

THE SKEPTICAL INTELLIGENCER.

VOL 3 ISSUE No. 2 November 1998



The Magazine of ASKE

ASSOCIATION for SKEPTICAL ENQUIRY



PART I

CONTENTS

Articles

Giving Up The Ghost To Psychology by <i>Rense Lange and James Houran</i>	2
A Feminist Critique Repudiation of Logic by <i>Noretta Koertge</i>	14
Homoeopathy - An Update by <i>Wayne Spencer</i>	20
No Contest: The Non-Debate Between Creationism and Evolutionary Theory in Britain by <i>Simon Coleman and Leslie Carlin</i>	24

Review Essay

Intellectual Impostures by <i>David L</i>	31
-------------------------------------------------	----

SEE

Book Reviews

Eye and Brain by <i>Bruce Evans</i>	36
Abracadabra by <i>Dougie Gibbard</i> ..	37
The Psychic Mafia by <i>Tony Youen</i>	39
Positively False by <i>Jamie Revell</i> ...	40

PART II

Some Articles Of Note by <i>Wayne Spencer</i>	43
-----------------------------------------------------	----

Comment

Religion, Science & Skepticism - A Response by <i>Steuart Campbell</i>	53
Religion, Science & Skepticism - Another Response by <i>Doug Bramwell</i>	54
A reply to Cambell and Bramwell by <i>Dónal O'Mathúna</i>	55

ARTICLES

Giving Up The Ghost To Psychology

By Rense Lange and James Houran

Rense Lange (Ph.D. Psychology; M.A. Computer Science) is a psychometrician with the Illinois State Board of Education. A former professor of computer science and experimental psychology at the University of Illinois at Springfield, Lange considers himself a generalist with primary interests in cognitive psychology, qualitative and quantitative research methods. He is the co-author of several books and chapters dealing with issues in psychology and artificial intelligence. In addition, he has contributed more than thirty scholarly papers in the areas of social, cognitive, and abnormal psychology, computer science, neural nets, and chaos theory. Dr Lange believes that many of the same processes causing 'paranormal' perceptions and experiences play a central role in 'normal' cognition and behaviour as well, and that nonlinear approaches may be required to build adequate models of such phenomena.

James Houran, (B.A. Psychology; M.A. Clinical Psychology) currently is an Instructor of Clinical Psychiatry at the Southern Illinois University School of Medicine. As an undergraduate, Houran began researching issues in parapsychology and abnormal psychology, with a special focus on haunting/ poltergeist phenomena and human perception. He has received a number of grants and scholarships in support of his work, including the 1992 Eileen J. Garrett Research Scholarship in Parapsychology (New York: Parapsychology Foundation, NY). Houran has authored more than 30 articles in both psychology and parapsychology journals, and serves as a reviewer for several journals. He is one of the youngest Full Members of the Society for Scientific Exploration, and his research with Rense Lange has been featured in the popular media, most notably on the A&E television network.

The authors are jointly editing a scholarly book tentatively titled A Haunting Question of Perception: Scientific Perspectives on Hauntings and Poltergeists to be released by Greenwood Press which examines hauntings and poltergeists from various academic perspectives, including anthropology, sociology, physics, parapsychology, psychiatry, transpersonal psychology, neurology, and semiotics.

“‘Fact,’ physically speaking, is the ultimate residue after human purposes, desires, emotions, and ideas and ideals have been systematically excluded. A social ‘fact,’ on the other hand, is a concretion in external form of precisely these human factors” (Dewey 1931/1985: 64)

Introduction: Hauntings and Poltergeists as Social Facts

Poltergeist-like episodes may be characterized as clustered perceptions of ambiguous psychological experiences and physical manifestations that may be exacerbated during periods of psychophysical stress and often focus around adolescents, and especially girls. If such experiences and phenomena persist over long periods of time at a particular location, they are called hauntings (Roll 1977, Gauld and Cornell 1979). Hauntings and poltergeists have been reported in most cultures throughout history. Carrington and Fodor

(1951) collected incidents of 'stone-throwing' poltergeists from as early as A.D. 530 up through the medieval period. Pliny the Younger (1751) wrote a report of a haunted house that came to his attention, and A. R. G. Owen (1964) published summaries of poltergeist-like episodes from the 19th and early 20th centuries. More recent treatises (e.g., Roll 1977, Gauld and Cornell 1979) indicate that accounts of poltergeist-like episodes from across the world show remarkable similarities. Yet, people's interpretation of such experiences is closely tied to psychological, social, and cultural conditions (Roll 1977, Hess 1988).

For instance, Clark (1997) noted that demonology possessed a scientific status in the sixteenth and seventeenth centuries. Among the most notable scientists to take poltergeist-like episodes seriously was the British physicist and chemist Robert Boyle. He encouraged a Protestant minister named Francis Perrault to publish a treatise on "the devil in Mascon," which chronicled inexplicable noises and movements of objects that suddenly began in Perrault's home in 1612 (Thurston 1954). Boyle was one of a number of leading scientists and intellectuals who "encouraged and publicized work on witchcraft and kindred phenomena...as a way to combat atheism and skepticism and to support traditional views about God's relationship to his creation" (Briggs 1996: 99-100, see also Olson 1992). The scientific worldview that informed the arguments of these individuals did not exclude the demonological (Sharpe 1996, Clark 1997), and was radically different from that which is the basis of contemporary materialist science. Arguably, Boyle and those who shared his position were transitional figures situated between the old and the new scientific worlds. On the one hand, they embraced the experimental method; but on the other, their ontological presuppositions had at least one foot in the Middle Ages. In the long run, the spread of a new mechanical philosophy that had no place for occult forces, a growing conviction that extraordinary and paranormal phenomena had naturalistic causes, plus a number of other factors (such as a change in intellectual fashions) eventually led to the marginalization of the demonological point of view (see, e.g. Thomas 1971, Levack 1995, Sharpe 1996) and the rise of a new and modern science.

Discussions of hauntings and poltergeists continue to appear in the social science literature (e.g., Leon 1975, Ross and Joshi 1992, Houran 1997b), but most are published in parapsychology. For example, McHarg (1973: 17-18) reported a relatively recent case in which a 13-year-old girl in the Midlands, England, began having hallucinations of people:

"At first she saw an old man, who was taken to be her long-deceased grandfather. Then, in 1971, she repeatedly saw a young girl who claimed to have been strangled in 1808 and who wished to be buried in consecrated ground...Involvement of the rest of the family and of friends began when they witnessed ostensible poltergeist phenomena such as doors and

curtains opening and shutting, objects moving... Apparitions...then began to be seen by others, both singly and collectively. These were not only of dead persons, but also of persons known to be alive. Dogs, bears, birds and devilish 'horny things' were also seen - a coldness was usually experienced in the part of the body nearest to the apparition. Shared apparitions sometimes appeared, to different observers, to be differently dressed."

Although these types of experiences are depicted comically in movies like *Ghostbusters* and *Beetlejuice*, they often invoke fear and anxiety in real-life (Rogo 1974, Hufford 1982). The emotional turmoil can even motivate people to seek out therapy. For this reason, the *Diagnostic and Statistical Manual of Mental Disorders* of the American Psychiatric Association (1994), which is used internationally by mental health professionals to diagnose clinical conditions, now includes "Religious or Spiritual Problems" (see Turner, Lukoff, Barnhouse and Lu 1995). This development, coupled with the increased number of publications that discuss how to address anomalous experiences in psychotherapy (e.g., Hoyt 1980, Hastings 1983, Wilson 1990, Kauffman 1993, Peteet 1994), reflects the fact that 'paranormal' experiences are increasingly recognized as legitimate topics in clinical psychology and psychiatry.

Why Do People Experience Haunting and Poltergeist Outbreaks?

Some argue that this question is not a topic for serious inquiry and readily dismiss accounts as fraud or symptoms of mental illness. Indeed, deliberate deceit (see e.g., Owen 1964) and self-deception (see e.g., Eastham 1988) can explain some cases, and experiences typical of haunting and poltergeist outbreaks are also commonly encountered in schizophrenia and affective disorder. However, Cox (1961) noted that some fraudulent cases also contain manifestations that do not seem manufactured. Moreover, psychopathology is implausible as a general explanation since up to 10% of the people in the general population report experiences involving 'ghosts' or 'poltergeists' (Haraldsson 1985, Ross and Joshi 1992, Wober 1992). Yet, no widespread consensus exists concerning the etiology of hauntings and poltergeists.

The popular explanation for hauntings and poltergeists continues to be discarnate agency (Stevenson 1972), i.e., the idea that non-physical entities such as demons or spirits of the deceased act in the world of the living. Since the evidence offered in support of post-mortem survival is generally ambiguous and subjective (Gauld 1977), Stevenson (1972) argued that discarnate agency is evidenced by phenomena reflecting intelligence and purpose – i.e., as opposed to manifestations that show little evidence of intelligence such as explosive sounds or random movements of objects. Even if this reasoning is accepted, however, it appears that cases involving apparitions (and therefore presumably discarnate agents) are not significantly more likely to involve 'intelligent or purposeful' manifestations (Alvarado and Zingrone 1995).

The hypothesis of psychokinesis (PK), i.e., the idea that anomalies result from interactions between shifts in the consciousness of living human beings and the physical environment (Roll 1977, Radin and Rebman 1996), can be seen in this context as a contemporary version of the above. Although some experimental evidence for PK is suggestive (see e.g., Radin 1997), its putative effects are too small to account for the large-scale phenomena often reported

during hauntings and poltergeist-like episodes (such as apparitions, flying objects, moving furniture, loud percussive sounds). It has been argued therefore that PK effects can be magnified under certain conditions (yet to be described), thereby producing the phenomena associated with hauntings and poltergeists. However, explanations invoking large-scale PK (also called macro-PK or recurrent spontaneous psychokinesis: RSPK) are moot until definitive evidence is presented. Moreover, the PK hypothesis lacks a compelling theoretical framework to explain its prima facie conflict with modern scientific theory.

Other researchers adhere to more conventional explanations. A nice summary is provided by Tandy and Lawrence (1998: 360) who list : "...water hammer in pipes and radiators (noises), electrical faults (fires, phone calls, video problems), structural faults (draughts, cold spots, damp spots, noises), seismic activity (object movement / destruction, noises), electromagnetic anomalies (hallucinations), and exotic organic phenomena (rats scratching, beetles ticking)." Interestingly, Tandy and Lawrence also reported that standing air waves can elicit sensory experiences suggestive of ghosts, a natural cause which had not been documented previously.

Box . Major types of contextual variables that influence the interpretation of ambiguous stimuli.

Cultural beliefs or expectations: A predisposed cultural (e.g., religious or heritage) belief in ghosts, angels, demons, or other supernatural entities.

Demand characteristics of the situation: A direct or indirect suggestion that the situation or psychophysical state will produce paranormal phenomena (e.g., folklore or religious expectations).

An emotional or physical state of the person related to misperceptions: Any intense emotional state (e.g., fear), physical or mental illness (e.g., terminal illness), or substance use (e.g., narcotics) which itself would facilitate hallucinations.

Embedded cues: Characteristics within the percipient's environment or memory which may structure or be incorporated into a psychological experience by the percipient (e.g., olfactory perception of lilacs in a room with a prominent lavender hue).

Metaphorical or symbolic reference: A situational characteristic which elicits a stereotypical meaning or inference (e.g., a special religious day like the Sabbath, 12:00 midnight: "the witching hour," or the year 2000).

We take the perspective that there are a multitude of ambiguous psychological and physical phenomena which, given the proper context, can be interpreted as paranormal (for extensive discussions of such ambiguous stimuli, see e.g., Houran and Lange 1996c, Houran 1997a, Houran and Lange 1998). Therefore, like others (e.g., Cone 1995, Maher 1988), we argue that to establish a general theory of hauntings and poltergeists it is more productive to study the affective and cognitive dynamics of people's interpretation of ambiguous stimuli. According to this view, ambiguous phenomena such as those listed by Tandy and Lawrence become paranormal only after being interpreted as such against the backdrop of a shared human reality. In this sense, hauntings and poltergeist-like episodes are delusions... or in other words, social facts. We will review our own empirical research that has led us to this conclusion.

Insights from a Social Science Perspective

While performing content analyses of accounts of hauntings and poltergeist-like experiences (Lange, Houran, Harte and Havens 1996), we were struck by the fact that many percipients seemed almost eager to draw very definite and far-reaching conclusions from very limited and ambiguous information. Although percipients may insist that their experiences reflect consensual reality, it became increasingly clear that the contents and modalities of a wide variety of paranormal experiences are consistently and predictably shaped by 'contextual variables' in the environment, as defined in the box below. The effects of contextual variables were also found in content analyses of angelic encounters (Lange and Houran 1996), deathbed visions (Houran and Lange 1997a), and anomalous photographic effects (Lange and Houran 1997a).

Subsequent research (Houran and Lange 1996a, 1997b, Houran 1997c) indicated that percipients' experiences and beliefs concerning poltergeist-like phenomena are also affected by variables such as age, sex, and tolerance of ambiguity. Tolerance of ambiguity is an emotional and perceptual personality variable first described by Frenkel-Brunswick (1949). She described intolerance of

ambiguity as the tendency to resort to black and white solutions characterized by premature closure, often at the neglect of consensual reality. In essence, intolerance of ambiguity results in rapid and overconfident judgment of ambiguous stimuli or events. As such, intolerance of ambiguity is one factor that has been hypothesized to underlie hallucinations and delusions (for a review, see Williams 1994). Budner (1962) considered tolerance of ambiguity as a motivating factor for individuals in social situations as well. In particular, he defined intolerance of ambiguity as the tendency to perceive ambiguous situations as threatening, whereas tolerance of ambiguity denoted the tendency to perceive ambiguous situations as desirable.

The question arose, therefore, how context interacts with a percipient's sex and tolerance of ambiguity in eliciting perceptions of the paranormal. We do not claim to have a general answer to this question. However, a reanalysis of earlier studies (Houran and Lange 1996a, 1997b) using path analysis techniques consistently identified a model that encompasses all of the variables referred to above (Lange and Houran 1998). Although our model is based exclusively on questionnaire data, it was derived using a statistical technique called "path analysis" that can extract causal information from correlational data (for an overview of this technique, see Crowley and Fan 1997). To date, our model has only been applied in haunting and poltergeist contexts and the following discussion focuses on this issue. We feel, however, that our model may provide insights in the understanding of other psychological phenomena as well.

Modeling Poltergeist-like Episodes as Delusions

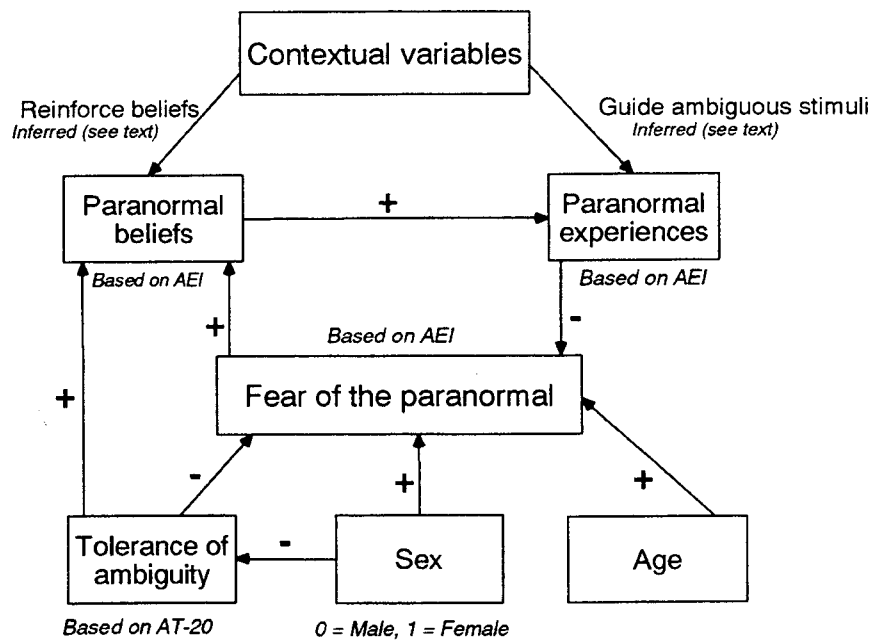
Using an attribution theory framework (Kihlstrom and Hoyt 1988, Maher 1988, Reed 1988), we regard hauntings and poltergeists as mistaken perceptions arising from an interaction among paranormal beliefs, paranormal experiences, and fear of the paranormal. However, we extend this basic framework by incorporating contextual variables as well as factors such as percipients' age, sex, and tolerance of ambiguity. The resulting model is summarized by the

path diagram in Figure 1 which shows the nature and direction of the relations among these variables, as indicated by the arrows.

In this figure, links of the form $A \xrightarrow{+} B$ indicate that variable A produces an increase in variable B, whereas links like $A \xrightarrow{-} B$ indicate that variable A inhibits variable B. The variables in the figure (as listed inside the boxes) were measured by standard psychological scales. In particular, paranormal belief, paranormal experience, and fear of the paranormal were measured by the Anomalous Experiences Inventory (Kumar, Pekala and Gallagher 1994), whereas tolerance of ambiguity was assessed

by MacDonald's (1970: 793) AT-20 scale. Although contextual variables are shown in Figure 1, they were not directly included in the path analysis studies. Instead, their effects on the perception of ambiguous stimuli are inferred from the results of earlier studies (Lange et al. 1996, Lange and Houran 1996, Houran and Lange 1997a). The model in Figure 1 has been replicated in two separate studies (Lange and Houran 1998) and is based on the responses of people who claimed to have had at least one haunting or poltergeist experience as originally defined in Lange et al. (1996: 757).

Figure 1: A Process Model of Poltergeist Delusions



Note: Summary of the findings in Lange and Houran (1998). All links have statistically significant regression weights ($p < 0.05$, 1-sided), as determined via structural modeling techniques. The links involving contextual variables are hypothetical and inferred since contextual variables were not measured simultaneously with the other variables.

Next we summarize the functions of three types of variables in the model.

1. Contextual Variables

Just as the same ambiguous round shape can be perceived as an orange or a cup of water depending upon whether the person is hungry or thirsty (Horowitz 1975), so can an apparition be perceived as a demon, an angel, or a deceased loved one, based on environmental influences such as embedded cues, demand characteristics, symbolic-metaphorical references, as well as an individual's psychophysical state or prior beliefs (for a more detailed discussion see Lange et al. 1996: 755-58). We found that the more specific aspects of paranormal experiences are congruent with contextual variables as well. For instance, a person in an empty ballroom might hear the sound of waltz music and see people dancing, whereas a person in a room with a prominent lavender hue might report the smell of lilacs. Moreover, the number of experiential modalities increased with the number of contextual variables. Thus, when one contextual variable is present percipients might only see an apparition, whereas the introduction of additional contextual variables might induce them to *hear* or *smell* something as well.

Whereas most of our work on contextual variables involved content analyses of percipients' personal accounts, it is not difficult to demonstrate context effects experimentally. For instance, in one study (Lange and Houran 1997b) individual subjects were taken on a tour of a performance theater under renovation, and afterwards they completed an experiential questionnaire by Green et al. (1992: 74-8). In the 'control' condition the theater was said to be undergoing remodelling, whereas in the 'informed' condition the subject had been told that the theater was haunted and to be aware of any unusual experiences. As expected, people in the informed condition reported a much greater number of physical, extrapersonal ('psychic'), and transpersonal ('mystical') experiences relative to those in the control group. Thus, contextual variables guide the interpretation of ambiguous stimuli, and therefore Figure 1 shows a link from contextual variables to paranormal experiences. The link to paranormal beliefs was included because such beliefs are an

integral part of the context. Our theater experiment referred to above further showed that those in the informed condition experienced significantly more intense emotional responses, a finding that is consistent with the process described next.

2. Process Variables

Attribution theory explains delusions as a byproduct of a percipient's failure to find a standard explanation for ambiguous stimuli. In particular, such theories assume that certain intense ambiguous experiences may be interpreted as personally significant to the perceiver, and that a lack of a consensual explanation for these experiences leads to the arousal of fear. Often, such fears can be reduced through essentially 'normal' reasoning. However, if no standard explanation can be found then contextual variables may cause the person to label ambiguities as paranormal. Once fear of the anomalous is reduced in this way, the resulting label will likely persist as a defense mechanism (Maher 1988). Such labelling can have a strong effect on people's subsequent attitudes (Eiser 1990). Moreover, labelling is likely to make these attitudes resistant to change (Lange and Fishbein 1983, Fishbein and Lange 1990).

The above account is consistent with the finding of the negative-feedback loop shown in the top part of Figure 1. According to this figure, any increases (decreases) in belief and experience are accompanied by a corresponding decrease (increase) in fear, thereby neutralizing the initial changes in fear. However, variations in the environment provide a continuous source of ambiguous stimuli in need of an interpretation, and thus a person's beliefs and fears are unlikely to remain stable. This process is exemplified in instances of collective delusions termed 'mass or contagious psychogenic illness.' Here, groups of people report intense physiological symptoms that have a mysterious onset, a sudden increase, followed by a gradual decline (Colligan, Pennebaker and Murphy 1982, Wessely 1987). Individual perceptions of ambiguous stimuli may follow a similar pattern.

For instance, in one of our studies (Houran and Lange 1996b) we asked a married couple to chronicle the frequency of strange or unusual events in their *unhaunted* residence for a period of thirty

days. The observed events included complex ('intelligent') and repeated movements of a souvenir voodoo mask, the erratic functioning of a telephone in the same general area of the house, and a mysterious voice. Although few anomalous events were observed over days 1 through 5, the frequency increased dramatically over days 6 through 15, only to die out thereafter. Since the distribution of events conformed to the logistic growth curve typical of infectious processes, we dubbed the effect 'perceptual contagion.' Published accounts of poltergeist-like episodes in the parapsychological literature show similar clustering effects (Roll 1968, 1969, 1970). This strongly suggests that perceptual contagion played a role in these cases as well (see Jones and Jones 1994: 38).

Note that the negative-feedback loop in Figure 1 implies that beliefs directly induce experiences (and *not* vice-versa), and similar conclusions were reached in our research on death anxiety (Lange and Houran 1997c). At first sight, these findings contradict Irwin's (1993) contention that the relationship between paranormal belief and paranormal experience may be bi-directional. However, this contradiction may be more apparent than real. *First*, in Figure 1 experiences lead to a decrease in fear through beliefs, while beliefs are also fueled by intolerance of ambiguity. Thus, the net effect of an increase in paranormal experiences on paranormal beliefs may be negligible. *Second*, the presence of contextual variables affects paranormal beliefs and experiences simultaneously and in a similar fashion. It is not surprising therefore that belief and experience scales should show a positive correlation. Hence, the question whether beliefs or experiences are primary cannot really be answered. Instead, we prefer to interpret the circular relation between paranormal beliefs and experiences as characteristic of the delusional process.

3. Exogenous Variables

The bottom part of Figure 1 shows that paranormal experiences and beliefs are related to more stable characteristics of the percipients such as age, sex, and tolerance of ambiguity. That is, fear of the paranormal is greater for women, older people, and those with a low tolerance of ambiguity. Remember that anecdotal reports suggest that

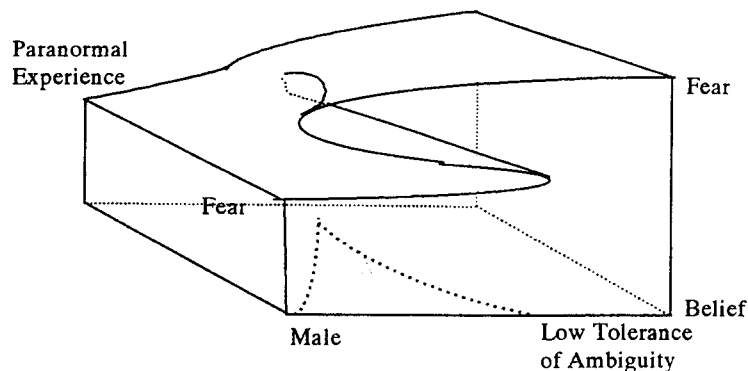
poltergeists-like experiences focus around young women (Owen 1964, Roll 1977, Gauld and Cornell 1979). This notion is consistent with our the finding that being female is associated with a greater fear of the paranormal as well as a lower tolerance of ambiguity. Unfortunately, our samples contained very few adolescents and no measures of psychological stress were obtained, and it was not possible to verify the focusing effect in its entirety. However, Keinan (1994) has already shown that intolerance of ambiguity is associated with enhanced magical thinking, especially during times of stress. By contrast, those with a greater tolerance of ambiguity solve problems through logical analysis and are more successful in coping with stress (Kuypers 1972, Parkes 1984).

In Figure 1 belief in the paranormal is both positively and negatively affected by tolerance of ambiguity, suggesting the existence of two different underlying processes. First, given the proper context, those with a high tolerance of ambiguity seem to seize upon paranormal explanations for ambiguous stimuli. In fact, these people may interpret ambiguous stimuli as a source of awe, wonder, or an amusing curiosity- perhaps not unlike the experiences of some artists (Zausner 1998) or collective delusions facilitated by wish-fulfillment (Bartholomew 1997). Second, those with a low tolerance of ambiguity are fearful of ambiguous stimuli and they may adopt paranormal labels to relieve this anxiety.

It would appear that a fear of the paranormal presupposes the perception of a clear boundary between what is 'normal' and what is not. Hence, the attribution explanation summarized earlier should apply mainly to individuals with a low tolerance of ambiguity. Such individuals face the choice between two conflicting alternatives: they can maintain their preferred 'normal' view of the world while incurring an increase in fear, or they can avoid this fear at the cost of having to accept an undesirable paranormal explanation. Paranormal explanations might be undesirable for a variety of reasons. Not only could such explanations threaten one's peace of mind, they might also lead to negative social consequences when expressed publicly.

The existence of a basic choice between belief and fear is difficult to test using standard statistical techniques in the social sciences.

Therefore, we designed (Lange 1998b) software to tackle this issue using models derived from catastrophe theory (for an overview, see Guastello 1995). Analogous to the sudden buckling of a beam under a gradually increasing load, we hypothesized that fear of the paranormal and belief in the paranormal create a polarity such that percipients switch from being fearful to believing in the paranormal due to relatively minor changes in their environments. The results of a study by Lange (1998a) are summarized in Figure 2. Consistent with predictions it was found that: (1) a low tolerance of ambiguity produces gradual shifts from fear to belief, especially for women; and (2) more sudden transitions from fear to belief result from fear of the paranormal in conjunction with paranormal experiences. These findings are consistent with Wessely's (1987) conclusion that fear is the primary factor in the genesis of contagious delusions. In other words, fear of the paranormal creates a positive-feedback loop such that fear is self-reinforcing. As in Lange and Houran (1998), perceived experiences of the paranormal were found to decrease fear, but this decrease was outweighed by fear.



At present, it is not clear if, and how often, percipients vacillate between fear and belief. Also, whereas it seems likely that fear can be used to stimulate delusions of the paranormal, it is not clear how such delusions can be suppressed. Nevertheless, the notion that paranormal delusions are the result of an approach-avoidance type of phenomenon revolving around a conflict between fears and beliefs must seriously be entertained at this point.

Epilogue

In addition to providing a coherent accounting of hauntings and poltergeists, Figure 1 may also explain other delusions. We are particularly impressed by the similarity between descriptions of poltergeist-like episodes and contagious psychogenic illnesses. For instance, like poltergeist outbreaks, contagious psychogenic illnesses are characterized by ambiguous stimulants that trigger a sudden onset and cessation of dramatic symptoms, predominantly in young females, during times of psychosocial stress (Colligan et al. 1982, Wessely, 1987). Also, the interpretation of the contagious episode seems to change according to the context. Engs, McKaig and Jacobs (1996: 197) recently reported an ostensible case of mass psychogenic illness:

"The incident began around 6:00 p.m. during the first week of school, a time when students are beginning to form support networks. The weather during the week had been extremely hot and humid, making most of this all-female non-air-conditioned residence facility uncomfortable. While waiting in line in the snack bar, a student reported that she had seen some dusty substance in the air; another student began to feel very ill and went to the food manager to report this information. Almost immediately, other students reported symptoms similar to the first student and claimed that they smelled a bad odor. The reported symptoms included shortness of breath, eye and skin irritation, and a general feeling of sickness... In all, 69 students and workers, about 8% of the total population, reported symptoms... An exact cause of the ailments of the students who took ill was not determined."

Interestingly, believers in the paranormal have been found to score higher than non-believers on measures of neuroticism and hypochondriasis, i.e., complaints about bodily ailments and a subjective state of suffering (Windholz and Diamant 1974). To further illustrate our analogy between poltergeist-like episodes and contagious psychogenic illnesses, Table 1 compares the major features of the McHarg (1973: 17-18) and Engs et al. (1996: 197) cases.

CHARACTERISTIC	POLTERGEIST	PSYCHOGENIC ILLNESS
1. Precipitated by stress	unclear in this case	social & environmental pressures
2. focusing on particular person	young girl	female student
3. ambiguous triggering stimulant	'apparition'	'dusty substance in air'
4. psychological & physical effects	apparitions, coldness, movement of objects	shortness of breath, eye & skin irritation, bad odor, general feeling of sickness
5. clustering (contagion)	family has experiences	other students become ill as well

Table. Comparison of the major aspects of the poltergeist and mass psychogenic illness examples cited in the text. =

It should be pointed out that we do not consider the model in Figure 1 to be final. For example, it is not clear how our model explains more benign phenomena such as angelic encounters (Lange and Houran 1996), and 'reconstructed' angelic encounters in particular, i.e., encounters that are only later interpreted as involving angels. Although it is possible that such encounters induce fear despite their benign nature, unpublished research by the authors suggests that cultural factors may affect the types of emotions that result (e.g. fear vs. awe, wonder, curiosity, or mystical experiences). Also, the model currently takes only one personality variable into account (i.e., tolerance of ambiguity), whereas other variables such as perceived locus of control, hypnotizability, magical ideation, depressive tendencies, stress resistance, or creativity were ignored.

The finding that percipients' reaction to ostensibly paranormal events can be described in terms of a clear dichotomy (i.e., fear vs. belief) strongly suggests that delusions create 'attractors' in percipients' cognitions which serve to neutralize otherwise threatening experiences. The models to describe such phenomena are likely to be complex. However, we are confident that they will provide significant insights into 'normal' human emotion, cognition, and imagination as well.

Acknowledgments and Notes

We thank Wayne Spencer for inviting this article, which is an expanded version of "A Process Model of Poltergeist Delusions" solicited by the *Australian Parapsychological*

Review. Also the paper benefited greatly from the comments provided by the Editor and the editorial board. Address correspondence to J. Houran, 301 University Court West, Springfield, IL 62703, USA, or send e-mail to: rlange3726@aol.com.

References

- Alvarado, C. S. and Zingrone, N. L. 1995. Characteristics of hauntings with and without apparitions: An analysis of published cases. *Journal of the Society for Psychical Research* 60: 385-97.
- American Psychiatric Association. 1994. *Diagnostic and Statistical Manual of Mental Disorders* (4th ed). Washington, DC: Author.
- Bartholomew, R. 1997. Collective delusions: A skeptic's guide. *Skeptical Inquirer* 21: 29-33.
- Briggs, R. 1996. *Witches and Neighbours: The Social and Cultural Context of European Witchcraft*. London: HarperCollins.
- Budner, S. 1962. Intolerance of ambiguity as a personality variable. *Journal of Personality* 30: 29-50.
- Carrington, H. and Fodor, N. 1951. *Haunted People*. New York: Dutton.
- Clark, A. 1997. *Thinking with Demons: The Idea of Witchcraft in Early Modern Europe*. Oxford: Oxford University Press.
- Colligan, M. J., Pennebaker, J. W. and Murphy, L. R. (eds.) 1982. *Mass Psychogenic Illness: A Social Psychological Analysis*. Hillsdale, NJ: Erlbaum.

- Cone, W. P. 1995. Paranoia and the Paranormal. Reprint posted on the Internet <<http://www.ufomind.com/psych/paranoid/articles/one.html>> Accessed 11 August 1998.
- Cox, W. E. 1961. Introductory comparative analysis of some poltergeist cases. *Journal of the American Society for Psychical Research* 55: 47-72.
- Crowley, S. L. and Fan, X. 1997. Structural equation modeling: Basic concepts and applications in personality assessment research. *Journal of Personality Assessment* 68: 508-31.
- Dewey, J. 1985. Social science and social control. In J. A. Boydston (ed.), *John Dewey: The Later Works*. Vol. 6. Carbondale, IL: Southern Illinois University Press. Pp. 64-8. (Original work published in 1931).
- Eastham, P. 1988. Ticking off a poltergeist. *Journal of the Society for Psychical Research* 55: 80-3.
- Eiser, J. R. 1990. *Social Judgment*. Pacific Grove, CA: Brooks/Cole.
- Engs, R. C., McKaig, R. N. and Jacobs, B. 1996. Mass hysteria or toxic fumes? A case study for university administrators. *NASPA Journal* 33: 192-202.
- Fishbein, M. and Lange, R. 1990. The effects of crossing the midpoint on belief change: A replication and extension. *Personality and Social Psychology Bulletin* 16: 189-99.
- Frenkel-Brunswik, E. 1949. Intolerance of ambiguity as an emotional and perceptual personality variable. *Journal of Personality* 18: 108-143.
- Gauld, A. 1977. Discarnate survival. In B. B. Wolman (ed.), *Handbook of Parapsychology*. New York: Van Nostrand Reinhold. Pp. 577-630.
- Gauld, A. and Cornell, A. D. 1979. *Poltergeists*. London: Routledge and Kegan Paul.
- Green, E., Parks, P., Green, A., Guyer, P., Fahrion, S. and Coyne, L. 1992. Gender differences in a magnetic field. *Subtle Energies* 3: 65-103.
- Guastello, S. J. 1995. *Chaos, Catastrophe, And Human Affairs*. Mahwah, NJ: Erlbaum.
- Haraldsson, E. 1985. Representative national surveys of psychic phenomena: Iceland, Great Britain, Sweden, USA, and Gallup's multinational survey. *Journal of the Society for Psychical Research* 53: 145-58.
- Hastings, A. 1983. A counseling approach to parapsychological experience. *Journal of Transpersonal Psychology* 15: 143-67.
- Hess, D. J. 1988. Poltergeists and hauntings as idioms of distress: Intervention strategies and their psychocultural contexts. *Proceedings of Presented Papers: The 31st Annual Convention of the Parapsychological Association*. Pp. 274-90.
- Horowitz, M. J. 1975. Hallucinations: An information-processing approach. In R. K. Siegel and L. J. West (eds.), *Hallucinations: Behavior, Experience, And Theory*. New York: Wiley. Pp. 163-95.
- Houran, J. 1997a. Ambiguous origins and indications of "poltergeists." *Perceptual and Motor Skills* 84: 339-44.
- Houran, J. 1997b. Predicting anomalous effects on film: An empirical test. *Perceptual and Motor Skills* 84: 691-94.
- Houran, J. 1997c. Preliminary study of tolerance of ambiguity of individuals reporting paranormal experiences. *Psychological Reports* 82: 183-87.
- Houran, J. and Lange, R. 1996a. Tolerance of ambiguity and fear of the paranormal. *Perceptual and Motor Skills* 83: 365-66.
- Houran, J. and Lange, R. 1996b. Diary of events in a thoroughly unhaunted house. *Perceptual and Motor Skills* 83: 499-02.
- Houran, J. and Lange, R. 1996c. Hauntings and poltergeist-like episodes as a confluence of conventional phenomena: A general hypothesis. *Perceptual and Motor Skills* 83: 1307-16.
- Houran, J. and Lange, R. 1997a. Hallucinations that comfort: Contextual mediation of deathbed visions. *Perceptual and Motor Skills* 84: 1491-04.
- Houran, J. and Lange, R. 1997b. Tolerance of ambiguity and fear of the paranormal in self-identified percipients of haunting/RSPK phenomena. *Journal of the Society for Psychical Research* 62: 36-40.
- Houran, J. and Lange, R. 1998. Rationale and application of a multi-energy sensor array in the investigation of haunting and poltergeist cases. *Journal of the Society for Psychical Research* 62: 324-36.

- Hoyt, M. F. 1980. Clinical notes regarding the experience of 'presences' in mourning. *Omega* 11: 105-11.
- Hufford, D. J. 1982. *The Terror That Comes in The Night: An Experience-Centered Study of Supernatural Assault Traditions*. Philadelphia, PA: University of Pennsylvania Press.
- Irwin, H. J. 1993. Belief in the paranormal: A review of the empirical literature. *Journal of the American Society for Psychological Research* 79: 1-39.
- Jones, M. B. and Jones, D. R. 1994. Testing for behavioral contagion in a case-control design. *Journal of Psychiatric Research* 28: 35-55.
- Kauffman, J. 1993. Dissociative functions in the normal mourning process. *Omega* 28: 31-8.
- Keinan, G. 1994. Effects of stress and tolerance of ambiguity on magical thinking. *Journal of Personality and Social Psychology* 67: 48-55.
- Kihlstrom, J. F. and Hoyt, I. P. 1988. Hypnosis and the psychology of delusions. In T. F. Oltmanns and B. A. Maher (eds.), *Delusional Beliefs: Interdisciplinary Perspectives*. New York: Wiley. Pp. 66-109.
- Kumar, V. K., Pekala, R. J. and Gallagher, C. 1994. *The Anomalous Experiences Inventory*. Unpublished Psychological Test. West Chester, PA: West Chester University.
- Kuypers, J. A. 1972. Internal-external locus of control, ego functioning, and personality characteristics in old age. *The Gerontologist* 12: 168-73.
- Lange, R. 1998a. Fear vs. Belief: A Cusp Catastrophe Model of Delusions. Paper presented at the Eight Annual Conference of the Society of Chaos Theory in Psychology and the Life Sciences, Boston, MA. July 28 - August 1.
- Lange, R. 1998b. GEMCAT II: A Distribution-Free Method for Testing the Statistical Properties of Thom's Catastrophe Equations as Defined by Sets of Generalized Latent Variables. Paper presented at the Eight Annual Conference of the Society of Chaos Theory in Psychology and the Life Sciences, Boston, MA. July 28 - August 1.
- Lange, R. and Fishbein, M. 1983. The effects of category differences on belief and agreement with the source of persuasive communication. *Journal of Personality and Social Psychology* 44: 933-41.
- Lange, R. and Houran, J. 1996. Role of contextual mediation in direct versus reconstructed angelic encounters. *Perceptual and Motor Skills* 83: 1259-70.
- Lange, R. and Houran, J. 1997a. Fortean phenomena on film: Evidence or artifact? *Journal of Scientific Exploration* 11: 41-6.
- Lange, R. and Houran, J. 1997b. Context-induced paranormal experiences: Support for Houran and Lange's model of haunting phenomena. *Perceptual and Motor Skills* 84: 1455-58.
- Lange, R. and Houran, J. 1997c. Death anxiety and the paranormal: The primacy of belief over experience. *Journal of Nervous and Mental Disease* 185: 584-86.
- Lange, R. and Houran, J. 1998. Delusions of the paranormal: A haunting question of perception. *Journal of Nervous and Mental Disease* 186: 637-645.
- Lange, R., Houran, J., Harte, T. M. and Havens, R. A. 1996. Contextual mediation of perceptions in hauntings and poltergeist-like experiences. *Perceptual and Motor Skills* 82: 755-62.
- Leon, C. A. 1975. "El Duende" and other incubi: Suggestive interactions between culture, the devil, and the brain. *Archives of General Psychiatry* 32: 155-63.
- Levack, B. P. 1995. *The Witch-Hunt in Early Modern Europe* (2nd ed). London: Longman.
- MacDonald, Jr., A. P. 1970. Revised scale for ambiguity tolerance: Reliability and validity. *Psychological Reports* 26: 791-98.
- Maher, B. A. 1988. Anomalous experience and delusional thinking: The logic of explanations. In T. F. Oltmanns and B. A. Maher (eds.), *Delusional Beliefs*. New York: Wiley-Interscience. Pp. 15-33.
- McHarg, J. F. 1973. Poltergeist and apparitional haunting phenomena affecting the family and associates of an adolescent girl with well-controlled epilepsy. In W. G. Roll, R. L. Morris and J. D. Morris (eds.), *Research In Parapsychology 1972* (pp. 17-9). Metuchen, NJ: Scarecrow Press.
- Olson, R. 1992. Spirits, witches and science: Why the rise of science encouraged belief in the supernatural in 17th-century England. *Skeptic* 1: 34-43
- Owen, A. R. G. 1964. *Can We Explain The Poltergeist?* New York: Garrett.

- Parkes, K. R. 1984. Locus of control, cognitive appraisal, and coping in stressful episodes. *Journal of Personality and Social Psychology* 46: 655-68.
- Peteet, J. R. 1994. Approaching spiritual problems in psychotherapy: A conceptual framework. *Journal of Psychotherapy Practice and Research* 3: 237-45.
- Pliny the Younger. 1751. *Letters*, Book 7, Letter 27. (Earl of Orrery, ed.). George Faulkner: Dublin.
- Radin, D. I. 1997. *The Conscious Universe: The Scientific Truth of Psychic Phenomena*. San Francisco, CA: HarperCollins.
- Radin, D. I. and Rebman, J. M. 1996. Are phantasms fact or fantasy? A preliminary investigation of apparitions evoked in the laboratory. *Journal of the Society for Psychical Research* 61: 65-87.
- Reed, G. 1988. *The Psychology of Anomalous Experience: A Cognitive Approach*. (rev ed.). Boston, MA: Houghton Mifflin.
- Rogo, D. S. 1974. Psychotherapy and the poltergeist. *Journal of the Society for Psychical Research* 47: 433-46.
- Roll, W. G. 1968. Some physical and psychological aspects of a series of poltergeist phenomena. *Journal of the American Society for Psychical Research* 62: 263-308.
- Roll, W. G. 1969. The Newark disturbances. *Journal of the American Society for Psychical Research* 63: 123-74.
- Roll, W. G. 1970. Poltergeist phenomena and interpersonal relations. *Journal of the American Society for Psychical Research* 64: 66-99.
- Roll, W. G. 1977. Poltergeists. In B. B. Wolman (ed.), *Handbook of Parapsychology*. New York: Van Nostrand Reinhold. Pp. 382-413.
- Ross, C. A. and Joshi, S. 1992. Paranormal experiences in the general population. *Journal of Nervous and Mental Disease* 180: 357-61.
- Sharpe, J. 1996. *Instruments of Darkness: Witchcraft in England 1550-1750*. Harmondsworth: Penguin.
- Stevenson, I. 1972. Are poltergeist living or are they dead? *Journal of the American Society for Psychical Research* 66: 233-52.
- Tandy, V. and Lawrence, T. R. 1998. The ghost in the machine. *Journal of the Society for Psychical Research* 62: 360-64.
- Thomas, K. 1971. *Religion and the Decline of Magic: Studies in Popular Beliefs in Sixteenth and Seventeenth Century England*. London: Weidenfeld & Nicolson.
- Thurston, H. 1954. *Ghosts and Poltergeists*. Chicago, IL: Henry Regnery.
- Turner, R. P., Lukoff, D., Barnhouse, R. T. and Lu, F. G. 1995. Religious or spiritual problem: A culturally sensitive diagnostic category in the DSM-IV. *Journal of Nervous and Mental Disease* 183: 435-44.
- Wessely, S. 1987. Mass hysteria: Two syndromes? *Psychological Medicine* 17: 109-20.
- Williams, C. 1994. Factors influencing reports of paranormal experience: Intolerance of ambiguity and frequency of perceived imagery. *Proceedings of Presented Papers: The 37th Annual Convention of the Parapsychological Association*. Pp. 417-28.
- Wilson, J. P. 1990. Post-traumatic stress disorder (PTSD), and experiences anomalous trauma (EAT): Similarities in reported UFO abductions and exposure to invisible toxic contaminants. *Journal of UFO Studies* 2: 1-17.
- Windholz, G. and Diamant, L. 1974. Some personality traits of believers in extraordinary phenomena. *Bulletin of the Psychonomic Society* 3: 125-26.
- Wober, J.M. 1992. *TV and the Supernatural: Resistance of Beliefs to a Debunking Series*. London: Independent Broadcasting Commission.
- Zausner, T. 1998. Creativity: Panic Attacks, and States of Awe: A Model from Nonlinear Dynamics. Paper presented at the Eight Annual Conference of the Society of Chaos Theory in Psychology and the Life Sciences, Boston, MA. July 28 - August 1.

A Feminist Critique Repudiation of Logic

by Noretta Koertge

Noretta Koertge is professor of the history and philosophy of science at Indiana University. A former chemist, she studied philosophy of science at the University of London and is the author of numerous articles on the methodology of both the natural and social sciences. She co-wrote (with Daphne Patai) Professing Feminism: Cautionary Tales from the Strange World of Women's Studies (New York: Basic Books, 1994). Oxford University Press has just released a book she edited on the "Science Wars" and the Sokal affair called A House Built On Sand: Exposing Postmodernist Myths About Science.

Introduction

Logic is the systematic study of patterns of correct inference. The first treatise on logic is Aristotle's *Prior Analytics*, written around 350 B.C. and there are remarkable similarities between the way he presented his theory of valid arguments and the way it is still taught today. He analyzes the form of various inferences and then illustrates them with concrete examples. He begins with very simple cases:

"If no B is A, neither can any A be B... e.g. if no pleasure is good, no good will be pleasure."

"If some B is not A, it does not follow that some A is not B. By way of illustration let B stand for animal and A for man: not every animal is a man, but every man is an animal." (Aristotle 1964: 5)

Aristotle's exposition of syllogistic reasoning was the core of what came to be called the *Organon*, the instrument of demonstrative reasoning, and Logic was the most honoured member of the trivium, which functioned as the "core curriculum" throughout the Middle Ages.

Today students are still strongly encouraged to take logic - at Indiana University Beginning Logic is required for undergraduates majoring in Nursing, Physical Therapy and Social Work. Irving Copi, author of a series of very popular logic textbooks states the traditional rationale:

"...the study of logic, especially symbolic logic, like the study of any other exact science, will tend to increase proficiency in reasoning. And...the study of logic will give students certain techniques for testing the validity of all arguments, including their own." (Copi 1979: 5)

As was the case with claims made about Latin, it is very difficult to provide evidence for the salutary influence of the study of logic on human reasoning in ordinary life situations, but it clearly does help students do well on the Graduate Record Exam and the Law School Admission Test. For that reason alone one might well expect feminists to urge women students to take logic and to point out that it is not just women students who find logic difficult. A responsible academic advisor should actively encourage those who lack confidence to stick with courses like logic and mathematics instead of falling prey to old stereotypes about women lacking the aptitude for abstract, linear thinking.

Unfortunately, the predominant feminist response has been to attack logic and other traditional canons of rationality as sexist. We will look at two separate lines of attack, one dealing with the way logic is taught, the other directed at the discipline itself.

Sexist Syllogisms, Quantifiers and Quips

Logic textbooks are full of exercises which give the student practice in translating strings of ordinary English sentences into logical notation and then appraising the formal correctness of the inferences they comprise. Many of the examples are now classics - who has not heard the syllogism about Socrates and his mortality? But there is also a tradition among textwriters of generating witty examples which are intended to keep students awake as they work their way through Venn diagrams, truth tables or natural deduction schemata. So the exercises in Lewis Carroll's famous logic book include whimsical sentences such as these:

No lizard needs a hairbrush. (p. 130)

Some vain persons are not professors. (p. 131)

Guinea-pigs are hopelessly ignorant of music. (p. 115)

A prudent man shuns hyenas. (p. 109)

My dreams are all about Bath-buns. (p. 120)

As the last example about Bath buns (British sweet rolls) illustrates, these little student exercises provide us with glimpses of both the author's psychology and contemporary popular culture. Thus Carroll's book also contains:

All Britons are brave. (p. 102)

No niggers are white. (p. 103)

Some Jews are rich. (p. 140)

No Gentiles say "shpoonj". (p. 112)

All uneducated people are shallow. (p. 150)

No photograph of a lady ever fails to make her simper or scowl. (p. 101)

A good husband is always giving his wife new dresses. (p. 121)

One is immediately struck by the number of references to Jews in Carroll's exercises. (The list above is by no means complete.) Post-World War II American texts also reflect the concerns of the time, but now gender roles are a major topic of interest.

Copi's exercises include:

A communist is either a fool or a knave. (Copi 1979: 77)

The United Nations will become more responsible or there will be a third world war. (Copi 1979: 11)

If any husband is unsuccessful then if some wives are ambitious he will be unhappy. (Copi 1979: 89)

All members are both officers and gentlemen. (Copi 1979: 77)

Whoso findeth a wife findeth a good thing. (Copi 1979: 71)

All popular girls are good conversationalists. (Copi 1968: 159)

All successful executives are intelligent men. (Copi 1968: 134)

All tenors are either overweight or effeminate. (Copi 1979: 83)

A similar pattern is found in other well respected books of the period. Women or girls do not figure at all in most of the exercises and when they do appear they are almost always in passive, trivial or demeaning roles:

Single women are decorous only if they are chaperoned. (Kalish and Montague 1964: 98)

Women without husbands are unhappy unless they have paramours. (Kalish and Montague 1964: 98)

The only sophomores who date Betty are those who like Greek. (Suppes 1957: 56)

Mary dates only boys who own cars. (Suppes 1957: 62)

Women are wonderful. (Suppes 1957: 107)

Simone de Beauvoir is not a great writer. (Suppes 1957: 107)

If either red-heads are lovely or blondes do not have freckles, then logic is confusing. (Suppes 1957: 18)

There is no question that the exercises employed in these logic books reinforced traditional sexual stereotypes. Whether this fact played a significant role in deterring women from liking logic is much less clear. As the last example above reminds us, many students, male and female, find logic confusing, boring or difficult. What we can conclude, however, is that at this moment in time, thanks to the success of the women's movement, students are now sensitized to gender stereotypes and find sentences such as "every girl loves a sailor" every bit as inappropriate as Lewis Carroll's exercises about Jews with long

beards. And more recent books, such as the 5th edition of Kahane's *Logic and Philosophy* (Kahane 1986) portray women and men in a wider variety of roles:

Art watched "General Hospital", but Betsy didn't.
(Kahane 1986: 33)

And in Kahane's dialogue about the Liar's Paradox it is Bonny who says "I know", and provides the proof while Charlie says things like, "Maybe yes, maybe no" and "I don't know why." (Kahane 1986: 193)

I wish I could end the story of the feminist critique of logic on this happy note. Unfortunately, however, some feminists have claimed that not just the homework exercises but the very enterprise of characterizing the formal structure of logical inference cannot be separated from sexism, racism, and totalitarianism. And in her new book, *Words of Power: A Feminist Reading of the History of Logic* (Nye 1990), Nye concludes that while men are masters of logic, women are more inclined to be masters [sic] of reading (Nye 1990: 184). If Nye is right, women students would be well-advised to stay away from logic classes. The skills that logic purports to teach are socially deleterious and thank goodness women have little aptitude for them. But how good are the arguments which she and other radical critics provide? Let us both read them and evaluate the correctness of their reasoning.

Is Logic Inherently Repressive? Or Nye's Ad Hominem Attack

Conflict between rationalists and romantics, those who would rely on reason and those who would privilege feelings, predate feminism, but feminists have added some new arguments and lots of new anger to the debate. Nye's *Words of Power* (Nye 1990), published in Routledge's *Thinking Gender* series, provides a good example of the radical feminist critique. Because it is more clearly written and argued than most (Nye has not entirely abandoned her traditional training!), it is worth examining in some detail.

Nye begins with a story about the feelings she had in her logic class, how there was only one other woman in her class, how she was too unsure of herself to raise her hand in class, and how difficult it

was to think in the way required. When confronted with the example, "Jones ate fish with ice cream and died", Nye, who had come to philosophy from literature, finds her mind wandering off into speculation about why Jones ate such a bizarre dish and why death was the consequence. The difficulty she experienced in representing the structure of the sentence with p's and q's raised a troubling question in Nye's mind:

"Is it because I, as a woman, had a different kind of mind, incapable of abstraction and therefore of theorizing, [sic] is it because I was too 'emotional'?"
(Nye 1990: 2)

Many women have had such doubts. The liberal feminist reply is an analysis of how logical pedagogical styles as well as societal gender stereotypes make women feel alienated from logic. Nye's response is to put the shoe of blame on the other foot. She argues that given its historical development from the time of the Greeks, logic as we know it today, is not only alienated from women but also has been and continues to be a weapon of oppression.

Nye's first complaint is a familiar one to logic teachers - by requiring that sentences be formalized, logicians strips away nuances and metaphorical meanings. As Nye puts it:

"The philosopher who combs the tangles from language must also be a butcher who trims away the fleshy fat of ordinary talk to leave the bare bones of truth." (Nye 1990: 33)

Nye believes that training in logic makes us focus too much on what is said instead of on who said it or why. As an example she cites the success of the Willie Horton ad in the Bush-Dukakis campaign. Nye believes that listeners behaved too much like logicians in their processing of the commercials; i.e., they concentrated too much on the arguments about parole policies and too little on the emotional impact of the pictures. Needless to say, a logician would immediately point out the existence of what are technically called "hidden lemmas," (unstated assumptions) in the Willie Horton argument and conclude that the listeners were not being logical enough!

Nye's second objection is directed at Aristotle's Law of the Excluded Middle, a favorite target of feminists who see it as the basis of patriarchal dualistic thinking. The law of excluded middle simply says that everything is either A or not-A. It would be a contradiction to say of something that it is at once A and not-A. But Nye argues that this logic does not apply to "ambiguous bodily individuals who so often both are and are not what we desire of them." (Nye 1990: 51)

Many lay criticisms of the law of excluded middle are based on a crude confusion between contraries and contradictories. The law does not claim that everything is either black or white and that there are no shades of gray. What it does say is that everything is either black or not-black, white or not-white, gray or not-gray. Aristotle's logic does not rule out the possibility of hermaphrodites, lukewarm baths, or wars which end with no victor.

But logicians themselves have had many interesting discussions of all of Aristotle's laws of negation. Some are worried about the proper analysis of intrinsically vague terms, such as city (How big must a town be before it counts as a city?) and have developed a formal analysis in terms of what are called "fuzzy sets". Others have resisted the idea that every sentence is either true or false and have experimented with so-called "three-valued logics". Philosophers of science have tried to develop a measure of "verisimilitude" which would permit us to say of two false sentences that one has a higher truth content than the other. Logic has more resources and more flexibility than are dreamt of in most feminist philosophy.

We now come to Nye's original criticism of logic, one based on an unusual reading of its history, starting with the Greeks, progressing through the Middle Ages, and then jumping to the early 20th century. Nye proudly owns up to committing the *genetic fallacy* and arguing *ad hominem* (Nye 1990: 174) since she apparently believes that the historical context in which a theory develops and the character of the person who originates it are always relevant to the evaluation of the truth of that view. A logician might well agree that such historical and psychological factors are relevant to our understanding of what the person was trying to say,

but are typically irrelevant to whether the view is well argued.

So when Nye describes Aristotle's syllogistic, she also describes his theory of reproduction according to which the active male semen impresses its form on passive female matter and his doctrine of the "natural slave". We learn not only of Abelard's struggle to reconcile Stoic logic with Aristotelianism but also of his dialectical assault on Heloise. And it is claimed (I confess I couldn't follow the argument) that the racist sentiments in Frege's private diary are somehow relevant to his approach to mathematical logic.

Nye finds even more damning the uses to which logic was put. Thus, she claims, as logical discourse came to be admired in Hellenic law courts or public fora, those who did not follow the prescribed modes were disenfranchised:

"Logic rendered them all speechless, unable to voice their reservations and scruples, unable to validate or refute what had been said from their own experiences. And it was this dazzlement and this silencing that logic was *meant* to create." (Nye 1990: 79; *my italics*)

Although Abelard listed an enormous number of inconsistencies within medieval theology in his controversial *Sic et Non*, in the end this only served to strengthen Christian dogma and the power of the Church:

"Logic could be used to make theology a self-consistent body of forced belief, it could rationalize the conflicting ordinances of canon law into the decree of a universal Church, and it could order an effective system of administration over diverse social orders based on codified canon law." (Nye 1990: 94)

Nye's list of the atrocities aided and abetted by logic also includes Protestant witch hunts,

"The renewed Protestant campaign against witches was expressed in a fundamentalist logic" (Nye 1990: 119)

and functionalist sociology:

"With the discipline of functionalist logic, the institutions within which words have meaning are preserved, structured by economic and emotional inequality, coherent with a culture that plays and replays scenes of rape and violence against women." (Nye 1990: 150).

The book culminates by positing a link between Frege; a giant of twentieth century logic, and Hitler:

"Hitler...guided by sentiments not unlike the ones expressed in Frege's diary, worked out the master-logic of National Socialism. ...National Socialism thought like Frege's, did not concern itself with empirical content. ...No personal experience could negate [its] body of truth. The applications of logic to action that Frege had promised came readily to hand. If Jews are a mongrel race, they must be exterminated. 'A thought like a hammer' [Frege's phrase] demanded instant obedience to the dictates of logic." (Nye 1990: 169)

Nye's feminist reading of the history of logic ends with these words: "Logic in its final perfection is insane." (Nye 1990: 171).

Conclusion

It will be difficult for male scholars to reply to Nye's writings. If they say the history is wrong, she will answer:

"The point of these readings...was to take up the words that have fallen from logician's mouths and reshape them...shaping them into a response that might wound more painfully than refutation." (Nye 1990: 176)

If they claim that she equivocates in her use of the term "logic", that it is insane to pretend that *Principia Mathematica* and *Mein Kampf* are both logic books in the same sense of the term (cf. Merrill's comments), she will reply that she challenges the traditional rules of discourse and refuses its pretensions to autonomy. (cf. Nye 1990: 176)

If one asks whether she isn't overreacting a bit, whether she didn't find at least some liberating moments in two thousand years of intellectual endeavor, she will reply that "as I read I saw little to pity or admire" and she was determined to avoid "the old trap, an attentive listening woman who understands all and forgives all." (Nye 1990: 175)

Others may even grant that logicians in the past didn't do "the right thing", but ask, why couldn't there be "a politically correct...nonpoisonous logic that philosophers can practice in their writings and teach in critical thinking courses?" (Nye attributes the question to Don Levi, Nye 1992: 4). But Nye is dubious: "My question is whether logic even in its current more modest analytic form - a study of what counts as a reason - even when supplemented within [sic] interpretative readings, doesn't keep some of its poison." (Nye 1992: 4)

But perhaps a feminist could answer Nye. Perhaps a feminist could make the practical argument that in today's academy, logic and related abstract disciplines, are prerequisites for any number of fulfilling and important careers, such as nursing, medicine, economics, biochemistry, law, and computer science. Logic, math, and set theory serve as gatekeepers because many students, not just women, find them difficult. To tell a young woman to resist logic because it is a tool of domination and will poison her mind is to put yet another barrier in her path. Although the Hippocratic doctors could not always live up to it, their injunction to "At least do no harm" has much to commend it. Perhaps radical feminists might be prevailed upon to "at least do no harm to women" for it is young women who will most suffer from a repudiation of logic and critical thinking.

The question of the historical use and misuse of the tools of logical analysis and inference is an interesting and legitimate one and I found much of what Nye said about Greek and Medieval law thought provoking. But let us not omit the liberating moments in history. Let us also trace the connections between John Stuart Mill's *System of Logic* and the way he argues in *On Liberty* and note the influences of rationalist philosophers of Enlightenment on the writers of our *Bill of Rights*. Let us tell our women students who admire Adrienne Rich's *Dream of a Common Language* (Rich 1993) that Leibniz and d'Alembert had a related dream and discuss the similarities and differences.

And most importantly of all, let us stress the use of logic as an instrument of criticism. Nye is correct in saying that too often logic is viewed as a hammer - if you accept these premises, then by God (and by modus ponens) you've got to accept these logical consequences. But modus tollens is a rule of

logic, too. And modus tollens says that if a logically correct argument leads to a false conclusion, then by God (or by Goddess!) something is wrong with the premises. Here logic is acting like a tiny sharp needle - the discovery of one little falsehood can discredit an enormous deductive system. That is why understanding logic is an invaluable tool for people who have little physical or economic strength but do have sharp wits and a rigorous mind.

The typical scholarly response would be to check Nye's sources and correct any misinterpretations. For example, Nye claims that in Frege's essay entitled *Thoughts*, he says that logical thought "can be used like a 'hammer' is used, to bring about the 'great events of world history'...[B]etter than a material hammer, it may be used by many at a time, by a state, by a ruling party." (Nye 1990: 159-160) Her next chapter which attempts to link Frege with Hitler is then titled, *A Thought like a Hammer: The Logic of Totalitarianism*.

But if we go back to Frege's own essay, we find little solace for the authoritarian. Frege begins his final paragraph this way:

"How does a thought act? By being grasped and taken to be true...If, for example, I grasp the thought we express by the theorem of Pythagoras, the consequence may be that I recognize it to be true, and further that I apply it in making a decision..." (Frege 1977: 28-29)

So far Frege has focused on the inner world of the individual thinker and how our judgments of truth may influence our actions. He then goes on to describe how thoughts are passed on to others:

"The influence of man on man is brought about for the most part by thoughts. People communicate thoughts...Could the great events of world history have come about without the communication of thoughts? And yet we are inclined to regard thoughts as unactual, because they appear to do nothing in relation to events, whereas thinking, judging, stating, understanding, in general doing things, are affairs that concern men. How very different the actuality of a hammer appears, compared with that of a thought!" (Frege 1977: 29)

Nye would have us believe that this essay about the reality of ideas and their influences on the lives of

individuals who judge them to be true should be read as a recipe for brain-washing and extermination camps. It is, of course, impossible to refute a "reading". But perhaps the quotations I have displayed might prompt some readers to read Frege for themselves. When confronting books which provide a wholesale condemnation of a long and complicated episode in human history one should always consider the possibility that some such accusations are telling us more about the accuser than the accused.

Bibliography

- Aristotle. 1964. *Prior and Posterior Analytics*. Translated by John Warrington. Everyman. London, Great Britain: J. M. Dent & Sons Ltd.
- Carroll, Lewis. 1958. *Symbolic Logic and The Game of Logic*. New York, NY: Dover Publications, Inc.
- Copi, Irving M. 1968. *Introduction to Logic*. 3rd ed. New York, NY: Macmillan Company.
- Copi, Irving M. 1979. *Symbolic Logic*. 5th ed. New York, NY: Macmillan Publishing Co., Inc.
- Frege, Gottlob. 1977. *Logical Investigations*. Translated by P.T. Geach and R. H. Stoothoff. Bristol, Great Britain: Western Printing Services.
- Kahane, Howard. 1986. *Logic and Philosophy : A Modern Introduction*. 5th ed. Belmont, California: Wadsworth Publishing Company.
- Kalish, Donald, and Richard Montague. 1964. *Logic: Techniques of Formal Reasoning*. Harcourt, Brace & World, Inc.
- Merrill, Daniel D. 1992. *Comments on Words of Power* (unpublished ms.). Portland, Oregon: American Philosophical Association (Pacific).
- Nye, Andrea. 1990. *Words of Power: A Feminist Reading of the History of Logic*. Thinking Gender. New York: Routledge.
- Nye, Andrea. 1992. *Response to papers on Words of Power* by Don Levi and Daniel Merrill (unpublished ms.). Portland, Oregon: American Philosophical Association (Pacific).
- Rich, Adrienne. 1993. *The Dream Of A Common Language: Poems, 1974-1977*. New York: W.W.Norton & Co.

Suppes, Patrick. 1957. *Introduction to Logic*.
Edited by J. L. Kelly and P. R. Halmos. Princeton,

New Jersey: D. Van Nostrand Company, Inc.

Homoeopathy - An Update

By Wayne Spencer

Wayne Spencer is a civil servant and the editor of the Skeptical Intelligencer. He is also a member of ASKE.

Introduction

Homoeopathy is a therapeutic method first developed by the German physician Samuel Hahnemann at the end of the eighteenth century. The defining principle of homoeopathy is that diseases fall to be treated by "using preparations of substances whose effect on healthy subjects is SIMILAR to the manifestations of the disorder (symptoms, clinical signs, pathological states) in the individual patient" (Homoeopathic Medicine Research Group 1996: 64). In classical homoeopathy a substance is regarded as a remedy for a particular condition if it causes the symptoms of that condition when administered to healthy subjects (Schindler et al 1996: 29). Substances viewed as therapeutic are converted into actual remedies by means of a process of successive dilution in water or other solvents that may be extended to a point where the solution in principle does not contain even a single molecule of the diluted substance (National Council Against Health Fraud 1994: 52; Schindler et al. 1996: 30).

In an earlier article in the *Skeptical Intelligencer* (Spencer 1997), I summarised a number of papers and studies on the popularity, value for money, and efficacy of homoeopathy. The purpose of this article is to briefly update my discussion of the evidence relating to the question of whether or not homoeopathic remedies are effective treatments.

Lancet meta-analysis

As I mentioned in my earlier article, the latest attempt at a comprehensive review of the evidence from clinical trials of homoeopathic remedies is the meta-analysis¹ by Linde et al. (1997). The Linde et al. (1997) analysis was the product of an extensive

search for relevant published and unpublished studies, and included a number of sophisticated features designed to ascertain whether the results of the authors' quantitative analysis were caused by such things as: (a) the effect of a few trials; (b) a bias towards the publication of positive results; or (c) the inclusion of poor quality studies. Despite these features, the analysis still indicated that overall the results for the patients in the pooled studies who had been treated with homoeopathic remedies were better than those for patients who had received a placebo in a way that was unlikely to be the result of chance². The authors concluded that that "The results of our meta-analysis are not compatible with the hypothesis that the clinical effects of homoeopathy are completely due to placebo" (Linde et al. 1997: 839).

The Linde et al. (1997) paper immediately generated a degree of controversy, criticism and scepticism. For example, Vandembroucke (1997) argued that "A randomised trial of 'solvent only' versus 'infinite dilutions' is a game of chance between two placebos" and took the results to indicate a need to further improve the methods used to evaluate whether a treatment is effective, while Ernst and Barnes (1998a) identified a number of trials that had not been included in the meta-analysis. More recently, however, Ernst (1998) has re-analysed the data used by Linde et al. (1997). In this re-analysis, attention was restricted to high quality studies that conformed with the principles of classical homoeopathy:

¹The data of Linde et al. as presented in their meta-analysis, were used. The present re-evaluation was confined to such studies which received a rating of

90 (out of a maximum of 100) points in at least one of the two rating systems used by these authors for assessing methodological quality of the studies. Moreover trials were excluded if they were 1) not on highly dilute (thus still containing molecules of their >>mother tincture<<), 2) conducted on complex (non-Hahnemannian) mixtures which are not administered according to the >>law of similars<<, 3) were on isopathic (e.g. potencies produced from allergens as a treatment for hayfever) rather than truly homoeopathic medicines (i.e. based on Hahnemann's >>like cures like principle<<."

Only five trials satisfied these criteria. When the data from these trials was pooled and a meta-analysis performed, the results indicated that the clinical effects of homoeopathic remedies are identical to those of placebos. The positive results in favour of homoeopathy found by Linde et al. (1997) in their original analysis had vanished.

Post-operative ileus

Recently, a number of reviews have examined the evidence for homoeopathic remedies for single conditions. Barnes and Ernst (1997) carried out a meta-analysis on studies of the effects of homoeopathy on post-operative ileus, a condition that occurs after abdominal surgery. This condition was chosen because a review of the literature suggested that it was the one on which the largest number of homoeopathic clinical trials had been conducted. To identify relevant trials, the authors used a list of more than 350 references compiled by the European Homoeopathic Research group, supplemented with the results from additional searches using the MEDLINE database. To be included in the meta-analysis, studies had to (1) be a trial on humans; (2) present data in a way that could be used by the authors' meta-analytic techniques; and (3) include a placebo control. Six studies were included in the analysis. The data from the studies on the time that elapsed from the end of the surgical procedure to the first passage of intestinal gas was used as the basis of the meta-analysis.

The results of Barnes and Ernst's (1997) main meta-analysis showed a statistically significant result in favour of homoeopathy. A further analysis, restricted to trials that had a rating of more than 55 out of a maximum of 100 on a scale of

methodological quality used in an earlier review of homoeopathy (Kleijnen et al. 1991), reduced but did not extinguish the positive results. However, Ernst and Barnes stressed that a number of drawbacks in the original studies and the methodology of meta-analysis precluded a firm conclusion. Thus, amongst other things, they pointed out that: (1) their meta-analysis may have been subject to various biases, including biases in the original reports and a bias in favour of the publication of positive results (Barnes and Ernst do not seem to have included any quantitative measures to evaluate publication bias); (2) three of the studies analysed (two positive and one negative) are these that had not been peer-reviewed; (3) studies provide few details of how the time to first flatus was measured.

In addition to the reservations raised by Barnes and Ernst themselves, it may be doubted whether a score of 56 out of 100 is an adequate criteria for a high quality study. The hypothesis that any positive result from a trial of homoeopathy is the result of biases introduced by shortcomings in the way the trial was carried out is initially somewhat more plausible than the proposition that implausible high-dilution effects unknown to physical science are at work. As one step towards addressing this consideration, it would seem reasonable to restrict the analysis to only the most exemplary studies (it is noticeable here that the highest quality (and largest) study included in the meta-analysis (with a score of 90) was negative). Furthermore, it should be noted that Kleijnen et al's (1991) quality scale does not seem to award marks for the adequate concealment of randomisation³. Recently, evidence has become available that failure adequately to conceal the results of randomisation leads to inflated estimates of treatment efficacy (Schulz et al. 1995), and many of the leading medical journals now require that reports of clinical trials demonstrate such concealment as a condition of publication (see, for example, Altman 1996). One would expect that this essential prerequisite of an effective clinical trial to be present in any attempt to evaluate homoeopathy.

Barnes and Ernst (1997) also analysed separately the results for dilutions which are likely to include a single molecule of the original diluted substance and dilutions which are not. They found that the results for the relatively low dilutions were

positive, while the results for the ultra-high dilutions were negative. However, they also stressed that the analysis of the ultra-high dilution studies included only three studies (two when a low quality study was excluded) and may have lacked the statistical power to detect any homoeopathic effect present in the studies.

Delayed-onset muscle soreness

Ernst and Barnes (1998b) conducted a systematic review⁴ of homoeopathic remedies believed to be effective for delayed-onset muscle soreness ('DOMS'). Trials had to (1) be on humans; (2) include a placebo control group; (3) be conducted double-blind⁵; and (4) include quantitative data on the outcome of muscle soreness. The trials were located by searching the MEDLINE, EMBASE, CISCOP and Cochrane library databases, and by searching through the bibliographies of the papers located and other reviews of homoeopathy and DOMS. Eight studies that met the authors' criteria were found.

Ernst and Barnes (1998b) concluded the data they located "do not suggest that the homoeopathic remedies used in the above trials are effective in alleviating DOMS". Partly positive results were found in three studies, but the trials in question were not randomised. In addition, these studies were part of a larger series of five trials, the results of which were inconsistent. Three studies that used somewhat more rigorous methods⁶ all failed to find statistically significant differences between the treatment and placebo groups.

Chronic asthma

Finally, Linde and Jobst (1998) examined the available clinical trials of homoeopathy as a treatment for stable chronic asthma. The authors searched the databases of the Cochrane Airways Group, the Cochrane Field of Complementary Medicine, the Glasgow Homeopathic Hospital, and the Munchener Modell, plus the bibliographies of the articles they found. Only randomised, placebo-controlled trials were selected. Three trials met the authors' criteria. However, the trials differed greatly in the patients included, the interventions used (each used a different homoeopathic remedy) and methodological quality, and as a result a quantitative meta-analysis could not be undertaken. Two of the trials reported

statistically significant positive outcomes in favour of the homoeopathic treatment, while the third did not. The authors concluded that the evidence currently available is insufficiently reliable to allow conclusions to be drawn about the effectiveness of homoeopathy as a treatment for asthma. They also expressed doubt as to whether the remedies used in the trials are representative of the individualised prescriptions given in classical homeopathic medicine.

Conclusion

The various reviews published since my earlier article on homoeopathy do not present a substantial case in favour of classical homoeopathy. The evidence from clinical trials remains mixed and weak. When it is also taken into account that background knowledge in the physical sciences indicates that high-dilution effects of the type posited by homoeopathic theory are implausible (see, for example, Park 1997), it appears that there are currently no adequate grounds to accept the view that homoeopathic remedies are clinically effective.

Notes

1 In the context of clinical trials, a meta-analysis has been defined as "a statistical analysis that combines or integrates the results of several independent clinical trials considered by the analyst to be 'combinable'" (Huque 1988). For details of the methods, justifications, and shortcomings of meta-analysis, see Bailar (1997a, 1997b); the recent six-part series published in the *British Medical Journal* (Egger and Smith 1997, 1998; Egger, Smith and Phillips 1997; Smith, Egger and Phillips 1997; Egger, Shneider and Smith 1998; Smith and Egger 1998) and the series of articles in the 13 September 1997 special issue of the *British Medical Journal*. For a straightforward guide on how to critically evaluate a meta-analysis, see Greenhalgh 1997).

2 Readers interested in the technical details of the statistical analyses carried out by Linde et al. (1997) are referred to the original paper.

3 In a simple randomised clinical trial, the subjects are allocated at random to either the treatment group (the subjects who are going to receive the treatment under investigation) or the control group (the subjects who receive a placebo instead) before the trial begins. This is called randomisation. The results of randomisation should be concealed from both the patients and the investigators involved in the trial. If that does not happen, bias may distort the results of the trial. For example, the investigators may

consciously or unconsciously treat or evaluate the members of the treatment and control groups differently.

4 A systematic review has been defined as "any review of a body of data that uses clearly defined methods and criteria" (Egger and Smith 1997) and "an overview of primary studies which contains an explicit statement of objectives, materials, and methods and has been conducted according to explicit and reproducible methodology" (Greenhalgh, 1997). Such a review does not necessarily include the pooling of data and statistical testing characteristic of a meta-analysis.

5 'Double blind' means that neither the patients nor the investigators knew who was receiving the treatment under investigation and who was receiving a placebo.

6 These higher quality trials were those which scored 55 or more on Kleijnen et al's (1991) quality scale. This is the same (arguable unsatisfactory) definition used in Barnes and Ernst (1998). The scores of the three negative 'high quality' trials were 60, 85 and 85 respectively.

References

- Altman, D. G. 1996. Better reporting of randomized clinical trials: the CONSORT statement [editorial]. *British Medical Journal*; 313: 570-571.
- Bailar III, J. C. 1997a. The promise and problems of meta-analysis [editorial]. *New England Journal of Medicine*; 337: 559-561.
- Bailar III, J. C. 1997b. Assessing assessments. *Science*; 277: 528-9.
- Barnes, J and Ernst E. 1997. Homeopathy for postoperative ileus? A meta-analysis. *Journal of Clinical Gastroenterology*; 25: 628-633.
- Egger, M., G. D. Smith and A. N. Phillips. 1997. Meta-analysis: principles and procedures. *British Medical Journal*; 315: 1533-7.
- Egger, M. and G. D. Smith. 1997a. Meta-analysis: potentials and promise. *British Medical Journal*; 315: 1371-4.
- Egger, M. and G. D. Smith. 1997b. Meta-analysis: bias in location and selection of studies. *British Medical Journal*; 316: 61-6.
- Egger, M., M. Schneider and G. D. Smith. 1998. Meta-analysis: Spurious precision? Meta-analysis of observational studies. *British Medical Journal*; 316: 140-4.
- Ernst, E. 1998. Are highly dilute homeopathic remedies placebos? *Perfusion*; 11: 291-292.
- Ernst, E. and J. Barnes. 1998a. [Letter]. *Lancet*; 351; 366.
- Ernst, E. and J. Barnes. 1998b. Are homeopathic remedies effective for delayed-onset muscle soreness? A systematic review of placebo-controlled trials. *Perfusion*; 11: 4-8.
- Greenhalgh, T. 1997. How to read a paper: papers that summarise other papers (systematic reviews and meta-analyses). *British Medical Journal*; 315: 672-5.
- Homeopathic Medicine Research Group. 1996. *Dictionary of Homeopathy*. Commission of the European Communities.
- Huque, M. F. 1988. Experiences with meta-analysis in NDA submissions. *Proceedings of the Biopharmaceutical Section of the American Statistical Association*; 2: 28-33.
- Kleijnen, J, Knipschild, P and ter Riet, G. 1991. Clinical trials of homeopathy. *British Medical Journal*; 302: 316-23
- Linde, K., N. Clausius, G. Ramirez, D. Melchart, F. Eitel et al. 1997. Are the clinical effects of homeopathy placebo effects? A meta-analysis of placebo-controlled trials. *Lancet*, 350: 834-43
- Linde, K. and K. A. Jobst. 1998. Homeopathy for chronic asthma (Cochrane Review). In: *The Cochrane Library*, Issue 3, Oxford: Update Software.
- National Council Against Health Fraud. 1994. Homeopathy: A position statement by the National Council Against Health Fraud. *Skeptic* [US]; 3(1): 50-57.
- Park, Robert L. 1997. Alternative medicine and the laws of physics. *Skeptical Inquirer*, 21: 24-8.
- Schindler, G., C. Hentschel, B. Brinkhaus, W. Gaus, E. Ernst, D. Reilly and E. G. Hahn. 1996. Constraints analysis in homeopathic medicine - a survey in five European countries. In: Homeopathic Medicine Research Group. *Report*. Commission of the European Communities
- Schulz K. F., I. Chalmers, R. J. Hayes and D. G. Altman. 1995. Empirical Evidence of bias: dimensions of methodological quality associated with estimates of treatment effects in controlled trials. *Journal of the American Medical Association*; 273: 408-12.
- Smith, G. D., M. Egger and A. N. Phillips. 1997. Meta-analysis: beyond the grand mean? *British Medical Journal*; 315: 1610-4.

Smith, G. D. and M. Egger. 1998. Meta-analysis: unresolved issues and future developments. *British Medical Journal*; 316: 221-5.

Spencer, W. 1997. Homoeopathy. *Skeptical Intelligencer*; 2(2): 21-24.

Vanderbroucke, J. P. 1997. Homoeopathy trials: going nowhere [editorial]. *Lancet*, 350: 824-5.

No Contest: The Non-Debate Between Creationism and Evolutionary Theory in Britain

Simon Coleman and Leslie Carlin

Dr. Simon Coleman is a lecturer in anthropology at the Department of Anthropology at the University of Durham. Leslie Carlin is a research assistant in the Department of Epidemiology and Public Health at the University of Newcastle. This article was first published in Creation/Evolution (1996, 16(1): 1-9). It is reprinted with the kind permission of the National Centre for Science Education, who retain the copyright

The history of creationist controversies is associated with two great debates: Huxley versus Wilberforce at Oxford in 1860, and Darrow versus Bryan in Tennessee during the Scopes trial in 1925. However, if the American trial remains emblematic of political, educational and religious conflicts in the contemporary U.S.¹, in Britain the Oxford debate belongs largely to a quaint if distant episode in the nation's Victorian heritage. Even at the time of the Scopes episode, leading British clerics, scientists, and educators remained nonchalant at the thought of similar events' occurring in their own country. In a special supplement to *Nature* produced at the time, the Reverend Eric Waterhouse of Wesleyan College, Surrey, remarked (1925: 79): "The great majority of clergy and ministers in Great Britain accept the theory of the evolution of species." More forcefully, the Right Reverend E. W. Barnes, Lord Bishop of Birmingham, took the opportunity to contrast the "ignorant fanaticism" of developments in the U.S. to the perceived "reasonable formulation of the Christian faith" in Britain (1925: 74).

Referring to more recent attitudes, Berra (1990) argues that nowhere in western Europe has creationism been an important issue of debate. Thus Barker 1985: 181) exaggerates only slightly in claiming that the educated public of post-war England has merely begun to countenance the possibility that people might believe Genesis was sustainable on

scientific grounds. In support of her argument, she quotes a striking passage not from a secular text but from the *International Church Index* (1981: 88): "There was an historical debate in the middle years of the last century. This is not now an issue concerning anyone." Admittedly, some religious groups in Britain, including Pentecostals, Mormons, Jehovah's Witnesses and Seventh-Day Adventists, do reject evolution in favor of more literal interpretations of the Bible. However, the number of people included in these groups is unlikely to add up to more than a few hundred thousand people (Barker, 1985: 182).

The important point is precisely that creationist views in Britain are marginal and largely confined to sectarian groups rather than the mainstream. Poll data from the U.S. (cf. Woodrum and Hoban, 1992: 315), implying that 74% of people agree that biblical creation should receive as much weight in schools as the theory of evolution, seem truly incredible from a British perspective. For instance in both the U.K. and the U.S., the British Christian Education Movement has marketed a video on the interplay between science and religion, featuring both creationist and evolutionary views of human origins. According to a member of the movement (Blaylock, pers. comm.), U.S. educators tend to complain that there is "not enough about creationism." Their British counterparts, in significant contrast, comment that the material actually contains

too much about precisely the same subject.

In this paper, we examine the British experience of creationism, contrasting it with the past and present situation in the U.S. It might seem paradoxical that a European nation whose union of church and state is still largely intact should display such an unproblematic acceptance of theories of evolution. However, our aim is to uncover the varied factors contributing to the relative lack of widespread, public controversy associated with such ideas. We shall therefore examine not only historical factors but also the extent to which the political, legal, and religious contexts of the country have proved uncondusive to the success of a minority social movement such as that of the anti-evolutionists. A particular focus will be on the teaching of evolution in schools. In the U.S. this issue has proved to be a key symbolic and legislative battleground between opposing viewpoints, whereas in Britain it has largely proved irrelevant. Finally, we speculate upon the possibility that, under changing cultural and political conditions, creationism could become a more active force in the British Isles.

Creationist Groups In Britain

When it appeared in 1859, Darwin's *Origin of Species* provoked considerable interest and not a little controversy in Britain. However, Darwin's ideas soon gained increasing acceptance, if not complete comprehension, from metropolitan centers in the country, even if more peripheral areas continued to read the Bible literally (Ruse, 1982: 286). Evolution never became a great bone of contention among British evangelicals (Bebbington, 1989: 207). Neither did opposition to the new theory ever become an effective, well-organized movement.

Admittedly, there was *some* anti-evolutionary reaction in 19th century Britain. The Victoria Institute was formed in 1865 to act as a forum for those opposed to evolution. In 1897, the Institute had 1,246 members, some of them Fellows of the Royal Society (Numbers, 1992: 141). Twenty years further on, though, the Institute's outlook had become decidedly liberal, and it advocated theistic evolution rather than creationism. Its membership had dropped dramatically, and those who remained were deemed apathetic by a visiting Canadian, George McCready Price, who had been active in the North American

creationism movement. Price, in turn, was viewed skeptically by the British when he attempted to promote a more strident anti-evolutionary position². According to Numbers (1992: 142), Price wrote home that he was "somewhat disappointed in the apparent lethargy of the friends of the Bible over here, regarding the subject of evolution."

In the significant year of 1925, a spokesman for the Christian Evidence Society stated that in Europe there appeared to be much less interest in the relationship between science and religion "owing to the fact that religious people do not oppose the findings of natural science today; and men of science do not attack religion" (quoted in Bebbington, 1989: 207). Nevertheless, some opposition to evolution appeared in the 1920s, and the early 1930s saw the gradual formation of the Evolution Protest Movement (EPM) with the electrical engineer Sir Ambrose Fleming as its president. The movement published scientific evidence in support of the Bible, as well as trying to influence both the Board of Education and the British Broadcasting Corporation (BBC), but it gained little public support. As Bebbington (1989: 209) remarks of this group: "That it existed is evidence for an element of anti-evolutionary thinking in conservative evangelicalism; that it remained small is evidence for the weaknesses of the cause, even among evangelicals."

By the 1960s, the EPM had become relatively inactive. However, since then, a number of significant changes have occurred within British creationist circles - changes which have reflected a more global expansion of evangelical and specifically anti-evolutionary ideas (cf. Locke, 1994: 407). Whitcomb and Morris's *The Genesis Flood* came out in 1961, and the EPM helped distribute it in Britain. In 1963, the Creation Research Society, propounding a recent creation philosophy, was formed in the U.S. These events, along with conservative evangelical reactions against liberal theologies in the U.K., helped to provide the EPM with new momentum and a new direction. In 1980, the membership changed its name to the Creation Science Movement (CSM) implying a more active attempt to create a scientifically valid alternative to the question of human origins. By the mid 1980s over 80% of the Movement members were professing themselves to be "young earthers" (Numbers, 1992: 327), and toward the end of the

decade its chairman was claiming the support of some 1300 people (Locke, 1994). In recent years the group has continued to distribute its journal *Creation* as well as bringing out a newspaper aimed at teenagers called *Original View*.

Just as the period since the 1960s has seen some significant changes in the fortunes and philosophy of the CSM, so it has produced a number of new creationist organizations in the country. The Biblical Creation Society was founded in the late 1970s by a group of evangelical Christians. By the early 1980s it had a membership of some 700 people, ranging from "young earthers" to "mature earthers" (who believe the earth was created 6,000 years ago but looks older) to gap theorists (Howgate and Lewis 1984: 703). As the name of the group implies, its members have consciously avoided what has been seen as the North American tendency to shy away from using the Bible as a weapon in debate. For example, in the group's journal, *Biblical Creation*, an editor comments disapprovingly on the idea that scientific creationism can survive as a non-religious entity:

It is clear that these strange ways of thinking have been called forth by the peculiar character of the American constitution, and the need to fight the U.S. educational system on its own terms.... [W]e should not uncritically swallow the idea that such a distinction has any validity [outside a U.S. court of law] (de S. Cameron, 1981: 6-7).

Other organizations which have appeared on the British creationist scene include the now-defunct Newton Scientific Association (cf. Numbers, 1992: 325) which did attempt, like some U.S. organizations, to limit its discussions to overtly scientific questions. Barker (1985: 190) notes that in 1977 a newsletter called *Daylight* was started to support parents opposed to evolutionist teaching in Catholic schools, and indeed a Catholic Creation Society was also formed. Further influence of creationist ideas was evident in an exhibition on Darwinism put on in the Natural History section of the British Museum in 1981. The curators chose to present Darwinian evolution as "one possible explanation" of human origins (cf. Hayward, 1985: 13). Darwin's theory was juxtaposed with another view "that God created all living things perfect and unchanging." This decision to

give intellectual space to a creationist viewpoint was described by *Nature* as proclaiming "Darwin's death in South Kensington [London]" (26 February, 1981 :735; also in Hayward 1985: 13).

Britain: Religious, Social and Political Context

The overall picture we have given of creationism in Britain has been of a small number of relatively obscure groups, each generally made up of hundreds rather than thousands of members. To a certain extent these groups have had overlapping memberships, tolerating some internal divergences of views. However, each of the groups has exhibited some differences in emphasis, for instance over the degree to which religious and scientific discourses should be mixed together. Although influenced and even reinforced by developments in the U.S., the groups have also demonstrated some desire for national autonomy as well as a concern over the extent to which they might be unduly influenced by American-style forms of fundamentalism. Undoubtedly, British creationists have had a much lower public profile than their counterparts in the U.S., even though they share some of the same aims, such as access to the media and the chance to educate children in their ideas.

In order to understand the low public profile of creationism in Britain we must identify structural features that might encourage or restrain minority protest movements, beginning with recent trends in religious belief and worship. Belief in and knowledge of Christian doctrines and practices are declining among the British, even if 66-75% of the population maintain fairly consistently that they believe in some notion of God (Davie, 1994: 74-5). The Anglican Communion has developed a form of all-inclusive internal diversity or "fudged accommodation" (Bruce 1995: 94) incorporating a vast range of liturgies and attitudes within clergy as well as laity. In a book specifically devoted to religious education, Newbiggin remarks (1990: 98): "When a theologian in our culture appeals to 'biblical authority' he is met with politely raised eyebrows."

Alongside the softening of the mainstream religious center and a loss of the authority of mainline churches in the post-war period, there has been an increase in such forms of non-Christian pluralism as Islam, Hinduism, Sikhism, and New Religious

Movements. Most interestingly from the perspective of this paper, however, some firming on the right of the Anglican and broadly Protestant Christian spectrum has become evident over the past two decades or so. Evangelicals have not only been bolstered by the incentive to react against a liberalizing faith but have also proved more successful than other Christians at retaining younger generations within the religious fold. The House Church Movement and some Afro-Caribbean churches have expanded, and U.S. evangelists have found some British audiences for their campaigns. Recent years have seen growing numbers of Christian schools attached to independent churches, sometimes of North American origin (Davie, 1994: 136). Despite apparently encouraging signs for religion, especially of the conservative Christian variety, it must be remembered that the proportion of active believers in Britain is still small compared to that in the U.S. Over half of the North American population not only claims church membership but actually regularly attends services; in Britain less than 20% claim membership and fewer attend church (Bruce, 1990: 69). An important aspect of the visibility of conservative Christianity in the U.S. is its ability to appropriate the electronic media - especially as in recent years such Christians have grown more prosperous; in Britain partly for reasons discussed below) televangelists have made little progress. Few potential viewers are even aware that these preachers are available on cable or satellite broadcasts.

Not only are there far fewer evangelicals in Britain than in the U.S. - both in absolute terms and as a proportion of the total population - but the character of conservative Christianity in Britain is also rather different. In the U.S., such Christians have more extensive contemporary support combined with a history of having been, as far as was possible, the dominant, mainstream faith of the country in the 19th century. As a result, both the rhetoric and the aspirations of a religious majority have been retained, particularly since the revivals of the 1970s. In contrast, as Numbers (1992) notes, British evangelicalism has always been in a minority position and consequently has developed a stronger tradition of tolerance towards others - or at least a greater concern to keep a low theological profile. Bebbington

writes: "In Britain...the weakness of separatist fundamentalism meant that there was too narrow a social base for any counterpart to the 'Moral Majority'" (1994: 377). Even in *Biblical Creation*, in an article discussing the teaching of human origins in schools, the author accepts the need to present the theory of evolution while also pointing out its weaknesses and stresses the need to avoid mocking others who hold different views (Peet, 1982).

Even if British evangelicals had managed to gain a greater membership throughout this century, a number of factors would have hindered their attempts to gain a powerful voice in the religio-political mainstream. Those with access to sufficient organizational and financial resources can gain access to the American airwaves, and indeed some televangelists concentrate on "media ministries" alone. Most of the British media are rather more paternalistic and centralized in orientation. The BBC has in the past acted almost as the communicative equivalent of the Church of England, seeking to be internally tolerant within limits and certainly deciding what would be sufficiently educational and informative for its listeners and viewers. In religious terms, British broadcasting has moved in recent years towards a form of pluralism whereby representatives of different Christian denominations and non-Christian religions have been given some time on the airwaves. The Broadcasting Act of 1990 has in certain respects opened up electronic media to market forces, but broadcast channels have still generally been required to give time to denominations roughly in accordance with their size (Bruce, 1995: 55). The result has been to present a view of religion as essentially tolerant and ecumenical and, paradoxically, to edit out views considered extreme. Even the country's first exclusively religious radio station (Premier), which started broadcasting in 1995, has had to keep its message as noncontroversial and all-inclusive as possible in order to attract both advertisers and a sufficiently large share of the listening audience. In a context where deregulation has still not penetrated deeply and where money cannot buy mainstream broadcasting time, British creationists have concentrated much effort in breaking the perceived monopoly of the airwaves by liberals and evolutionists, but with relatively little success. As Numbers puts it (1992: 329): "If British

creationists envied one aspect of life in America it was 'freedom of the air'."

Not only are creationists - and evangelicals in general - denied widespread access to the media in Britain, but their ability to engage in the political process been much more restricted. As Bruce notes (1990: 125), in the U.S. the relatively more decentralized legislative and electoral systems have allowed well-organized interest groups to make their agenda seem salient, at least at local levels where concentrations of conservative Protestant populations may exist. Such groups can also of course invoke the rhetoric of minority rights and free speech in making their cases. In Britain, despite apparent governmental support for the values of individual responsibility and local community action, political power resides firmly in national, Parliament-controlled policies, while the courts are presided over by a judiciary appointed by a government politician, the Lord Chancellor.

Creationism in Education

From the first appearance of Darwinian theory, its supporters appear to have seized the initiative in British education - Thomas Huxley, for example, was a member of the London School Board. The centralization of the educational system over the last century, the diffuse influence on schools of the Church of England, and the small size of creationist groups all appear to be factors here. With the increase in non-Christian pupils in schools since the Second World War, evolutionary theory has at least had the virtue of not favoring any one religion's notion of human origins over any other.

The 1944 Education Act made religious worship and religious education (RE) in British schools a legal requirement for the first time (Cox, 1989: 1). It was tacitly assumed that (particularly Protestant) Christianity was the faith pupils would follow, although it was also assumed that no particular denomination would be favored in school assemblies. Accordingly, syllabi for each school district were to be decided by local bodies consisting of representatives from the Church of England, religious denominations, local political authorities and teachers' associations. The 1988 Education Act has sought to update rather than radically to alter the earlier legislation. It allows more influence from non-Christian bodies in local areas where this is relevant

and partially reflects the growing need for a multicultural perspective. However, it also stated that forms of worship and syllabi should indicate the fact that Britain is a broadly Christian country.

In the U.S., where religion is theoretically barred from public schools, science curricula have been the main policy target of creationists seeking "balanced treatment" of evolution with the Biblical story of creation. Individual school districts have found themselves pressured to drop evolution from the high school curriculum or to teach creationism alongside it. High school biology curricula in such states as Ohio were giving equal time to evolution and creationism in the 1980s (Berra, 1990). At that time over 20 states had "balanced treatment" bills waiting to be enacted (Locke, 1994).

British schools do not have to present creationism as a scientific alternative to theories of evolution in order to avoid charges of violating the separation between church and state. However, evolution is taught largely without protest in schools. In 1977 the head of a school's religious education department in England was actually dismissed because he refused to teach his county's agreed syllabus which treated the creation story as a myth (Barker, 1985: 183).

The extent to which British teaching practices accept theories of evolution as well as a relatively pluralistic, or at least comparative, orientation toward religion is revealed in an examination of current biology and religious studies programs. For instance, a biology syllabus for secondary-level (i.e. 11-18 year-old) pupils (Northern Examinations and Assessment Board, 1996: 7-19) includes a section on the knowledge of "selection, evolution and genetic engineering." The pupil is expected to learn that species have become extinct and that fossils provide information about adaptation and natural selection. The course does ideally include discussion of "social and ethical issues," but specifies that these are related to genetic engineering, selective breeding and cloning. Evolution *per se*, it is assumed, is not "an issue."

Such an approach can be compared with a sample from one religious education syllabus for secondary schools (Lohan and McClure, 1988). The Christian Education Movement, which is devoted to a liberal approach to teaching Christianity, has

identified what it calls "Common Areas of Content" (Blaylock, pers. comm.). These include "the origins and order of the universe" and "the place of humanity." We see here some familiar themes in contemporary religion, including a form of ecumenism that is consciously inclusive and internally diffuse. Course books have such titles as *Community, People, Story* (Lohan and McClure, 1988a) and *Communication, Celebration, Values* (Lohan and McClure, 1988b). The former of these two volumes includes a section on origins. Pupils are encouraged to read the "creation story" in Genesis and then reflect on their interpretations of these biblical passages; were the writers of the passage constructing "a story about their belief in a God who creates a good world [or] a scientific account about exactly how the world developed?" (p. 32). The possibility that a biblical text is produced by humans and need not provide an entire picture of the origins of the world is emphasized again at the bottom of the page, where the text juxtaposes the exclamation "Just a minute. Evolution - what's that?" with a picture of Darwin and a quotation: "My idea is that all forms of life have developed from simple living cells over millions of years."

Just as the title of the text emphasizes the social rather than transcendent aspect of religion in its title - referring to the notion of community - so the Fall of Adam and Eve is presented as "a breakdown in relationships," thereby depicting it in terms sufficiently generalized and humanly recognizable so as not to exclude non-Christians. Later, God as Creator is presented as a parent with worries over his children, while Genesis is said to present "an account of the beginning of things" (p. 69) - not, we notice, *the* account. Elsewhere in the text, the pupil learns, almost like an anthropologist, the beliefs and practices of the major world religions, juxtaposed and therefore in a sense made equivalent in a single course.

The outcome of this approach is often a graduate who values tolerance of opinion on the subject of evolution. For instance, a non-random sample of 20 British secondary school graduates was asked in a university class run by one of the authors to read a selection of different origin stories and then to comment on them in light of the theory of evolution. The students were enrolled in their first

year in an undergraduate degree in biological and cultural anthropology. Far from wanting to argue vociferously in favor of evolution, this group demonstrated only a weak adherence to its precepts. Most said that different beliefs about origins should be tolerated. Several doubted the correctness of natural selection, but all passed the final examination on evolutionary theory held several weeks later. As Demastes et al. (1995) note, lack of agreement with evolutionary thinking does not prevent students in a biology class for non-majors from using "scientific conceptions" when required. The students felt that the inclusion of RE classes along with biology at the secondary school level promoted their tolerance of differing beliefs. They also expressed the opinion that the intensity of debate between creationism and evolution in the U.S. results from Americans' being a less tolerant people than the British.

In the light of this minor example, it is worth remarking that the diversity and size of the American university system have encouraged the development of hundreds of independent institutions of evangelical character which have few counterparts in Britain (Bebbington, 1994: 374). As a consequence, a high proportion of American evangelicals move from school to college and graduate without having directly to encounter different views and faiths. In Britain, by way of contrast, Christian students at virtually all universities are exposed to a variety of religious perspectives. Scientists with a Christian organization called the Inter-Varsity Fellowship have actually led the way in endorsing evolution (Bebbington, 1994: 374).

The Future

The British cultural landscape seems likely to include (and perhaps thereby to defuse) minority views considered respectable, while filtering out those considered extreme. The U.S. system is more oriented toward encouraging well-coordinated and aggressive forms of activism, profiting from the adversarial style of the courts in attempting to make their cases. The nature of political and legal decision-making in Britain has not encouraged the coordination and streamlining of a creationist movement that has been fragmented and diffuse in its beliefs and aims. In the U.S., however, politically and legally disputed questions like school prayer and creationist

education have not just prompted debates over meaning and ultimate reality but also become tests of the influence that evangelicals can exert on the public sphere - flag-waving expressions of their ability to appropriate mainstream practices in the name of God (Woodrum and Hoban, 1992: 31).

Although we have argued that creationism is simply not a widely debated issue in Britain, a number of points in this paper have implied that possibilities for change in the future do exist. Increases in the deregulation of the media would help the creationists attempt to spread their message to as wide an audience as possible. If conservative Christianity manages to consolidate its position in opposition to liberalizing tendencies - particularly if reinforced by support from evangelicals abroad - then the grass roots support for the widespread dissemination for creationist views could grow. As Davie (1994: 70) has noted, an aspect of British evangelicalism in recent years has indeed been its gradual move toward corporate, social and potentially political activity rather than a more personal, quietistic orientation to the world.

Over the next few years, regional autonomy might well be gained in some form by the countries making up the U.K. Given such a development, Northern Ireland could provide a fertile ground for anti-evolutionist tendencies given its relatively high levels of religious activity compared to the rest of Britain. Furthermore, increased religious pluralism in Britain might ironically aid the evangelical cause by placing minority rights at the top of legislative and political agendas. The religious center of the country seems to be caving in, but this is not to say that its margins - including those occupied by creationists - are not maintaining themselves or in some respects becoming ever stronger.

Notes

1. A chapter in Wills's (1990) recent survey of religion and politics in America is actually entitled "Refighting Scopes."
2. It should not of course be assumed that Britain, or more accurately the U.K., is a homogeneous region. Levels of belief and practice tend to be higher in Northern Ireland, for instance, while in Scotland the Presbyterian rather than the Anglican Church represents the established faith. Wales, Scotland and Northern Ireland tend to be more Protestant than England (cf. Davie, 1994: 94). In addition, Scotland's

educational system is partially autonomous from the rest of the U.K. However, this paper examines the broad tendencies that can clearly be observed in the nation as a whole.

References

- Barker, E. "Let There Be Light: Scientific Creationism in the Twentieth Century." In *Darwinism and Divinity*, edited by J. Durant, pp. 181-204. Oxford: Blackwell, 1985.
- Barnes, E. W. Supplement to *Nature*. *Nature* 116 (11 July 1925): 74.
- Bebbington, D. W. *Evangelicals in Modern Britain. A History From the 1730s to the 1980s*. London: Unwin Hyman, 1989.
- Berra, T. M. *Evolution and the Myth of Creationism. A Basic Guide to the Facts in the Evolution Debate*. Stanford: Stanford University Press, 1990.
- Bruce, S. *The Rise and Fall of the New Christian Right. Conservative Protestant Politics in America 1978-1988*. Oxford: Clarendon Press, 1990.
- Bruce, S. *Religion in Modern Britain*. Oxford: Oxford University Press, 1995.
- Cox, E. 1989. "Introduction." In *Reforming Religious Education. The Religious Clauses of the 1988 Education Reform Act*, edited by E. Cox and J. M. Cairns, pp. 1-4. London: Kogan Page, 1989.
- Davie, G. *Religion in Britain Since 1945. Believing without Belonging*. Oxford: Blackwell, 1994.
- Demastes, S. S. "Students' Conceptions of Natural Selection and Its Role in Evolution: Cases of Replication and Comparison." *Journal of Research in Science Teaching* 32, no. 5 (1995): 535-550.
- de S. Cameron, N. M. "Creation in the News." *Biblical Creation* 3, no. 8 (1981): 4-7, 1981.
- Facey, R.A. *International Church Index (Doctrinal)*. Plymouth: PDS Printers, 1981.
- Hayward, A. *Creation and Evolution. The Facts and the Fallacies*. London: Triangle, 1985.
- Howgate, M.E., and A .J. Lewis. "Creationism in Confusion." *Nature* 311 (25 October 1984): 703.
- Locke, S. "The Use of Scientific Discourse by Creation Scientists: Some Preliminary Findings." *Journal for the Public Understanding of Science* 3 (1994): 403-424.
- Lohan R. and M. McClure. *Community, People, Story. A modular programme of religious education, Level 2*. London: HarperCollins, 1988a.

Lohan, R. and M. McClure. *Communication, Celebration, Values. A modular programme of religious education, Level 2*. London: HarperCollins. 1988b.

Northern Examinations and Assessment Board. *Biology Syllabus*. Manchester, England: Northern Examinations and Assessment Board, 1996.

Newbiggin, L. "Religion, Science and Truth in the School Curriculum." In *Christian Perspectives for Education*, edited by L. Francis and A. Thatcher, pp. 93-99. Leominster: Gracewing, 1990.

Numbers, R.L. *The Creationists. The Evolution of Scientific Creationism*. Berkeley: University of

California Press, 1992.

Peet, J. H. "The Teaching of Evolution and Creation." *Biblical Creation* 4, no.11 (1982): 5-10.

Ruse, M. *Darwinism Defended. A Guide to the Evolution Controversies*. Reading, Massachusetts: Addison-Wesley, 1982.

Waterhouse, E. Supplement to *Nature*. *Nature* 116 (11 July 1925): 79.

Wills, G. *Under God. Religion and American Politics*. New York: Simon and Schuster, 1990.

Woodrum, E., and T. Hoban. "Support for Prayer in School and Creationism." *Sociological Analysis* 53, no. 3 (1992): 309-321.

REVIEW ESSAY

SEE

PART II

Intellectual Impostures

By David Unsworth

Review of Alan Sokal and Jean Bricmont. *Intellectual Impostures*. London: Profile Books. 1998. £9.99. Paperback. ISBN 1-8619-7074-9.

Contents: Preface to the English edition. Introduction. Jacques Lacan. Julia Kristeva. Intermezzo: Epistemic relativism in the philosophy of science. Luce Irigaray. Bruno Latour. Intermezzo: Chaos theory and 'postmodern science'. Jean Baudrillard. Gilles Deleuze and Felix Guattari. Paul Virilio. Godel's theorem and set theory: Some examples of abuse. Epilogue. Appendix A: Transgressing the boundaries: Toward a transformative hermeneutics of quantum gravity. Appendix B: Some comments on the parody. Appendix C: Transgressing the boundaries: An afterword. Bibliography.

Introduction

Intellectual Impostures by Sokal and Bricmont arose directly from the infamous hoax perpetrated by Sokal upon the American cultural studies journal, *Social Text*. Sokal's article, *Transgressing the Boundaries: Towards a Transformative Hermeneutics of Quantum Gravity* (reproduced as an appendix in the book under review), was a parody compiled from nonsensical - but genuine - quotations about physics and mathematics culled from the works of a number of prominent French and American academics. The article berated natural scientists for clinging to the dogma 'imposed by the long post-Enlightenment

hegemony' which included the assumptions that there is an external world which is independent of individuals and that human beings can obtain objective, albeit imperfect, knowledge of physical laws. In addition to containing falsehoods, non sequiturs and pure nonsense, the article deliberately misrepresents and parodies theories within mainstream physics and mathematics to see whether these assertions would be challenged by the editors. No such challenges were raised.

The article was accepted and published only to be exposed as a hoax by Sokal himself. Sokal's objective had been explicitly political. It was to: