p. 103.

² J. Hadamard, *The Psychology of Invention in the Mathematical Field* (Princeton, 1949), p. 135.

³ E. L. Woodward, *The Age of Reform, 1815-1870* (London, 1938).

read what John Stuart Mill¹ had to say about Bentham: "He (Bentham) had neither internal experience nor external. . . . He never knew prosperity and adversity, passion nor satiety: he never had even the experiences which sickness gives; He knew no dejection, no heaviness of heart. He never felt life a sore and weary burden. He was a boy to the last."

It would no doubt be pertinent to consider here the problem of vocational choice in all its vast diversity. Why, for instance, does a man become a gynaecologist and spend his life probing the minute parts of female genitalia? Clearly this cannot be "explained" in terms of conscious reasons or motives alone; the causal mechanisms assumed by analytic theory must also be invoked. Let us take one more example from scientific thought. It has been suggested² that Ehrlich's early passion for bright colours may have stimulated his absorbing interest in the study of dyes, thus influencing in powerful fashion the entire course of his intellectual activity.

We can illustrate the same effect in drama by reference to Voltaire. "If you render Voltaire less sensitive to criticism", said Diderot,³ "he will no longer be able to penetrate the soul of Merope."

Proust⁴ showed the same profound insight in the following passage:

A man who falls into bed like a log, and lies there as though dead until he awakes in the morning when it is time to get up, can never expect to make—I won't say discoveries of major importance—but even a few comments on the nature of sleep. A dose of insomnia is of no little value to those who would appreciate the gift of sleep, who would seek to cast even the feeblest ray into that mysterious darkness.

I suspect that this remark was prompted by the action of a publisher who rejected Proust's great novel because he could

¹ J. S. Mill, *Dissertations and Discussions: Political, Philosophical and Historical*, vol. i (New York, 1873), pp. 379-80 (quoted by H. Morgentau, *Scientific Man versus Power Politics* (1947), p. 199).

² W. I. B. Beveridge, *The Art of Scientific Investigation* (London, 1951), p. 138.

³ J. Stewart and J. Kemp, *Diderot: Selected Writings* (London, 1937), p. 244 (the quotation is taken from "Rameau's Nephew").

⁴ A. Maurois, *Proust: Portrait of a Genius* (New York, 1950), pp. 18, 182.

not understand why anyone needed to devote thirty pages to a description of the process of falling asleep.

Finally as an illustration of individuality expressed in content rather than form we may take an opera of Wagner. In this instance we appear to have a man who infused his private yearnings into his art without adequate transmutation. "Wagner poured into *Tristan and Isolde* his adultery with Mathilde Wesendonck, and if we want to enjoy this work we must, for a few hours, turn vaguely adulterous ourselves."¹

Forms of Intellectual Audacity

Individuality is not only expressed in the "personal style" of a particular idea, but also in the daring with which one allows oneself to contemplate it. The absurd must be divested of its uninviting character. In Faraday we see a man who was not, like Cardan, fascinated by the sheer perversity of an idea, but who enjoyed a marvellous intellectual mobility and freedom from barriers to thought. He was quite tireless in permitting himself to ponder on analogies between the known and unknown. Nothing seemed impossible to him before it had been put to the test; the most incredible things seemed credible.²

We may compare Cardan's audacity with the courage of Freud which consisted not in advancing crazy ideas but in the dispassionate analysis of material marked by a heavy social taboo. Imagine that eminent Victorian, Dr. Arnold of Rugby anticipating Freud and enunciating a sexual theory of dreams! Freud boldly unravelled the Gordian knot of convention. How different are those timid ones among us ever fearful of the impressions they may make on others and unable to resist irrelevant ideas. These "mental parasites" eventually consume our own original thoughts feebly seeking expression.

There can be no individuality of thought if one entertains only the ideas of other people and shrinks from contemplating one's own. This seems to be the meaning of Proust's parable

¹ J. Ortega y Gasset, *The Dehumanization of Art* (Princeton, 1948), p. 26.

² P. Lenard, *Great Men of Science* (London) (trans. by H. Stafford Hatfield), pp. 252-62.

L'Étranger. A gifted young man, Dominique, is always surrounded by a circle of admirers. Once when Dominique is alone a stranger comes to him and reproaches him because he receives everyone except himself. Dominique, intrigued and attracted by the stranger, promises to include him among his friends. The stranger replies: "If you receive me you must send away your usual friends." "This I cannot do", replies the young man, "because I cannot be alone." "Choose quickly", warns the stranger, even as the other guests are arriving. "Who are you?" cries out Dominique to the departing stranger. The sorrowing reply comes: "I am your soul." "I am yourself."¹

Idiosyncrasies in Habits of Work

Individuality expresses itself in idiosyncrasies of work habits. We can picture Rousseau working bare-headed in the full blaze of the sun so as to increase the flow of blood to the brain. Bossuet preferred a cold room with his head wrapped up. Schiller used to sit with his feet immersed in cold water, and his efforts seem to have been invigorated by the smell of decay—fading autumnal leaves, the sepulchral odour of the churchyard or a store of rotten apples in his desk.² Descartes and Leibnitz whilst at work placed themselves in an almost horizontal position. Bishop Lammenais walked about and followed his thoughts "in the midst of the noise of festivals as well as in silence and darkness".³ Balzac, garbed in a monk's cowl, consumed enormous quantities of fresh fruit and struggled right through the night. This continued for long periods while the inspiration lasted. Many are the famous poets and scientists who worked best at night or while lying in bed late in the morning. Some are inert and immobile or, like Beethoven, shut themselves in a room and shout and rush about like madmen.⁴ The mathematician Hadamard writes that he finds pacing up and down the room very helpful during thinking and he quotes, in this connection, Augier's remark that "legs are the wheels of thought". Apart

¹ D. Leon, *Proust: his Life, his Circle and his Work* (London, 1940).

² K. Birnbaum, *Psychopathologische Documente* (Berlin, 1920).

³ R. E. M. Harding, *An Anatomy of Inspiration* (Cambridge, 1942).

⁴ G. Humphrey, *Directed Thinking* (New York, 1948).

from individual differences in work habits or marked preferences for characteristic postures during work, there are variations in muscular tone. One person may find a tense state more conducive to intellectual effort, another may prefer a relatively relaxed condition. A third may prefer to linger and ruminate. Others are more productive during states of mental fatigue if there is at the same time a feeling of relaxation. "Happy ideas" never come to Hadamard either when he is tired or when sitting at his desk, but an hour after the fatigue of mental work has entirely passed away. Complete mental relaxation is rarely associated with intellectual activity of a high order.

Individuality in Problem-Solving

If we ask a number of people individually to carry out a certain task we usually find that there are characteristic differences in their approach. Let us take an example given by Katz¹ in a rather different connection. A nail has to be knocked into a piece of wood. If no hammer is provided one person may use a pair of pliers which is at hand. If he has no pliers he may use his shoe. In order to perceive the relevance of the shoe he must be able to "restructure" it, i.e. put aside the idea of the shoe as something to wear and see it as having a hard surface useful for hammering. This may not occur to another person who otherwise is equally intelligent. This second person may be too shy to remove his shoe (supposing that this is required), or perhaps he is finicky about handling rather dirty objects, and so the idea of "restructuring" the shoe will not occur to him.

The ability to see a situation in a new light means being free from rigidity in thinking, resourceful in evolving new hypotheses and seeing new possibilities of solving a problem when old methods fail. Some rigidity may be due to "overlearning" which tends to mechanize behaviour, reduce educability and blind one to new ways of doing things. If rats are overtrained to run a certain path towards a goal they will continue to prefer that path even when shorter ones are later made possible. Hilgard² remarks that overtraining may lead to a common adult

¹ D. Katz, *Gestalt Psychology* (New York, 1950), p. 86.

² E. R. Hilgard, *Theories of Learning* (New York, 1948), p. 340.

preference for artificial methods learnt in infancy. But here we must make a reservation. Increasing mastery of a pattern of behaviour does not invariably lead to a standard method of responding. In swimming or ice-skating, for example, it is characteristic of the novice to perform his single "act" and play safe. The expert, with greater self-assurance, varies his movements in ways barred to the beginner. So overlearning does not necessarily lead to rigidity. Whether it will or not probably depends, at least in part, on the degree of versatility achieved in alternative and associated skills.

Some preliminary experimental evidence¹ lends support to the view that rigidity in problem-solving tends to be associated with characteristic features of the personality as indicated by a Rorschach test. In the experiment a child is first asked to solve a simple problem, such as bringing a certain quantity of water in several containers of different size. This is followed by a series of similar problems which require a more complex method of solution. Finally, a third series is presented which can be solved by the simpler method if the child can overcome the "set" established while doing the intermediate problems. The experiment suggests that "rigid" and "flexible" children (i.e. those who continue to use the complex method and those who return to the simpler method) also differ in personal characteristics. "Rigid" children give fewer responses, which have a narrower content and are less well-organized. They are slower to respond and, judged by their reaction to colour and form, seem to be emotionally impoverished. There are also signs that they are more likely to act uncertainly in new situations, to avoid crises, and generally to be less well adjusted than "flexible" children.

Personal Factors and Types of Thought

If intellectual activity is an integral part of one's total personal life we should expect individuality to characterize both one's reactions to the theories of others and to leave a mark on one's own theories. We shall confine ourselves here to one or two

¹ E. L. Cowen and C. G. Thompson, "Problem-solving, Rigidity and Personality Structure", *J. Abn. Soc. Psychol.*, vol. xlvi (1951), pp. 165-76.

illustrations from psychology. How can we understand Pavlov's outright rejection of Gestalt theory without assuming some profound personal antipathy to a seemingly elusive abstract concept, and a liking for the specific and concrete? He wrote: "I feel a *strong repugnance* to, and emphatically reject any theory that claims to embrace fully everything comprising our subjective world, but I cannot refrain from analysing it, from obtaining a simple understanding of it, at separate points"¹ (my italics).

The work of E. B. Tichener illustrates the way a preference for imagery of a certain kind enters into an elaborate theory as a universal property of the human mind. The following passage brings out this point:

I rely in my thinking upon visual imagery in the sense that I like to get the problem into some sort of visual schema, from which I can make my way out and to which I can return. As I read an article or the chapter of a book, I instinctively arrange the facts or arguments in some visual pattern, and I am as likely to think in terms of this pattern as I am likely to think in words. I understand, and to that extent I enjoy, an author whom I can thus visualise.²

E. C. Tolman's use of spatial models illustrates the same tendency, for he expresses a preference for kinaesthetic imagery.³ Tolman himself tacitly accepts the notion of individuality when he sees in Lewin's humanitarianism an explanation of his emphasis on the *situation* in which a person is placed as the source of the causes of behaviour.⁴

When a number of individuals exhibit a tendency towards the same pattern of thought they may be said to constitute a type.⁵ Cardan's feat, for example, is of the kind that provokes the question: "how could such a strange idea enter anyone's mind?" This comment, as Hadamard⁶ writes, may be contrasted with the typical reaction to a different kind of discovery:

¹ Y. P. Frolov, *Pavlov and his School* (London, 1937).

² J. Downey, *Creative Imagination* (London, 1929), p. 38.

³ E. C. Tolman, "The Psychology of Social Learning", *J. Soc. Issues*, Suppl. Ser. No. 3 (1949).

⁴ E. C. Tolman, "Kurt Lewin: 1890-1947", *Psych. Rev.*, vol. lv (1948), pp. 1-4.

⁵ J. Cohen, "Physical Types and their Relations to Psychotic Types", *J. Ment. Sci.*, vol. 86 (1940) pp. 602-23.

⁶ J. Hadamard, *The Psychology of Inventions in the Mathematical Field* (Princeton, 1949), p. 135.

“how wonderful, but how obvious! Why did no one think of it before?” Here again we can see the effect of the individual distinctiveness of the innovator. Chesterton, who himself belonged to the second type, advised us to look at familiar objects until they look strange. Up to a point this is within everyone’s competence—the former type is perhaps much more rare.

Other specimens have also been distinguished among the flora and fauna of human thinkers. F. Th. Vischer has described “subject-matter specialists” and “interpretive specialists” respectively. “The fact-greedy gullet of the former can be filled only with legal documents, statistical work-sheets and questionnaires, but he is insensitive to the refinement of a new idea. The gourmandise of the latter dulls his taste for facts by ever new intellectual subtleties.”¹

The formation of types, due to occupational habits of thought, sometimes obscures a desirable individuality. Dr. Brock Chisholm, a former Director-General of the World Health Organization, has described some types of delegates to international conferences. Lawyers are often given the responsibility of cultivating official contacts but their training in rules and precedent is likely to prove a handicap. Soldiers skilled in tactical manoeuvring to gain pre-determined ends at the expense of the enemy are hardly suited for such a task. Military activity presupposes an opponent whom one has to circumvent and defeat. It does not usually teach us how to co-operate with other people who may be as sure they are right as we are. Nor does the business man’s training in profit-making prepare him for situations calling for co-operative rather than competitive effort.²

Early Feelings and Later Thought

In the previous paper referred to above³ an example was given which showed how an idea occurring to a given person at a particularly propitious time turned out to be the cognitive

¹ M. Weber, *The Methodology of Social Sciences* (Illinois, 1949), p. 112.

² G. B. Chisholm, “Social Responsibility”, *J. Soc. Issues*, Suppl. Ser. no. 1.

³ J. Cohen, “Ontogenesis of Thought”, *Psychiatry*, vol. xv (1952), pp. 27-31.

expression of deeply felt experiences during the years of childhood. Without the assumption of individuality in thought it would be difficult to account for the fact that this person and not one of the two hundred others who were present at the time had this particular idea. The example brings to mind the remark of Claude Bernard that feeling always takes the initiative in thought. If so, it is a methodological error in the study of thought to disconnect it from feeling. It is an error characteristic of the obsessive mind which, by ignoring the affective sources of thought, renders its study an impossible task.

We arrive at the same conclusion by a study of the way experiences in early life may affect creative writing in later years. Such a study has been made of the poetry of Keats with reference to its countless allusions to food.¹ One readily recalls such phrases as "roots of relish sweet and honey wild and manna dew", "Canary wine", "juicy pears", "dainty pies", "ripening fruits", "honey crammed cells", "oozing cider press". The poet W. B. Yeats compared Keats to a starving child pressing his nose against a bakery window. In his poems, sucking, eating and erotic experience merge into one. All his heroines are associated with food. We cannot digress here to speculate on the origin of these oral preoccupations. It suffices to suggest that we are not dealing here with a mere coincidence, but rather with the working-out in poetic art of deep-lying early experiences specific to Keats alone.

Freud's experience provides an interesting example of early intellectual influences on later thought. When he was 14 years old he was given a present of the works of Ludwig Börne, who had devised a recipe on how to become an original writer in three days. The instructions were to write down for three days everything that comes into the head without falsification or hypocrisy. Ernest Jones,² who tells us about this, suggests that the experience may have been the germ of Freud's later discovery of the technique of free association.

¹ H. G. McCurdy, "La Belle Dame Sans Merci", *Char. & Pers.*, vol. xiii (1944), pp. 166-77.

² E. Jones, *Sigmund Freud: Life and Work* (London, 1953).

The Role of Detachment in Thinking

The capacity to observe in a fresh and original way is likely to depend to some extent on being able to discriminate between a situation as it is perceived by others and as it is perceived by us. This implies becoming aware of our "personal context".¹ Such an awareness is likely to increase our sensitivity to our data in relation to ourselves and to put us on our guard against distortion, over-valuation and projection. If the introduction of technical expressions will not obscure the issue, the point may be put in this way: we have to distinguish a private or perceptual structure from a social structure, if we are dealing with a human problem, and from a reality situation, if we are confronted with a physical problem. The degree of personal involvement may be so slight as not to mar a realistic grasp of a given situation. Or it may be so intense as to lead to a misreading or misrepresentation of the facts. The feeling of anxiety in relation to any topic may lead to selective inattention or banish it from awareness altogether.

The place of detachment in productive thinking has a prominent place in Gestalt theory. According to this theory the thinker must ignore what he wants to happen, if he wishes to get at the root of a problem. He must forget about himself and allow his thinking to follow the structural requirements of the situation. He has to become an "obstetrician" and extract the solution from the "matrix" in which it is embedded. If his personal needs dominate his thinking, he may attempt a short-cut solution where a detour is objectively required. This view seems to imply that complete impersonal detachment from the possible outcome of one's enquiries is an essential condition of productive thinking. It is hard to accept this if it means that the thinker must be *indifferent* to the results of his investigations. An optimal emotional involvement is not the same as apathy or neutrality. The characteristic feature of the scientific investigator, for example, is not aloofness but a willingness to recognize when a particular result cannot be obtained by one method and

¹ F. F. Lombard, "Self Awareness and Scientific Method", *Science*, vol. cxii (1950), 289-93.

a readiness to try out other methods instead.¹ Scientific method does not demand an absence of intention to try and reach a particular result. Many scientists have eagerly sought to confirm their favoured hypothesis and any sign to the contrary has brought sharp disappointment. If enthusiasm is unbounded, there is, of course, a danger of blinding oneself to the shortcomings of a theory. In general, the greater the desire to reach a given result, the greater the care that must be taken to avoid overlooking errors.

In problems which require a detour rather than a short-cut method for their solution, it is useless to increase the attractiveness of the goal. This would make the task more difficult. For the more attractive the goal, the harder it is to move away from it and make a detour. Expectation of too great a reward or punishment, by transfixing the attention, may therefore hamper performance. There is then little scope for freedom of choice between alternatives. That is what tends to happen in a crisis. When the valence of the goal deviates from the optimal, conditions do not favour a correct grasp of the entire situation.

Nothing is more likely to endanger intellectual mobility than an undue attachment to one's own settled point of view. The thinker who keeps to his own ideas too long has been compared to a hen sitting on boiled eggs. This is what Claude Bernard probably meant when he said that "those who have excessive faith in their ideas are not fitted to make discoveries", and Souriau's observation that "in order to invent one must think aside", embodies a similar thought.

Because a task which is easy for one person is hard for another its performance probably requires a degree of motivation which varies from person to person. Many experiments supporting this view have been carried out since the Yerkes-Dodson law was suggested some forty years ago. In their experiments "motivation" is induced at various levels of intensity and the habits to be formed vary in their level of difficulty, the aim being to determine the optimal level of motivation for learning. In one experiment, for example, rats had to distinguish between stimuli

¹ L. Hogben, *The Retreat from Reason* (London, 1936), p. 9.

varying in brightness, an electric shock being given for incorrect discrimination. The shock could be relatively mild, moderate or severe and the discrimination also varied in difficulty. Experiments with human subjects have studied the effects of weak and strong shock on the speed and accuracy of sorting. The conclusion seems to follow, at any rate for these simple and artificial laboratory situations, that the easier the habit to be acquired (or the task to be carried out) the higher is the level of motivation required. There is an optimal strength of motivation for each level of difficulty.

As Young¹ has suggested, some practical lessons may be drawn from these experiments. If the same task is easy for brighter pupils and hard for duller ones, the motivation to be induced must vary with the difficulty of the task for each pupil. A threat of punishment may severely disturb the dull child instead of evoking his best efforts. Again, the more exacting or delicate a task, the easier it is to disrupt it. An interruption or noise which would have no effect on the operator of a pneumatic drill is liable to drive an intellectual worker to distraction. This helps us to understand why a famous conductor once violently threw his baton at his orchestra when someone played a false note.

Summary

An attempt has been made in this paper to show that thinking has an individual distinctiveness which is characteristic of the thinker. Just as a place for a *perceiver* is needed in a theory of perception so room must be left for a *thinker* in a theory of thought. The fact that each act of thought is unique does not remove it outside the bounds of scientific study any more than the uniqueness of an earthquake, or for that matter, any physical event, debars it from scientific analysis. In considering psychological factors that may affect preferences for different philosophical systems a distinction must be made between the impersonal formal content of the final system and the factors that led to the construction or choice of such a system.

¹ P. T. Young, *Motivation of Behaviour* (New York, 1943), pp. 280-7.

In general it may be supposed that a relationship exists between the character of a person and the kind of theory he chooses. Types of intellectual boldness have been described and idiosyncrasies of work-habit illustrated. The way individual differences might be expected to affect the approach to a problem or to the invention of a theory has been briefly indicated. Finally, the relation between feeling and thought has been touched upon and an effort made to clarify the problem of optimal detachment in thinking.