



## DIAGNOSING MORAL DISORDER: THE DISCOVERY AND EVOLUTION OF FETAL ALCOHOL SYNDROME

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**Abstract**—The diagnosis of fetal alcohol syndrome (FAS) was invented in 1973. This paper investigates the process by which a cluster of birth defects associated with exposure to alcohol *in utero* came to be a distinct medical diagnosis, focusing on the first ten years of the medical literature on FAS. Fetal alcohol syndrome was “discovered” by a group of American dysmorphologists who published the first case reports and coined the term FAS. However, the nature of the diagnosis and its salient symptoms were determined collectively over time by the medical profession as a whole. The paper traces the natural history of the diagnosis in the U.S. through five stages: introduction, confirmation and corroboration, dissent, expansion, and diffusion. FAS serves as an example of the social construction of clinical diagnosis; moral entrepreneurship plays a key role and the medical literature on FAS is infused with moral rhetoric, including passages from classical mythology, philosophy, and the Bible. FAS is a moral as well as a medical diagnosis, reflecting the broader cultural concerns of the era in which it was discovered, including a greater awareness of environmental threats to health, the development of fetal medicine, an emphasis on “the perfect child,” and a growing paradigm of maternal–fetal conflict. © 1998 Elsevier Science Ltd. All rights reserved

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### INTRODUCTION

Fetal alcohol syndrome (FAS), the constellation of symptoms including pre and/or postnatal growth retardation, central nervous system disorders including developmental delay and intellectual impairment, and characteristic craniofacial abnormalities linked to drinking during pregnancy, did not exist as a diagnosis twenty-five years ago. Yet today, FAS is widely cited as the leading preventable cause of birth defects in the U.S. (e.g., Warren and Bast, 1988; March of Dimes, 1992; CDC 1996; Stratton *et al.*, 1996) and “a major public health concern” (Stratton *et al.*, 1996). This paper explores the social construction of this diagnosis within the medical realm and the early evolution of FAS as both a clinical entity and a social problem in the minds of American doctors. I will argue that the diagnosis was shaped by the work of moral entrepreneurs in the field of medicine who “recognized” a new “syndrome”<sup>\*</sup> and ascribed an etiology to it, with little definitive proof. The term “fetal alcohol syndrome” was itself coined by a group of dysmorphologists who published the first three articles on

what they deemed “this tragic disorder,” but the nature of the diagnosis and its salient symptoms were determined collectively over time by a loose confraternity of medical practitioners and researchers. FAS thus serves as a case study of the diffusion of new knowledge in the medical community, illustrating how a new diagnosis enters and permeates the medical consciousness. This paper analyzes the first ten years of the medical literature on FAS, concentrating on the construction of the syndrome in the United States, where it was first discovered and where it has provoked the most concern. The paper outlines the early history of the diagnosis, drawing insight from social problems theory, examines the role of moral entrepreneurs in creating and disseminating new medical knowledge, and reveals the latent moral dimensions of the new diagnosis.

The recognition of a new disease or syndrome is sometimes the result of serendipity, but more often the result of determined investigation and scientific entrepreneurship. In the case of fetal alcohol syndrome, moral fervor powered the discovery as much as medical curiosity. Drinking during pregnancy—a social rather than a medical phenomenon—came to be considered a problem worthy of doctors’ ever-finite attention through the work of moral entrepreneurs. Howard Becker first described “moral entrepreneurship” in his 1963 book *Outsiders*. In his words, a moral entrepreneur is one who sees “some evil which profoundly disturbs him” (p. 147) and who sets out to remedy the situ-

<sup>\*</sup>A syndrome is “a group of symptoms and signs of disordered function related to one another by means of some anatomic, physiologic, or biochemical peculiarity.” Syndromes are often contested diagnoses—e.g., chronic fatigue syndrome, sudden infant death syndrome (SIDS), reflex sympathetic dystrophy—and as such are ripe for social construction analysis.

ation. Becker notes that while moral entrepreneurs are crusaders, on a holy mission, their crusades often have “strong humanitarian overtones” (p. 148). The moral entrepreneur believes that if other people do what he thinks is right, “it will be good for them” (p. 148). “Moral crusaders typically want to help those beneath them to achieve a better status” (p. 149). They derive power not only from the legitimacy of their moral position, but from their own “superior position in society” (p. 149). That is, moral entrepreneurs tend to be elites working to impress their moral vision on the rest of society. Becker cites prohibitionists and psychiatrists as typical moral entrepreneurs. In fact, Freidson has characterized the physician as an exemplary type of moral entrepreneur. Parsons (1975) has also noted the moral authority of the physician.

Since Becker, several observers have noted instances of moral entrepreneurship resulting in the creation of new diseases or diagnostic categories. Stephen Pfohl (1977), for example, characterized the discovery of child abuse as an instance of moral entrepreneurship; Peter Conrad (1975) and Frances McCrea (1986) have analyzed the moral entrepreneurship in the construction of hyperkinesis and menopause, respectively. Allan Brandt (1990: p. 159) has described the way “moral reformers”—who were epidemiologists and doctors as well—“equated moral dangers and health risks” in proving the causal link between cigarette smoking and lung cancer. In constructing a new diagnosis and by implication a social problem, doctors speak with unique authority: in our society, it is still primarily doctors who are granted the authority to identify a new disease. The medical-moral entrepreneurs who published on FAS thus held a formal medical mandate as well as a moral one.

#### DATA AND METHODS

In order to scrutinize the initial process of creating and establishing FAS as a diagnosis, I searched the medical literature for the period from 1966 through 1984 using the Medline database, which includes articles dating from 1966 to the present. Since the term “fetal alcohol syndrome” is not available as a keyword for searching articles published before 1976, I also used the keyword combinations “alcohol drinking and pregnancy,” “ethyl alcohol and pregnancy,” and “ethyl alcohol and abnormalities” for the entire period. The scope of the review was limited to English language articles concerning human subjects.\* Only a limited number of articles on the association between alcohol use and spontaneous abortion and alcohol and low

birthweight were reviewed for this analysis. For the period 1966–1972, preceding the first articles on FAS, there were more than 100 items (including articles, letters to the editor, and brief reports) on alcohol and pregnancy, the majority of these concerning the intravenous administration of ethanol to arrest preterm labor, at the time a common procedure (for example, see Fuchs *et al.* (1967)). Between 1973 and 1977, the first four years of the diagnosis, on average 41 items were published annually. In the next two years, an average of 74 items appeared annually, and from 1979 to 1984 more than 100 items appeared annually, with a peak of 160 items in 1981. Thus, there seems to have been sustained but subdued interest in the subject for the first several years after the diagnosis was created. However, it was not until the late 1970s and early 1980s that the literature really proliferated. It was in 1981 that the Surgeon General first issued guidelines recommending abstinence from alcohol for all pregnant women and those “considering pregnancy,” and urging health professionals to inquire routinely about the alcohol consumption of their pregnant patients (FDA, 1981).

#### THE HISTORY OF FAS AS A DISEASE: INTRODUCTION OF THE DIAGNOSIS

Three articles published over a 12 month period from June 1973 to June 1974 in the British medical journal *The Lancet* constitute the foundation for the novel diagnosis of FAS. All three articles were written by members of the Dymorphology Unit at the University of Washington School of Medicine in Seattle; these researchers constitute the core group of FAS moral entrepreneurs. David W. Smith in particular had an interest in identifying, naming and cataloging birth defects and was the author of an atlas of birth defects, *Recognizable Patterns of Human Malformation: Genetic, Embryonic and Clinical Aspects* (1970, first edition; 1976, second edition). The Dymorphology Unit’s identification of FAS was an extension of their work on chromosomal anomalies and part of a thrust in medicine at the time to categorize and name birth defects. In fact, in 1973 the U.S. Centers for Disease Control established the first nation-wide birth defects monitoring program.

The first article on this new diagnosis, “Pattern of malformation in offspring in chronic alcoholic mothers,” was published in June 1973, with Kenneth L. Jones, David W. Smith, Christy N. Ulleland and Ann Pytkowicz Streissguth sharing authorship (Jones *et al.*, 1973). This article was presented as an early warning call to clinicians; it stated, “The purpose of this report is to alert physicians and other health professionals to a pattern of altered morphogenesis and function in eight unrelated children who have in common mothers

\* Although there is an abundant literature on the effects of alcohol during pregnancy in animal subjects, a review of that literature would constitute a paper in and of itself. Thus, I will not consider it here.

who were chronic alcoholics during pregnancy” (Jones *et al.*, 1973: p. 1267). It presented detailed case reports of three Native American, three black, and two white children. The article noted the shared anomalies among these children, including developmental delay, microcephaly (abnormally small head), prenatal and postnatal growth deficiency, short palpebral fissures (which give the eye a round look), epicanthal folds (a distinctive feature of the eyelid), small jaws and flattened midface, joint anomalies, altered palmar crease patterns, and cardiac abnormalities. The authors concluded their observations by claiming that “the data are sufficient to establish that maternal alcoholism\* can cause serious aberrant fetal development. Further studies are warranted relative to the more specific cause and prevention of this tragic disorder” (Jones *et al.*, 1973: p. 1271).

The term “fetal alcohol syndrome” was first introduced in a second *Lancet* article five months later, written by two members of the Seattle team (Jones and Smith, 1973). This article described an additional three cases in Native American children, cataloged more of the children’s shared anomalies, and labeled the disorder.

In June 1974 the Seattle team (composed this time of Jones, Smith, Streissguth and Ntinios C. Myriantopoulos) published a third article, “Outcome in offspring of chronic alcoholic women” (Jones *et al.*, 1974), again in *The Lancet*. In this study, they used data from the Collaborative Perinatal Project of the National Institute of Neurological Disease and Stroke; the data were retrospective and based on chart reviews. They were able to identify 23 women with a history of chronic alcoholism and six cases of suspected FAS among these 23 women. Among these 23 women, they noted that perinatal mortality was 17%, 44% of surviving children had borderline to moderate mental deficiency, and 32% had abnormal physical features indicative of FAS. These 23 cases of maternal alcoholism and six cases of suspected FAS (none of the children was actually seen or definitively diagnosed) were found in a total sample of 55,000 cases, yielding both a very low incidence of FAS as well as little evidence that heavy drinking during pregnancy was a widespread problem.

\*Jones *et al.* wrote that the women “all satisfied the criteria for alcoholism as published in 1972 by the Criteria Committee, National Council on Alcoholism” (Jones *et al.*, 1973: p. 1267). According to their tabulations, these women had been alcoholics on average for more than nine years, more than half were known to experience delirium tremens, and at least one quarter suffered cirrhosis and nutritional anemia. In other words, their alcoholism posed severe threats to their own health.

† This article by Lemoine *et al.* was not recognized in the English-language medical literature until after 1973; however, it is often noted as “the first report of FAS.”

Although there were intermittent reports prior to 1973 noting a tendency for chronic alcoholic women to give birth to babies with a low birth-weight and a 1968 article reporting on 127 children of alcoholic women published in a French medical journal,† the three *Lancet* articles by the Seattle team were the first to delineate systematically and to label the association between chronic maternal alcoholism and a specific configuration of severe birth defects. These three articles—a total of 11 case reports and an uncontrolled, retrospective cohort study—formed the foundation for the diagnosis of FAS. The process of building on that foundation occurred in several stages.

#### CONFIRMATION AND CORROBORATION

In the first of these stages, the Seattle team’s observations were quickly followed by a spate of articles, letters to the editor, and case reports describing newly recognized patients with FAS (e.g., Ferrier *et al.*, 1973; Christoffel and Salasky, 1975; Tenbrinck and Buchin, 1975; Mulvihill *et al.*, 1976; Hanson, 1976; and Turner, 1979). Like the initial *Lancet* articles, these articles were based on case studies, typically small in number. Sometimes even reports of a single case were published, as in the December 1973 letter to the editor of the *Lancet* that begins, “Sir, we think that we have observed a case of the ‘fetal alcohol syndrome’ described by Jones *et al.* . . .” (Ferrier *et al.*, 1973). Although these articles primarily confirmed the original diagnosis, they occasionally added new symptoms. For the first several years, authors reported an unofficial tally of known cases, ticking up slowly from 11 (Jones and Smith, 1973) to 26 (Mulvihill *et al.*, 1976) to 41 (Hanson *et al.*, 1976) and so on. This count continued for years after the diagnosis was first introduced to the medical literature—the highest tally I could find in any article was 618 (Smith, 1979). In this phase, documentation of individual cases still held a special status; the phenomenon was not yet documented or measured at the population level, but consisted rather of a gradual aggregation of individual cases. For example, one article in *Early Human Development* proudly announced: “The world’s literature has been scoured to obtain data on 492 examples of the fetal alcohol syndrome (FAS) in the Northern Hemisphere” (Renwick and Asker, 1983: p. 99), a crude kind of meta-analysis. In this phase, almost every author who published on FAS committed a small act of moral entrepreneurship by taking part in the process of collective determination that shaped the diagnosis of FAS. Blumer’s theory of the collective definition of social problems is applicable here. Just as “a social problem exists primarily in terms of how it is defined and conceived in a society” (Blumer, 1971: p. 300), a diagnosis exists in terms of how it is defined and conceived in the society of medicine. Although fetal

alcohol syndrome was initially “discovered” by Smith and his colleagues, what FAS actually was—how to recognize it in a patient, what symptoms it encompassed—was not determined solely by the Seattle team.

#### DIAGNOSTIC DISSENT: QUESTIONING FAS AND ITS ETIOLOGY

Concurrently, articles questioning the diagnosis appeared. Some colleagues challenged Jones and Smith to define “severely chronically alcoholic” (e.g., Sturdevant, 1974). Others questioned whether there was in fact a “similar pattern” of defects among the original 11 cases on which the diagnosis is based (Johnson, 1974) or noted that the data were uncontrolled and retrospective (Mankad and Choksi, 1976). In letters to the editors of various journals, there was a serious debate about the correlation of maternal alcoholism with other factors that put the fetus at risk, such as malnutrition, poverty, inadequate prenatal care, and smoking, and about whether alcohol itself was the causative agent (e.g., Sneed, 1977; Mendelson, 1978; Wilson, 1981; Amman *et al.*, 1982; Çavdar, 1983; Çavdar, 1984). Other articles noted that both the frequency and the severity of defects in the offspring seemed to be correlated with the severity of the woman’s drinking problem and “hypothesized that embryonic disturbance is not as dependent on the amount of daily alcohol consumption as it is on the stage of maternal alcoholism” (Majewski, 1981: p. 129). Despite the resonance of this hypothesis with the original case reports of FAS, in which the mothers’ acute alcoholism drastically threatened their own health, the medical literature continued to focus on any alcohol exposure in any pregnancy as risky.

A few articles attempted to address the awkward fact that many heavy drinkers deliver normal babies by postulating that an inability to process acetaldehyde, one of the by-products of ethanol breakdown, results in a particularly high blood concentration of acetaldehyde in the fetuses of some women (Véghelyi and Osztovcics, 1978; Dunn *et al.*, 1979; and Abel, 1982). Acetaldehyde is both cytotoxic and highly teratogenic. Yet despite the potential of this hypothesis to explain why only some heavy drinkers and why even some moderate drinkers deliver babies with FAS, it was quickly discarded.\* Alcohol was assumed and accepted as the teratogenic agent at work.

\*This hypothesis has recently been reintroduced by molecular biologists who suspect that a deficiency in the enzyme alcohol dehydrogenase that breaks down ethanol may leave some fetuses at increased risk of developing birth defects (Kolata, 1995).

Although this debate about the etiology of FAS appeared in the American medical literature, it was primarily and most vigorously carried on by European doctors and scientists. Thus, the early debates on the etiology of what was called “fetal alcohol syndrome” in the U.S. followed a trajectory parallel to that Gusfield has demonstrated for drinking and driving. “In focusing almost exclusively on the factor of alcohol, [the debate] necessarily turns one element in a complex pattern of ‘causes’ into a single major factor” (Gusfield, 1981: p. 72). In the case of FAS, the single-minded focus on alcohol as the sole cause of the observed outcome blinded doctors to the social context in which prenatal exposure to alcohol occurred and to any potential ameliorating or exacerbating factors. Every woman was equally at risk; yet, that assumption contradicted research findings that suggested that even among chronic alcoholics, not every woman would have a baby with FAS. Moreover, some studies suggested that the appearance of the syndrome could be heavily influenced by other maternal characteristics. For example, one study that examined women who had at least three drinks a day during pregnancy found a rate of FAS of 71% among children of low-income women, compared with a rate of only 4.5% among women of higher socioeconomic status. The key difference between these two groups was their nutritional status during pregnancy (Bingol *et al.*, 1987).

In addition, there was some debate about moderate drinking vs. “alcoholism” as a risk factor for FAS. However, a letter to the editor of *The Lancet* that questioned “why the syndrome remains rare while social drinking during pregnancy is so common” expressed a doubt that was rarely seen in the literature (Dunn *et al.*, 1979: p. 44). Such deductive reasoning was largely ignored and most of the skepticism was soon overwhelmed by claims that “the data supporting the presence of a fetal alcohol syndrome are enormous” (Chernoff, 1979: p. 7) and that “the existence of FAS can no longer be denied” (Krous, 1981: p. 307).

Although dissent about the diagnosis of FAS was largely dismissed and had little impact at this point in its history, such dissent may nevertheless be integral to the establishment of the disease in several ways. It is part of what Gusfield calls “the selecting and compressing process by which... facts emerge” (Gusfield, 1981: p. 43). The very existence of dissent implies that the diagnosis was subject to professional debate and vetting. The fact that such debate was ultimately fruitless may even impart a specious reality to the diagnosis. Lipton and Hershaft (1985) have also noted the speed with which even dubious medical findings may be widely accepted within the medical community and the difficulty of extirpating medical “knowledge” once it has taken hold. In addition, Koren *et al.* (1989) have demonstrated a “bias against the null hypoth-

esis” in the case of the effects of cocaine in pregnancy: studies showing no adverse effect were less likely to be reported than those that demonstrated a positive association, even though the latter were typically less sound scientifically. The bias towards positive results in the scientific literature is exacerbated when there is an overt moral dimension to the research question at hand, as in the case of substance use in pregnancy.

Moreover, the construction of FAS in the U.S. medical imagination stands in distinct contrast to that in Europe. In the U.S. the risk is construed as absolute and universal. Europeans, who drink at much higher rates than Americans and who have much more liberal attitudes towards alcohol, viewed the turmoil over FAS in the U.S. with bemused skepticism. The distinction between European and American attitudes is evident along several dimensions. (1) Europeans take seriously the research question of whether there is in fact “a level of consumption which could be considered safe for the fetus which would allow the mother to take part in social gatherings, including meals, without absolute abstinence” (Florey and Taylor, 1992: S6). It is all but impossible to imagine such a statement appearing in an American journal, infused as the American literature is with the spirit of temperance. The European literature is much more likely to *suggest* that women be “discouraged” from drinking during pregnancy, rather than to *mandate* that they abstain. In the U.S., both risk and the subsequent prohibition against drinking are absolute, whereas in Europe, the literature on FAS frequently acknowledges gradations of risk: “the evidence is consistent with there being no harm associated with the consumption of a drink a day or less during pregnancy” (Olsen, 1992: S82). (2) The European medical literature frequently evinces concern for the harmful effect of scaring women with dire caveats, noting that “strong warnings without scientific justification cause guilt and concern which may be harmful for the mother and her child” (Olsen, 1992: S82). (3) European researchers, unlike their American counterparts whose writing betrays more moralism than pragmatism, have made a concerted effort to test interventions to reduce alcohol consumption during pregnancy among women who drink heavily. (4) Finally, Europeans seem more willing to admit ambiguity and uncertainty, to acknowledge that “past experience warns against making global inference from limited scientific experience and mix[ing] scientific evidence with moral attitudes” (Olsen, 1992: S83). Although the European literature is not without its own moral overtones, the differences between American and European views of FAS parallel more general differences in risk perception between the two cultures (Jasanoff, 1990).

#### WIDENING THE DIAGNOSIS AND THE SCOPE OF EXPERTISE

Even before dissent about the existence and etiology of fetal alcohol syndrome began to recede, the diagnosis entered an expansive phase. Joel Best (1990) identified the process of “domain expansion” in his study of missing children in the U.S., a case study in moral entrepreneurship. In describing the construction of social problems, Best writes:

Initial claims-making must persuade people that a problem exists. Once these early claims gain acceptance and the problem becomes well established, with its own place on the social policy agenda, claimants may begin reconstructing the problem. Reconstructing a social problem requires revising the claims-makers’ rhetoric. In particular, claims-makers are likely to offer a new definition, extending the problem’s domain or boundaries, and find new examples to typify just what is at issue (Best, 1990: p. 65).

The process that Best describes as occurring in the public arena is visible in the medical literature on FAS as well. Processes of “diagnosis expansion” and “expertise expansion” parallel to Best’s “domain expansion” characterize the next stage in diagnosis-building. Articles that exemplify diagnosis expansion were often published in the journals of medical specialties; they delineated what the authors believed to be previously unrecognized symptoms of FAS. Furthermore, such articles typify the process of expertise expansion by staking a claim for the role of the authors’ unique expertise within the territory of this new medical phenomenon, in both diagnosis and research. There were frequent references to the “exciting new field” (e.g., Clarren and Smith, 1978a) or to “new opportunities for research.” These articles reported on individual case studies or small, non-random samples. They typically asserted that a particular new symptom could be used to diagnose FAS and that a particular medical specialty could contribute to FAS research. Thus, these articles both expanded the criteria used to recognize and diagnose FAS and they expanded the range of specialists who can claim authority to contribute to knowledge of and research on FAS. Table 1 illustrates articles of this type and the claims they typically make.

A 1981 item in the “Medical News” section of the *Journal of the American Medical Association (JAMA)*, for example, began with the claim that “Tortuosity of the retinal vessels—both arterial and venous—may be a dead giveaway that a young patient is suffering from fetal alcohol syndrome” (González, 1981: p. 108) and went on to report on a study of 17 cases of FAS presented at a meeting of the American Academy of Ophthalmology. Vessel tortuosity was a “new finding” and “may be of help in diagnosing questionable cases of fetal alcohol syndrome,” according to the article (González, 1981: p. 108).

Likewise, a 1980 article in *Teratology* claimed “The abnormalities of dermatoglyphics (the pattern

Table 1. Sample of articles illustrating diagnosis and expertise expansion

Author(s) and date	Journal	Title	Claims
Møller <i>et al.</i> , 1979	<i>The Lancet</i> (letter to the editor)	Hepatic dysfunction in patient with fetal alcohol syndrome	"Hepatic dysfunction has not previously been described in connection with fetal alcohol syndrome—perhaps it has been overlooked because of silent symptoms or perhaps it is a very rare complication of the syndrome."
Khan <i>et al.</i> , 1979	<i>The Lancet</i> (letter to the editor)	Hepatoblastoma in child with fetal alcohol syndrome	"Transplacental exposure to alcohol could have promoted liver cancer in this infant."
Steed and Woolf, 1979	<i>American Heart Journal</i>	Cardiovascular malformations in the fetal alcohol syndrome	"Pulmonary artery dysplasia is a unique deformity, but appears to be a common cardiovascular anomaly in this syndrome."
Qazi <i>et al.</i> , 1980	<i>Teratology</i>	Dermatoglyphic abnormalities in the fetal alcohol syndrome	"The abnormalities of dermatoglyphics (the pattern of palmar creases and whorls) reported here constitute a valuable marker trait of the teratogenic effect of alcohol on fetal development and provide additional diagnostic signs for the fetal alcohol syndrome."
Cremin and Jaffer, 1981	<i>Pediatric Radiology</i>	Radiological aspects of the fetal alcohol syndrome	"A survey of our cases has shown that skeletal maldevelopment is a part of the syndrome and can help in its early recognition."
González, 1981	<i>Journal of the American Medical Association</i>	New ophthalmic findings in fetal alcohol syndrome	"Such conditions . . . may be of help in diagnosing questionable cases of fetal alcohol syndrome."
Tredwell <i>et al.</i> , 1982	<i>Spine</i>	Cervical spine anomalies in fetal alcohol syndrome	"The occurrence of neck fusion in the fetal alcohol syndrome is common enough for it to be used in making the diagnosis."
Adickes and Shuman, 1983	<i>Pediatric Pathology</i>	Fetal alcohol myopathy	"The disorder at the ultrastructural level in these damaged muscles from infants with the fetal alcohol syndrome is a unique constellation, warranting the term 'fetal alcohol myopathy.'"
Garber, 1984	<i>Journal of the American Optometric Association</i>	Steep corneal curvature: a fetal alcohol syndrome landmark	"Keratometry is recommended as a routine test in evaluating suspected FAS children and appears to have value in screening the general school population for FAS."
Yellin, 1984	<i>Neuroscience and Biobehavioral Reviews</i>	The study of brain function impairment in fetal alcohol syndrome: some fruitful directions for research	"It is concluded that FAS research efforts will benefit from the inclusion of psychophysiological studies."

of palmar creases and whorls) reported here constitute a valuable marker trait of the teratogenic effect of alcohol on fetal development and provide additional diagnostic signs for the fetal alcohol syndrome" (Qazi *et al.*, 1980: p. 157).<sup>\*</sup> A 1982 article in *Spine* asserted that "The occurrence of neck fusion in the fetal alcohol syndrome is common enough for it to be used in making the diagnosis" (Tredwell *et al.*, 1982: p. 331). Occasionally, this zeal to find new diagnostic tools for FAS was extreme, as in a 1984 article in the *Journal of the American Optometric Association* that found that steep corneal curvature was a symptom of FAS and concluded "Keratometry is recommended as a routine test in evaluating suspected FAS children and appears to have value in screening the general school population for FAS" (Garber, 1984: p. 595). Presumably, the mental retardation that is a hallmark of FAS would constitute a clearer marker of the syndrome in school children than the shape of their corneas.

<sup>\*</sup>Abnormal dermatoglyphics are also characteristics of Down's syndrome.

Articles of this type typically reported on uncontrolled studies, based on observations of small numbers of children affected with FAS. However, this approach is flawed in that it looks for clusters of defects only in the children of women who are known alcoholics and for additional markers of FAS only in children who are already diagnosed with FAS. There is no comparison with or reference to the distribution of these defects or diagnostic markers in the population at large. For example, what do we know about the incidence of steep corneal curvature in the general population; is it truly a distinctive feature of FAS only? Like much of the medical and scientific literature, the literature on FAS is oriented towards positive findings.

#### DIFFUSING THE DIAGNOSIS: "FAS 101" FOR BEGINNERS

The final stage of the early literature on FAS I have designated as "FAS 101" articles. These articles were also typically published in specialty journals, but they did not make new diagnostic or research claims. Rather, these were review articles intended to acquaint medical subspecialists with the diagnosis; they illustrate the process of educating a

Table 2. Sample of articles illustrating "FAS 101"

Author(s) and date	Journal	Title of article
Regional journals		
Stanage <i>et al.</i> , 1983	<i>South Dakota Journal of Medicine</i>	Fetal alcohol syndrome—intrauterine child abuse
Corrigan, 1976	<i>Texas Medicine</i>	The fetal alcohol syndrome
LeFrancois, 1984	<i>Vermont Registered Nurse</i>	Fetal alcohol syndrome: maternal alcohol ingestion: serious consequences in pregnancy
Journals of professional associations		
Jones, 1975	<i>Addictive Diseases: an International Journal</i>	The fetal alcohol syndrome
Altman, 1976	<i>Journal of Pediatric Ophthalmology</i>	Fetal alcohol syndrome
Streissguth, 1977	<i>American Journal of Orthopsychiatry</i>	Maternal drinking and the outcome of pregnancy: implications of child mental health
Robinson, 1977	<i>Developmental Medicine and Child Neurology</i>	Fetal alcohol syndrome
Streissguth, 1978	<i>American Journal of Epidemiology</i>	Fetal alcohol syndrome: an epidemiologic perspective
Rivard, 1979	<i>The Journal of School Health</i>	The fetal alcohol syndrome
Chernoff, 1979	<i>Currents in Alcoholism</i>	Introduction: a teratologist's view of FAS
Smith, 1979	<i>Hospital Practice</i>	The fetal alcohol syndrome
Rosenlicht <i>et al.</i> , 1979	<i>Oral Surgery, Oral Medicine, Oral Pathology</i>	Fetal alcohol syndrome
Abel, 1980	<i>Psychological Bulletin</i>	Fetal alcohol syndrome: behavioral teratology
Toutant and Lippmann, 1980	<i>American Family Physician</i>	Fetal alcohol syndrome
Lindor <i>et al.</i> , 1980	<i>Journal of Obstetric, Gynecologic and Neonatal Nursing</i>	Fetal alcohol syndrome: a review and case presentation
Beagle, 1981	<i>Journal of the American Dietetic Association</i>	Fetal alcohol syndrome: a review
Bader and Weitzman, 1983	<i>American Journal of Optometry and Physiological Optics</i>	Fetal alcohol syndrome
Ouellette, 1984	<i>Journal of Dentistry for Children</i>	The fetal alcohol syndrome
Davis and Frost, 1984	<i>Journal of Community Health Nursing</i>	Fetal alcohol syndrome: a challenge for the community health nurse

vast, diverse population of doctors and other medical practitioners, who are increasingly confined to the realm of their own specialty, about FAS. These articles tended to cite heavily the three original *Lancet* articles (Jones *et al.*, 1973; Jones and Smith, 1973; and Jones *et al.*, 1974), although they appeared as much as ten years later. These articles typically claimed that FAS is a major public health problem, or the leading cause of mental retardation, or the leading preventable cause of birth defects (e.g., Hanson *et al.*, 1976; Clarren and Smith, 1978b; Gordon and Lieber, 1979; NICHD, 1979; Smith, 1979; and Clarren, 1981). Members of the original Seattle team wrote or co-wrote many of the FAS 101 articles, such as articles by Streissguth in the *American Journal of Orthopsychiatry* (1977) and *American Journal of Epidemiology* (1978), by Smith (1979) in *Hospital Practice* and by Jones (1975) in *Addictive Diseases*. Two general categories of journals published FAS 101 articles: regional medical association journals such as *Texas Medicine* and *Vermont Registered Nurse*, and journals of professional associations, such as *Journal of the American Dietetic Association*, *American Journal of Optometry and Physiological Optics* and *Journal of Dentistry for Children*. Table 2 illustrates articles of

this type and the kinds of journals where they were published.

The FAS 101 articles typically exemplify a second type of diagnosis expansion: an enlargement of etiology and therefore risk. In their public health orientation and their alarmist tone, FAS 101 articles rapidly shifted the locus of risk from *alcoholics* to *alcohol use*, especially what authors called "social drinking." Whereas the classic diagnosis outlined by the Seattle team in the *Lancet* articles stipulated that the mother be a "chronic alcoholic" and that the child manifest a specific constellation of symptoms, the diagnosis of FAS has expanded over time to presume that any and all drinking during pregnancy harms the child in diffuse and multiple ways, another instance of domain expansion, or what Best calls "reconstructing the problem." Claims such as that "FAS ranges in severity from barely perceptible signs to debilitating abnormalities" (Toutant and Lippmann, 1980: p. 114), often made without proof, altered the diagnosis as originally articulated and broadened the social problem. In fact, the very terms used to denote the diagnosis proliferated to include "fetal alcohol effect" (FAE), "alcohol-related birth defects" (ARBD), and even "possible FAS."\* One author asserted, "As this is not an 'all-or-none' phenomenon, a milder degree of damage must occur, and this may be a contributing factor in babies who fail to thrive, children with minor motor disturbances and children with school learning problems" (Turner, 1978: p. 18). "Failure to thrive" is just the kind of diffuse, common, highly

\*The U.S. Institute of Medicine's 1996 report on FAS is a sterling example of this kind of diagnosis expansion. It created a complex hierarchy of degrees of FAS, including a designation of "partial FAS." What such a term truly means—that the observed birth defects are themselves only "partial" ones, that alcohol only "partially" caused the defects—remains unclear.

non-specific condition that is attributed to fetal alcohol exposure. Drinking during pregnancy was beginning to be held accountable for a whole range of medical and psychosocial problems in children. As Smith (1979: p. 121) contended, "The pertinent clinical question is not 'Does this child have FAS?' but 'Is this child's problem secondary to alcohol exposure *in utero*?' " According to him, "the implications of the existing data reach far beyond the alcoholic mother" (Smith, 1979: p. 121), suggesting that *any* drinking by *any* pregnant woman was dangerous. According to this formulation, diagnosing a child with FAS or FAE at times seems less a clinical exercise than a kind of moral crusade. Smith's reasoning places implicit blame for the medical and psychosocial problems of children on the mother's drinking during pregnancy. Thus, in the U.S., doctors and researchers have shifted concern from chronic alcoholism to moderate or so-called "social" drinking. The U.S. Surgeon General's 1981 warning exemplifies this expansion of risk. "The Surgeon General advises women who are pregnant (or considering pregnancy) not to drink alcoholic beverages and to be aware of the alcoholic content of foods and drugs" (FDA, 1981). Note that it targets not just alcoholic women, but all pregnant and even potentially pregnant women. Moreover, it suggests that even minuscule amounts of alcohol may be teratogenic. Thus, FAS enjoys what Best (1990: p. 58) calls "the rhetorical advantages of broad definitions." The scope of the problem depends on the definition of the syndrome, or the range of congenital and developmental problems in children attributed to alcohol exposure *in utero*. The broader that range is, the wider is the social problem represented by FAS and the greater the medical imperative to do something about it.

#### "HISTORICAL EVIDENCE" AND THE RHETORIC OF REDISCOVERY

The report of an association between maternal alcoholism and birth defects was initially treated as a new observation. "This seems to be the first reported association between maternal alcoholism and aberrant morphogenesis in the offspring," wrote Jones *et al.* (1973: p. 1267) in their first *Lancet* article. "Past evidence from animal experiments and human experience has not given clear indication of an association between maternal alcoholism and aberrant morphogenesis in the offspring" (italics added) (Jones *et al.*, 1973: p. 1270). Yet only six months later, the same researchers published an article claiming, "Historical reports indicate that the observation of an adverse effect on the fetus of chronic maternal alcoholism is not new" (Jones and Smith, 1973: p. 999). A rhetoric of

rediscovery thus early entered the medical literature on FAS. This rhetoric of rediscovery and its strong moral undertones are one of the most salient features of the early literature on FAS. Claims that an association was "recognized at least 250 years ago" (Erb and Andresen, 1978: p. 644), "has been suspected for centuries" (Clarren and Smith, 1978b: p. 1063 and Smith, 1979: p. 121), and even observed "since antiquity" (Tenbrinck and Buchin, 1975: p. 1144; and Clarren, 1981: p. 2436) permeate the literature. Authors claimed that FAS was "not a new observation" (Jones and Smith, 1975: p. 1) or that "it is not new but has been rediscovered several times" (Mulvihill\* *et al.*, 1976: p. 941; see also Warner and Rosett, 1975; and Buckalew, 1979). "Historical evidence" was used to bolster these claims of rediscovery; however, this "evidence" hardly meets acceptable modern standards of medical evidence; indeed, it often does originate in antiquity.

For example, one of the most common references was to an ancient Greek and Roman belief that intoxication at the time of procreation results in the birth of a damaged child, as expressed, many authors claimed, in the myth of Vulcan (Jones and Smith, 1973; Green, 1974; Jones and Smith, 1975; Corrigan, 1976; Turner, 1978). Some articles even noted that "Vulcan, the deformed blacksmith of the gods, was said to be the result of such influence" (Green, 1974: p.713). Several articles also referred to passages from Greek "philosopher/scientists," as they were called by one author (Abel, 1982). Aristotle's contention that "Foolish, drunken and harebrained women most often bring forth children like unto themselves, morose and languid" was quoted in *Pathology Annual* (Krous, 1981: p. 295). An article in *Human Biology* cited a passage from Plato's *Laws* that "It is not right that procreation should be the work of bodies dissolved by excess wine, but rather that the embryo should be compacted firmly, steadily and quietly in the womb" (Abel, 1982).

Another common reference was to an ancient Carthaginian custom prohibiting drinking on the wedding night. This custom was attributed to a concern to prevent conception under the influence of alcohol (Jones and Smith, 1973; Jones and Smith, 1975; Streissguth, 1977; Streissguth, 1978; Turner, 1978; Smith, 1979; Lindor *et al.*, 1980; Wilson, 1981). The Judaeo-Christian tradition also yielded purported evidence in the form of an Old Testament verse in which an angel speaks to a woman, telling her "Thou shalt conceive, and bear a son; and (therefore) now drink no wine or strong drink, and eat not any unclean thing" (Judges 13:7) (Clarren and Smith, 1978b; NICHD, 1979; Smith, 1979; Krous, 1981; Wilson, 1981; Abel, 1982). This verse even stood as an epigram to a 1978 article on FAS in the *New England Journal of Medicine* (Clarren and Smith, 1978b: p. 1063).

\*John Mulvihill was one of David Smith's students at the University of Washington Medical School.



However, all of these quasi-historical allusions were misconstrued. As Abel (1984a: p. 1) states, “Nearly all the statements investing the ancient and medieval past with precognition of this disorder are wrong.” In ancient Greece, Rome, and Carthage, the belief was not that drinking during pregnancy harmed the child, but that intoxication *at the moment of conception*—not during gestation—led to deformity (Abel, 1984a). The ancient Romans also used wine as an abortifacient (Plant, 1997), another reason that pregnant women may have been warned not to drink. Furthermore, the ancient belief was that the *father’s* drunkenness could affect the conception, as much as or more than the woman’s. Despite FAS authors’ frequent references to the lame god Vulcan, his deformity is never attributed to his mother’s drunkenness in ancient myth; in fact, his lameness is not even a congenital defect, but the result of injury (Graves, 1955; Hamilton, 1969). The Old Testament passage was misinterpreted as well. The injunction not to drink stems not from any awareness of the dangers of drinking during pregnancy, but from the child’s status as a Nazirite, a group forbidden among other things (including cutting their hair) to take any intoxicants (Abel, 1984a). Moreover, as Mary Douglas (1966) notes, ritual prohibitions are just that: ritual, not necessarily based on evidence or experience of harm from exposure.

In addition to these ancient references, two studies from the nineteenth century were also frequently noted in the FAS literature. The first was an 1834 report to the House of Commons in Britain, noting the “starved, shrivelled and imperfect look” of children born to heavy drinkers (Jones and Smith, 1973; Jones and Smith, 1975; Streissguth, 1977; Streissguth, 1978; Turner, 1978; Smith, 1979). The second was Sullivan’s 1899 study of women in a Liverpool prison that found that among 600 children of 120 women, spontaneous abortion and stillbirth rates were higher among chronic alcoholics and that their surviving children had an increased frequency of epilepsy (Jones and Smith, 1973; Green, 1974; Jones and Smith, 1975; Streissguth, 1977; Streissguth, 1978; Wilson, 1981).

Finally, one of the most interesting pieces of historical “evidence” marshaled in support of FAS was a 1751 engraving by William Hogarth. Made during England’s “Gin Epidemic,” the print depicts the chaos and social disorder attributed to the sudden abundance of cheap gin among London’s lower classes. Although the engraving was meant to be social satire, an exaggeration rather than an accurate depiction, a 1981 article in the *Journal of the American Medical Association* treated the print

quite literally and attempted to diagnose FAS in one of the figures in it. The author wrote:

The facial appearance of the child (falling off the lap of the woman seated in the foreground) is worthy of note. The eyes have a shorter than normal palpebral fissure, resulting in relatively round, “Orphan Annie” eyes. These are one of the features of the effects of maternal alcohol on fetal morphogenesis, described by Jones *et al.* as part of the fetal alcohol syndrome (Rodin, 1981: p. 1239).

However, many of the figures in the print are depicted with unusually round eyes; Rodin mistook a stylistic device on Hogarth’s part for medical evidence.\* In fact, in the companion piece to “Gin Lane,” called “Beer Alley,” in which Hogarth contrasts the salubrious nature of beer drinking with the debauchery induced by gin, many of the figures have the same round eyes.

Moreover, the rhetoric of rediscovery took on a life of its own; any historical mention of alcohol, pregnancy, and birth defects was inflated to evidence. It is telling that the authors often reported the particulars of this “evidence” incorrectly. For example, the Carthaginian prohibition against drinking on the wedding night was at times referred to as a Greek or Roman custom (e.g., Streissguth, 1978). The date of the 1834 report to the House of Commons was variously cited as “in the 1700 s” (Streissguth, 1978), in the “18th century” (Streissguth, 1977; Lindor *et al.*, 1980) and as 1934 (Turner, 1978). One article dated Sullivan’s 1899 study as “1800” (Lindor *et al.*, 1980). Since historical evidence was repeated uncritically from one article to the next, these errors proliferated in the literature. The imprecision of these references, itself atypical in the highly detail-conscious medical profession, betrays the latent functions of this so-called evidence.

Indeed, such “historical evidence” is atypical in the medical literature and demands that we ask why it is brought to bear on FAS. What is the purpose of these citations to passages from the Bible, from myth, from ancient texts, from art history, and from nineteenth-century England—what Abel (1984a) calls “the alleged history” of FAS? The rhetoric of rediscovery took on such an important role in the early literature on FAS for four main reasons. First, these historical and quasi-historical references were an attempt to augment the sparse data initially available to document the existence of the newly recognized syndrome. Faced with extremely small numbers of cases, FAS entrepreneurs sought to bolster the available evidence with references to the past. Early articles on FAS proceeded almost formulaically, marshaling ancient evidence, then moving forward through time to Jones and Smith (1973). One author publishing in the *Journal of the American Medical Association* in 1981 went so far as to put the historical record on a par with contemporary evidence, claiming that:

\*A review article in the *Annals of the New York Academy of Science* also uses Hogarth’s engraving, claiming that “the relationship of intoxication to child abuse and neglect is apparent” (Rossett, 1976: p. 16).

At present we are only a little more advanced in our knowledge of the pathogenesis of the fetal alcohol syndrome; no more concise statement of the overall problem has been made than that of the Middlesex Sessions Committee in 1735: "Unhappy mothers habituate themselves to these distilled liquors, whose children are born weak and sickly, and often looked shrivel'd and old" (Rodin, 1981: p. 1238).

By claiming that knowledge has not advanced since the eighteenth century, Rodin privileges historical reports, suggesting that in the case of fetal alcohol syndrome we need not look to scientific or even contemporary evidence to find proof of the authenticity of the diagnosis. History and myth are advanced as acceptable—perhaps even in this case preferred—ways of identifying and verifying medical conditions.

The second function of these historical references was their potential to refute the dearth of present-day experiential evidence of any correlation between drinking during pregnancy and poor birth outcome. Those medical observers who sought to locate FAS in the late twentieth century were faced with the task of explaining why, when women have been drinking and giving birth for thousands of years, or as one article noted "alcohol ingestion has been a feature of the human diet at least since the invention of glazed pottery...and the association of oral ethanol intake with subsequent illness of the imbibor is so well-known as to be cliché" (Green, 1974: p. 713), an association between drinking and birth defects had never been, in their collective memory, commonly acknowledged. Despite the claim of an article in *Pediatric Annals* that the association between drinking and poor birth outcome was "conventional wisdom" (NICHD, 1979: p. 106), the early FAS entrepreneurs believed that there was very little to suggest that doctors or laypeople had noted such an association, much less drawn firm conclusions about drinking during pregnancy and birth outcomes. Thus, observers of FAS in the late twentieth century cast their nets far back into the past, creating a history of FAS that relied on questionable "evidence", in order to persuade their audience that prior human experience *had* demonstrated the ill effects of drinking during pregnancy.

Yet, there are alternative possible explanations for this lack of experiential evidence. Heavy alcohol consumption raises the risk of spontaneous abortion, and under prevailing conditions of high fetal and infant mortality, fewer alcohol-affected babies may have survived birth or infancy. Moreover, the rate of birth defects overall has probably been higher in the past and FAS may not have been distinguishable among them. Furthermore, drinking among women may have been so common (as surely must have been true for certain populations at certain times) that no independent association between drinking and birth defects could be easily observed. Yet the observers of FAS who cited historical evidence never advanced such explanations,

turning instead to the rhetoric of rediscovery to bolster their claims regarding this new diagnosis.

Third, these references allowed writers to illustrate what they believed to be the timelessness and persistence of FAS as a human problem. Cries that "we cannot afford to repeat history" (Randall, 1979: p. 121) were typical. An article in the *Journal of Obstetrical, Gynecological and Neonatal Nursing* lamented "It is both appalling and unfortunate that these warnings were not heeded until recent times" (Lindor *et al.*, 1980: p. 222). Thus, these historical references enabled modern observers to express their own indignation and to register the gravity of the situation. As Best (1990: p. 17) has noted, "claims need to be compelling if they are to be successful."

In fact, the moral judgment implicit in most of the so-called historical evidence marshaled in the early literature on FAS was the final important purpose such citations served. There is an undeniable element of moral condemnation in many of the historical references. This censure is most apparent when the Bible is quoted. One article specifically enjoined that "until much more is known, it would seem advisable to observe the Biblical admonition that 'thou shalt conceive, and bear a son; and (therefore) now drink no wine or strong drink' (Judges 13:7)" (Krous, 1981: p. 307). Other authors offered this verse as an epigram. When doctors urge women not just to follow their advice, but to heed the Bible, they invoke moral as well as medical authority. Rodin's use of Hogarth's engraving also carried a moral weight of condemnation: it depicts a scene of chaos, of extreme disregard for human life, and of abandonment of maternal responsibility. Its appearance in the pages of *JAMA* in an article on FAS projected Hogarth's rebuke of extreme drunkenness onto contemporary women who drink during pregnancy.

Thus, the FAS entrepreneurs' own rediscovery of the evidence was remarkably ahistorical. In truth, the nineteenth and early twentieth centuries witnessed a period of prolonged attention to the effect of alcohol on offspring. Although most of this literature was not explicitly about fetal exposure to alcohol, it shared many of the social concerns and disapproval characteristic of the contemporary literature on FAS. FAS entrepreneurs drew on this literature very selectively, as I noted earlier; Sullivan's 1899 study of women in a Liverpool jail was frequently cited, for example. However, few others were. Why the initial literature on FAS seemed to ignore this earlier tradition remains an area of speculation. It may be that entangled as the earlier literature was in both the temperance and the eugenics movements, it was flawed in the eyes of modern doctors who strove for scientific objectivity and impartiality in their research. Their abandonment of this literature is thus extremely ironic.

## THE LANGUAGE OF OPPROBRIUM

The language used in much of the early literature on FAS also betrays the moral orientation of these writers. As Joseph Gusfield (1976) has noted with respect to the literature on drinking and driving, scientific writing often evinces literary rhetoric. In the medical literature on fetal alcohol syndrome, both word choice and metaphor frequently illustrated opprobrium, even when couched within ostensibly neutral medical terminology. Although the term used to denote the diagnosis in the second article by the Seattle team (Jones and Smith, 1973) has persisted,\* other writers have proposed and used such terms as “alcohol embryopathy” (Obe and Majewski, 1978), “fetal alcoholic syndrome” (italics in original) (Sneed, 1977) and even “fetal alcohol abuse syndrome,” which doubles the moral censure by implying that not only does the woman abuse alcohol, she also abuses her unborn child. Both the term and the diagnosis itself have widened over time to “possible fetal alcohol syndrome,” “partial FAS,” “fetal alcohol effect (FAE),” “alcohol-related birth defects (ARBD),” and “alcohol-related neurodevelopmental disorder (ARND)” (e.g., Turner, 1978; Chernoff, 1979; Beagle, 1981; Clarren, 1981; Qazi *et al.*, 1982; McCarthy, 1983; Abel, 1984b; Stratton *et al.*, 1996). Note that this widening encompasses only a larger role for alcohol in the etiology of adverse birth outcome, but does not broaden the possible causes or explanations for what is observed and diagnosed as FAS. The author of a letter to the editor of the *New England Journal of Medicine* who wryly noted that “alcohol abuse may have a role in the ‘fetal alcohol syndrome,’ but the syndrome may eventually prove to be a ‘polydrug-abuse syndrome’ or conceivably ‘a polydrug-abuse-nutritional-deficit-stress induced fetal syndrome’” (Mendelson, 1978: p. 556) was a rare voice of caution indeed. Far more common were such reproving titles as “The tragedy of fetal alcohol syndrome” (Powell, 1981), “FAS—the incurable hangover” (Beattie, 1981), and “FAS—intrauterine child abuse” (Stanage *et al.*, 1983). Just as in the social construction of the drinking and driving debate, in the debate over FAS “the rapidity with which alcohol is perceived as villain exem-

plifies the moral character of factual construction” (Gusfield, 1981: p. 74).

Not surprisingly, women, their actions and their bodies were often referred to in harsh terms: “maternal alcoholic environment”† (Corrigan, 1976: p. 73), “recidivist maternal alcoholics” (Corrigan, 1976), “fetal hazard” (Green, 1974; Hanson *et al.*, 1978), “acute fetal poisoning” (Kline *et al.*, 1980: p. 176), “fetal damage” (Little and Streissguth, 1981) and “embryotoxin” (Lindor *et al.*, 1980; Sokol, 1981) were all used to describe women and their bodies. Although in some cases, these terms are standard medical jargon, they nonetheless bear metaphorical force. Writers typically focused on the “harsh intrauterine environment” (Krous, 1981: p. 306) created by women who drink during pregnancy: in their eyes, such women have clearly failed to fulfill their roles as nurturers. One writer commented bluntly:

The intrauterine environment of the alcoholic mother is a risky and complex milieu within which her fetus develops and grows. She inflicts upon her fetus the potential teratogenic effects of not only alcohol but also often adds the insults of malnutrition, hepatic cirrhosis, infection, smoking, drug abuse, hyperpyrexia (fever), and trauma (Krous, 1981: p. 301).

Again, the effect of the woman’s own poor health on the fetus was made to seem intentional, almost willful: she “adds the insults,” as though she deliberately chooses to be malnourished, sick, addicted and traumatized herself and thus to undernourish, infect, addict and traumatize her fetus.

Such language reveals the use of FAS as a stigmatizing condition. Indeed, the literature contains several examples of how FAS was and is used to label affected women and children as medical and social problems. Most commonly, the diagnosis of FAS in a child was used to diagnose the mother as an alcoholic retrospectively (e.g., Hanson *et al.*, 1976; Smith, 1979; Davis and Lipson, 1984). As Smith noted, “Clinicians familiar with FAS have been alerted to previously unrecognized alcoholism in a mother simply because her child had a distinctively ‘FAS’ face” (Smith, 1979: p. 124). Erb and Andresen (1978: p. 644) likewise noted in *Clinical Pediatrics* that “many children will be identified as displaying FAS and their mothers can be identified as alcohol abusers.” Since alcoholism in the mother was one of the original criteria for a diagnosis of FAS, this tautology seems particularly insidious, reasoning as it does that since the child has FAS, the mother is an alcoholic; therefore, the child has FAS. Indeed, the power of FAS as a morally stigmatizing category helps to explain the rapid embrace of this new diagnosis in the medical and lay world alike.

“Rhetoric is central, not peripheral to claims-making. Claims-makers intend to persuade, and they try to make their claims as persuasive as possible” (Best, 1990: p. 41). One way FAS entrepre-

\*It is interesting to speculate on why the syndrome was not named eponymously, as so many patterns of malformation—and diseases more generally—are (Merton, 1973). Perhaps “Jones–Smith syndrome” sounded simply too quotidian, as I heard one doctor suggest at a medical conference; however, it is more likely that fetal alcohol syndrome was so named to highlight what its discoverers believed to be its cause. The proliferation of other labels containing the word alcohol supports this supposition.

†Referring to the pregnant woman’s womb as the “maternal environment” is a rhetorical tactic of the famous American anti-abortion film *The Silent Scream* as well.

neers dramatized their claims was to use case studies as evidence.\* “Examples of atrocities” are used to “typify social problems” (Best, 1990: p. 40). Case reports such as the ones included in the original *Lancet* articles are standard in medicine; they constitute an important way of knowing (Hunter, 1991). Yet they can also serve a dual purpose: “Atrocity tales do not merely attract attention; as typifications, they also shape perceptions of the problem” (Best, 1990: p. 29). They become “the referent for discussion of the problem in general” (Best, 1990: p. 28). The particular case is the foundation not only of individual doctors’ knowledge of FAS, but comes to represent the diagnosis and the wider social problem. “The individual case is the touchstone of knowledge in medicine” (Hunter, 1991: p. 28).

Yet often the humanitarian impulses of the clinicians faced with individual cases of FAS were at odds with their inclination to censure what they saw as inappropriate social behavior. The importance of diagnosing FAS in infancy was often stressed, yet just as often a note of deep pessimism was sounded. The early literature on FAS typically noted that there was little evidence of catch-up growth in FAS children or of any ameliorative effect of a positive environment or special educational intervention. Jones and Smith wrote of the “overwhelming magnitude of the handicapping problems that maternal alcohol can impose on a developing fetus” (Jones and Smith, 1974: p. 349). Particularly in the early literature, the damage at birth was referred to as irreversible and children with FAS were dismissed as beyond the realm of medical intervention. “Even the presence of a few stigmata should be considered a warning of future developmental delay” (Christoffel and Salasky, 1975: p. 967). The grim prognosis of Jones *et al.* in 1974 (p. 1078)—“Thus the offspring of chronic alcoholic women, whose development and function are often permanently damaged by their adverse intrauterine environment, frequently become a problem for society in postnatal life”—neatly summarizes the attitude of most of the early writers on FAS.† Both the woman who drinks during pregnancy and her child are beyond hope and destined to be societal problems.

\*This rhetorical device is evident as well in the recent U.S. Institute of Medicine report (Stratton *et al.*, 1996) on FAS, in which an entire chapter is devoted to vignettes of children and adults with FAS and women who drank during pregnancy.

†Ironically, this prognosis also closely echoes the kind of assessment made by many of the nineteenth-century medical writers and temperance crusaders.

‡ Some children whose mothers had been participating in research protocols were born in the U.S. with the phocomelia caused by thalidomide. However, the drug was never approved for use in the U.S., so the disaster was largely contained there (Knightley *et al.*, 1979).

#### THE SOCIAL CONTEXT OF MEDICAL-MORAL ENTREPRENEURSHIP AND FAS

The emergence of the diagnosis of fetal alcohol syndrome demonstrates some of the ways in which disease may be used to exert social control, at once expressing and reinforcing social ideologies. Indeed, FAS both evokes and reflects a particular era of American social history. The discourse of rediscovery so crucial to the early construction of the diagnosis also illustrates the cycles of attention and inattention that infuse the history of medicine (Warner and Rosett, 1975). This newest cycle of attention to drinking and birth outcome emerged at a time when awareness of teratogenic substances in the environment was increasing, when the cult of purity during pregnancy was reaching new heights, when fetal medicine was coming into its own as a field of specialization, and when there was a growing desire to control reproductive outcomes. Broader social forces as well as trends within medicine contributed to the sudden visibility of FAS in 1973.

The first of these forces was a growing awareness of environmental risks. The publication of Rachel Carson’s *Silent Spring* in 1962 galvanized public attention to environmental toxins. People felt a heightened sense of threat to personal health from toxic and teratogenic agents in the environment. The late 1960s and early 1970s were a period of intense alarm about the environment generally, and human exposure to harmful man-made substances such as DDT and PCBs particularly. The Toxic Substances Control Act, passed in 1976, was first introduced into Congress in 1969 and in 1970 Congress enacted major amendments to the Clean Air Act. In fact, environmental concerns were often constructed as and transmuted into threats to human health, thus personalizing risk (Burger, 1990).

Moreover, the public sense of environmental endangerment became linked to a growing awareness of the vulnerability of the fetus as a result of two events of the early 60s. From 1959 to 1962, thousands of women around the world, primarily in Europe, gave birth to babies with severe deformities after taking the sleeping drug thalidomide during pregnancy. The babies were born with no or only vestigial limbs, as well as crippling internal organ malformations. The thalidomide disaster was largely averted in the U.S. due to the vigilance of the FDA.‡ However, in 1961 unforgettable images of the thalidomide children appeared on television and throughout the print media worldwide (Knightley *et al.*, 1979). Ashley Montagu’s popular book *Life Before Birth* (1965) epitomizes the effect the thalidomide disaster had on lay and medical thinking in the U.S.

For those of us in the world who were spared, the story of thalidomide is a warning bell, clanging out an urgent warning: it can be dangerous to gobble down *any* pills

indiscriminately and unthinkingly. We depend on our Food and Drug Administration and our doctors to protect us from harm from drugs, but this is not enough. Each of us must take personal responsibility, too, for ourselves and our children (italics in original, Montagu, 1965: p. 89).

The theme of “personal responsibility” is one that continues to dominate American thinking about health and illness.

Shortly after the horror of the thalidomide babies, the U.S. experienced a small rash of babies born with profound disabilities in 1964–65 after their mothers’ exposure to rubella, or German measles, during the first 16 weeks of pregnancy. Both of these events helped to change the way the lay public and doctors alike thought about pregnancy and the vulnerability of the fetus. The placenta could no longer be seen as an impermeable barrier. Just as the environment became an unsafe place, full of hazardous toxins against which the public was powerless to defend itself, the womb too came to seem increasingly threatened by external forces as well as by substances the pregnant woman was exposed to or even ingested herself. Pregnancy came to seem not only perilous, but imperiled. The frontispiece for Montagu’s *Life Before Birth* (1965), for example, proclaimed that “From the moment of conception until delivery nine months later, the human being is more susceptible to his environment than he will ever be in his life again.”

Concurrently, technological advances made it possible both to observe fetal development more closely and to treat fetal conditions *in utero*; the fetus became a patient in its own right (Daniels, 1993; Maynard-Moody, 1995). As ultrasonography, which was first developed in the 1960s, became widespread in the 1970s, both doctors and the public could “see” the fetus in ways that had not before been possible. Intrauterine photography further revealed the once-occluded mysteries of pregnancy and fetal development. Picture, for example, the famous *Life* series of photographs of embryonic and fetal development. Such imagery represents a dramatic change in not only the relationship between the pregnant woman and the fetus, but between the public and the fetus. Cynthia Daniels (1993: p. 17) argues that “once this very private internal process became publicly visible the possibility arose for the public control of pregnancy.” Prenatal diagnostic technology erased the woman in the act of illuminating the fetus (Rothman, 1986). The pregnant woman came increasingly to be seen

merely as a vessel, a “fetal container” (Annas, 1986). Moreover, the fetus came to be seen as “a fully formed ‘preborn baby,’ a free-floating being temporarily housed in the womb but with interests and needs of its own” (Daniels, 1993: p. 1). In addition, the fetoscope and new techniques of fetal surgery enabled doctors to treat the fetus as a patient in its own right, violating the sanctity of the womb to perform surgery directly on the fetus.

As the fetus gained in visibility and prominence, the bond between the pregnant woman and the fetus frayed considerably. The “organic unity of the fetus and the mother” (Martin 1987: p. 20) was challenged and upset by medical, political, legal and social developments in this period, which was marked by an increasing tendency to see the pregnant woman and the fetus as being at odds, their individual welfares as oppositional rather than mutual. This notion of maternal–fetal conflict evoked and reflected rampant tension over changes in gender roles; certainly the 1960s and early ’70s were a time of overt gender conflict and change, as women sought equality in the workplace, in higher education, and in the political arena, as well as in personal relationships. Women increasingly stepped out of and beyond their traditional roles.

Moreover, the alienation of pregnant woman and fetus began in an era in which women were gaining new levels of control over reproduction, both through the introduction of oral contraceptives in 1965 and the legalization of abortion. At the very least, it is ironic that FAS was first diagnosed in 1973, the same year that abortion was legalized in the U.S. Kristin Luker has noted the ways in which the American debate about reproductive rights is deeply embedded in notions of women’s social roles and responsibilities. The construction of FAS reflects these same conflicts “about women’s contrasting obligations to themselves and others” (Luker, 1984: p. 193). The paradigm of maternal–fetal conflict, implicit in much of the discourse on both FAS and abortion, captures the sense that women cannot be trusted to act in ways assumed in the past to be “natural,” intrinsic to their status as mothers or potential mothers.\* This shift embodied social unease not only over the changing roles of women, but social distress about women’s growing propensity to act in ways that were independent of and perhaps in opposition to the maternal role as socially constructed. “A new social mythology encouraged the view that some women were not just bad mothers but ‘anti-mothers,’ who violated their most fundamental natural instincts and who threatened to destroy the institution of motherhood altogether” (Daniels, 1993: p. 3). A *JAMA* article proposed that to prevent FAS “the notion of mothering from conception, not birth, must be fostered in the non-pregnant” (Clarren, 1981: p. 2439), as if to enmesh women further in a cult of motherhood. (See also Smith, 1979, for a similar admoni-

\*Concern for changing social mores was explicit in some of the early FAS literature; writers often noted increased drinking among younger women as cause for concern (e.g., Streissguth, 1977). “In the past, women who drank excessively tended to be in an older age group, usually past their childbearing period, but now drinking beer and wine is becoming part of the teenage way of life” (Turner, 1978: p. 19).

tion.) In this respect, concern about drinking before as well as during pregnancy was something of a bellwether for the “preconception” movement that is gaining prominence today and that exhorts women to begin changing their diets, taking vitamin supplements and avoiding alcohol, tobacco and other substances when they are *considering* becoming pregnant. Thus, the ritual prohibitions of pregnancy now extend to women who are no more than potentially pregnant.

The paradigm of conflict is evident as well in the rise in the number of court-ordered cesarean sections and in attempts to expand the legal definition of child abuse to include drinking during pregnancy, as well as in calls for punitive measures such as incarcerating pregnant women who drink, rather than providing them with health and social services (see Dorris (1989) and Daniels (1993) for examples of these kinds of responses to FAS). In 1997, a Wisconsin woman was charged with attempted murder for drinking during pregnancy; in 1998, South Dakota enacted a law criminalizing substance use during pregnancy.

In addition, the diagnosis of FAS emerged in the U.S. during the baby bust of the 1970s, following the baby boom of 1946–1964. Thus, it neatly exemplifies a societal shift taking place over the course of the twentieth century, from an emphasis on “quantity” of children to “quality” of children (Preston, 1986; Keyfitz, 1986; Zelizer, 1985; Menken, 1985). Social pressure to have “a perfect child” complemented this demographic pattern (Blank, 1990; McGee, 1997). Moreover, people began to see reproduction as being within their mastery.

Yet, a subtle consequence of the success in preventing unwanted birth is that fertility now appears to be more within individual control. Women, or couples, have perhaps with great effort, been able to turn off fertility; they had come to believe that was the real problem and to expect that they could turn fertility on easily (Menken, 1985: p. 473).

Prenatal diagnostic technologies like amniocentesis promised greater control of not only the process of pregnancy, but its final product as well. Women and their partners sought to control not only the timing of reproductive events—which the availability of new methods of contraception and the newly legal status of abortion enabled them to do—but the outcome of pregnancy as well.

Finally, the early medical literature on FAS illustrates and reveals our tendency to see disease as the consequence of individual behavior, or what Sylvia Tesh (1981) has called “inappropriate lifestyles.” FAS illustrates an endemic problem of contemporary American society: the individualization or privatization of public health. Irving Zola (1972: p. 500) noted that “the labels health and illness are remarkable ‘depoliticizers’ of an issue. By locating the source and the treatment of problems in an in-

dividual, other levels of intervention are effectively closed.” The work of the moral entrepreneurs who created the diagnosis of FAS and who disseminated it within the medical world in fact illustrates the politics of assigning causality to disease: an undesirable birth outcome could be attributed to the moral failure of the mother who drank to excess during pregnancy, rather than to any aspect of her environment, no matter how disadvantaged it may be, or to biology itself. Thus, the prevention of FAS was perceived to rest squarely with the individual and to be predicated on a change in her “lifestyle.” As one doctor wrote, “Unlike many other problems of newborns, FAS could easily be prevented by maternal avoidance of alcohol” (Beagle, 1981: p. 276). In the U.S., this individualization of public health taps into deeply-held American notions of free will, autonomy, and control over one’s own destiny.

Furthermore, the moral construction of the risks incurred by drinking during pregnancy individualized social responsibility. Women who drank during pregnancy delivered not only deformed babies, but social problems as well. Recall the judgment voiced by Jones and his colleagues in the first article on FAS: “the offspring of chronic alcoholic women . . . become a problem for society in postnatal life” (Jones *et al.*, 1974: p. 1078). Even more bluntly, Clarren and Smith (1978b: p. 556) wrote in the *New England Journal of Medicine*, “One fundamental fact should no longer be doubted in the medical or lay community: a *large* number of congenital malformations and central-nervous-system dysfunctions will be prevented through maternal avoidance of heavy liquor consumption during pregnancy” (emphasis added). To prevent FAS required only “maternal avoidance”—no collective action, no attempt to ameliorate social inequality, no concerted social change were necessary.

## CONCLUSION

The moral dimensions of the medical classification of fetal alcohol syndrome are hardly unique. As Susan Sontag (1978) has demonstrated in the cases of tuberculosis and cancer, our society’s conceptions of disease are often weighted by moral valences as well as biological realities. However, the moral entrepreneurship that shaped the diagnosis of FAS was unusually strong, so much so that moral and emotional evidence sometimes overtook scientific fact. In a “world of limited and flawed knowledge” (Gusfield, 1981: p. 53), as our world must necessarily be, moral categories appeal for their simplicity and rigor. If doctors cannot say with any degree of certainty how much alcohol is safe, how much unsafe in pregnancy, they can invoke Biblical authority where scientific expertise fails. Moral pronouncements are absolute; they admit no ambiguity, unlike the messy world of lived reality. As such,

they are almost like magic bullets, quick fixes for otherwise intractable, insoluble problems.

The diagnosis of FAS is an expression not only of physical disorder—microcephaly, midfacial hypoplasia, vessel tortuosity, curvature of the spine—but of moral and social disorder as well. The entrepreneurs who created the diagnosis of FAS give witness not only to a clinical reality, but also to what they saw as social turmoil and moral disorder. Jones and Smith and their colleagues at the University of Washington saw evidence of a tragic disorder not only in their patients' bodies, but in society as well—particularly in the lives of the alcoholic women who bore these children.

And yet there is a paradox at the heart of this act of moral entrepreneurship. The observers of FAS indeed identified an "evil which profoundly disturbed them," and accordingly they sought to extend the realm of their expertise and influence. They saw themselves as healers of society; yet their actual role as clinicians afforded them precious little capacity to "cure" either the women or the babies affected by heavy drinking during pregnancy. Medical doctors exerted their professional expertise to identify the new disease, yet their medical expertise granted them no more power to prevent its occurrence or ameliorate its sequelae than anyone else.

Most of the moral entrepreneurs who created the diagnosis of FAS at once retreated from the social problems that were at its root, as being beyond their bailiwick. Yet in assuming that improved outcomes rest on individual change, rather than broader change in the social conditions that put individuals at risk, these clinicians thus made FAS merely a victim-blaming strategy. As one doctor wrote, "Previous to this discovery, learning and developmental problems often found in children of alcoholics were attributed to a disruptive home life and poor caretaking" (Rivard, 1979: p. 98). In such sentiments there is almost a sense of relief that difficult, often intractable social conditions can be safely ignored and that poor outcomes can instead be attributed to a biological cause which itself can be ascribed to individual behavior rather than to social conditions. Such an abdication of social responsibility may be particularly appealing for physicians, who, despite their moral entrepreneurship, are as a class known for their avowed reluctance to engage in the lives of their patients beyond the body itself.

Such entrepreneurship—self-aggrandizing, yet ultimately impotent—is typical of medicine, as Freidson notes.

The jurisdiction that medicine has established extends far wider than its demonstrable capacity to "cure." . . . Thus, the medical profession has first claim to jurisdiction over the label of illness and anything to which it may be attached, irrespective of its capacity to deal with it effectively (Freidson, 1970: p. 251).

In fact, the moral force that doctors brought to bear on the diagnosis of fetal alcohol syndrome is directly related to their powerlessness as medical doctors to do much about it. What they could not cure as physicians, they hoped to banish as moralists.

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