

## BOOK REVIEWS

### SHAMANISM: ARCHAIC TECHNIQUES OF ECSTASY.

By Mircea Eliade. Translated by Willard R. Trask. Bollingen Foundation, distributed by Pantheon Books, 1964, 610 pages.

"What a magnificent book remains to be written on the ecstatic 'sources' of epic and lyric poetry, on the prehistory of dramatic spectacles, and, in general, on the fabulous worlds discovered, explored and described by the ancient shamans . . ." So ends the epilogue of this book. Meanwhile: what a magnificent book Prof. Mircea Eliade *has written!* It is addressed not only to the specialist but to the general reader:

"We have sought to present it [shamanism] in its various historical and cultural aspects and we have even tried to outline a brief history of the development of shamanism in Central and North Asia. But what we consider of greater importance is presenting the shamanic phenomenon itself, analyzing its ideology, discussing its techniques, its symbolism, its mythologies. We believe that such a study can be of interest not only to the specialist but also to the cultivated man, and it is to the latter that this book is primarily addressed . . . When it becomes a matter of entering so vast and varied a mental universe as that of shamanism . . . we are dealing with a whole spiritual world, which, though different from our own, is neither less consistent nor less interesting. We make bold to believe that a knowledge of it is a necessity for every true humanist; for it has been some time since humanism has ceased to be identified with the spiritual tradition of

the West, great and fertile though that is" (pp. xix-xx).

And yet, after having read this monumental work, I am not fully persuaded that the shamanistic tradition is so totally alien to "the spiritual tradition of the West." Certainly Prof. Eliade is very careful to halt the discussion in certain places, and to suggest that here we enter quite a different realm from shamanism, perhaps that of religion in the official sense in which it is supposed to be understood in the West. But the break seems as formal, conventional and perfunctory as the occasional use of the word "tricks" or the prefix "pseudo" in connection with shamanistic feats that might be called "paranormal." On the whole, Prof. Eliade sidetracks any discussion of this topic, saying he is not concerned with the "reality" of such occurrences, only belief in them and the role they play. He uses something of the technique of the more sophisticated Jungians, concerning himself only with "mental" or "psychic" reality and leaving the cosmological interpretations to others.

Prof. Eliade also bypasses the question of the nature of the spirits. "All through the primitive and modern worlds we find individuals who profess to maintain relationships with 'spirits,' whether they are 'possessed' by them or control them. Several volumes would be needed for an adequate study of the problems that arise in connection with the mere idea of 'spirits' . . . But the study of shamanism does not require going into all this; we need only define the shaman's relation to his helping spirits . . ." (p. 6). Perhaps; perhaps not; perhaps "several volumes" would

hardly meet the case. But it is certainly a possible approach to write as if shamans were in touch with spirits, while disclaiming all ontological pretensions.

However, there are two central and crucial related points on which Prof. Eliade makes a definitive and unambiguous stand: he regards the shaman as the recipient of some valid, and valuable, cosmic revelation; and he does not consider him as being, in his capacity as shaman, a sufferer from some form of mental disease. "Psychopaths or not, the future shamans are expected to pass through certain initiatory ordeals and to receive an education that is sometimes highly complex. It is only this two-fold initiation—ecstatic and didactic—that transforms the candidate from a possible neurotic into a shaman recognized by a particular society" (p. 14). There can be "no question of anarchical hallucinations and a purely individual plot and dramatis personæ; the hallucinations and the mis-*en-scène* follow traditional models that are perfectly consistent and possess an amazingly rich theoretical content" (p. 14).

Prof. Eliade argues at length that, whereas the mental patient is an "unsuccessful mystic" (p. 27), the shaman is a highly successful and efficient member of his community: he is one who is not controlled by his illness but can control it; generally his presence is imposing, his health and versatility excellent, his intelligence higher than that of his milieu.

The problem of distinguishing between the phenomena of mysticism and those of psychopathology is one that faces any serious writer on the topic; and the author primarily concerned with the mystic is apt to dwell on the crucial *differences* between the shaman or the mystic on the one hand, and the insane or neurotic patient on the other. Thus, Dr. R. M. Bucke, who was a celebrated psychiatrist in his

day, Medical Superintendent of an asylum for the insane, Professor of Mental and Nervous Diseases, President of the Psychological Section of the British Medical Association, and President of the American Medico-Psychological Association, emphasized in his *Cosmic Consciousness* (1901) how great was the gulf dividing a mental patient from a recipient of a great mystical experience. Again, Dr. Gerda Walther in the Preface to the second (1955) edition of her important *Phänomenologie der Mystik* describes how she took special pains to make actual observations on mental patients, so as to get first-hand experience enabling her to test the conventional assumption that the mystical is closely linked, if not identical, with the insane; and she, too, stresses that the differences are more important than the resemblances.

It may well turn out that when one is concerned with psychopathology, the similarities and the points of contact are the most important; after all, if Prof. Eliade is right, and the insane person is a mystic *manqué*, then a study of mysticism is highly germane to an understanding of mental illness; but when concerned with shamanism and mysticism the differences between the mystic and the psychopath have to be stressed, if a totally false picture is not to emerge.

Another very important point in a study of this field was made by the late Dr. R. R. Marrett, Rector of Exeter College and Reader in Anthropology at Oxford, in his Preface to Dr. W. Y. Evans-Wentz's "Tibetan Yoga and Secret Doctrines": "Now there is a certain point at which most of us, however dispassionately scientific in intention, are apt to refuse to take the other man seriously when he talks what seems to us to be nonsense. Thus disparaging terms, such as 'primitive credulity,' 'confusion of categories,' 'prelogical mentality'

and so on, come to invade accounts of the unsophisticated mind that to a corresponding extent are falsified; because science has no business to say 'wrong' when it merely means 'different.' Likewise, in dealing with the beliefs of our own peasantry we may hardly be aware of the implication of relative worthlessness attaching to our use of such a word as 'survival'; though its Latin equivalent *superstitio* might warn us of the danger" (p. xxii, 1958 edition). This pitfall is, on the whole, avoided by Prof. Eliade—although he does make the customary propitiatory offerings to the official Western *larés and penates*. But the bulk of the writing testifies not only to his care and erudition, but also to his respect and sensitive sympathy for the alien cultures he is presenting. He writes with the same *finesse* (in Pascal's sense) as did the late Heinrich Zimmer, and as Joseph Campbell does, with both of whose writing there could be a certain affinity.

What distinguishes the shaman from other "technicians of the sacred" (p. 297) such as priests and sorcerers, and from other mortals who are often believed to hold high positions in the world of spirits, such as heroes and kings, is his initiation into the realm of ecstasy; "A first definition . . . will be: shamanism = *technique of ecstasy*" (p. 4). In general, shamans have nothing to do with sacrifices, nor with regular worship, their principal function being that of "psychopomps"—a word never defined. They are experts and guides in the realm of cosmic dreams.

They perform the functions of spiritual healers, exorcists, intermediaries between the living and the dead, often also summoning the souls of the living. They guide the souls of the departed to the realms where they belong, and above all, the shaman is a mediator between "cosmic regions." "The shaman knows the mystery of the

breakthrough in plane" (p. 259), this communication being possible and essential in the cosmology accepted by peoples with shamanic cults.

"The universe in general is conceived as having three levels—sky, earth, underworld—connected by a central axis . . . This axis [cosmic pole, tree, etc.] passes through an 'opening' or a 'hole'; it is through this hole that the gods descend to earth and the dead to the subterranean regions; it is through the same hole that the soul of the shaman in ecstasy can fly up or down in the course of his celestial or infernal journey.

". . . The symbolism of the 'Center' is not necessarily a cosmological idea. In the beginning, 'center' or site of a possible breakthrough in plane, was applied to any sacred space, that is, any space that had been the scene of a hierophany and so manifested realities (or forces, figures, etc.) that were not of our world, that came from elsewhere and primarily from the sky . . . Later it was supposed that manifestation of the sacred itself implied a breakthrough in plane" (pp. 259-60). Prof. Eliade's use of the words "not necessarily a cosmological idea" in this connection is instructive.

The tree symbolism is of great, virtually universal, importance as connecting the shaman with the "higher" and "lower" worlds, mediating his ascensions and descents. The idea of an original paradisaical state also is almost universal: once upon a time all men were able to communicate with the world of gods and spirits; but some calamitous event, perhaps a sin or fall, debarred the bulk of mankind from these realms. But the shaman can live in both worlds, linking his fellow mortals with the sacred cosmic dreams of their society.

Other widespread cosmic dream figures are the bird, symbol of the divine messenger and of the liber-



ated soul, the horse, often eight-legged, who carries the subtle body of the shaman to its celestial trysting place, and the dog who defends the nether regions against intrusion.

Prof. Eliade lays great stress on the vocational element of shamanism. Even where shamanism is hereditary, a call from the spirit world is also necessary. There are isolated cases of shamans who became such because of a personal decision, but these are generally considered less powerful. The call from the spirit world is frequently highly unwelcome: the calling of a shaman, though a spiritually privileged person, is arduous, dedicated and often lonely; and the initiation ordeal, whether inflicted by the spirits or the tribe, is invariably painful in the extreme: it effects a sort of supernatural selection. Madness and even death may be the result if the shaman cannot endure his initiatory tribulations; but madness followed by death may also be the result of the refusal of a shamanic vocation. ". . . in primitive man as in all human beings the desire to enter into contact with the sacred is counteracted by the fear of being obliged to renounce the simple human condition and become more or less pliant instruments for some manifestation of the sacred (gods, spirits, ancestors etc.)" (p. 23).

Frequently there is a "hysterical crisis" at the onset of a shamanic career, often followed by a period of roaming the wilds, and animal-like vocalization and behavior generally. This would appear to serve the function of divesting the future shaman of the social conventions of his tribe, though other elements enter, such as the symbolism of the sacred animal ancestor. Often also the future shaman "becomes absent-minded and dreamy, loves solitude, and has prophetic visions and sometimes seizures that make him unconscious"

(p. 19). Thus, morbid phenomena accompany the onset of the shamanic vocation, but these have to be mastered and controlled, and a period of training, usually by other shamans, precedes full initiation. The symbolism and the experience of mystical death and rebirth, of ascent into higher, and descent into lower, worlds as parts of essential shamanic experience are universal.

There is a particularly interesting brief section on "Contemplating One's Own Skeleton" (p. 62), an exercise which seems widespread among shamans. It ends: "Everywhere, we find the will to transcend the profane, individual condition and to attain a transtemporal perspective . . . a certain recovery of the very source of spiritual existence, which is at once 'truth' and 'life'" (p. 64).

The idea that the magician can leave his body at will is "a strictly shamanic notion" (p. 415). One of the features of the shamanistic on which Prof. Eliade lays considerable stress is the achievement of "inner heat" which "forms an integral part of the technique of 'primitive' magicians and shamans: everywhere in the world acquisition of 'inner heat' is expressed by a 'mastery over fire' and, in the last analysis, by the abrogation of physical laws—which is as much as to say that the duly 'heated' magician can perform 'miracles,' can create new conditions of existence in the cosmos, in some measure repeats the cosmogony" (p. 412). Numerous examples of fire-walking, fire-handling and fire-swallowing are given. "A similar rite consists in walking on a 'bridge of swords.' It is believed that the spiritual preparation before the ceremony makes it possible to walk on swords and fire unharmed. In this case, as in innumerable examples of mediumship, spiritism or other oracular techniques, we encounter an endemic phenomenon of spontaneous

pseudo-shamanism, which is difficult to classify but whose most important characteristic is *easiness* (p. 456).

Another power universally attributed to shamans is that of being able to fly (p. 477), and Prof. Eliade associates the bird symbolism, that so often features on the shaman's costume, with the ubiquitous reports of levitations in connection with shamans, mystics, mediums, yogins, fakirs, alchemists and saints. "Magical flight is the expression both of the soul's autonomy and of ecstasy . . . This myth of the soul contains in embryo a whole metaphysics of man's spiritual autonomy and freedom; it is here that we must seek the point of departure for the earliest speculations concerning voluntary abandonment of the body, the omnipotence of intelligence, the immortality of the human soul . . . The point of primary importance here is that the mythology and the rites of magical flight peculiar to shamans and sorcerers confirm and proclaim their transcendence in respect of the human condition" (p. 480).

There are several important references in connection with levitation, in particular Olivier Leroy's *La Lévitacion*, Paris, 1928, whose outstanding example is St. Joseph of Cupertino. A less well-known example is that of Sister Mary of Jesus Crucified, an Arabian Carmelite nun, who "rose high into the air, to the tops of the trees . . . 'but she began by raising herself with the help of some branches and never floated free in space'" (p. 482). In this respect her experience parallels that of a yogi photographed by an informant of ours in front of his own house in India: the yogi put a cloth-covered stick on the ground, put his hand on it, and was then seen to rise into the air, his feet leaving the ground until he was floating in the horizontal position in which he was photographed. He explained that

he required the stick to steady himself, so as not to float away. (The photograph and details were published in "Psychic News," August 1957, p. 1).

If clairvoyance and prophecy are added to this catalogue of shamanistic activities, it will be amply clear how very close is the parallel between shamans and mediums, though by and large the role of the shaman is more active: he creates songs, language, poetry, dances, music, mythology, claims which could be made by but few mediums.

Prof. Eliade bypasses the great similarity with mediumistic and occultistic activities by repeated assertions that shamans, unlike mediums, converse with the spirits but are generally not possessed by them. I decline to believe that a writer as phenomenally well-read as Eliade does not know that mediumistic experience, just like shamanistic experience, ranges from converse with "spirits" to possession by and identification with them. In any case, he quotes Findeisen as an authority (12 entries) and he also refers to T. K. Oesterreich's book, *Possession*, though the references to the latter are very inadequate, not to say slippery.

Again, there is a statement that "Recent researches have brought out the shamanic element in the religion of the paleolithic hunters. Horst Kirchner [in 1952] has interpreted the celebrated relief at Lascaux as a representation of a shamanic trance . . ." (p. 503), and then there follow important and interesting supporting references, among them one to Findeisen's *Schamanentum*. And there is not one word in this connection about Dr. Margaret Murray, the only reference to whose "God of the Witches" (1934) is in a note, *en passant*, in connection with "helping spirits in European medieval sorcery" (p. 92). This is the only reference in the book to Margaret Murray: there is not even, and this is unpardonable,

a reference to her *The Witch-Cult in Western Europe* published in 1921. It was, of course, Dr. Murray's great and central contention that the witch cult in Europe was the continuation of the religion of the paleolithic hunters, a ubiquitous cult driven underground by Christianity, and persecuted nearly, if not quite, to extinction.

As soon as shamanism gets too near home, in time or space, whether in the form of mediums or witches, discretion becomes the better form of valor: there are special inquisitors, witch-hunters, witch-finders and their modern counterparts, privileged to deal with such matters, and woe betide the trespasser who crosses the sacred barrier! There are two references to Sir Wallis Budge (p. 487, 488) in connection with ascending to heaven by ladders, but no mention of Budge's crucial contention that the complex, highly sophisticated ancient Egyptian religion had its origin in the shamanism of the local tribes, closely resembling modern Sudanese beliefs: the Egyptian priests of Ra achieved the semblance of theological unity by the supposition that all the local deities were only facets or aspects of Ra (see *Osiris, the Egyptian Religion of Resurrection*, 1911), much as the mediæval Church used to convert local gods into saints (or devils).

Prof. Eliade (p. 435) draws attention to the great similarity between certain characteristics of Central and North Asian shamanism and Tibetan Lamaistic practices, and indeed a study of some of the relevant works certainly strongly suggests that the Lamaistic Buddhist religion, too, was derived originally from local shamanistic beliefs and practices. This seems particularly clear from a study of Evans-Wentz's *Tibetan Yoga and Secret Doctrines*; see for example "The doctrine of the psychic heat" (pp. 172-209, 2nd edition, 1958).

It seems quite possible now to suggest the thesis that quite generally the great religious systems have local shamanistic roots, and that one cult gradually supplants and swallows the rest on becoming the state religion of some much larger unit than the tribe, such as an empire or a kingdom. So long—and only so long—as a religion can keep alive an element of the genuinely shamanistic, so long as it can put its members in touch with the world of cosmic dreams and produce enough cosmic dreamers, the religion lives. If and when it ceases to be able to provide, or allow, what Prof. Eliade calls "the breakthrough in plane"—it ossifies.

The last 300 years have faced mankind with something quite new: with a secular cosmology which precludes any expression of religious experience, all cosmic dreaming, in terms of the officially accepted picture of the universe, at least without duplicity or subterfuge. This is a very unstable and a very dangerous state of affairs, and so long as it prevails "breakthrough in plane" is and remains either a hollow fiction or an unmentionable and perhaps even unthinkable experience.

Prof. Eliade has written a superb, informative and important book which (in full accordance with the discreet promise of the first word of the subtitle) at no point offends against the unwritten but iron-hard rules of anthropological convention. This inevitably entails certain limitations, certain unresolved half-contradictions, and the use of some words and phrases that deflect. The "cultivated general reader" to whom the book is ostensibly addressed will be kept on his toes trying not to lose the thread between anthropological technicalities and conventional niceties. A key paragraph occurs at the end of Chapter 13, "Parallel myths, symbols, rites," in which he discusses "aberrant shamanic practices," a topic introduced somewhat abruptly.



ly and ambiguously: ". . . we refer especially to rudimentary and mechanical means of obtaining trance (narcotics, dancing to the point of exhaustion, 'possession,' etc.\*)" (p. 493). This paragraph, the last one before the last chapter, "Conclusions," ends as follows:—

"We may ask, for example, if the aberrant aspect of the shamanic trance is not due to the fact that the shaman seeks to experience *in concreto* a symbolism and mythology that, by their very nature, are not susceptible of being 'realized' on the 'concrete' plane; if, in short, the desire to obtain, at any cost and by any means, an ascent *in concreto*, a mystical and at the same time *real* journey into heaven, did not result in the aberrant trances that we have seen [but these have, in point of fact, not been described at all, and the reader is bound to infer that he means all trances]; if, finally, these types of behavior are not the inevitable consequence of an intensive desire to 'live,' that is, to 'experience' on the plane of the body, what in the present condition of humanity is no longer accessible except on the plane of 'spirit.' But we prefer to leave this problem open; in any case, it is one that reaches beyond the bounds of the history of religions, and enters the domain of philosophy and theology" (p. 494).

Nothing, after all, must be changed. In the last resort, by means of a few inverted commas and italics, an ambiguity and a final hiatus, he relegates shamanic experiences to the realm of the unreal and delivers it, perhaps to its doom, into the competence of the philosopher and the theologian. Of course, if Prof. Eliade did not do this he would not be an accredited authority, since one cannot break the conventions *and* be an authority.

ANITA KOHSEN

[Reprinted from *Cosmos*]

PHANTASTICA, NARCOTIC AND STIMULATING DRUGS  
By Louis Lewin. New York: E.P. Dutton and Co. Inc., 1964. Pp. xvii + 335. \$5.95. This English edition was first published in 1931 as a translation of the second German edition. The first German edition was published in 1924. The book was written for the general reader. It is an introduction to the lore of mood-affecting drugs. It does not deal with pharmacology, chemistry or psychology, and does not describe medical applications or laboratory experimentation.

The author, a physician, was a pharmacology professor at the University of Berlin during the decades around the turn of the century. Prof. Lewin made prolific contributions to the scientific literature of the pharmacology of natural products. He published monographs on peyotyl, kava-kava, and *Banisteria caapi*. His biography is outlined in a preface by Prof. Bo Holmstedt. This book does not quote sources, but references to the material described may be found in the author's textbook *Gifte und Vergiftungen*. Historical and anthropological accounts, and some personal observations, make up most of the book. Here and there the author makes predictions or states attitudes that stand up well in the light of present knowledge. He suggested the use of drugs that induce temporary mental derangement for the study of similar derangements arising from insanity. He believed that the discovery of such drugs by primitive peoples marked the beginning of scientific observation. He saw the resemblance of some drug effects to influences reported from the spiritual life. With regard to psychedelics, he stressed the primary role of personal predisposition toward the experience. He observed that most pharmacologically active substances have some effect on the

nervous system, what we would call behavioral toxicity.

The author divided mood-affecting drugs into five classes according to their gross mental effects: euphorica, inebriantia, hypnotica, extantia, and phantastica. By phantastica, the author meant drugs giving rise to sensory illusion, not necessarily hallucinations. The term includes psychedelics.

About one-sixth of the book is about phantastica. Lewin held the view that internal visions were true subjective happenings, and experiences of inward perception. He quotes from the prophet Ezekiel, and mentions several mystics. He described phantastica as thaumaturgic substances, and reports the use of many different psychedelic plants by various isolated or primitive cultures for eliciting religious experiences.

The similarity of some drug hallucinations to those produced in fever was noted, and the author conjectured that even without external influences, the body might produce toxins that give rise to physical or mental disorder, or what we call psychosomatic effects.

The author did considerable pharmacological research on peyotl alkaloids. *Anhalonium lewinii* was named in his honor. In discussing peyotl, he quotes Sahagun, a contemporary of Cortez, regarding the nanacatl mushroom, and ololiuhqui, but he did not investigate them.

Sensory illusions and hallucinations are described in detail. There is extensive quotation from Beringer, a physician, who reported the subjective effects of mescaline in 1922. Lewin emphasized the unique relation of the drug experience to the individuality of the subject. He predicted that peyotl alkaloids would be used in research on brain physiology, psychology, and psychiatry, and that chemistry would play a leading role in this field. He predicted a rich harvest of scientific re-

sults from human experimentation, but warned that subjects would bias their reports by suggestion or by the desire to sound interesting.

He recorded the history of *Cannabis* usage in the Near East, Africa, and India. He described in detail the mild symptoms of hemp smoking, as well as some of the temporary psychoses and apparent addictions that occur among some users. He does not point out the obvious fact that the social environment of the hashish consumer gives the form to experiences.

The use of *Amanita muscaria* by Siberian natives is described. Superficially resembling mescaline, it differs in that violent excitation occurs, frequently leading to a temporary raving madness. He unkindly attributes mental inferiority and low intellectual standards to these adventurous tribesmen.

A number of plants of the family Solanaceae are described, including henbane, belladonna, and various *Datura* species. He assigned an important role to these drugs in demonology and witchcraft, suggesting that the terrifying and distressing hallucinations induced by these drugs may have been used often for criminal or political activities. Among primitive tribes, these drugs were used for ordeals and for working up excitement before battle.

The use of *Banisteria caapi* among the natives of the upper Amazon region is related. A strong resemblance to mescaline is noted, except for the vertigo and vomiting. Lewin reports one case of a man who experienced hallucinations from tincture of *Gelsemium sempervirens*, leading to addiction, insanity and death. Various plants are mentioned which are addicting to range animals, generally called loco weeds. He gives no evidence of hallucinations other than the intoxicated behavior of the animals. The fact that they are addicting is evidence against their classification as phantastica. The European



broom, *Saromanthus scoparius*, is reported to be addicting to sheep. Perhaps this relates to the rumor that Scotch broom, a common decorative shrub in the United States, may contain a mood-altering substance.

The few scientific observations and generalizations presented in the book are not contradicted by present knowledge, and it is a pleasure to read a book of this sort where the author is not trying to justify a pet theory. On the one hand, he seems to agree that Vital Energy existed as a distinct physical force, but on the other hand in explaining drug action he neatly summarized the idea of enzyme inhibition. To the present day reader, much of the book is obsolete. Many old drugs are no longer used, and very many new mood-affecting drugs are now known. Most of the substances mentioned by Lewin as crude plant preparations have now been isolated, identified, and synthesized. For the present day reader to form a fair judgment about psychedelic drug usage, a minimum amount of pharmacology, chemistry and psychology must be known, and none of this is to be found in Lewin's book. The absence of any reference to the contemporary psychological literature available when the book was written is a serious omission. No mention, for instance, is made of the introduction and withdrawal of cocaine from psychotherapy by Sigmund Freud. Not even the work of Lewin's contemporary researchers in pharmacology are mentioned. The technical obsolescence of this book would be more apparent if it considered a less esoteric topic—for example, if it were on nutrition.

The book was probably reprinted because of the present notoriety of mood-altering drugs, particularly LSD, as presented in the public press. Lewin himself stated that many persons had been led to addiction by reading popular accounts of drug research. The per-

son with a vague wish to "turn on" would find very little encouragement in this book. The general impression implied is that drug experiences are dangerous and unpleasant, and indulged by savages and the mentally deranged.

Most knowledge of the mental dimensions of drug effects was reported long after this book was written. Also, the social context of drug experience and addiction has changed significantly. Far better introductions exist for the modern reader, many in less expensive paperback editions. There is very little in Lewin's book to prepare the reader for the "higher religion" of psychedelic experience that has burst upon us in the last decade.

ROBERT J. DUMMEL

#### THE STRUCTURE OF SCIENTIFIC REVOLUTIONS

By Thomas S. Kuhn. Chicago: Phoenix Books, University of Chicago Press, 1963. Pp. 172. \$1.50.

An apparently arbitrary element compounded of personal and historical accident is always a formative ingredient of the beliefs espoused by a given scientific community at a given time. Normal science, the activity in which most scientists inevitably spend almost all their time, is predicated on the assumption that the scientific community knows what the world is like. Much of the success of the enterprise derives from the community's willingness to defend that assumption. Normal science, for example, often suppresses fundamental novelties. Nevertheless, so long as those commitments reflect an element of the arbitrary, the very nature of normal research ensures that novelty shall not be suppressed for very long. . . . When the profession can no longer evade anomalies that subvert the existing tradition of scientific practice—then begin the extraordinary investigations that

lead the profession at last to a new set of commitments, a new basis for the practice of science. Their assimilation requires the reconstruction of prior theory and the re-evaluation of prior fact, an intrinsically revolutionary process that is seldom completed by a single man and never overnight.

However, in the early stages of a science (e.g., psychology?) there are no such stable foundations . . . and different men confronting the same range of phenomena, but not usually all the same particular phenomena, describe and interpret them in different ways.

The characteristics of all discoveries from which new sorts of phenomena emerge include: the previous awareness of anomaly, the gradual and simultaneous emergence of both observational and conceptual recognition, and the consequent changes of categories and procedures often accompanied by resistance. Here (P. 63) a perceptual experiment is cited in which Bruner and Postman asked subjects to identify on short and controlled exposure a series of playing cards. Many of the cards were normal, but some were made anomalous, e.g., a red six of spades and a black four of hearts. The results showed that in certain subjects there was an intense resistance to the perception

of the unconventional, accompanied sometimes by acute personal distress.

In science, as in the playing card experiment, novelty emerges only with difficulty, manifested by resistance, against a background provided by expectation. Initially, only the anticipated and usual are experienced even under circumstances where anomaly is later to be observed. The author then goes on to show why "normal science," a pursuit not directed to novelties and tending at first to suppress them, should nevertheless be so effective in causing them to arise.

Drawing his data from history, philosophy, and psychology, Kuhn argues that "normal science" presupposes a conceptual and instrumental framework or paradigm accepted by an entire scientific community; that the resulting mode of scientific practice inevitably evokes "crises" which cannot be resolved within this framework; and that science returns to normal only when the community accepts a new conceptual structure which can again govern its search for novel facts and for more refined theories.

Thomas S. Kuhn, formerly on the faculty of the Univ. of Calif., is now professor of the history of science at Princeton.

JOHN R. B. WHITTLESEY

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