The Development of Social and Environmental Accounting Research 1995-2000

By

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ABSTRACT

This paper reviews five years of social and environmental accounting literature (from 1995-2000) in an attempt to evaluate the current position. The methodology used follows that employed in Mathews (1997a) which covered a period of 25 years in three time periods: 1971-1980; 1981-1990; and 1991-1995. The literature was classified into several sub-groups including empirical studies, normative statements, philosophical discussion, non-accounting literature, teaching programmes and text books, regulatory frameworks, and other reviews. In this review a number of new sub-categories have been employed as appropriate.

The author is able to conclude on an optimistic note. The additions to the literature during the period 1995-2000 are encouraging. Researchers in this area are perhaps less naï ve and more experienced than previously, and this, when added to their enthusiasm should lead to penetrating observations and commentaries over the next five years.

INTRODUCTION

This paper is based on the format used in the review article (Mathews, 1997a) which examined the development of the social and environmental accounting literature (SEAL) over a twenty-five year period from 1970-1995. The current project continues that survey over the period since 1995 using substantially the same methodology. The review covers a wide range of published sources excluding conference and discussion papers, however, the author does not claim to have covered all of the material published in this field. Sources appearing in the last few months of 2000 have not been included.

The literature is divided between a number of categories which, although to some extent subjective, served well in the previous work (Mathews, 1997a). Some of the categories are reasonably obvious choices, for example empirical and normative. The normative have been divided between normative and philosophical on the basis of whether the authors were willing to generate normative statements or models. The other categories were a subjective response to the literature itself and included in addition to those already mentioned, radical/critical literature, the non-accounting literature, teaching programmes and textbooks, regulatory frameworks, and other reviews of the literature. New categories have been added as needed to accommodate newly developing sub-fields of SEAL, including environmental aspects of cost/management accounting, environmental audit, social audit and sustainability. In most instances the subject matter of the item places it within a category, although some material could fit into more than one group. The paper considers the body of SEAL both as individual items within a category, but also in aggregation as a trend within that category and within the overall SEAL.

METHODOLOGY

The time period covered by this review is from 1995 until late 2000. The sub-sections employed are a relatively loose means of comparing similar and dissimilar contributions, and also as an approximate guide to the relative proportions in each category. The descriptions are self-explanatory, although, as noted in Mathews (1997a), the separation between normative statements and philosophical discussion was more difficult than anticipated. In many cases the categorisation was a matter of how strongly the author(s) made their arguments, and/or how focused or general the points were that were being made.

DEFINITIONS OF SOCIAL AND ENVIRONMENTAL ACCOUNTING

Mathews (1997a) noted a number of definitions for social accounting published prior to 1995, concluding that definitions appeared to be problematic because of the debate about voluntary or compulsory disclosures, and the quantitative vs qualitative dimensions. The definition which implicitly governs this survey of the literature is broad, as provided by Mathews and Perera (1996, p.364):

> At the very least, social accounting means an extension of disclosure into non-traditional areas such as providing information about employees, products, community service and the prevention or reduction of pollution. However, the term `social accounting' is also used to describe a comprehensive form of accounting which takes into account externalities ... Public sector organisations may also be evaluated in this way, although most writers on the subject of social accounting appear to be concerned with private sector organisations.

Gray et al., 1996, have defined social accounting as:

> More specifically, social accounting is about some combination of: (a) accounting for different things (i.e. other than accounting strictly for economic events); (b) accounting in different media (i.e. other than accounting in strictly financial terms); or(c) accounting to different individuals or groups (i.e. not necessarily only accounting to the providers of finance) and (d), accounting for different purposes (i.e. not necessarily accounting only to enable the making of decisions whose success would be judged in financial or even only cash flow terms) (Gray, Owen and Adams, 1996, pp.3, 11).

EMPIRICAL STUDIES

The almost total domination of interest in environmental accounting in the late 1990s is shown very clearly in the following section where, with one exception, it is environmental disclosures that interest the empirical researcher. The papers considered are by: Gamble et al. (1995), Kreuze et al. (1996), Frost and Wilmshurst (1996), Fekrat et al. (1996), Deegan and Gordon (1996), Deegan and Rankin (1996), Deegan et al. (1996), Walden and Schwartz (1997), Lawrence and Khurana (1997), Wycherley (1997), Burritt and Welch (1997), Cormier and Magnan (1997), Brown and Deegan (1998), Neu et al. (1998) Adams et al. (1998), Deegan and Rankin (1999), Milne and Chan (1999), Herbohn and Herbohn (1999), Williams (1999), Williams and Pei (1999), Boyce (2000), Campbell (2000), Deegan et al. (2000), Solomon (2000), and Wilmshurst and Frost (2000).

Gamble et al. (1995) (US) investigated the quality of environmental disclosures in the 10K and annual reports of 234 companies in twelve industries, between 1986 and 1991. An instrument was designed to measure the content of environmental disclosures, and descriptive reporting codes were used, based on the manner in which the sample firms disclosed environmental information. Companies in the sample were from industries thought to have the greatest potential for environmental impact; oil and gas; chemicals and related; plastics, resins and elastomers; soap, detergent and toilet preparations; perfume, cosmetics and toilet preparations; paints varnishes and lacquers; petroleum refining; steel works and blast furnaces; motor vehicles and car bodies; and hazardous waste management.

The main findings were that there had been a significant increase in environmental disclosure in annual reports in 1989. Certain industries, for example petroleum refining, hazardous waste management and steel manufacturing were judged to have provided the highest quality of disclosures in annual reports,

and the period 1989 to 1991 produced a significant increase in 10K environmental disclosures. The authors concluded that the overall quality of disclosures was low, although as stated above, some were better than others. Gamble et al. (1995) also noted the lack of guidance from regulatory authorities, which they described as `troubling'.

Kreuze et al. (1996) (US) presented the results of a survey of environmental disclosures in the annual reports of 645 Fortune 500 companies. Most companies did not provide any information about the corporations' environmental philosophy or policies, and 73% of the reports surveyed did not contain any discussion of environmental issues anywhere in the report. Of the companies that did make reference to environmental matters, 34% did so in a cursory manner in the letter to shareholders. The remainder provided either footnotes or some other type of disclosure within the report. Industry variations were noted, with companies in the energy, steel, chemicals, pulp and paper industries, and utilities, more likely to include environmental disclosures. The incidence of disclosures in these industries was 50%, compared with 21% for all other companies. Overall environmental disclosures were general and limited, with the majority providing only generic disclosures. The authors provided a list of 17 issues, which they thought should be addressed and included in future annual reports.

Frost and Wilmshurst (1996) (Australia) reported the results of a survey of Australian companies. They obtained a 30.4% response rate from a questionnaire sent to the Chief Financial Officers (CFOs) of companies listed on the Australian stock exchange in 1994-1995. Less than half (43%) of the respondents agreed with the statement that environmental information was useful to the users of annual reports, and only 36% agreed that accountants should contribute to environmental management within the firm. 39% supported the position that environmental issues are outside the role of accountants, and 46% opposed the mandatory disclosure of environmental information in the annual report. All together a rather dismal set of results for those favouring the extension of accounting disclosures.

Fekrat et al. (1996) (US) studied the scope and accuracy of environmental disclosures made in corporate annual reports. They also attempted to provide a modest test of the voluntary disclosure hypothesis in the context of environmental disclosures. Environmental disclosures of 168 companies in six industries from 18 countries were analysed and the mean scores for disclosures and environmental performance were examined. Overall, the results indicated significant variations in environmental disclosures, and no clear support for the voluntary disclosure hypothesis, as well as a lack of association between disclosure and environmental performance.

Industries differed in the amounts of disclosure ranging from Forestry (highest) to the Motor Industry (lowest) and nationally from Canada (highest) to Japan (lowest). The authors noted that there appeared to have been little overall change for more than a decade. Several research questions

were identified 1. The relationship between reliance on financial markets and environmental disclosures, 2. The impact of environmental disclosures on firms' non-financial markets, 3. Market valuation of environmental disclosures, 4. Accounting for and auditing of environmental disclosures, and 5. Events in the regulatory process that provide information to the market. It should be noted that, like many other US based contributors, Fekrat et al. (1996) see environmental accounting as an extension of traditional financial accounting information produced to service the needs of the capital markets, and not for the benefit of a wider society.

Deegan and Gordon (1996) (Australia) analysed the environmental disclosure practices of Australian corporate entities in three ways. Firstly, by reviewing the annual reports of a sample of companies for the 1991 financial year, secondly, by determining the change in corporate disclosure practices for the period 1980-1991 and thirdly, by investigating the role of environmental lobby groups. Overall, they found an increase in environmental disclosures over the period 1980-1991, but the standard of the 1991 disclosures was not necessarily very impressive, with an average of 186 words of self-laudatory material per annual report. Environmental lobby groups appeared to have an effect because there was a positive correlation between environmental sensitivity and the level of disclosure, and in some sensitive industries between environmental disclosure levels and firm size.

Deegan and Rankin (1996) (Australia)) analysed environmental disclosures made by firms which had been successfully prosecuted by the Australian Environmental Protection Authority (EPA). Using legitimacy theory as their theoretical basis, the authors examined a sample of annual reports to determine whether there was any difference in the disclosure patterns of firms which had been prosecuted by the EPA, compared to those which had not been prosecuted. The authors concluded that where there are no regulations or requirements to the contrary, Australian companies willingly provide information favourable to their image, even after prosecution.

Deegan et al. (1996) (Australia) reported the results of a study of the attitudes of Australian accountants towards environmental accounting. It was found that Australian accountants showed a distinct lack of consensus on many issues related to the environment, and did not really agree with the view that environmental issues should be incorporated within financial statements. This agrees with the findings of Frost and Wilmshurst (1996).

Walden and Schwartz (1997) (US) investigated changes in the level of environmental disclosures following the 1989 Exxon Valdez oil spill, off Alaska. Environmental disclosures of 53 companies in four industries for 1988, 1989, and 1990 were examined for both quantity and quality of information. The results showed significant positive differences in the levels of environmental disclosures from 1988 to 1989 and from 1989 to 1990, in both quantity and quality. The authors interpret the results as showing that environmental disclosures in these industries were time or event specific, and made in the self-interest of the firm, following perceived public policy pressure.

Lawrence and Khurana (1997) (US) studied the financial reporting and public policy issues related to US municipal landfills where Superfund settlements had been concluded. In some cases, it could be shown that environmental liabilities represented a considerable financial burden to municipalities, but in other cases this was not the position. The extent of disclosures varied considerably, with approximately two thirds of the sample municipalities neither accruing liability for future clean up costs, nor disclosing the components of the clean up costs, which had actually been expended.

Although reliable estimates were made of total clean up costs, the estimate of municipal shares tended to be understated. The extent of municipal landfill clean up costs is revealing since the earliest site was dated at 1880, and a great many dated from the 1930s. This aspect alone suggests that in some cases the extent of environmental clean up extends further in both extent (public sector as well as private sector responsibilities) and time period than has hitherto been recognised.

Wycherley (1997) (UK) interviewed 30 UK environmental managers to get their opinions about the level of assistance provided by the accountants within their organisations. Apparently the environmental managers experienced a variety of responses from their accountants, ranging from supportive provision of cost information to scepticism about the role of accounting in environmental matters and a general resistance to change. The author concluded that organisations would benefit if accountants became involved in the quantification of cost savings associated with improved environmental performance. However, environmental training would need to be provided for this to happen.

Burritt and Welch (1997) (Australia) reported on an exploratory analysis of the environmental disclosures of a sample of Australian Federal public-sector entities. The annual reports of sixty entities were examined for the ten-year period 1984-1993. The results showed an increase in total environmental disclosures over the period with budget entities reporting a greater volume of environmental disclosures than non-budget entities. The predominant form of environmental disclosure was qualitative not physical or financial. Seven themes were found with community education and training, and energy related disclosures the most prominent. Future directions for research in this area identified by the authors included; possible new accountability structures based on ecological considerations, and measurable environmental outcomes.

Cormier and Magnan (1997) (Canada) investigated how investors assessed the financial implications of a firms' environmental performance as evidenced by the comparison of pollution record with existing regulations; this was described as the pollution measure. The authors hypothesised that the larger the pollution measure, the greater the magnitude of implicit environmental liabilities which investors will use to reduce their valuation of the stock. These implicit environmental liabilities reflect environmental costs and losses which are expected to occur, but which have not yet been incorporated into financial statements. The results suggested that market participants assess implicit environmental liabilities in respect of companies involved in the pulp and paper, chemical and oil

refining industries, where the pollution measure is greatest. Weaker evidence was found for steel, metal and mining firms.

Brown and Deegan (1998) (Australia) examined the public disclosure of environmental performance information in terms of media agency setting theory and legitimacy theory. Nine industries were reviewed across the period 1981-1994. It was argued that the media could drive community concern about the environmental performance of particular organisations, leading to increased disclosure of environmental information within the annual report. In the majority of industries studied, higher levels of media attention were significantly associated with higher levels of annual report environmental disclosures. Significant findings supported the hypotheses in the case of five out of the nine industries. The authors indicated a number of limitations to the study. Media sources were limited in availability, and it was not known which Australian media sources have the greatest relative impact. The study did not control for the location of the disclosure in the media, although this is the subject of further research. Lag effects could not be provided for in the research design, and media attention to specific events was not related to specific environmental disclosures. Notwithstanding these limitations, this is an interesting study, which confirms the usefulness of legitimacy theory as a predictor of environmental disclosures in annual reports under some circumstances.

Neu et al. (1998) (Canada) studied Canadian public company annual reports in the mineral extraction, forestry, oil and gas, and chemical industries, between 1982 and 1991. They focused on three concerns; the influence of external pressure on environmental disclosures in annual reports, including the amount and strategies used in disclosure; the characteristics of environmental disclosures vis-à-vis other social disclosures; and the association between environmental disclosures and actual performance. Attempts to understand why there are environmental disclosures in annual reports required "unpacking" the notion of organizational legitimacy "by highlighting the influence that different relevant publics have on the observed level of environmental disclosures" (p.278). Multiple relevant publics with different levels of power encourage differential disclosure responses, and these disclosures provide opportunities for organisations to manage public impressions. The authors suggest that organisations use "a combination of acquiescence, compromise and defiance strategies within their environmental disclosures to respond to the concerns of relevant publics; further, the strategy adopted is influenced by the relative power of these publics" (p.279). Further research is needed in the intersection between environmental disclosures and environmental performance, which is described as `always equivocal and partial'. It was thought that research into impression management would be useful.

Verschoor (1998) (USA) studied the possible link between the corporations' financial performance and its commitment to ethics. The emphasis of the paper was on attempting to find a link between

overall financial performance and an emphasis on ethics as an aspect of corporate governance. Verschoor found that 26.8% of the 500 largest US public corporations commit to ethical behaviour towards stakeholders, or emphasise compliance with codes of conduct. The financial performance of these corporations ranked higher than that of those corporations, which did not behave in this way. The statistical significance of the difference was a highly significant p=<0.0005.

Adams et al. (1998) (UK) reported on corporate social reporting in Western Europe. The study identified factors that influence all types of social disclosures by using content analysis to examine 150 annual reports from six countries; Netherlands, Sweden, Switzerland, France, Germany and the United Kingdom. Significant factors influencing corporate social reporting patterns were found to be company size, industrial grouping and country of domicile. The largest companies were more likely to disclose all types of corporate social information. Industry membership was instrumental where companies reported environmental and some employee information, but not in respect of ethical disclosures. Size and industry membership was important in all six countries, but there were significant variations between countries. Although legitimacy theory may explain certain differences related to size and industry membership, it is suggested that the reasons for the differences may be much more complex requiring further research.

Deegan and Rankin (1999) (Australia) explored the issue of a potential information supply/demand imbalance due to differing `perceptions' between report users and report preparers, about the relative importance of various disclosures about environmental performance to users. The research question addressed was whether an `expectations gap' existed within Australia in respect of this issue. The study surveyed the attitudes of senior executives from 462 of the largest Australian companies (the preparer group) as well as the attitudes of 474 individuals from a number of categories of report users. The authors concluded that an expectations gap existed and that in order to close the gap initiatives may have to include raising the awareness of members of professional accounting bodies, and the development of reporting standards relating to environmental and social performance.

Milne and Chan (1999) (New Zealand) reported the results of a study of corporate social disclosures and decision-making by investors. The study attempted to determine whether narrative social disclosures in the annual report actually impact on the way investors allocate investment funds. The overall findings suggested that investors drawn from the accounting and finance professions largely ignored narrative social disclosures in making investment decisions. The authors noted that "at best the decision experiment elicited a 15% switch in investment funds" (p.452) and called for further research to establish more clearly investor preferences.

Herbohn and Herbohn (1999) (Australia) investigated the potential implications of an emerging forestry accounting policy based on Discussion Paper No.23 Accounting for Self-Generating and

Regenerating Assets, Exposure Draft No.83 (entitled Self-Generating and Regenerating Assets) and AASB 1037 (same title), for the accounting practices of Australian forestry enterprises. The authors were concerned with two main objectives (1) to discuss recent developments in forestry accounting policy and, (2) to discuss the results of a postal survey of forest manager's reactions to the forest accounting regulations.

The results of the study indicated that there was opposition to mandated environmental disclosures which were proposed in Discussion Paper No.23, and the introduction of income volatility caused by the current market valuations required by AASB 1037, and changes in the value of forest assets also required by AASB 1037. The authors argued that the issues; "need to be re-examined using a larger sample to provide further insight into the influence that an organisations' social, economic and political environment has on its reporting practices" (p.433).

Williams (1999) (Australia) attempted to discover factors, which are significant in influencing the quantity of voluntary environmental and social accounting disclosures (VESAD) in annual reports in Australia, Singapore, Hong Kong, the Philippines, Thailand, Indonesia, and Malaysia. The annual reports of 356 listed companies were surveyed by content analysis, using the number of sentences of relevant disclosure as the dependent variable. Multiple regression analysis found that two cultural dimensions (uncertainty avoidance and masculinity), and national political and civil systems were significant determinants of quantities of VESAD, but that the legal system and the equity market were not influential. The author concluded that the socio-political and economic system interacts to lead the organisation to perceive the need to meet social expectations and avoid Government regulation, by producing VESAD. This is argued to be consistent with Bourgeois Political Economy Theory.

Williams and Pei (1999) (Singapore) examined information released via corporate web sites. The objective was to compare and contrast corporate social disclosure practices between web sites and annual reports, in terms of the number of firms reporting, the amount of information released and the nation of origin. The sample was made up of 172 organisations within the Asia-Pacific region (Australia, Singapore, Malaysia and Hong Kong). It was found Australian and Singaporean firms provide significantly more corporate social disclosures through web sites than annual reports, whereas, respondents in Malaysia and Hong Kong showed no significant differences. Furthermore, organisations in all of the sample countries appeared to provide more narrative information on web sites than in annual reports, especially with disclosures related to products and consumer-related information.

Boyce (2000) (Australia) reported the circumstances surrounding a major development proposal capable of yielding economic, environmental and social goods and bads. The paper explored the various factors which were taken into account within the official independent reports leading to

approval of the proposal, and how these were reported and accounted for. The use of financial and economic factors is contrasted with those relating to social and environmental factors. "The use of accounting to create environmental and social visibilities, and to facilitate discourse and debate is examined" (Boyce, 2000, p.27).

Campbell (2000) (UK) examined the annual reports of a major UK corporation over an extended period of time divided into sub-periods related to the tenure of several chief executives. The author noted that whilst the majority of the literature attempts to relate changes in voluntary corporate social reporting (CSR) in terms of either legitimacy theory or political economy of accounting, in the longitudinal study of one corporation the variation in disclosure appeared to be driven by the Chairman in office at the time. The author argued that the marginal variability of disclosure can be explained by the varying perceptions of reality of successive holders of the office of Chairman.

Deegan et al. (2000) (Australia) examined the manner in which major Australian corporations reacted through their annual report disclosures to five major social incidents. The results of the study indicated that after four of the five incidents, the sample firms provided more social information in their annual reports than they did before the incidents. The authors argued that the results of the study "are consistent with legitimacy theory and show that companies do appear to change their disclosure policies around the time of major company and industry related social events" (p.127). It appears that voluntary social disclosures by major corporations are strategic, and used as a device to reduce the adverse effects on the corporation of particular events

Solomon (2000) (UK) presented the results of a postal survey of three groups named `normative group', `interested party group' and `company group', on the subject of a conceptual framework and developing standards for the disclosure of corporate environmental reporting (CER). The aspects surveyed included users, qualitative characteristics, elements, verification, cost, time period and communication. The findings of the survey indicated that CER could shadow financial reporting in the UK (and by implications in other Anglo-American accounting countries) in terms of an implicit conceptual framework, in relation to users, qualitative characteristics, verification, bearing the cost, time period and communication. There appeared to be an unavoidable difference between CER and financial reporting in the area of elements. The author concluded with a recommendation that the quality and quantity of CER in the UK be encouraged by a shadowing of financial disclosure practices.

Wilmshurst and Frost (2000) (Australia) reported the results of a mail survey of Chief Finance Officers (CFOs) of selected Australian companies. The CFOs were asked to rate the perceived importance of specific factors in the decision to disclose environmental information in annual reports. Analysis of the content of annual reports and the ratings of perceived importance disclosed a number of significant co-relations, providing limited support for legitimacy theory as an explanatory link

between influential factors as seen by management and actual environmental disclosures. The authors argued for "case study based research to gain an understanding of the trade-off that occurs between the competing requirements for information to be included in the annual report" (p.23) because this task cannot be achieved through the use of passive survey research.

NORMATIVE STATEMENTS

Mathews (1997a) (New Zealand) noted changes in the proportion of normative and philosophical components of SEAL over time. The willingness of researchers to generate normative statements and models, which was evident during the 1970s, tended to give way to more cautious philosophical discussions in the 1980s and early 1990s. Since 1995 there may have been a slightly increased willingness to try to bring together decidedly held views in statements or models of what ought or should be done. As in Mathews (1997a), the dividing line between normative and philosophical is not clear-cut, and classification may be subjective and problematic in some cases. In order of appearance the contributions to be considered in this section are; Gray et al. (1996), Schaltegger et al. (1996), Birken (1996), Mathews (1997b), Boone and Rubenstein (1997), Elkington (1997, 1999), and Magness (1997).

In their concluding chapter, Gray et al. (1996) make a number of suggestions for furthering the progress of Corporate Social Responsibility (CSR) in the face of a less than ideal world. They accept (reluctantly perhaps?) that for the foreseeable future financial statements are going to be the main means by which organisations demonstrate accountability and that CSR must be differentiated. Gray et al. appear, therefore, to be unwilling to indicate directions in which the financial accounting and reporting part of information distribution should go, excepting that the whole should be an accountability model involving compliance-with-statute reporting. This could be seen as a limitation of their overall model, since if they accept the inevitability of financial reporting remaining important, why not attempt to modify that dimension? Certainly, it would have been interesting to know which areas they would attempt to modify, and in which order.

The first steps in the development of a systematic social and environmental reporting system (as suggested by Gray et al., 1996) would be to identify the purpose and focus of the report, and then to specify the way in which the organisation is conceptualised so as to satisfy the information characteristic of completeness. The purpose of the annual report, as stated by Gray et al. (1996) is to discharge accountability and the focus is societal, with the organisation a sub-system within the wider society. Whilst it is accepted that the completeness criteria can never be satisfied, the authors argue that statements designed to show a social balance and an eco-balance for each organisation, would enable the reader to form a view of the overall performance of the organisation. There would be a need to specify the rights to information of stakeholder groups, which Gray et al. (1996) see as being incorporated in policy statements issued by the reporting entities:

> Sustainability is the end goal, incorporating notions of eco-justice and eco-efficiency. It is argued that the current financial accounting system could provide some assistance with disclosures affecting intra-generational equity and inter-generational equity. Finally, recoding of the data contained within the accounting system might shed light on the distribution of costs, to reveal more accurately those costs related to; employment, use of energy, packaging or waste disposal costs, expenditure on replaceable and finite raw materials, forms of transport costs, environmental liabilities and expenditures, revenues from developing nations, legal fines and related costs, and so on (Gray et al., 1996, p.298).

The agenda set out above is clearly an advanced one, which will require a great deal of development. A first step suggested by Gray et al (1996, p.298) would be to bring together all currently disclosed social, environmental and employee information into a single social and environmental report within the existing conventional annual report.

Schaltegger et al. (1996) (Germany) have advocated a new form of accounting for the environment which involves "ecological accounting", which is developed separately from conventional accounting, and then integrated into traditional accounting, both financial and managerial. Ecological Accounting is divided between internal (management) and external (financial) forms of accounting. The internal form includes the use of Life Cycle Assessment and "ecological investment appraisal". The external use of ecological accounting would need to address the same qualitative characteristics as financial accounting, as well as dealing with taxation and consolidation issues, but using physical units of measurement in many instances. When integrating ecological accounting into traditional accounting, the authors attempt to have both a financial and an environmental perspective, but in the end it is the financial measurement which dominates.

The somewhat complex approach adopted by Schaltegger et al. (1996) differs from the mega-accounting model put forward below (Mathews, 1997b) in the following ways; first, the existing financial accounting system is taken as a given, second, there is no concern for social accounting data collection and reporting, and third, the attempts to integrate ecological accounting with conventional accounting go further than may be appropriate for external financial reporting at this point, since it leads to the domination of the environmental by the financial, and raises many of the problems which led to the failure of earlier models.

Birkin (1996) (UK) describes his paper as fundamentally empirical because it was written as a result of his life experiences. However, within the context of this review it is either philosophical or normative. A subjective judgement places it within the latter group because, after a lengthy philosophical discussion of the relationship between mankind and the environment, Birkin develops a model for accounting for ecological holism, and the development of a balance sheet containing four components; stakeholder burden, stakeholder base, ecosystem burden and ecosystem base.

Mathews (1997b) (New Zealand) describes a model based on reporting to a broad stakeholder group, driven by the social contract of business approach, which envisages three separate statements (financial, social and environmental) each based on an appropriate conceptual framework, using standards and subject to audit. The basic underpinning positions are shown in the Table below:

Table 1
The Basic Underlying Principles of the Model

1. Information is made available to all stakeholders in recognition of the SOCIAL CONTRACT OF BUSINESS WITH SOCIETY. This implies a willingness to supply information to stakeholders who do not have a direct financial relationship with the preparer.

2. The annual report is a COMPREHENSIVE INFORMATION SYSTEM including separately reported economic, social and environmental position statements.

3. STAKEHOLDERS are defined as all members of society who have RIGHTS TO INFORMATION about those entities that are deemed to be significant and liable to publicly report on performance and condition.

4. A CONCEPTUAL FRAMEWORK would be required for each area until integration is possible.

5. LEGALLY BACKED STANDARDS would be mandated for each area until integration is possible.

6. Statement components would have equal status in terms of AUDIT requirements.

7. THREE SEPARATE POSITION STATEMENTS together make up the ANNUAL REPORT of the entity to account to the other parts of the social and economic system in which the organisation is situated.

8. Each report would contain appropriate financial data and non-financial data would be used in the social and environmental accounting position statements. Furthermore, raw data could be available as advocated by Wallman (1997, p.108) under the rubric of “access accounting”, and thus avoid the problems associated with too great a degree of aggregation.

9. Any transfer of financial information from one position statement to another would be made outside of the three individual statements; for example if the impact of the organisation on the social structure of the area or the environment could be reliably determined in financial terms this could be shown as an offset to the income earned, and vice versa.

The model shares some ideas with that of Gray et al. (1996), but is probably less radical in that the place of conventional financial accounting as an equal partner with the social and environmental, differs from their (apparently) reluctant acceptance of the need to have a financial dimension at all. The proposed use of conceptual frameworks, standards and audit are not referred to in Gray et al. (1996). However, Mathews (1997b) does not refer to eco-justice.

Boone and Rubenstein (1997) (Canada) developed a model to account for the externalities resulting from environmental pollution. The authors use the term full cost accounting for this process. To ascribe monetary losses from externalities, two approaches may be taken; (1) the cost of control approach and (2) the damage function approach; "The cost of control approach uses the cost of installing and operating environmental control technologies as an approximation of the dollar value of externalities incurred". The damage function approach uses "…environmental and scientific data and modeling techniques combined with economic methods to estimate external impacts and costs" (Boone and Rubenstein, 1997, p.19). Provided that these figures can be determined, the authors demonstrated that an environmental equity account could be constructed, whereby externalities are shown as external costs in the income statement (reducing income) and the corresponding balance is placed in the balance sheet as an environmental equity.

The model is based on an implied social contract between the entity and society. The concept is an interesting one since, if there is an Environmental Equity Account, this could be used to require the payment of dividends, or the equity could be repurchased to eliminate the environmental equity balance. In both cases the payment would presumably go to the government, since it has the final responsibility for remediation and care of the environment, and the effect would be to internalise the externality thus affecting the costs and profits of the entity. The paper does not discuss these issues, and is therefore not a fully developed model.

However, Boone and Rubenstein (1997) is an advance on Boone and Howes (1996) which outlines some of the basic features of full cost accounting, and provides ten pointers for the implementation of full cost accounting. The conceptualisation of external environmental and human health impacts (externalities) is not the same as actually including them in costs of production or capitalising environmental equities on the balance sheet.

Elkington (1997, 1999) (UK) has proposed a triple bottom line approach to integrate financial, social and environmental reporting. Elkington (1999, p.19) argued that "there is no fundamental conflict between sustainable value creation and long-term shareholder value added". Changing from short term to longer term focus may require the use of total net value added whereby Economic Value Added (EVA) and similar concepts will need to be adjusted for both positive and negative impacts on natural social and human capital.

Elkington refers to social value added, total net value added and the need for standards and audits. His approach appears to be closer to that of Mathews (1997b) than that of Gray et al. (1996). The whole area of normative model building in the development of combined frameworks for social, environmental and conventional financial reporting is only just beginning.

Magness (1997) (Canada) contributed similar arguments to those of Boone and Rubenstein c entered on the concept of environmental equity. This concept requires that externalities be identified, measured and valued leading to an environmental equity balance, which may be used to improve the environment. The same effect might be achieved by an environment tax provided that the proceeds were spent on repair to the environment; however, this alternative is not discussed in the article.

PHILOSOPHICAL DISCUSSION

INTRODUCTION

Mathews (1997a) used the philosophical discussion section for a review of those articles which discussed the author(s) views on social and environmental aspects of accounting without coming to a strong conclusion or statement about what ought or should be done. In this paper the section has been expanded in order to recognise collections of literature with a common subject such as environmental auditing or management accounting. There is also a general section serving the same purpose as in Mathews (1997a).

GENERAL

The contributions in this general section include McLean (1995), ACCA (1997), Shields and Boer (1997), Owen et al. (1997), Lockhart (1997), and Miller (1998).

McLean (1995) (NZ) argued that the `greening' of corporations would produce desirable business outcomes including increased volumes of business. The most notable feature of this article was that it extended to New Zealand the arguments, which had been used in the UK and Europe for some time.

The Association of Chartered Certified Accountants published a guide to environment and energy reporting and accounting (ACCA, 1997) which was part normative, part philosophical and part-empirical; thus exposing some of the limitations of the structure being used in this paper. The guide argues for extensive disclosures of audited environmental and energy information in the annual report or the environmental report of corporations. This was a state of the art monograph in 1997, which would still be extremely useful to those considering the preparation and audit of environmental and energy related data. The location of energy related material in the environmental field is a new development; previous literature often placed energy matters within a social accounting dimension.

Shields and Boer (1997) (US) provided the guest editorial to a special edition of the *Journal of Accounting and Public Policy,* in which they reviewed the papers in the special edition, and suggested a number of topics for future research. These topics were grouped into five categories; financial accounting, managerial accounting, external and internal auditing and taxation. An examination of the listed subjects reveals (as with Fekrat et al. (1996)), a US concern with the usual narrow range of stakeholders and decision-making objectives, and little, if any, recognition of a wider

accountability to other stakeholders including the general public. The papers published in the special edition included Walden and Schwartz (1997), Lawrence and Khurana (1997), Mishra et al. (1997) and Cormier and Magnan (1997) which are included in other sections of this chapter.

Owen et al. (1997) considered the challenges to social and environmental accounting which arise, through attempts by the accounting profession to assimilate these alternative reporting forms, and associated accountability constructs, within existing financial and managerial accounting, and assertions of ineffectiveness in changing society which are made by the critical theorists.

The issue of potential capture is clearly identified as a threat by contributors such as Power (1991, 1992, 1994, 1997) and Mouck (1995) and exemplified by Wambsganss and Sanford (1996). Owen et al. (1997) are quite clear that capture must be avoided if premature closure of the discussion is to be prevented, and suggested inter alia that one way forward is that set down by Gray et al. (1996).

The issues of capture and avoidance are seen as a more significant threat than the criticisms levelled by the critical theorists, mainly because the existence of a critical school can provide an intellectual base, against which the proponents of mainstream social and environmental accounting research can evaluate the extent of legitimation and capture. Furthermore, the critical theorists do not appear to offer alternatives, only criticism of the status quo, and of mainstream attempts to effect change. This state of affairs is now being recognised by their own members. Owen et al. (1997) conclude by illustrating where reformist change is taking place, and suggest that the critical school must surely recognise that some progress is being made.

Lockhart (1997) (US) discussed aspects of US taxation, which are described as alternatives to the polluter pays principle. The subject of this paper are subsidies, tax credits and property tax exemptions which are described as viable options for creating incentives to meet environmental goals. The author suggested that these approaches, which are used quite regularly at the state level in the US, may contribute new ideas for policies for more widespread application worldwide. There appear to be very few contributions to the social and environmental accounting literature concerning taxation.

Miller (1998) (UK) examined the margins of accounting: Accounting, it is argued, is an assemblage of calculative practices and rationales that were invented in other contexts and for other purposes. To draw attention to the margins of accounting is to emphasize the fluid and mobile nature of accounting (Miller, 1998, p.605).

Miller (1998) concluded that the mechanism by which the margins of accounting change is complex, involving multiple sites and sources. Accounting has a low epistemological threshold and “is riven with tensions as to its identity and its boundaries” (p.619), and finally, accounting is an improvisation,

" a form of briolage", although Miller qualifies this apparently damning conclusion by stating that, in this respect, accounting is probably very similar to other modern disciplines, including management. This paper is certainly a timely commentary on aspects of the nature of accounting as we seek to add the social and environmental to the financial in complex model-building exercises.

ENVIRONMENTAL ASPECTS OF COST/MANAGEMENT ACCOUNTING

Mathews (1997a) did not report any major SEAL emanating from the cost and management accounting perspective prior to 1995. Since that time there have been a number of contributions relating to the managerial and management/cost accounting perspective on environmental accounting as distinct from financial accounting and reporting. These include Lawrence and Cerf (1995), Epstein (1996a, 1996b, 1996c), Bailey and Soyka (1996), Milne (1996a), Ranganathan and Ditz (1996), Larson and Brown (1997), Roth and Keller (1997), Parker (1997), Freedman (1998), Carrera and Iannuzzi (1998), and Corrigan (1998). These contributions have been located as a sub-section of philosophical discussion because they do not easily fit under any other of the main sections.

Lawrence and Cerf (1995) (US) provided a comprehensive description of multifunctional processes operated by Chevron to identify contaminated sites which needed to be remediated, and the ways in which liabilities are determined for disclosure to the shareholders. Sites are frequently identified by outside parties, but where possible the corporation tries to identify them through proactive screening of operating sites.

The management is driven by the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act/ Superfund Amandmant and Reauthorization Act (CERCLA/SARA) legislation, also known as `superfund' and seeks to avoid the most costly and punitive aspects of the legislation by being proactive in the remediation of company sites. Chevron uses a cross-functional process involving finance, accounting, environmental project engineers, regulatory experts, legal staff and others to assist in "…properly and confidently reflecting a company's environmental responsibility" (Lawrence and Cerf, 1995, p.54). The use of external audit to attest to the outcome is not discussed, suggesting that this is an internal process only. Since 1995, additional guidance has been developed by the AICPA to assist in determining the values to be disclosed to shareholders where remediation sites have been identified.

Epstein (1996a) (US) described the process of life-cycle assessment of product by corporations, including designing and managing for product takeback. This has consequences for the organisation of design and production processes. Life Cycle Assessment (LCA) and Life Cycle Costing (LCC) are used to gain a better understanding of the financial and environmental effects of corporate products. Environmental costs may relate to past production (remediation costs, which receive the

most attention in the US), current production and future costs related to current production (which may be estimated based on LCA).

Epstein (1996a) also argued for a wider stakeholder recognition, which would include employees, suppliers, customers, society, the local community, the environment and shareholders. This is termed total stakeholder analysis. Other techniques described in this paper include estimating future environmental impacts, performance evaluation systems for teams, managers and strategic business units, and steps for implementing a corporate environmental strategy. The latter involves eight steps to better environmental management.

Epstein (1996b) argued that full environmental cost accounting can assist in improving environmental management. Before corporate environmental plans can be implemented, environmental costs must be identified and accumulated, that is these costs must be separated out from places where they have been hidden in various general and administrative or manufacturing overhead accounts, and in general property plant and equipment accounts. Epstein (1996b, pp.12-13) stated that if environmentally related costs are "properly identified, traced, recalculated, and arrayed, companies often find that some products have been undercosted and some overcosted". More appropriate strategies may then be identified and considered. "Three categories of costs should be examined: (1) current costs for past sins; (2) current costs for current sins; and (3) future costs for current sins" (Epstein, 1996b, p.14).

The first group, the costs of remediation, are now being felt by many corporations and in some cases are being passed on to current business units which, it is argued, can create further distortions. Whether this is appropriate or not has yet to be resolved. There is no controversy about the current costs of polluting activities, which should be included in current product costs. But the problem is how to do this in a non-distorting manner. Unless environmental costs have been accurately determined the allocation of these costs will be to a greater or lesser extent arbitrary and potentially distorting. With regard to the future costs of current sins, it is argued that ""Estimates of the future costs related to current production must be included in product costs for effective product management decisions" (Epstein, 1996b, p.14). Epstein (1996b, p15) cited the use of an eco-accounting cost matrix as a means of accounting for current costs of past and current sins. This would not replace current cost/management accounting but supplement present systems.

Epstein then discussed accounting and managing for the future costs of current sins, and the future product life cycle. This section of the paper deals with the concept of product takeback and the disposal of post-consumer waste. Companies may then change product and process designs, sometimes leading to increases in profitability through easier assembly and disassembly and reduced costs. This requires multi-functional and interdisciplinary teams to design and produce products. Life Cycle Assessment (LCA) and full environmental cost analysis using Life Cycle Costing

(LCC) are aimed at including future costs in the current period. LCA attempts "to identify all of the environmental costs (and benefits), internal and external, associated with a process, product, or activity throughout all stages of its life on the company, its users, and the corporations stakeholders. …LCC attaches a monetary measure to every effect of a product and projects likely future costs (and benefits) (Epstein, 1996b, p.17). Epstein concluded that the integration of environmental costs with product costs is only just the beginning, that post-consumer waste and life cycle analysis will be increasingly important, and that the integration of environmental impact into management decisions is going to occur regardless of external reporting developments.

Epstein (1996c) is a full length book which incorporates many of the ideas contained in the previous items. This book is one of the most thorough of the `business can cure environmental problems' genre. The structure includes the importance of developing a corporate environmental strategy, minimising environmental impacts through recycling, takebacks, life-cycle assessments and various methods of reducing waste, systems for identifying, organising, and managing corporate environmental impacts, internal reporting and auditing systems, external reporting systems and environmental audits, costing, capital budgeting and performance evaluation systems, implementing a corporate environmental strategy and a survey of regulations that govern environmental reporting.

The basic premise is that modern corporations can be organised and managed to perform in a less environmentally damaging manner, within the current regulatory system. There is no attempt to challenge the basic economic and social system, or the notion of produce, consume and generate economic growth. The data used in the book comes from a survey by interviews carried out by the author amongst industrialists and senior managers, and therefore it is not surprising that the social and economic system itself is not challenged to any extent.

Bailey and Soyka (1996) (US) discussed the plethora of new terms, which were being used to describe forms of environmental accounting. The authors concluded that there was little agreement at that time about what environmental accounting consisted of except that it was a `good thing'. It is described as a management tool. Furthermore, the authors argued that it is essential to define clear and achievable objectives and identify and overcome barriers to organisational change. In the view of the authors, environmental accounting does not necessarily require an environmental accounting system. Bailey and Soyka (1996) recommended focusing on the information and motivation needs of relevant decision-makers as a means of identifying the environmental accounting information required. The movement towards fully developed environmental accounting has still a long way to go but the principles, tools and examples already exist. The tenor of this paper is really towards keeping environmental accounting away from the general accounting system and in the hands of environmental managers.

Milne (1996a) (NZ) reviewed a number of mainstream management accounting textbooks and the general research literature in that area, concluding that accounting in general and management accounting in particular, had ignored the non-market activities associated with private sector organisations and their impacts on the biophysical environment. The paper developed a three-dimensional framework to conceptualise sustainable decision-making. Several main decision approaches were identified; the first was no accounting for nature, which was stated to be the general position of management accounting, which pursued narrow economic objectives. To move beyond this narrow perspective, the paper considered accounting for externalities, which would require extended cost-benefit analyses and non-market valuation techniques. Coming from the economics tradition these would need to be modified by management accountants; However, the outcome of making explicit the environmental impact of private sector organisations is worthwhile.

The developments required to make management accounting consistent with sustainability is much more complex, because sustainability is not susceptible to either financial analysis or to an expansion of economic activity, unless ecological limits and social and ecological values are taken into account. Milne (1996a) did not appear to believe that management accounting provides any leadership in accounting for sustainability, although some aspects of management accounting could provide assistance with accounting for externalities. This article may be compared and contrasted with the more optimistic views portrayed in Epstein (1996a, 1996b, 1996c).

Ranganathan and Ditz (1996) (US) discussed the interaction of environmental costs and management decision-making activities and the need to evolve an appropriate cost accounting system. Many environmental costs are pooled in overhead accounts and then allocated in a crude manner across all products and processes. This approach is unsatisfactory because environmental costs are large and growing, and not all products and processes contribute to these environmental costs that can appear across a wide variety of business activities. The cost accounting system can assist in providing management with more relevant information through a study/reclassification of raw materials, managing the cost of waste, informing pricing decisions, and segmenting product costs (by product line, formulation and environmental versus other, for example). The authors suggested that elements involved in the better management of environmental costs included informing decision-makers of environmental costs, making managers accountable for the costs they generate, incorporating environmental costs into management initiatives, identifying other indicators of environmental costs, and integrating environmental accounting into business processes (Ranganathan and Ditz, 1996, p.40).

Larson and Brown (1997) (US) argued for the development of a system of metrics to track environmental performance so that it can be managed. The authors argued that the optimal metrics system is unique for each company. They provided a structure by which to proceed; know what your goals are; address the needs of all stakeholders; do not reinvent the wheel; and design to fit the ideal

process. Quantitative metrics can be indicators that monitor the flow of resources, products and waste, or indicators that monitor direct impacts on local environmental systems. Qualitative metrics measure management system implementation or organisational process. Common pitfalls in design include; selecting the right number of indicators: defining and developing terminology; developing units of measurement; and translation/language issues. In collecting data, matters to be considered include: frequency of collection; adding comments to data and documentation; dealing with data; verification, sorting and analysis; and reporting (Larson and Brown, 1997, pp.84-85).

The authors concluded with two cautions; measurement perception of the system being measured, and measurement systems which are often quantitatively based, appear to be objective although based on assumptions and values that are not always transparent (Larson and Brown, 1997, p.88).

Roth and Keller (1997) (US) considered the relationship between quality, profits and the environment. They argued that environmental responsibility lies conceptually on a continuum between `light' and `dark green' philosophies, which may determine the extent to which sustainability and other developments are pursued. Nevertheless, there are a number of environmental responsibilities which should be common to all corporations. These include: reusing parts and supplies; recycling; eliminating or reducing pollution; manufacturing products that are recyclable; reducing unnecessary packaging; reducing waste; reducing energy consumption; manufacturing energy efficient products; manufacturing products with longer lives; manufacturing products that are easy to repair; and reclaiming products from consumers.

The authors quote the often-stated point that total quality management and environmental responsibility may be good for business as well as the environment. However, they also note the deeper green position of Gray et al. (1993) that a fundamental conflict exists between success as currently measured and `dark green' environmental responsibility. The likely outcome according to Roth and Keller (1997) is that companies will opt to follow a `light green' attitude until social and investor attitudes change and become clearer. In doing this they can be assisted by accountants with a redesigned cost accounting system to ensure that waste is reported as a variance. In addition, it is argued that full disclosure of environmental and quality data would give a more comprehensive evaluation of the company's performance, until a deeper green accounting was demanded by society. In the meantime the accounting profession should develop and refine comprehensive performance measures.

Parker (1997) (Australia) developed some of the same points as have been made by other authors reviewed in this sub-section in that he correctly identified many areas, other than annual report disclosures, as locations for reform and development. These include developing environmental management strategies including compliance with legal regulations, comprehensive environmental management and sustainable development.

Environment strategy opportunities can be found in the application of environmental technology, energy conservation systems, product development and marketing, packaging, and recycling. All of these activities would require an input from the accounting discipline, including attempts to determine cost/benefit for specific strategies, determining cost savings of competing alternatives, developing full cost, life cycle costing, environmental cost categories, accounting for waste, investment appraisal, the further development of management control systems and environmental performance evaluation. As with the other authors in this sub-section, Parker (1997) provides a counter balance to the pervasive view that social and environmental accounting would be limited to alternative disclosures in the annual report.

J. Freedman (1998) (US) reported on a conference dealing with strategies for environmental cost accounting, which continue to increase in importance as management and management accountants seek to understand the costs and benefits of proactive environmental strategies. For example, what are true environmental costs and cost drivers? The use of total cost/benefit analysis to identify and quantify internal costs and benefits associated with the product life cycle, and designing for the environment, are some of the recently developed techniques which were considered. It was concluded that management accountants should become involved with those new techniques to assist managerial decision making.

Carrera and Iannuzzi (1998) (US) described Environmental Cost Accounting (ECA) (also known as full cost environmental accounting, eco-accounting, full cost accounting, environmental accounting, total cost accounting, and green accounting) as a managerial accounting tool, connecting finance and economics with environmental management. Ideally ECA would lead to environmental costs being tracked to products and processes and not allocated from a common pool. Environmental costs are estimated to be 2% of sales value.

Carrera and Iannuzzi (1998) considered a number of leading companies in the ECA field including Ontario Hydro, Baxter, Amoco and Dupont. Starting an ECA programme is probably easiest if the most obvious costs are pursued first. The authors concluded that proactive environmental companies use ECA data to improve their bottom lines while also improving their environmental performance.

Corrigan (1998) (Australia) reported on the International Federation of Accountants (IFAC) study entitled *Environmental Management in Organisations: The Role of the Management Accountant* which focused on how management accountants can contribute by developing and implementing environmental management systems. The IFAC study adopted the perspective of the Society of Management Accountants of Canada, which identified four functions making up environmental management accounting activities; cost accounting including both internal and external environmental costs, and life cycle analysis and life cycle costing; financial management covering the

generation, analysis and use of environmental risk and liability information for investment appraisal and capital budgeting; assessment of risk; and information systems to support environmental management accounting. Interestingly, to date, there has been no suggestion of capture of environmental accounting by the management accountants.

SUMMARY

As noted in the introduction to this sub-section, the previous 25 years of social and environmental accounting research produced very little information about the involvement of cost and management accounting techniques, or their adaptation, in these emerging fields. There has been considerable development reported over the past five years, and although some may argue that in many cases this is aimed at increasing profits for organisations, rather than improvements to the environment, there is also a considerable element of preventing environmental costs (and damage) at the same time. The nature of management accounting is such that the majority of the data developed will be retained for use by management and not disclosed to other stakeholders.

ENVIRONMENTAL AUDITING

One interesting and important development over the last five years, is the attention that auditors both internal and external have given to social and environmental matters. This interest has been prompted in part by the setting up of standardisation systems for environmental management, which contain an audit or verification requirement. Interesting contributions in this area come from Hilary (1995), Maltby (1995), Langford (1995), Dittenhofer (1995), Power (1997), Black (1998) and Tucker and Kasper (1998).

Hilary (1995) (UK) reported on the European Community (EC) Eco-Management and Audit Scheme (EMAS), consisting of 21 Articles and 5 Annexes, which became effective from 10 April 1995. The overall objectives were to promote continuous environmental performance improvements by committing sites to; establish and implement environmental policies, programmes, and management systems; periodically evaluate in a systematic and subjective way the performance of the site elements; and provide environmental performance information to the public. EMAS was not intended to replace existing Community or national environmental legislation or technical standards, but as an additional activity.

EMAS is open to companies operating industrial activities. Registration requires companies to adopt an environmental policy containing commitments to comply with legislation, but also aimed at continuous environmental performance improvements. EMAS is subject to revision after a three-year review. A fundamental feature of EMAS is the public environmental statement and its validation by accredited verifiers. The statement is to include a description of site activities; an assessment of significant environmental issues; information on pollution emissions; waste production; consumption of raw materials, energy and water, and noise; a presentation of the company's environmental

policies and site programme and management systems; the deadline for the next statement; and the name of the accredited environmental verifier. Simplified statements are required during the intervening years. Accredited environmental verifiers have two roles (1) to check that elements of EMAS are in place, operational, and carried out to specification, and (2) to check reliability and coverage of the information in the environmental statement and verification of the information.

BS 7750 was almost the same as EMAS, but needed to have the environmental statement added, to be fully comparable. EMAS and related activities (BS 7750 and ISO 14000) were also discussed by Gray et al. (1996) and Schaltegger et al. (1996). Maltby (1995) referred to environmental audit as a growth area, which had received little attention in the auditing literature, noting that there was no mandatory requirement for companies to have an environmental audit, neither are there generally accepted standards related to this work.

Maltby (1995) (UK) discussed both direct and indirect pressures, which may be exerted on companies, to adopt environmental audit. Direct pressure comes from the EC eco-audit also known as EMAS and the indirect pressure comes from public environmental disclosure. The voluntary EMAS will require registered companies to have an environmental policy and an environmental management system with quantifiable targets for continuous improvement of performance. Audit must be carried out at a minimum of every three years, leading to an audit report submitted to management and a published environmental statement, both subject to independent external verification. By comparison, BS 7750 required that the operation of the environmental management system should be internally audited and evaluated on a regular basis. In addition to direct and indirect pressures, there is a legal pressure with recent UK environmental legislation providing many opportunities for corporate legal infringements.

Langford (1995) (UK) noted that under EMAS regulations the accreditation of verifiers in the UK is the responsibility of the National Accreditation Council for Certification Bodies (NACCB). This is clearly the basis for ongoing contests for position between external auditors, internal auditors, and those employed in the technical areas as environmental managers and auditors.

Dittenhofer (1995), writing from a US perspective, argued that environmental auditing could be performed by both internal and external auditors. Both groups must accommodate the risk and exposure caused by environmental issues. However, the majority of environmental audits advocated by the author are related to past events and remediation rather than EMAS type audits, although product audits are referred to. At the time Dittenhofer was writing, contingent liabilities for environmental damage by US corporations were governed by SFAS 5, which was being used for a purpose for which it had not been intended.

Power (1997), (UK) in a perceptive article, noted how accountants were beginning to respond to the shift in regulatory style following the development of EMAS. The market for environmental audit and verification of voluntary statements has prompted a move by some accountants to become involved in a field that they had hitherto neglected. In doing so they have to establish a claim to the appropriate level of expertise in order to overcome competing claims by experts in other fields, such as the applied sciences. They attempt to do this on the basis of an overall claim to audit systems of management control. This process is ongoing with external auditors competing with internal auditors, who are in many cases competing with environmental managers, to determine the overall control of the environmental audit process. The intensity of the debate reported by Power (1997) suggests a belief by some accounting firms that a lot of business will come from the audit of these systems.

Black (1998) (US) noted that since about 1970, wherever there was any environmental auditing in the US it was driven by compliance with legislation relating to air and water standards. The attention of environmental auditors should now shift to to the audit of fully integrated environmental management systems, which are designed to "sustain and promote environmental advances while utilizing far fewer resources than a compliance approach requires" (Black, 1998, p.24). This requires five changes to the environmental auditing scene; broader audits going well beyond compliance; integrated environmental audits within the overall organisation; a widespread involvement with a need to take a wider perspective such as life cycle assessment; an emphasis on certification leading to the creation of a new qualification; and a merging of the roles of internal auditors and environmental auditors.

Tucker and Kasper (1998) examined the role of the internal auditor in environmental auditing following changes to the approach of the EPA. They argue that the ISO 14000 standard is more likely to affect US corporations than BS 7750 or the EMAS scheme. Tucker and Kasper provide arguments in favour of management moving from a technical view of environmental audit, not employing the internal audit function, to an integrated approach.

SOCIAL AUDIT

The early history of the Social Audit movement is well covered in Gray et al. (1987) and Gray et al. (1996), and to a lesser extent in Mathews (1993). After a period of quiescence the area of social audit has now been revived, but in a somewhat different and more benign form from the perspective of the target organisations. A recent report on behalf of the New Economics Foundation (NEF), the Association of Chartered Certified Accountants (ACCA) and the Institute of Social and Ethical Accountability (ISIA) by Gonella et al. was published in 1998 by ACCA. The report provides a review of contemporary practice, which explores the conceptual and practical roots of current practice, the drivers of this practice including managerialist/stakeholder management, value shift and base, and public interest and accountability.

A number of common themes are identified, including eight underlying principles and a variety of approaches to social audit. The report concludes with an agenda for action. The overall result is an updated social audit, which does not appear to be driven by an overt political agenda of conflict between organisation and public, but is more of a managerial tool for keeping the organisation onside with various constituencies. Some critics might suggest that Social Audit has been captured by the managerial group and `turned' to support the status quo in a manner that would have been unthinkable in the 1970s.

In 1998 *Critical Perspectives on Accounting* produced a special edition dealing with the use of the US Single Audit Act as a possible vehicle for corporate social audit. The format of the special issue was to include not only the proposal but also a number of critiques and a response from the original authors. Sutton and Arnold (1998) began the series of papers by proposing that the US Single Audit requirements for state and local governments would provide a demonstrative platform for a workable social responsibility reporting system. It was argued that by using the Single Audit requirements as a benchmark, traditional criticisms suggesting that social responsibility disclosures are infeasible are countered by the demonstrated experiences of state and local governments.

In response, Defeo and Falk (1998) (UK) argued that there are differences in the nature of the contracts which govern the activities of the two types of organisations. The authors base their arguments on economic analysis, and conclude that no firm conclusions are warranted before further analysis demonstrates that net welfare to society will be enhanced by mandating such disclosures.

A response by M. Freedman (1998b) (US) offered limited support for the proposal, and accepted that the Single Audit Act may be a step that leads to more social disclosure, provided that those involved do not take it too literally. There is a concern that aspects of the Act dealing with social problems may be given only perfunctory treatment.

Gray (1998) (UK) offered support also, however, although recognising their attempts to develop accounting which might better reflect a wider range of stakeholders and social responsibilities, Gray is critical because Sutton and Arnold (1998) have ignored the extensive social accounting literature.

Lee (1998) (UK) also provided a critique of Sutton and Arnold (1998). He viewed the requirements of the Single Audit Act as related to the expansion of audit from a traditional financial focus and from the public to the private sector. Lee (1998) concluded that the Single Audit Act proposal "could be expanded to an external audit of management rather than be limited to an assessment of managerial controls" (p.217).

Roberts (1998) (UK) also commented on Sutton and Arnold (1998) and noted that the corporate single audit would require regulated, mandatory, corporate social reporting in order to meet the

information needs of a broad set of users interested in social as well as financial performance. Roberts argued that stakeholder theory provided a framework to deal with the information needs of multiple corporate stakeholders.

Shaoul (1998) (UK) challenged the fundamental assumptions of the corporate social reporting school, to which it was asserted that Sutton and Arnold's paper belonged. Shaol used financial analysis from the perspective of other stakeholders and, drawing on a financial analysis of the recently privatised UK water utilities, attempted to demonstrate that "Sutton and Arnold's thesis is redundant at best but may perhaps serve to reinforce the false ideology of the stakeholder concept" (p.235). In response to the various critiques of their single audit act paper, Sutton and Arnold noted that most accounting researchers and policy makers have advocated an economic stakeholder approach to accounting standard setting and corporate reporting. They argued that this is based on the use of contracting relationships to establish key constituencies and users of corporate financial reporting.

The authors argued that if contracting theory is to be the foundation for standard setting it is necessary to move away from a primitive `might is right' model to one that deconstructs power positions "and bases contracting theory on an ethical rather than economic foundation. Rawls theory of justice is used to demonstrate such a contractarian ethics approach to policy making" (p.251).

An important contribution to the area of social accounting and social auditing was provided by The Copenhagen Charter (1999) (The Charter), a publication sponsored by the Danish offices of Ernst and Young, KPMG, PriceWaterhouse Coopers and the House of Mandag Morgan. It was launched at the Third International Conference on Social and Ethical Accounting , Auditing and Reporting, and is concerned about developing sensitivity to the values of stakeholders. The Charter is a " . . . management guide to stakeholder dialogue and reporting". It aims to set out, briefly and concisely, the most important motives and principles involved" (p.1).

Part One discusses The Effects of Stakeholder Reporting, which is aimed at providing balanced and sustainable value creation for all stakeholders. It is argued that " . . . the processes of stakeholder dialogue and reporting must be embedded throughout the organisation, in the mission, vision and values of the company, and in management and corporate governance systems " (p.2).

The Charter goes on to discuss internal value creation (dialogue-based, values-driven management), responses to new management challenges, and a strategic information system and external value creation. The latter involves dialogue and communication, ". . . management to communicate a more complete picture of the company to its stakeholders to improve both shareholder and stakeholder value, and to account for its performance in living up to values that are important to key stakeholders"

(p.3) and reputation management, an insurance policy protecting the company's reputation by means of an `early warning system'.

Part two of the Charter is devoted to the Principles of Stakeholder Reporting. These are listed in three groups; laying the groundwork, embedding and communicating. Laying the groundwork includes the involvement of top management who should demonstrate commitment, by determining objectives and resource allocation, setting up task groups, and preparing management and employees. The embedding process includes revising vision strategies and values, identifying key stakeholders and focus areas, identifying values and critical success factors, dialogue with stakeholders, determining key performance indicators, adaptation of management information systems, and monitoring effectiveness for continuous improvement. Communicating is subdivided into preparing reports, having objectives, budgets and action plans for improvements, verifying reports, publishing reports, and consulting stakeholders about performance and values.

Part Three is entitled Credibility in Stakeholder Reporting and involves accounting principles (not necessarily GAAP), information relevance (including negative information as appropriate) and verification.

The first standard for building corporate accountability and trust was issued in November 1999 by the Institute of Social and Ethical Accountability (ISEA). The ISEA states that the AA1000 standard " . . . provides both the framework that organisations can use to understand and improve their ethical performance and a means to judge the validity of ethical claims made." The AA1000 standard is `best practice' as agreed by world-wide experts and would give both internal and external stakeholders greater reassurance that the disclosures were not merely public relations `puff'.

Adams and Harte (2000) (UK) explored accountings' potential to reveal discrimination in employment. The authors argued that this would not be a simple solution, but an enabling mechanism, which has the potential to disclose social information. The paper considered what form an accounting to make discrimination visible might take, and how it might be introduced. The approach taken by the Human Resources Department Canada (1997), which rated companies on the basis of five ratios, was quoted with approval by the authors. Alternative strategies for introducing social disclosures of this type might be; to encourage contract compliance, to encourage mutual regulation, voluntary sector regulation, a good equal opportunities employer logo similar to ISO 9000 or ISO 14001, regulation or regulation and audit. The authors would favour a change in the management of organisations "which would give workers greater involvement in the running of the firm" (p.73), but believe that organisations might prefer regulations which would avoid such fundamental changes.

SUSTAINABILITY

Bebbington and Tan (1996, 1997) (NZ) reported on their attempts to develop an experimental accounting aimed at calculating the notional cost of environmental sustainability. This is an interesting discussion which assesses the costs of various ways of achieving sustainability, such as planting forests to act as Carbon sinks or imposing various levels of Carbon taxes. There will no doubt be further discussions about these and other alternatives during the next few years.

Hart (1997) (US) discussed the strategies needed to achieve sustainability, based on a business driven technological approach (that is not one based on attempting to control population or on lowering the level of affluence for developed countries). Hart (1997) argued that to achieve sustainability requires a combination of pollution prevention, product stewardship and clean technology. Pollution prevention is a stage beyond pollution control, because by redesigning plants and processes it is possible to prevent waste and pollution, and so not have to control it or clean up after it has occurred. Product stewardship involves minimising pollution from manufacturing and also reducing the environmental impacts associated with the full life cycle of the product. This concept is extended into designing for the environment. Clean technology is stated to be the key to increased wealth, especially in Asia, where it would be appropriate to move directly to advanced clean technology, without passing through the dirty technology associated with western economic development.

According to Hart (1997) by combining pollution prevention, product stewardship, and clean technology, modern corporations are able to offer a vision of sustainability. Whether this is a vision or a mirage will be an empirical question to be determined over the next few decades. Although clean technology is clearly essential, so also are population reduction (or at least restraint) and probably some restraint on wealth accumulation by developed countries as well. Past problems with inappropriate behaviour by the management of some corporation's make the optimistic account by Hart (1997) seem too optimistic.

Lamberton (1998) explored the accounting needs of an ecologically sustainable organisation. In discussing the ecologically sustainable organisation, Lamberton (1988) considered various perspectives including anthropocentric, ecocentric, and ecohumanistic, before settling for the sustaincentric paradigm which is both people centred and conservation based (Gladwin et al., 1995; cited by Lamberton, 1998, p.191). The major assumptions of this paradigm are: Ecological, social and economic interdependence; Humankind as stewards of human and non-human nature;

Humankind bound by the principles of intergenerational, intragenerational and interspecies equity; Economic growth bounded by ecological limits; Reduced consumption in developed countries to enable preservation of natural and social life support systems; Stabilisation of the human population; Poverty reduction schemes created to provide work and basic social needs (health care, family planning, nutrition, education) to the poor; Maintenance of critical natural capital.

Sustainable development may be decomposed into ecological social and economic dimensions making up five measurable objectives; eco-efficiency, sustainable financial performance, ecological sustainability, intergenerational equity, and intragenerational equity. Each is examined, together with the information that would be required to evaluate organisational performance in that area. The traditional role of financial quantification as a measure of performance is reduced in overall importance becoming only one part of the sustainable performance metric. This paper is an excellent contribution, which should be set against that of Hart (1997), to get a more balanced view of the future of accounting for sustainable development.

Magretta (1997) (US) reported on the concept of sustainable development (economic growth and environmental sustainability) which some US business leaders argue is a possibility within the current economic system. This approach is in direct contrast with the views of many environmentalists, who would argue that sustainability could only come through reduced economic activity and the non-consumption of natural capital and other resources.

Birkin and Woodward (1997) (UK) took a zero-based approach to accounting for sustainable development. They argued that two types of alternative have to be evaluated; different ways of achieving each end objective, and the different levels of effort and resources required. The environmental decision package should then be ranked against packages for other new and ongoing environmental projects and activities.

RADICAL CRITICAL LITERATURE

It was noted by Mathews (1997a) that at one point any literature relating to social and environmental disclosure was regarded as radical. Later the critical theorists began to examine social and environmental aspects of accounting, but tended to regard social accounting as simply a means by which management justified the status quo. During the early 1990s, the radical/critical literature began to make a contribution to SEAL. In the period currently under review, there have been radical/critical contributions to SEAL through the journals *Critical Perspective on Accounting* and *Advances in Public Interest Accounting,* as well as the Manchester Interdisciplinary Perspectives on Accounting (IPA) and Asian-Pacific Interdisciplinary Research in Accounting (APIRA) conferences. Some other journals have also published critical theoretical articles. Since conference papers are not included in this review, attention is concentrated on papers in these journals by Lehman (1995), Wambsganss and Sanford (1996), Lehman (1996), Milne (1996b), Gibson (1996), Lehman (1999), and Everett and Neu (2000).

Lehman (1995) (Australia) examined the contribution which the ideas of Rawls (1971) can make to environmental accounting. The author used Rawls (1971) to establish that accounting is a moral discourse; that the environment is a primary good; and that accounting can assist in developing a more transparent society.

One issue of Critical Perspectives on Accounting presented a paper by Wambsganss and Sanford (1996) and three critical commentaries by Lehman, Milne and Gibson. The article by Wambsganss and Sanford (1996) illustrated the problems, which may occur when environmental issues are seen as amenable to treatment using standard financial accounting models. They proposed that pollution allowances issued to utilities by the Environment Protection Agency (EPA) should be treated as donated assets in the books of the recipients, with a corresponding increase in contributed capital.

When used to compensate for pollution, the book value of the allowances would be entered as part of the cost of production and closed to retained earnings at the end of the period. The authors argued that this would more effectively estimate the cost of pollution in the financial statements, and implement a market solution. The paper brought a strong response from the three commentators.

Lehman (1996) argued that environmental accounting on this basis fails to tackle the urgencies of the environmental issue. The author asserts that environmental accounting will prove destructive of nature because it does not contextualise the relationship between humanity and nature.

Milne (1996b) argued that the proposal relies on unacceptably narrow assumptions that utilities and their shareholders own rights to pollute, and that economic efficiency should be the sole arbiter in determining the regulation of environmental resources. Furthermore, it is argued that an analysis of US emissions regulations shows that both assumptions are invalid.

Gibson (1996) argued that reporting pollution allowances is not the real problem in addressing atmospheric pollution, rather the problem is the economic philosophy which attempts to address ecological problems in economic terms. Alternatives to the valuation of permits were explored within both market and non-market frameworks. Clearly as set out by Gibson (1996) there are alternatives to the use of tradable pollution permits to reduce pollution and reduce environmental degradation.

Lehman (1999) introduced the communitarian perspective into the discussion of a role for social and environmental accounting and auditing. In this paper Lehman (1999) critically analyses modern social and environmental accounting which, he argues, have been based on procedural liberal frameworks that limit proposals for reform. The second part of the paper argued that social and environmental accounting focuses on the corporation as the accounting entity and "mistakenly claims to be able to influence it". The author seeks to develop an alternative approach through modern communitarian thought in order to foster debate about the role of corporations and their social and environmental impacts. Lehman (1999, p.239) argues that: "…environmental accounting is not about putting a number on normative issues but rather it is about narrating how reporting entities affect nature".

Everett and Neu (2000) (Canada) addressed the general characteristics of ecological modernisation, which is capable of several interpretations. However, in the view of the authors one appears to be dominant in the environmental accounting literature, the `first world corporatist interpretation' The characteristics appear to include systems theory, win-win solutions, global regulation, and reformist or `pragmatic values'. The authors found these characteristics problematic, because some values such as environmental justice and non-human life are submerged and others are privileged. Through an examination of discourse the authors highlight problems with current trends in environmental accounting such as further industrialisation and continued economic growth.

NON-ACCOUNTING LITERATURE

Three examples of non-accounting literature have been included in this sub-section. These are Burke and Logsdon (1996) from the management perspective, di Norcia (1996) from the philosophy literature, and Myers and Kent (1998) from the field of economics.

Burke and Logsdon (1996) (UK) discussed how corporate social responsibility (CSR) benefits organisations and may increase profits. They developed a matrix with CSR behaviour on one dimension (for example philanthropic contributions or employee benefits are two possibilities) and five strategic dimensions (centrality, specificity, proactivity, voluntarism, and visibility) on the other dimension. The combination of the two dimensions produces a strategic outcome such as customer loyalty, future purchases, productivity gains, new markets or products. As might be expected from a management-oriented contribution, there is little discussion of the philosophical underpinning of CSR actions, but a clinical analysis of the business decision rules which would yield the highest total payoff in terms of collective benefits to the firm and its stakeholders, and fall within the range indicated for strategic CSR (Burke and Logsdon, 1996, p.501).

di Norcia (1996) (US) approaches environmental and social performance from a philosophical perspective. The author goes on to discuss environmental commitments and action plans involving four direct and three indirect environmental performance measures. The direct measures are pollutant load levels, pollutant concentration levels, ecosystem impact levels, and ecosystem rehabilitation measures; the indirect measures are technological indices of the `environmental friendliness' of a product or other factors, economic trend indicators and organisational indicators. The location of firms on a social performance spectrum is posited.

The extent to which subsidies paid by government departments and their agencies are damaging to the environment is the subject of *Perverse Subsidies* by Myers and Kent (1998). This is an economics based study which, in a somewhat journalistic fashion, examines how taxes are often used in ways which the taxpayer would probably not have approved of if known about in advance. Some of these subsidies are damaging to the environment, although others may be beneficial to society as a whole. One problem is trying to distinguish between the two. Economists like Myers

and Kent (1998) periodically attempt to identify and measure subsidies; accountants do not appear to become involved in this area at all.

TEACHING PROGRAMMES AND TEXT BOOKS

There are six items to be discussed under this heading; Gray et al. (1996), Epstein (1996c), Sefcek et al. (1997), Elkington (1997), Gordon (1998) and Grinnell and Hunt (2000).

Gray et al. (1996) (UK) is probably the only choice of textbook for those wanting to approach the study of social and environmental accounting from an accountability perspective. The restricted range of textbook available suggests that the market is small, and this relates well to anecdotal evidence about the number of courses being taught. Of course, there will be many instructors who compile collections of readings for low enrolment programmes such as social and environmental accounting, especially at the graduate level.

Some instructors might wish to approach the subject of environmental accounting from a managerial or management accounting perspective. In which case they may find Epstein (1996c) a suitable approach. There may also be a cultural or ideological difference which leads to the choice of textbook since Gray et al. (1996) is clearly UK/Europe centered/influenced and Epstein has a North American perspective.

Sefcek et al. (1997) is a US contribution to the field. However, the authors employ a comparatively restricted definition of an environmental accounting course, and despite their support for the Accounting Education Change Commission goal of a wider education for accountants, limit development to technical issues ancillary to existing accounting courses. Their article does not address any of the qualitative goals which one might expect to see considered in such a programme.

The plan put forward by Sefcek et al. makes no substantial reference to the moral issues which other authors have used to drive environmental accounting (for example Gray et al., 1994; Gray et al., 1996). The approach taken by Sefcek et al. (1997) is likely to be favoured by those educators who are not well versed in the literature of accounting as being in need of a broader view of stakeholders, reporting relationships, and accountability. It is equivalent to the capture hypothesis put forward by some in regard to, for example, environmental auditing.

Elkington (1997) (UK) is a lengthy book of more than 400 pages in which the author outlines his vision for the future of western style industrial economies and commerce in general. The problem of developing sustainable capitalism is examined by propounding the thesis of the triple bottom line; capitalism must satisfy legitimate demands for accountability in terms of economic, social and environmental performance. This approach must permeate all aspects of business operation including life-cycle technology, working with environmental and social activist groups, modifying

corporate governance, modifying the products and services offered in all markets, accepting regulations and accountability and audits. In all these aspects of change, the author is optimistic that corporations will survive and become sustainable.

The book is divided into four parts. Part I reviews early greening and explores some of the implications of the emerging triple bottom line for 21st century business. Part II outlines revolutions already under way, which must be successful for corporations to become sustainable. Part III focuses on the sustainable corporation and market changes which will be needed for this to be achieved. Part IV discusses sustainability audits which Elkington believes will be applied by many organisations to their suppliers and other parties with which they have to interact. Although strongly evolutionary, this book is not part of the critical tradition because it does not challenge current social, political and economic structures. Instead it advises corporations how to change and thus avoid such challenges.

Gordon (1998) (Canada) reported a study of final year undergraduate students, enrolled in a compulsory undergraduate accounting theory course, where their reactions to social and environmental accounting issues was measured before, and after, they undertook a programme in this aspect of accounting. The results indicated that it was possible to induce a change in attitudes of senior undergraduate students about to enter the workforce. The study has important implications for progressive accounting education.

Grinnell and Hunt (2000) (US) described the development and structure of an integrated course in accounting, with an emphasis on how accounting information can be used to support corporate environmental strategy. The authors also discussed their experiences in running such a course, and summarised the perceived benefits and difficulties associated with such a course. The authors argued that such a course would assist in meeting the objectives of the Accounting Education Change Commission and the American Institute of Certified Public Accountants. However, it would not be seen as radical in comparison with similar courses outside of the United States. There are no challenges offered to the established social, economic and political order by Grinnell and Hunt (2000).

REGULATORY FRAMEWORKS

One area in which a form of regulation has developed in the period since 1995 is that of the disclosure of environmental liabilities. Although there are no accounting standards which specifically deal with environmental liabilities and their disclosure in annual reports, in the US Statement of Accounting Standards No.5- Accounting for Contingencies (SFAS 5) has been pressed into service. Later, in 1996, other provisions modified the SFAS 5 approach. These alternatives are no substitute for accounting standards. However, at the present time there is very little actual regulation of

disclosures in relation to social and environmental matters in any Anglo-American accounting country.

Rezaee et al. (1995) (US) and Steadman et al. (1995) (US) commented on the use of SFAS 5 for the disclosure of environmental contingent liabilities. Rezaee et al. (1995) provided some basic statistics. In 1995, there were 1,200 National Priority List (NPL) sites requiring long-term clean up. There were a total of 25,000 sites with an estimated average clean up cost per site of $25 Million. The total cost of pollution is quoted as being 2.3% of GNP in 1990 (up from 1.5% of GNP in 1971) and this was expected to rise to 2.8% in 2000 and 5.2% of GDP in 2020. Rezaee et al. (1995, p.2) reported that to maintain US environmental quality at 1987 levels would cost $55 Billion per year by 2000 for the public sector, and a similar amount for the private sector.

The list of environmentally related laws impacting on US corporations is extensive and yet the requirements for recognition and disclosure in corporate annual reports is relatively restricted and based on SFAS 5. It is noted that "The statement requires the recognition of a liability when it is probable that an obligation exists and its costs can be reasonably estimated". SFAS 5 dates from 1975 and an interpretation dating from 1976 (FASB Interpretation No.140) indicated that when a range of reasonable loss is estimated, the minimum should be recorded.

Other provisions for dealing with environmental contamination treatment costs are contained in Emerging Issues Task Force (EITF) No. 90-8 including contamination removal costs, costs to acquire pollution control equipment, costs of environmental studies, and costs of fines and penalties levied under environmental laws. Generally these items should be expensed unless it can be shown that they increase asset life or performance or prevent further contamination or prepare the property for sale, in which case they may be capitalised. SFAS 5 covers environmental losses, which should be disclosed when it is possible that a loss has been incurred but cannot be reasonably estimated, or there is at least a reasonable possibility that a loss has been incurred.

The authors pointed out that there is considerable potential for environmental risks and uncertainties to affect all aspects of financial statements because of compliance costs, capital charges, remediation costs, tort damages, and legal action by relevant authorities. Clearly the authors would wish to see disclosure go well beyond the minimal provisions outlined here.

Steadman et al. (1995) were concerned that small businesses should be properly advised about the provisions of SFAS 5 by their CPAs. The authors noted that SFAS 5 was being pressed into service to make disclosures for which it was never designed, and that in some instances this was responsible for inappropriate levels of disclosure or no disclosure being made at all. Furthermore, the measurement and disclosure of a potential liability is very difficult to quantify. Measurement is a concern because no specific authoritative support has been issued to assist the practitioner.

The problems associated with SFAS 5 led to the production of a proposed Statement of Position in mid 1995, which was commented on by Munter et al. (1996) and a final document in 1996, effective for fiscal years from December 15. This was commented on by Stevens (1996). It was noted that specific guidance is given on the recognition, measurement and disclosure of environmental remediation liabilities (ERLs). However, the guidance does not extend to disclosures of current environmental impacts or even remediation actions taken by management on their own initiative, and asset impairment issues are excluded. The SOP applies when the criteria for SFAS 5 are met (i.e. information available indicates probability that an asset has been impaired or liability has been incurred and the amount can be reasonably estimated) and ERLs should indicate incremental direct costs of remediation and costs of employees directly involved in remediation efforts. The advances provided by SOP 96-1 over SFAS 5 appear to be marginal and the area is still awaiting an appropriate level of accounting standard leading to a full disclosure of environmentally induced liabilities, whether self-disclosed or brought on by external pressures.

Miller and Stanko (1997) (US) commented on the effect of environmental liabilities on government entities. The EPA has targeted landfill sites, many owned and operated by state and local governments. This makes them potentially responsible parties (PRPs) under the CERCLA legislation and liable for remediation costs. Miller and Stanko (1997, p.14) quote a figure of 1387 landfill sites which are current or former landfills including 250 operated by local governments. The strict liability under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and Superfund Amendments and Reauthorization Act (SARA) means that remediation costs are unavoidable by some party at some time; but in the interim, progress on clean-up is slow (Miller and Stanko, 1997, p.15).

The accounting issues involved are covered by Governmental Accounting Standards Board (GASB) statement 18, Accounting for Municipal Solid Waste Landfill Closure and Postclosure Care Costs, which applies to all state and local government entities. It requires estimates of the total current cost of landfill closure and postclosure care, with a portion to be charged as an expense each period.

SOP 96-1 also applies to state and local government entities that have been identified as PRPs. In many cases government agencies are being named by private sector entities attempting to offload some of their own liabilities as PRPs. It appears that the process can go on for lengthy periods without much action at the `tipface'.

Abdolmohammadi et al. (1997) (US) reviewed the US environmental accounting experience with particular reference to legislative provisions. These may be divided between those laws designed to control and prevent environmental degradation, and those intended to deal with remediation. The article also discussed the US Environmental Protection Agency (EPA) proposal to incorporate environmental protection costs in companies' cost accounting systems. There is an extensive list of

relevant US legislation in an appendix. The authors claim that legal pressure has led to a significant improvement in the quality of professional guidance for environmental accounting. Although the US remediation regime is well documented, the extent of legislation relating to prevention and control is perhaps not as well known.

Hethcox, Riley and Williams (1998a, 1998b) (US) considered accounting for small business environmental issues. The authors noted that in the period 1992-1994 only 200 out of 1,200 resolved lawsuits were with large public companies and the remainder involved smaller non-public entities. The article gives details of some of the cases resulting in penalties for both private and public sector entities. This may show that both small and large organisations are affected by environmental laws, however, it may also be seen as the legal processes targeting small entities disproportionately, because the larger corporations are able to delay or avoid legal actions reaching completion. Hethcox et al. (1998b) examined the provisions of SFAS 5 and SOP 96-1 as they affect small businesses. Summaries of these accounting requirements are provided for those advising small businesses.

Hochman (1998) (US) provided yet another summary of the legal basis for environmental regulation in the US including the minimal liability disclosures required for SOP 96-1. As stated previously, the initiating factor is the inclusion of the site by the EPA and the listing of the corporation as a PRP. Interestingly, because of the length of time involved in the remediation of a site, an environmental liability can be discounted to reflect the time value of money, but only where the aggregate amount of the liability and the amount and timing of cash payments can be readily determined. In measuring the liability, the likely contribution of other PRPs should be included.

Wilmshurst and Frost (1998) (Australia) referred, inter alia, to the issue of ED 65 The Consideration of Environmental Matters in the Audit of Financial Statements, by the Australian Accounting Research Foundation in July 1997. The authors noted that if the provisions of ED 65 are accepted and become a standard, the major implications would include; the need to consider the impact of environmental matters in financial statements, examine compliance with regulations, review internal record systems, consider risk through environmental impact and violations of laws, and review internal audit operations.

There is a lack of involvement of accountants with environmental management systems and environmental impact in general. The authors argued that there are two ways of getting a greater involvement by accountants in the environmental management process; greater recognition within the accounting education system, and through a more proactive response by accounting regulators. Unfortunately neither seem very likely in the near future.

Beets and Souther (1999) (US) have argued that although many companies are beginning to produce periodic environmental reports, these reports lack credibility because of the absence of reporting standards and a lack of verification. The authors suggest that within the US context much can be learnt from the European EMAS and international ISO experiences. This could lead to the development of standards and attestation along the same lines as financial accounting standards and audit, with a private sector standard setting group similar to the FASB producing standards and another group similar to the Auditing Standards Board of the AICPA promulgating environmental verification standards. An alternative approach would be to have the EPA develop standards or a private sector body develop the standards and the EPA act as an oversight agency analagous to the FASB-SEC relationship.

All of these suggestions will concern those who are worried about the capture of the social and environmental accounting movements by the traditional professional accounting processes which are not seen as independent of management. However, if the reports are kept separate and additional to conventional financial statements (refer Mathews, 1997b) some of these concerns may be allayed. This is certainly an area to be debated if the large public accounting firms simply see environmental accounting and auditing as a means of increasing their traditional role in business (Power, 1997) with no additional training for personnel or greater sensitivity to expanded stakeholders and environmental issues.

OTHER REVIEWS OF THE LITERATURE

The author is not aware of any other comprehensive reviews of the literature covering this period, other than those making up the literature review as a part of other research.

SUMMARY

This paper has reviewed a range of (mainly) journal articles published between 1995 and 2000, using the format employed by Mathews (1997a), with the addition of additional sub-headings for cost/management accounting, environmental auditing, social audit and sustainability. The need to use additional sub-headings indicates an increase in contributions in those areas. Overall, the ascendancy of environmental accounting over social accounting is maintained although the latter is represented by the social audit section, reference to an empirical study, and the production of a social accounting standard, which may point to an important development in this area. There are also references to two attempts to develop large scale multi-dimensional reporting models.

The environmental literature itself appears to have broadened to embrace managerial and auditing aspects of environmental systems, some interest by critical theorists, sustainability, and most recently references to the need for disclosure and auditing standards to be applied to environmental accounting. This development, if sustained, will produce mixed reactions from those who are concerned about the capture of environmental accounting by the established accounting profession. Several empirical studies examined the motivation held by management in respect of environmental

disclosures. In general, this appeared to be a narrow form of legitimacy theory, based on the perceived need of management to address issues and events which may be of concern to certain limited stakeholders. This emasculated view of legitimacy theory is probably at variance with that held by many who advocate greater transparency in the reporting process. The jury is still out on this matter, but it will be of concern to those fearing capture by the preparers.

CONCLUDING COMMENTS

This review demonstrates the widespread coverage of matters relating to social and environmental accounting. Researchers following many paradigms and perspectives are now making contributions. Empirical research is now addressing the motivation of management in making voluntary non-traditional disclosures, and some findings are indicative of a continuation of self-serving behaviour which tends towards attempts at capture through legitimacy theory (Deegan and Rankin, 1999; Deegan et al., 2000).

Management accounting writers have detailed the ways in which organisations can benefit from embracing the aims of eco-efficiency; becoming less damaging to the environment can be profitable by reducing costs and opening up business opportunities (Epstein, 1996c) and the same approach has been taken by management writers (Elkington, 1997).

Audit firms are at last showing an interest in adding environmental audit to the range of work that they will undertake and according to Power (1997) there is evidence of attempts to displace internal auditors. The internal auditors are, of course, attempting to displace the environmental technologists and managers from that field (Tucker and Kasper, 1998).

Critical theorists are now much more willing to engage with environmental issues pointing out the dangers of capture by dominant interests and also (Everett and Neu, 2000) highlighting the manner in which some perspectives are privileged over others.

A few attempts have been made to design models to encompass multiple forms of accounting and reporting (Gray et al., 1996; Mathews, 1997b, 2000), but as yet this is a minority activity. There is very little interest from professional accounting bodies in developing conceptual frameworks and standards for non-traditional accounting and reporting. However, other groups have attempted to design the means to further disclosure in an organised manner.

Evidence of educators attempting to modernise the accounting curriculum by including social and environmental accounting subject matter is in short supply. Of course, it may be that much unpublicised work is being done which the academic staff concerned do not want to publicise. A review of this type can only use published work.

As noted previously, relatively little (by way of volume) relates to social as opposed to environmental accounting literature. However, to some extent the social related material may be more substantial in some cases, in particular the Copenhagen Charter and the standard issued by ISEA (AA1000) are substantial works.

Areas which appear to be under-represented over the past five years include regulation and legislation, externalities and taxation. All have a place in the literature relating to social and environmental impacts of organisations.

The author is able to conclude on an optimistic note. The additions to the literature during the period 1995-2000 are encouraging. Researchers in this area are perhaps less naï ve and more experienced than previously, and this, when added to their enthusiasm should lead to penetrating observations and commentaries over the next five years.

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