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STANDARDS SYSTEMS IN CANADA, THE U.K., WEST GERMANY,
AND DENMARK: AN OVERVIEW

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by

David Hemenway

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Abstract

This report provides an overview of the voluntary standards systems of Canada, the UK, West Germany, and Denmark. The immediate purpose is to identify areas where further research might be useful. Ultimately, the aim is to gain a better understanding of national standards systems in other highly industrialized countries. Based on interviews and other research, the author discusses these aspects of the four standards systems: (1) history; (2) organization and finances; (3) standards development; (4) certification and accreditation; (5) international standards work; (6) consumer and labor participation; (7) metric conversion; (8) antitrust aspects; (9) research into economic impacts; (10) the government's use of standards and its role in standards work; and (11) other activities. The author concludes that further research is needed into standards systems of these and additional countries -- for example, Australia, Japan, and Sweden.

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About OSIAD

Foreword

In recent years, engineering standardization and product certification activities in the United States have received considerable attention from the Congress and others in the Federal government, and from the private sector. Increased public awareness of the significant social and economic impacts of engineering standardization and product certification has stimulated renewed interest in the workings and effects of standards-setting and certification processes, especially as these processes relate to public policy concerns such as energy and material conservation, protection of the environment, health and safety, industrial innovation and competition, international trade, and metric conversion.

Economist David Hemenway, a specialist in industrial organization theory at Harvard and author of the book Industrywide Voluntary Product Standards (Ballinger Press, 1975), has provided valuable new insights on and constructive criticism of current standardization and certification practices in the United States. He is a strong advocate of the need for additional economic research and analysis in the standards field, and his work has been instrumental in stimulating others to review the theory and practice of standardization and certification in the broader context of the social sciences.

As the Nation's central measurement reference laboratory, and as a major Federal scientific and engineering institution seeking to help solve national problems, the National Bureau of Standards (NBS) has played an important and well-recognized technical support role in national and international standardization activities, both governmental and non-governmental. NBS is responsible for providing the Nation's basic measurement reference standards for the physical sciences and for the development of state-of-the-art measurement technology in these fields.

Because of this responsibility, and because of its close working relationships with product standards-setting bodies and certification agencies in the government and the private sector, NBS and its parent agency, the Department of Commerce, are frequently asked to comment on proposed national standards policy documents. Recent examples include a proposed policy governing Federal participation in and use of voluntary (non-government) standards (OMB Circular), a recommended National Standards Policy prepared by the National Standards Policy Advisory Committee, and proposed legislation (S.825 and HR 1184, introduced in 1977) covering national and international standardization, laboratory accreditation, and product certification.

In preparing responses to these national policy proposals, questions arose as to how other countries have dealt with the kinds of issues currently facing the U.S. For example: How have other countries defined the government and private sector roles in standardization? Have other countries been able to assure adequate participation by consumer and small business interests in standards-setting? How have they handled metric conversion in standardization? To what extent do other governments support or control participation in the international standards activities of the International Standards Organization and the International Electrotechnical Commission? To what extent are other countries concerned with potentially anti-competitive effects of standards?

Since much of this information was not readily available in summary form suitable for study and meaningful analysis, NBS management approved a request to undertake a comparative overview study of the national standards systems in several highly industrialized countries, and Dr. Hemenway agreed to do the study. Canada, the United Kingdom, and the Federal Republic of Germany were selected initially, and a brief description of Denmark's standards system was added later. Dr. Hemenway was also asked to suggest whether more extensive cross-national comparative studies might be useful.

Much of the material for this report was obtained during interviews with people in the national standards organizations and other groups in Canada, the UK, West Germany, and Denmark, as well as in the United States. All reasonable efforts have been made to insure the factual accuracy of the report, and also to caution the reader that changes may have occurred since the information was originally collected. Copies of the report were sent to the Directors of the Standards Council of Canada, the British Standards Institution, Deutsches Institut für Normung, and Dansk Standardiseringsraad. Their comments are included in the Appendix. The opinions expressed in this report are those of Dr. Hemenway, and not necessarily of the National Bureau of Standards. Dr. Hemenway's study has already generated a high level of interest at NBS, and I am confident that his report will be extremely informative and useful for the U.S. standards community in general.

On behalf of NBS, I would like to express my gratitude to all of those who so helpfully provided information and insights for this study.

Lawrence D. Eicher, Director
NBS/Office of Engineering Standards

Executive Summary

This report provides an overview of the voluntary standards systems of Canada, the UK, West Germany, and Denmark. The immediate purpose is to identify areas where further research might be useful. Ultimately, the aim is to gain a better understanding of national standards systems in other highly industrialized countries, especially in such areas as government versus private sector roles in standardization, metric conversion, participation of consumer and other interests, and regulatory uses of standards. The country studied most intensively for this report was Canada.

The Canadian Standards System

A governmental investigation of the Canadian standards system led in 1970 to the creation of the Standards Council of Canada. The mission of the SCC is to coordinate and promote voluntary standardization. Among other things, it has

- *accredited five standards-writing organizations;
- *assigned specific subject areas to standards-writing organizations to help avoid duplication;
- *encouraged organizations to submit their standards to become National Standards of Canada;
- *provided money to standards-writing organizations to increase the efficiency of standards writing; and
- *helped increase Canadian participation in international standards organizations.

The Canadian Standards Association has written 1,200 standards (1976). These are primarily industrial standards, including the Electrical and Boiler Codes commonly cited in government regulations. Much of CSA work is in the certification area. The Canadian Gas Association's 85 standards are primarily safety standards for use in certifying gas appliances. CGA standards are approved by a voluntary association of chief provincial gas inspectors (the Interprovincial Gas Advisory Council), and are usually adopted by provincial authorities. Underwriters Laboratories of Canada tests and certifies products in the fields of fire safety, accident prevention, and burglary protection. It also produces standards in these areas (100 as of 1976) which are often used in regulations.

The Canadian Government Specifications Board originally prepared government purchasing standards. Its scope is now broader, with more than half its work lying outside the procurement field. It is a government organization, but has been accredited by SCC. Its 1,800 standards include many construction standards referenced in model building codes. The Bureau de normalisation du Quebec has 775 standards for a wide variety of products. Its purpose is to help meet the standards needs of the province of Quebec.

There are three principal independent certifiers in Canada: ULC in fire, CSA in electrical, and CGA in the gas appliance area. Their programs were developed primarily to assist in government regulation. The SCC plans to accredit both certification and testing organizations.

Canada's participation in international standardization was never commensurate with its economic importance. Since the creation of the Standards Council, Canada has markedly increased its international involvement, partly because SCC subsidizes transportation expenses for Canadian representatives. SCC is trying to harmonize international and national standardization.

Canada's Metric Commission was established in 1971. The SCC provides a central focus for coordinating metric conversion of standards, and is responsible for ensuring that the National Standards System is represented on the Metric Commission's committees.

Mandatory regulations of Canadian national, provincial, and local governments often cite voluntary standards. A 1974 study found that 530 voluntary standards, including many American standards, were referenced in Federal acts and regulations.

The British Standards System

In 1942 the British Standards Institution (BSI) was officially recognized by the government as the sole organization for issuing standards having a national application. About one-fourth of its budget comes from government grants. Its 7,000 "British Standards" cover a wide variety of areas, but most are for industrial products.

British standards writing differs from the U.S. approach in at least three ways: (1) BSI tries to obtain trade associations and other institutions as members, rather than companies or individuals. (2) While BSI wants all interests to be represented, it is not concerned with numerical balance -- partly because there is no formal voting. (3) BSI avoids formal voting because they feel it tends to polarize the minority -- "consensus" means unanimity in the sense that no one objects. Additionally, BSI staff members serve as secretaries on all technical committees and are responsible for detailed drafting of standards.

BSI has a Quality Assurance branch which conducts testing and operates certification programs. Its principal certification scheme is the Kitemark, which is used in conjunction with about 250 British Standards, mostly for industrial equipment.

BSI's third activity is its Technical Help to Exporters program. This aids British exporters by providing them with information on foreign regulatory requirements.

Because of Britain's heavy dependence on foreign trade, BSI devotes most of its resources to international standardization. It has successfully coordinated its domestic and international standards committees. The BSI philosophy is "Do it once; do it right; do it internationally." Many international standards have been adopted unchanged as British Standards.

Consumers in Britain feel the same frustration as their American counterparts at being unable to mold the standards system to meet their needs. However, BSI does have a Consumer Standards Advisory Committee which tries to recruit consumers to serve on the technical committees concerned with consumer products.

Metric conversion became official policy in 1965 and BSI played a central role in standards conversion. Antitrust law in the UK specifically exempts BSI standards, and BSI has never been hit with an antitrust suit. Economists in the UK rarely study standards, but there have been three recent investigations which discuss the economic effects of standards for light bulbs, burglar alarms, and contraceptive sheaths.

The West German Standards System

The Deutsches Institut fur Normung (DIN) is Germany's principal standards writer and the only organization that creates nationally recognized voluntary standards. Its 17,000 standards appear to be widely used -- for example, in German building codes. Most of DIN's members are firms and labor unions. DIN does not have either explicit balance requirements or formal voting.

In 1975 Germany formalized the relationship between the central government and DIN through a Standards Treaty. This contract recognized DIN "as the competent Standards Organization" for West Germany and as the German representative in nongovernmental international standards organizations. The Treaty advanced the trend toward an integrated and consistent set of German standards, and it confirmed the principle of referring to DIN standards in government legislation and administration. As a result of the Treaty, standards committee participants employed by the government are considered representatives of the government and are granted decision-making authority by the agencies. Furthermore, DIN has agreed to give preferential treatment to Federal requests for standards. Before the Treaty was signed, DIN formed a Consumer Council which is fully funded by the government.

The Danish Standards System

As a small country dependent on foreign trade, Denmark makes frequent use of other countries' standards. Denmark's main standards organization, Dansk Standardiseringsraad (DS), puts most of its small resources into international standardization. DS is a nongovernment organization, but it expects to receive over half of its 1978 budget (about \$2 million) from the government.

DS runs a small certification system for products ranging from beer bottles and cotton cloth to steel for reinforcement of concrete. It does no testing itself, but generally chooses test houses that have been accredited under a new government program.

Britain

Mr. David George
British Standards Institution
2 Park Street
London, W1A 2BS

Mr. Adam Sedgwick
National Federation of
Consumer Groups
61 Valentine Rd.
Birmingham B14 7AJ

Dr. S. J. Prais
National Institute of Economic
and Social Research
2 Dean Trench Street
Smith Square
London SW 1P 3HE

Dr. J. D. Gribbin
Price Commission
R505, Neville House
Page Street
London SW 1P 4LS

Ms. Linda Christmas
c/o The Guardian
119 Farringdon Rd.
London

Germany

Dr. H. Reihlen
Deutsches Institut für
Normung e.V.
D-1000 Berlin 30

Dr. Pierre Guillet de Monthoux
Wissenschaftszentrum:
International Institute for
Management
Griegstrasse 5-7
1000 Berlin 33

Denmark

Mr. Leif Nørgaard
Dansk Standardiseringsraad
Aurehojvej 12
DK-2900 Hellerup

In the United States, the American Society for Testing and Materials and the American National Standards Institute gave useful initial advice. My contacts at NBS, Carol Chapman, Larry Eicher, and Joan Koenig, provided continuing help and support for which I am grateful.

David Hemenway
July 1978

PART ONE: THE CANADIAN STANDARDS SYSTEM

NB: The principal research for this section of the report had been completed by May 1977. Certain developments that occurred the following year were brought to the attention of the author. Asterisks in the body of the text denote statements affected by these developments, and updated information is given at the bottom of the page.

David Hemenway
May 1978

I. Canada and the United States

Canada and the United States are strikingly similar. An American travelling in Canada can easily forget he is in a foreign country. The nations share a common culture, the same basic philosophical, moral and political beliefs, and similar technologies and institutions. There is a constant exchange of ideas, fashion, labor, capital and materials. There exists a fundamental interdependence of the two countries.

There are, of course, important differences. One is the size of the countries. While Canada is geographically larger than the United States, it has only one tenth as many people. The Canadian economy is thus also smaller, though almost equally advanced. Canada is a developed and prosperous nation; the standard of living of the average Canadian is about the same as that of his American counterpart.

Because of its size, the American economy dramatically affects the Canadian. As a smaller nation, Canada depends much more heavily on foreign trade than does the United States, with exports representing close to 25% of gross national product. Over half of its trade is with the United States. (Britain and Japan are its other major trading partners.) American firms have invested heavily in Canada, and U.S. subsidiaries dominate important industries such as automobiles and aircraft.

Politically, Canada has been more influenced by British traditions than has the United States. And while an increasing governmental role in the economy since the Depression has

paralleled the American experience, in Canada more emphasis has been placed on provincial rather than federal responsibility.

Finally, while the United States possesses a larger racial minority, Canada can claim a larger ethnic minority. Some 30% of the population are French Canadians, and the federal government supports the concept of official bilingualism. One explanation of the increased degree of provincial autonomy and authority is the division between French and English speaking Canadians, and the separatist movement in the predominantly French province of Quebec.

Four important differences between the United States and Canada have been mentioned:

- (1) Canada has a much smaller population
- (2) Canada has a much larger economic neighbor
- (3) Canada places more emphasis on provincial authority
- (4) Canada has a single, large, ethnic minority

These factors lead to differences in Canadian and American standards and standards writing institutions.

Canada's small size naturally causes it to write fewer standards. Additionally, since there are some economies of scale in standards writing, Canada, unlike the United States, has never had more than a handful of standards writing organizations. It probably could not have supported a great many more.

The existence of the large, advanced, neighboring United

II. The Standards Council of Canada

A. History:

The principal standards writing organization in the early 1960's was the Canadian Standards Association (CSA). It had responsibility for Canadian representation at international standards meetings, and wrote almost all of the domestic engineering standards. The other major standards body was the Canadian Government Specifications Board (CGSB). It wrote standard specifications for many federal government purchases (a function similar to that of the predecessor of the U.S. General Services Administration), and by the 1960's was also producing product standards in areas not covered by CSA. An attempt in 1958 to amalgamate these two institutions to form a truly national standards body was blocked by CSA. Had this attempt succeeded, there probably would have been no need for the creation of the Standards Council.

In 1964 the Canadian Standards Association asked the federal government for increased funding to help underwrite its international standardization activities. The government grant to CSA at that time was only sufficient to cover membership dues to the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). Travel costs and administrative expenses were not subsidized. The CSA request led to a federal study and report, a federal-provincial conference, and finally in 1970 to the passage of Bill C-163 setting up the Standards Council of Canada.

The system before 1970 was deemed inadequate for a variety of reasons. A letter sent for comments in 1968 to some 250

standards and certification.

Although there are differences in Canadian and United States societies and standards, these seem far less remarkable than the similarities. While this fact decreases the possibilities for many interesting cross-national comparisons, those differences that do exist are effectively highlighted and more easily analyzed. And in the standards area, the most striking difference has appeared quite recently with the creation of the Standards Council of Canada.

II. The Standards Council of Canada

A. History:

The principal standards writing organization in the early 1960's was the Canadian Standards Association (CSA). It had responsibility for Canadian representation at international standards meetings, and wrote almost all of the domestic engineering standards. The other major standards body was the Canadian Government Specifications Board (CGSB). It wrote standard specifications for many federal government purchases (a function similar to that of the predecessor of the U.S. General Services Administration), and by the 1960's was also producing product standards in areas not covered by CSA. An attempt in 1958 to amalgamate these two institutions to form a truly national standards body was blocked by CSA. Had this attempt succeeded, there probably would have been no need for the creation of the Standards Council.

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The system before 1970 was deemed inadequate for a variety of reasons. A letter sent for comments in 1968 to some 250

organizations by the Federal-Provincial Conference on the proposed SCC listed seven failings:

- (1) a lack of coordination and long-term planning;
- (2) inadequate technical, financial and administrative support;
- (3) absence of a mechanism for establishing truly national standards;
- (4) lack of sufficient representation of all sectors of interest in the formation of standards;
- (5) inadequate coverage of certain industrial sectors;
- (6) insufficient attention given to consumer interests;
- (7) insufficient Canadian participation in international standardization.

Support for the creation of a Standards Council came from those who felt that CSA had not been, and could not satisfactorily become the national standards-writing organization of Canada. Since its creation in 1919 the Canadian Standards Association had issued only some 700 standards, of which approximately half were in two specific fields, the electrical and the photographic. By contrast, the British Standards Institute by 1968 had issued 4,600 standards and the Swedish Standards Association about 3,000. CSA was geared to provide industrial standards and had not been aggressive in helping to alleviate the problem of the dearth of consumer good standards. CGSB action had filled only a part of this standards vacuum. Not surprisingly, the Consumers Association of Canada was a strong supporter of the bill. So was the Canadian Gas Association which wanted to publish its own standards rather than having them published as CSA standards.

The government wanted a closer association of government agencies and standardization bodies, and an official link to the international standards arena. The imminence of metric conversion also helped the bill's supporters. Additionally, the American LaQue report¹ which advocated a stronger partnership between the U.S. government and the private standards sector had recently been published, and this appears to have influenced Canadian thinking. If the U.S. government was going to help create a national standards system, a similar development in Canada seemed essential.

Finally, it was believed that there was a lack of broad representation on many technical standards committees, and too much reliance on the principal of a stipulated majority. The bill thus emphasized the importance of both balanced committees and consensus standards.

Bill C-163 received considerable attention and debate in 1970. The Canadian Standards Association, which had been involved with its creation, ultimately opposed the bill, but its late opposition was not enough. In October, 1970, the act received royal assent, and in June 1971 the first members were appointed to the Standards Council.

B. Organization and Finances:

The Standards Council of Canada is a corporation established by an Act of Parliament. While it is not a government agency, nor its staff part of the public service, it is funded by Parliamentary appropriation and reports to Parliament through the Ministry of Industry, Trade and Commerce. So while the SCC

is officially independent in its policies and operations, it is limited to the extent that, like any government agency, its funding requests go through Treasury Board analysis.

The Council itself is large, composed of 57 members, 41 representing a cross-section of private interests, 6 from the public service, and 10 members representing the provinces. The Council meets three times a year. It elects nine of its members to form the Executive Committee. Council members have full time jobs and responsibilities elsewhere. Not surprisingly, staff input plays a crucial role in the running of the SCC. Total staff number only about 50, a little less than half working directly in the international standardization branch. Presently, many of the top staff members are ex-military officers. There are no economists.

Expenditures by the SCC have been low. In fiscal year 1976, a little over \$2 million was spent, some \$400,000 being direct financial assistance to standards-writing organizations to help them increase their productivity (decrease delays) primarily in domestic work. Overall the SCC has averaged less than \$1 million per year expenditures in its first 6 years of operation.

C. Functions and Activities:

The purpose of the SCC is to foster, coordinate and promote voluntary standardization as a means of advancing the national economy, and to insure that Canada is appropriately represented

write, publish or sell standards. Instead it is the organizer, supervisor and official spokesman of the national standards system.

Accreditation is the backbone of the national standards system. The SCC had accredited five standards-writing organizations (SWOs), thus creating a kind of national federation, and the Council is also contemplating the accreditation of both testing and certification organizations. The five accredited SWOs are: the Canadian Standards Association (CSA), the Canadian Gas Association (CGA), the Canadian Government Specifications Board (CGSB), Underwriters' Laboratories of Canada (ULC) and the Bureau de normalisation du Quebec (BNQ).

Accreditation can force improvements in standards-writing procedures, and enhance the credibility of standards-writing organizations. Standards produced by accredited SWOs can be used with more security by both purchasers and government regulators. (To the extent that accreditation brings greater commonality in procedures, it may be most helpful in an area such as construction which is serviced by a number of standards-writing bodies.) While accreditation can improve the image of SWOs, as is the case with accreditation of other institutions such as hospitals and colleges, the benefits accrue primarily to the lesser known organizations. CSA can argue with some justification that accreditation has done little to enhance its worldwide reputation.

The SCC has set down a dozen criteria for accreditation.²

staff, well-defined procedures for the preparation and distribution of standards, a suitable standards identification system, and adequate records of committee meetings. Of particular interest are requirements that committee membership be balanced, that there be at least one level of review and approval beyond the technical development stage, that there be a clear separation of managing and policy-making functions, and that the organization be substantially national in character.

SCC accreditation has led to some changes in standards-writing organizations. While the Council has not set exact guidelines, its general promotion of the concepts of balance and consensus* has helped broaden the technical committee base at CGSB and elsewhere. The major modification of standards-writing procedures, particularly at CGSB, has been caused by the requirement of a second level of review. The Canadian Gas Association agreed to demonstrate the division between its standards writing and trade association activities. And in general the existence of the SCC has resulted in a reconsideration by all SWOs of their goals and procedures.

The accreditation requirements are not very tough. The major Canadian standards writing organizations have all received accreditation without undue difficulty. Even Quebec's BNQ has gained this status, though it is not really "substantially national in character." Most important U.S. standards writers (perhaps excluding some trade associations) would have little

*Following the American Society for Testing and Materials (ASTM), the SCC says consensus "implies much more than the concept of a

trouble meeting the requirements. (The feeling at SCC is that ASTM and the American Society of Mechanical Engineers (ASME), for example, would quickly qualify.)

It has now become more difficult for additional organizations to become accredited SWOs. The Council has endorsed the principle that unlimited accreditation is not in the national interest, and to avoid undesirable proliferation, will encourage non-accredited institutions to process their standards in cooperation with existing accredited SWOs. Applicants for accreditation will be required to demonstrate why the standards it proposes cannot be promulgated by, or in association with, existing accredited institutions.

The SCC not only accredits SWOs, but also assigns specific subject areas to these organizations to help avoid duplication. However, the Council has no real authority to prevent any organization from preparing a standard in any area. The SCC thus acts largely as a persuader and coordinator. While some of the more difficult areas have not yet been assigned, agreements have resulted in CSA transferring gas appliances standards and installation codes to the CGA, and also relinquishing certain fire standards to ULC.

The Council has the authority to approve standards submitted to it as "National Standards of Canada." The SCC encourages, but cannot force, standards to be submitted for approval, and it generally expects those to come from accredited

SWOs. though other institutions may submit standards. The Council has enumerated thirteen criteria for approval, including requirements that the standards should not restrain trade, should be reviewed periodically and revised when necessary, should be consistent with other national and international standards, and should be available in both official languages. The principal benefits of a National Standard are increased recognition and reliability. By mid-1977 there were only some 130 National Standards, the majority from CGSB, and many of those were clothing size standards. While the accredited SWOs are all planning to submit more, this important part of the National Standards System seems barely to have gotten off the ground.

The SCC has responsibilities for education and information. Thus far, the thrust of most of its activities in this area have been devoted to explaining its own policies and goals to the accredited SWOs and others involved in standardization. Education of the general populace has received less emphasis.* The Council has produced a series of pamphlets, and in 1974 began quarterly publication of the colorful "Consensus" magazine. While the SCC has recognized the importance of a national, integrated standards information service, in mid-1977 it possessed only an embryo information system, no standards

*UPDATE: Canada's first general film on standards, "Standards are for Living" is now in general circulation to both television stations and community groups. A program of communication of information to the general public is well on its way.

library and no catalog of standards.*

A continuing criticism of most voluntary systems is that the standards take too long to be developed. In an attempt to increase the speed and efficiency of the administrative and procedural aspects of standardization, the Council has adopted a program of financial assistance to SWOs on a matching grant basis. In 1975-76 some \$400,000 was given, which represented about 10% of the standards-writing budgets of SWOs. It is perhaps too early to judge the effect of these continuing subsidies designed to improve "productivity," and no analysis has yet been undertaken.

The SCC has a variety of other functions and responsibilities in such areas as metric conversion, international standardization, and the accreditation of certification and testing organizations. The Council's activities in these areas are discussed in subsequent chapters. An overall evaluation and impression of the Council is given in the final portion of this report.

*UPDATE: The SCC Standards Information Service, inaugurated in January 1977, has already begun building up a standards library. The first edition of the SCC catalogue of standards was published in August 1977, the first supplement in April 1978.

III. Standards-Writing Organizations

This report focuses on five principal Canadian SWOs: the Canadian Standards Association (CSA), the Canadian Gas Association (CGA), Underwriters' Laboratories of Canada (ULC), the Canadian Government Specifications Board (CGSB) and to a lesser extent, the Bureau de normalization du Quebec (BNQ). All have been accredited by the Standards Council of Canada. There are other organizations that write some standards (e.g. the Electronic and Electrical Manufacturers Association of Canada) but these seem of less importance. However, the National Research Council (NRC), Canada's national home of science, does deserve some brief mention. NRC does basic research, gives grants, and is guardian of the basic national measurement standards. It also authors the Canadian National Building and Fire Codes which reference many of the standards of the accredited SWOs.

Of the five accredited SWOs, three (CSA, CGA and ULC) are private, non-profit institutions. CGSB is part of the federal government, and BNQ is part of a provincial authority. The three private standards writers are also important certifiers; the two government-associated SWOs are not. CSA and CGSB are the oldest and largest of the standards writers. The table on the following page gives some indication of the amount of standardization activity of Canadian and foreign SWOs. It is only an indication, of course, since standards vary by type, area, breadth and depth of coverage, quality, and importance.

Standards-Writing Organization	Number of Standards Issued
CANADA	
Canadian Standards Association	1,200
Canadian Government Specifications Board	1,800
Underwriters' Laboratories of Canada	100
Canadian Gas Association	85
UNITED STATES	
American Society for Testing and Materials	5,500
General Services Administration	5,000
American National Standards Institute	6,200
UNITED KINGDOM (BSI)	6,500
JAPAN (JIS)	7,100
FRANCE (AFNOR)	7,600
U.S.S.R. (GOST)	18,000
GERMANY (DIN)	11,600

Source: Canadian Government
Specifications Board:
Role and Operations,
March 1976

A. The Canadian Standards Association:

1. History:

Until World War I Canada relied extensively on the technology and standards of other countries, principally Great Britain and the United States. In 1914, for example, there was only one major national engineering organization, the Canadian Society of Civil Engineers. It was not until 1917 that the first steps were taken to establish a Standards Committee in Canada. In that year the British Engineering Standards Committee requested the Civil Engineers Canadian Advisory Committee to consider setting up such a Canadian committee.³ As with the founding of the American Standards Association in the United States, the federal government was involved at the onset. The Canadian Department of Trade and Commerce assisted in the early discussions leading to the founding of the Canadian Standards Association.

The CSA was chartered in 1919, and for the first four years its offices were located in the West Block of the Parliament Buildings in Ottawa. Until 1944 it was known as the Canadian Engineering Standards Committee, and it almost exclusively prepared engineering standards. Its founders were Canadian industrialists.

2. Organization and Finances:

The CSA is a private, not-for-profit organization. It is both a standards developer and certifier. CSA employs

over 400 people, some 60 in the standards area and the rest in certification. Over 3,000 volunteers serve on its standards committees. In fiscal '76, its revenues totalled over \$11 million, the large majority of this coming from certification activities. The standards-writing part of CSA is financed by membership dues, sale of publications, and a small grant from the SCC. Sustaining membership fees brought in \$450,000, with 2,000 members paying \$225 each. The SCC grant for increased productivity was \$184,000. In its April 1977 issue of Quarterly Review the standards division reported a deficit of over half a million dollars.

The Association is governed by a Board of Directors composed of representatives elected by the members, who are all those individuals sitting on CSA committees. The Board appoints an executive committee from among its members to administer the affairs of the Association when the Board is not in session. Of the 25 Board members in 1976, one was from a consumer's group, two from universities, and a couple from government. The large majority are corporate employees.*

3. Functions and Activities:

CSA writes a wide variety of standards. In the last few years it has been deeply involved in standardization

*UPDATE: In 1977 the composition of the Board was as follows:

Manufacturers	10	Universities	2
Retired	3	Government	3
Utilities	3	Consumer	1

in health care, data processing, and the environmental, occupational and nuclear safety areas; it writes standards for mobile homes, bicycles and refrigerators. However, the bulk of CSA activities remain in areas such as construction, mechanical engineering, electrical engineering, metallurgy, the automotive and chemical industries.

CSA publishes the Canadian Electrical Code, a truly Canadian production, and different from the U.S. code. By contrast, the CSA Boiler Code calls up large portions of the American Society of Mechanical Engineers (ASME) code. Within the CSA structure, the Canadian Welding Bureau has developed, among other things, a Code for the training and examination of welders. All these codes and a great many other CSA standards are commonly adopted in government regulations.

CSA has some 1,200 standards on issue. In its fiscal year ending March 1976 it published 45 new standards, 44 new editions, and 156 revisions. This was a significant numerical increase over the previous year's output. Of the total number of new and revised standards, five were adopted from the International Organization for Standardization (ISO) and four from the American National Standards Institute (ANSI). Very few CSA standards have been advanced to the SCC for acceptance as national standards.

4. Standards Development:

The Canadian Standards Association has recently changed its rules governing standardization. There is now a three layer system: a Standards Policy Board, Standards

Steering Committees, and the Technical Committees. The policy board consists of approximately thirty members appointed by the Board of Directors. It meets twice a year, develops the regulations governing standardization, and determines general overall policy. The policy board is responsible for establishing the steering committees and reviewing conflicts or disputes among them.

There are currently Standards Steering Committees in each of 38 board areas of standardization. Each committee meets annually and is responsible for planning, monitoring and coordinating the standards-writing activities within its area, encouraging the promotion and acceptance of those standards, and coordinating its activities with other steering committees. The steering committees are also responsible for the establishment of technical committees.

The job of the technical committees is the actual development and maintenance of standards. There are also subcommittees and task forces, but no voting at this level. CSA requires that each technical committee be "reasonably balanced." This is not precisely defined. However, there are generally four categories of interest: producers, users, regulatory authority and general interest, and an operating rule seems to be that no group can have 50 percent or more. Unlike ASTM, producers are not prohibited from the chairmanship.

Approval of a standard requires affirmative votes from two-thirds of the total voting membership (of the people

eligible to vote). Negative votes require explanations, and there must be an attempt to resolve these. There is now a Standards Appeal Board whose sole function is to adjudicate appeals, which must be based on procedural rather than technical considerations. Formerly, final appeals would go to the Board of Directors, but this was a rare occurrence.

A CSA standard must also be approved by the appropriate steering committee. The steering committee assures that the draft standard has been subjected to proper procedures, and does not conflict with other standards. An affirmative vote amounting to 60 percent of the total voting membership is required for approval.

B. The Canadian Gas Association:

1. History:

The Canadian Gas Association is currently divided into three distinct parts: the trade association, the approvals and standards area, and, an affiliate, the Canadian Gas Research Institute. In 1907 CGA was founded purely as a trade association by the gas industry. This remains its principal function. While manufacturers of gas equipment in the United States have their own trade association, CGA is composed of a broad spectrum of the gas industry including gas utilities and also equipment manufacturers, transmission companies, gas producers, pipeline contractors and LP* distributors. CGA is a spokesman for the entire gas industry.

The approvals (certification) and standards activity

* Liquefied Petroleum

of CGA did not begin until the late 1950's. (The research institute was formally created in 1974.) Prior to 1956 distribution of natural gas was quite limited. Most of the country still manufactured gas. Then Alberta increased its production of natural gas and began distribution to the West Coast and the East. Provincial authorities quickly recognized the need for certification of gas equipment; some provinces considered the establishment of their own testing laboratories.

Both industry and government realized that requirements for individual provincial approvals would prove unduly burdensome and costly. It was agreed that a national standards and certification policy was desirable. CGA therefore established its Approvals Division.* Subsequently, the Chief Gas Inspectors of the provinces formed the Interprovincial Gas Advisory Council (IGAC), a forum to discuss common problems and policies and promote the acceptance of uniform standards and certification.

The testing and certification required standards, and in the initial absence of appropriate Canadian standards, American Gas Association (AGA) standards were used. CGA soon worked out an arrangement with CSA whereby CGA would provide most of the technical and secretarial work, and Canadian standards would be processed through CSA procedures and listed in its series of standards. In the 1970's, after negotiations with the Standards Council of Canada, this standards responsibility was entirely transferred to CGA.

2. Organization and Finances:

In order to qualify for accreditation as a standards-writing organization, CGA had to demonstrate the separation of its trade association functions from its approval and standards activities. Yet all aspects of CGA remain industry oriented. In its publication, Approvals and Standards, CGA asserts

"We, as a non-profit organization, set up by industry, serve the industry by assuring equipment meets the standards required by the industry, government, inspection agencies, and the public. Our operations are guided by a Management Committee, consisting of outstanding individuals from all phases of industry."⁴

In 1975 the total revenue of the association was \$1.5 million, most of this coming from membership fees and certification activities. The standards program was the only one that was not self-supporting. The cost of standards writing was estimated at \$200,000, but standards sales were only \$18,000 (doubling the previous year's revenue);* the Standards Council grant was \$25,000. Unlike CSA where the certification branch subsidizes standards writing, CGA receives funding primarily from the natural gas utilities, although standards include propane requirements as well. The staff in the standards area is naturally very small. There are currently six people to administer CGA's standards-writing activities.

*UPDATE: By 1977 standards revenue had reached \$70,000, in large part due to the sale of installation codes.

3. Functions and Activities:

CGA writes standards for gas appliances and components for home and industry, and some LP standards for camping equipment. These are primarily safety standards. While there are already some efficiency and durability requirements, there is general agreement that emphasis must now be placed on creating even more such standards. Though CGA standards are voluntary standards developed by the consensus principle, it is fully expected that they will be made mandatory by provincial regulation. They are written mainly for the purpose of certification.

CGA does make use of American standards. There are many similar conditions in the two countries, and the U.S. has more experts and resources. (The AGA has twice the staff to supervise standards writing.) Provincial authorities generally will accept CGA standards that incorporate parts of ANSI standards. There are some differences in U.S. and Canadian standards, due in part to climatic conditions, to field problems (e.g. for products sold only in Canada), and, one suspects, to nationalistic feelings.

In the beginning of 1976 there were 83 CGA standards. By 1978 14 had been accepted as National Standards of Canada by the Standards Council; eventually 100% of CGA standards will receive national status.

4. Standards Development:

CGA standards are written by about thirty technical committees. However, unlike the American Gas Association,

it lacks a principal centralizing committee which is often helpful for consistency. Like all accredited SWOs, CGA requires balanced representation on committees. While balance is not defined in its standards-writing procedures, it seems operationally to mean less than 50% manufacturers. There is no rule concerning who can serve as chairman. Approval of a standard requires a two thirds majority of the total voting membership.

After a standard is approved by the technical committee, it goes to the Interprovincial Gas Advisory Council (IGAC). The role of IGAC provides the most interesting aspect of CGA standardization. IGAC is composed of the chief gas inspectors of each province, the Yukon and Northwest Territories, and one member from the federal government. The IGAC is entirely a voluntary organization; it is not a legal identity, and the provincial authorities responsible for safety regulations are not bound to accept its recommendations. But they normally do. The Interprovincial Gas Advisory Council thus performs a crucial function in helping create uniform nationwide regulations for gas appliance safety.

Attempts are made at the technical committee level to reconcile all negative votes. If this is not possible, a minority report is forwarded to IGAC at the time of its ballot. IGAC reviews and votes on the technical committee's recommendations. The proposed standard becomes an official CGA standard if approved by a majority of IGAC membership.

Before the standard is submitted as a national standard, it goes to CGA's Standards Advisory Committee (SAC) which determines whether there was technical committee balance, and if the other general due process procedures outlined by the SCC were followed. The SAC meets once a year and is currently composed of one utility member, one propane distributor, one gas appliance manufacturer, one fire marshall, one electrical inspector, one installation code committee representative, and one representative from the IGAC, the Consumer's Association of Canada, the National Research Council and the Canadian Gas Association. Following their approval, the standard goes to the SCC for acceptance as a National Standard of Canada.

C. Underwriters' Laboratories of Canada:

1.2. History, Organization and Finances:

Underwriters' Laboratories, Inc. (ULI) of Chicago was founded in 1895. Before the creation of Underwriters' Laboratories of Canada (ULC), ULI often tested, inspected and labelled fire prevention and fire protection equipment manufactured in Canada. ULC was incorporated in 1920, but it did not become truly independent until 1949. ULC is now an entirely separate Canadian entity without financial, legal or other connection with ULI. The two do, however, maintain technical liaison in matters of mutual interest.

ULC is sponsored by a group of general insurance companies in Canada, whose representatives constitute the Board

of Directors. It is primarily engaged in testing and certification although it is becoming increasingly active in the standards writing area. ULC is a non-profit and completely self-supporting organization, with revenues coming principally from engineering examinations, testing, listing, and labelling fees billed to manufacturers. It receives a small amount from SCC for special projects and some revenue from the sale of its various publications. It has a total staff of 90, most of whom are engaged in testing and certification activities. ULC does not issue an annual report.

3. Functions and Activities:

ULC administers standards writing programs in the specialized fields of fire safety, accident prevention and burglary protection. Most of its standards are referenced in government regulations. There are about 150 ULC standards, though only about half are currently covered by technical committees. This is due to the fact that before the creation of the Standards Council of Canada, ULC operated, like ULI, without formal standards committees, although it circulated standards for comment. The SCC also required a separation of standards and certification, and ULC is purging its standards of references to its own testing and inspection. Its 1977 booklet "Standards of Underwriters' Laboratories of Canada" lists only 42 standards, 3 of which have become National Standards of Canada.* ULC has decided that all standards should be produced so that they

* UPDATE: Its 1978 booklet lists 48 standards, 16 of which have become, or are in the process of becoming National Standards.

can, if desired, become National Standards; thus all will go through the same procedures.

4. Standards Development:

To become an accredited SWO, Underwriters' Laboratories of Canada agreed to change its standards-writing procedures. The SCC required formal technical committees and a second level of review. Currently there are eight ULC Standards Committees concerned with some 83 standards, with the committees being individually responsible for from one to as many as 30 standards. Interestingly, ULC personnel, generally certification engineers, chair six of these committees. This simplifies communication between staff and committee chairman, but allows the charge that any resulting standard is more a ULC creation rather than the consensus of all interested parties. This potential problem may be further increased by the fact that preparation of an initial detailed draft standard is frequently assigned to a ULC staff member.

The size of the standards committee is generally kept between 16 and 30 members. There is a requirement that committees be balanced, though balance is not specifically defined. The SCC mainly requires that no single category of membership dominate the voting. Also, attention is given to the need to obtain national and regional representation. Two-thirds majority of the total committee membership is necessary for approval of a standard. Where a number of standards are involved, the responsibilities for these are typically vested in task groups, which may be established on a permanent or ad hoc basis. The task groups prepare material for consideration by the committee. They do not need to be

balanced, do not vote, and can include people not on the standards committee as long as there is a formal liaison with the committee. The task force report allows dissenting comments.

Early in the standards-development process the certification branch, the Fire Council, and any other interested party gets to comment. The Fire Council is an important entity, and functions not unlike the Interprovincial Gas Advisory Council. The Fire Council is composed mainly of inspection authorities and insurance inspection agencies. While the Council acts essentially in an advisory capacity, ULC standards generally become what the inspection authorities want. If the Fire Council objects, a standard probably won't get published.

Formerly the Fire Council acted as a second level of review, but the SCC required a different organization. Therefore, a Standards Review Council was formed to monitor the general functions of the standards-making process. While only standards that will be submitted to become National Standards need go through this Council, it normally reviews all new ULC standards. The Council meets once a year, and is composed of 13 members, including representatives from industry, inspection authorities, and the academic community.

D. Canadian Government Specifications Board:

1. History:

CGSB was formed in 1934 under the sponsorship of the National Research Council.* It was originally known as the "Government Purchasing

* A government organization which publishes national fire and building model codes based on standards written by other organizations.

Standards Committee" and its function was to prepare federal purchasing standards outside the engineering field already covered by the Canadian Engineering Standards Association. In the thirties and forties the committee was responsible for the development of standards for paints, soaps, textiles, petroleum, business forms, fuels, refractories and leather. The scope of its activities gradually expanded outside the procurement field; currently more than half its work is in other areas.

The committee initially produced internal standards written by staff, but over time it converted to an open consensus operation. In 1948 it was renamed the Canadian

Government Specifications Board, and in the 1960s it was transferred to the Department of Defense Production, now part of the Department of Supplies and Services. In the 1970s the creation of the Standards Council of Canada led to a modification of CGSB standards-writing procedures. The base of its technical committees, formerly government and central Canadian oriented, has been broadened. And a second level of review—the Review Board and an Advisory Panel — was established.

2. Organization and Finances:

Unlike CSA, CGA and ULC, the Canadian Government Specifications Board is neither a testing nor a certification organization. It merely prepares standards. Additionally, CGSB is not a private institution. It is a government financed and government operated organization. This makes it of special interest since it writes many general standards and has been accredited as a national standards-writing organization.

Although the secretariat is located within the Department of Supplies and Services, the board itself is inter-departmental, composed of seven deputy heads of federal departments and agencies, the president of the National Research Council, and the executive director and secretary of CGSB. CGSB operates on a cost recovery basis. Its revenues come from selling its services to other government agencies who pay CGSB for the cost of standards development.

construction materials.

CGSB must go to other government agencies for its funding. If it can't persuade them to finance a project, the project will not be undertaken (there are a few CGSB standards where financing comes partly from private sources). CGSB is thus like a little independent island in the government, an important producer of standards selling its product in something akin to a market environment.

Total revenues in 1976 totalled about \$1 million, \$184,000 from the SCC, \$150,000 from sale of standards, and most of the remaining from other government agencies. Staff size is 40. These are primarily engineers and chemists. Breadth of knowledge is required since CGSB is involved in so many standards areas.

3. Functions and Activities:

CGSB writes standards in over one hundred subject areas, including thermometers, solid fuels, building sealants, x-ray films, matches, life jackets, office supplies, fishing gear, glass, brushes, air filters, hearing aids and toy safety. Construction is currently the principal area of CGSB standards activity; some 350 standards have been published in this field. While CGSB standards are usually not written specifically for regulation, of the 190 standards referred to in NRC's model building code, 51 are from the Canadian Government Specifications Board.

There are approximately 1,800 CGSB standards. In

1970 only 56 were available in French edition. Now all are. CGBS has been the most aggressive SWO in promoting its standards to national status. About 115 of the 130 national standards are from CGSB, and about 60 of these are garment sizing standards. CGSB intends to submit as many standards as possible for SCC approval; but many procurement standards are not of national interest and broad based representation is not needed.

4. Standards Development:

CGSB standards are developed by Standards Committees, composed of 15 to 30 members. Committee membership is limited to Canadian residents or representatives of Canadian organizations. CGSB requires that the committees be reasonably balanced between producer and non-producer elements. In order to both be and appear unbiased, committee chairmen are usually selected from representatives of general interest or user organizations. Also following the ASTM example, CGSB defines consensus not in terms of a certain majority percentage, but in more flexible language:

"A consensus requires less than unanimity, but more than a simple majority. Unimportant or nonpersuasive objections are not allowed to block indefinitely (the standard) . . . On the other hand, one or two important negative votes on a letter ballot usually require the document to be reconsidered by the whole committee."⁵

Operationally, of course, this definition of consensus may be little different from that of the other accredited SWOs who, like CGSB, attempt to resolve negative ballots.

After approval by the technical committee, the standard goes to the ten member Board for full approval as a CGSB standard. If the standard is to be submitted for acceptance as a national standard, it receives Advisory Panel comments and ratification by the Review Board. The Advisory Panel consists of a substantial and open mailing list of individuals and organizations with interest in the standard. The Review Board is broadly based, consisting of 53 members from consumer groups, other SWOs, the federal and provincial governments, research organizations and universities. It reviews negative ballots, ensures that proper procedures were followed, and that the standard is in the national interest. Five or fewer negative votes the Review Board signifies approval. Finally, before submission to the SCC, the standard is reviewed by the CGSB secretary, the staff officer involved, and the Director of the Standards and Specifications Branch of CGSB.

E. Bureau de normalisation du Quebec:

BNQ was founded in 1962 to help meet the standards needs of the province of Quebec. In 1966 its services were offered to industry in Quebec. It has written standards for a wide variety of products including industrial tractors, snow removal equipment, and police uniforms. In 1977 there were 775 BNQ standards. It has not submitted any standards to the SCC for approval as national standards.

Like CGSB, BNQ is not primarily a testing or certifi-

cation organization. It has no testing facilities of its own, though it does have permanent arrangements with a few laboratories in order to perform laboratory tests for its own needs or for some BNQ standards users. It certifies only a very small number of products.

IV. Certification* and Testing

A. Certification in Canada:

Standards-writing organizations are often certifiers. In Canada, the three principal independent certifiers are CSA, CGA and ULC. While there is some limited competition among these three, each enjoys a substantial degree of monopoly power, ULC mainly in the fire, CSA in the electrical, and CGA in the gas appliance area. The certification programs of these institutions were developed primarily to assist provincial and sometimes federal authorities. Their importance rests on mandatory regulations.

The Standards Council of Canada has the authority to accredit certification organizations. While it plans to exercise this authority, discussions over a number of years have yet to result in an actual program.** The Council cites two interrelated reasons for accrediting certification organizations: (1) to emphasize the credibility of those accredited, and (2) to assist in maintaining a high level of service quality among these organizations. Not surprisingly, the three major certifiers did not embrace the idea of a SCC accreditation scheme. They felt their existing programs were already credible, especially to those who mattered--the regulators. And there was some fear of losing built-up reputational advantages. The only real benefit to them might be increased

*The term here refers exclusively to third-party certification, the testing and certification of a product by an independent organization not directly involved in its purchase or sale.

**UPDATE: The SCC is now prepared to call for applications for accreditation in the area of certification.

international recognition.

It will be of interest to see the kind of accreditation program ultimately created by the SCC, to analyze its effects and compare it with the ANSI program. One of the many problems currently facing the Council is determining its legal obligations under accreditation and deciding whether it will accept possible liability.

B. Certification - Theory:

Third-party certification is an important practice in developed countries. Unfortunately, it has not been carefully studied by economists, or it seems, by the Standards Council of Canada. A few of the complex economic issues raised by certification are discussed below.

1. Integration of Certification and Standards Writing:

A single organization may both write standards and certify products against these standards. While this integration of functions can increase efficiency by, among other things, insuring the usefulness and applicability of standards, it can also create problems. For example, a standards writing and certification organization may have an incentive to push for standards that maximize certification revenues rather than consumer well-being; it might tend to make too many minor changes in standards, thus requiring renewed, expensive testing. Other "conflict of interest" problems might be caused if such organizations are financed by the dues or sustaining membership fees of some of the manufacturers whose products are going to be tested.

2. Monopoly versus Competition: The Optimal Number of Certifiers:

A common situation in both the United States and Canada is for certifiers to have some degree of monopoly power. Institutions with protected market power can often afford to be inefficient. A monopoly certifier, for example, could have high costs, delays and backlogs. It could be arbitrary and resistant to change, and yet still survive and even prosper.

It is not certain, however, that increasing competition would be an unmixed blessing. Competition may produce a kind of Gresham's Law effect, with certifiers with easy requirements driving out the tougher ones.

It is also unknown whether or not accreditation can effectively insure high quality standards in the certification field, or if accreditation can or should be used as a method of increasing competition.

3. Certification Without a Standard :

Like America's Underwriters Laboratories (ULI), CGA and CSA are willing to certify without a standard. If no suitable standard exists, they will test with respect to other recognized documents. CGA, for example, will issue a report to the IGAC. If the report is accepted, the product can then be certified. The AGA, on the other hand, will only certify against a consensus standard. In the well known flue-vent damper case, the AGA refused to certify because the required standard did not exist.

4. Pricing Policies:

In the U.S., manufacturers of new, innovative products

sometimes grumble that their certification costs are much higher than for the non-innovators. The situation is similar in Canada, where pricing is also normally done on a cost basis. Pioneer manufacturers pay more simply because more time is spent testing. As the testing becomes more routine, costs and certification prices fall. This may be sound business pricing policy, but it may not be optimal from the broad social perspective.

Although independent certifiers in Canada are generally non-profit organizations, they can and have practiced price discrimination. CGA, for example, formerly had a "seal service charge," where larger manufacturers producing more products and requiring more seals paid more, even though testing and certification costs were not substantially greater. The prices paid by larger producers for certification thus tended to subsidize the smaller. ULC currently has a similar pricing arrangement in its label service charge.

It should be emphasized that the term "price discrimination" is not used perjoratively. To an economist it means simply that prices don't reflect marginal costs. There is some discrimination in the pricing of many, perhaps most, products. What needs to be emphasized is that there are many intriguing and important economic issues with respect to certification that are not well understood, and do not seem to have been adequately addressed by economists, legislators, regulators, or potential accreditors in either Canada or the United States.

C. Testing: Accreditation Policies in Canada, the United States and Australia

The Standards Council of Canada plans to accredit not only certification organizations but also test houses. The testing industry is much more competitive than the certification industry. While no comprehensive survey has yet been made in Canada, it has been estimated by the SCC that there may be one thousand testing firms and laboratories that would be potential candidates for accreditation.⁶

There has been a growing interest in testing laboratory accreditation in the United States. In 1975 ANSI went on record as supporting a national voluntary laboratory accreditation system. The Department of Commerce has recently established an accreditation program, but it is small, new, and has yet to have had any real impact. Senate bill S-825 (1977) would require a similar, but a broader and more aggressive approach.

There has been accreditation of testing laboratories in North America in the field of concrete. The National Bureau of Standards (NBS), in conjunction with ASTM has been operating in this area for many years. The Canadian Standards Association also accredits concrete testing laboratories.

Australia is one country with long term experience in the accreditation of testing laboratories in a wide variety of areas. The National Association of Testing Authorities (NATA) has been in existence for over twenty-five years. It is primarily a private association of testing organizations governed by a Council composed of professional institutions,

standards organizations, government representatives, and the member laboratories. NATA provides for registration (i.e. accreditation) of laboratories in one or more of nine specific fields. Two-thirds of its income comes from a federal government grant.

The Australian system is working. The NATA accreditation is well known and accepted; a testing laboratory is in difficulty without it. This program has been examined by a number of countries, but apparently never by an economist. Indeed, there seems never to have been a careful economic study of the testing industry in any country, nor evaluation of the economic costs and benefits of the identification of credible laboratories via accreditation. The Standards Council of Canada has not advanced very far in its planning for the establishment of such a program; it is much closer to creating a system for the accreditation of the smaller number of existing and potential certification organizations.*

*UPDATE: The Council is now prepared to call for applications for accreditation in the area of certification, and work is progressing on the criteria for the accreditation of testing laboratories.

V. International Standards

The International Standards Organization (ISO) was founded in 1946. In the early post war years, however, there was only limited interest in international standardization. National standards organizations still gave first priority to national standards, and international standardization "was considered as a useful but hardly an indispensable activity."⁷

Things began to change in the mid-1960s. The number of standards promulgated by ISO rose from 85 in 1959 to 1,200 in 1969, to over 3,000 by 1976. In 1971, ISO began to publish Standards rather than Recommendations. While a Recommendation is intended for use as a basis for a national standard, an ISO Standard is a document designed as a standard in its own right. Western European countries are increasingly adopting ISO standards as national standards.

Canadian, like United States, participation in international standardization has never been commensurate with its economic importance. Before the creation of the Standards Council of Canada, Canada and the U.S. were the only two countries whose national standards organizations were without direct links to the national government. ANSI held the U.S. membership to ISO, and CSA the Canadian. While the federal government gave CSA an annual grant, it was quite small, generally sufficient to pay membership subscriptions, but not participant transportation to international standards meetings.

Although Canada was a charter member of ISO, and paid high dues, in 1970 it did not hold a single Secretariat to a main ISO technical committee. In that year Robert F. Legget, chairman of the Canadian National Committee on ISO from 1957 to 1969, could write:

"Although a start has been made in recent years at assisting with ISO work, and although Canada has made some notable contributions in one or two special fields, her general record leaves much to be desired. . ."8

One of the principal reasons for the establishment of the SCC was to improve Canadian participation in international standards setting. And under SCC direction, Canada has markedly increased its involvement at both the technical and policy levels. Ralph Hennessey, executive director of the SCC, is currently vice president of ISO. The number of Canadian secretariats of technical committees, subcommittees and working groups has jumped to over thirty. Funding is an important factor in this enhanced international participation. The Standards Council subsidizes transportation expenses, usually for one Canadian technical representative.

While Canadian participation has improved, more could be done. In an interview in November 1975, ISO president Dr. Ake Vrethem had this to say about North American commitment to international standards writing:

"I hope and I think that it's not unrealistic to suggest that Canada's target for its participation in the work of ISO and IEC should be to double or treble its contribution. I'm not talking about money: I'm talking about the contribution which can be expressed in the number

of technical secretariats that Canada will undertake. Such a doubling or trebling would bring Canada up to a proportional part of the international standardization burden that would be in relation to Canada's importance in technology, industry and trade. Parenthetically I would like to say that exactly the same wish goes for the United States. I'm afraid that there can never be a true balance in international standardization as long as North America leaves it to Europe to provide 75% of the technical secretariats - when, for instance, a small country like Sweden has about 70 secretariats while Canada has got less than 30. . ."9

A 1975 table of ISO secretariats is given below. It indicates that "Canada (still) has much ground to catch up."¹⁰ Figures given in parentheses indicate some of the progress that has been made in this area in the last two years.

		Technical Committees	Sub- Committees	Working Groups	Total
AFNOR	France	31 (32)	130 (143)	142 (181)	303 (356)
BSI	United Kingdom	32 (26)	104 (90)	157 (165)	293 (281)
DIN	Germany	15 (17)	74 (85)	118 (156)	207 (258)
ANSI	United States	17 (18)	50 (57)	82 (96)	149 (171)
SIS	Sweden	7 (9)	21 (24)	48 (47)	76 (80)
UNI	Italy	3 (3)	23 (15)	20 (11)	46 (29)
NNI	Netherlands	4 (4)	12 (13)	27 (29)	43 (46)
IBN	Belgium	6 (4)	13 (12)	18 (17)	37 (33)
SNV	Switzerland	5 (4)	13 (14)	4 (7)	22 (25)
SCC	CANADA	1 (2)	11 (12)	10 (17)	22 (31)
ISI	India	4 (4)	7 (4)	10 (9)	21 (17)
JISC	Japan	1 (1)	6 (6)	8 (12)	15 (19)
SFS	Finland	-	3	9	12
ON	Austria	2	3 (5)	6	11 (13)

The International Standardization Branch of the SCC has twenty-two employees. The Branch provides secretariat services for the two Canadian National Committees (CNCs) that supervise Canadian participation in ISO and IEC (International Electrotechnical Commission). The Standards Council is itself the member body of the ISO, and the CNC/IEC, sponsored by the SCC, is the member of IEC.

The SCC is attempting to harmonize national and international standardization activities. However, this process is only in its initial stages; its beginnings awaited the accreditation of SWOs and the assignment of subject areas. An ultimate goal is for a single technical committee to be responsible for both national and international standards work in any given area. The Standards Council also wants to assure adequate representation internationally in important industries not covered by domestic standards writers, such as automobiles and aircraft.

In pursuit of these goals, a Canadian Advisory Committee has been formed for every ISO technical committee of interest to Canada (for CNC/IEC, the advisory committees are called Canadian Subcommittees). The advisory committees appoint a chairman, and the chairman appoints one expert to represent Canadian interests. There does not appear to be great concern over advisory committee balance. Perhaps it is hoped that with increased harmonization of advisory and SWO committees (as advisory committees become identical with the domestic technical

committees) domestic balance will insure a balanced Canadian position internationally.

The Standards Council encourages accredited SWOs to adopt recognized international standards as a basis for national standards whenever Canadian practices and conditions permit. Currently, however, this merely represents a policy statement, for there has been little real promotion or pressure for this kind of harmonization of standards.

There also has been little promotion of Canadian standards abroad. Unlike West Germany which has encouraged foreign adoption of DIN standards as part of its trade promotion, the Canadian export position is primarily one of "we can meet your requirements."

VI. Antitrust and Liability

Canadian antitrust legislation has historically been less rigorous than the United States', and less vigorously applied. In 1969 the Economic Council of Canada made an intensive examination of the country's competition policy.¹¹ The Council concluded that the anticombine laws had been ineffective in dealing with monopolization and oligopoly, and virtually inoperative with respect to price discrimination and mergers. Tying agreements and exclusive dealing arrangements were not even covered. Many service industries were outside the purview of antitrust law. The requirement for criminal rather than civil suits tended to straitjacket enforcement. Fines were low; the possibility of adverse publicity seemed to be the primary deterrent to violations.

In response to the Economic Council's report, the government decided to proceed in two stages with the most important revision of Canada's competition policy yet undertaken. A bill incorporating the Stage I revisions was proclaimed on January 1, 1976. As a result, all service industries are now covered by the Combines Investigation Act. Tying agreements and exclusive dealing arrangements are also explicitly covered, and are dealt with under civil rather than criminal law. The Stage II revisions dealing particularly with mergers and monopolization have been incorporated in a bill which, as of January 1978, was awaiting second reading in the House of Commons.

Before the recent amendments, the Combines Act had been mainly effective in restraining only three kinds of business conduct deemed to be detrimental to the public: collusive price fixing, resale price maintenance, and misleading price advertising.¹² Price fixing and withholding agreements are, of course, a principal method of limiting competition that involves standards. However, there is a limited kind of antitrust immunity for standards activities.* There have been only a few Canadian antitrust cases involving standards. The case most directly concerned with standardization was the Asphalt Roofing Case decided in the mid-1950s.

The Asphalt Roofing Case attacked a conspiracy among manufacturers in the form of an open-price arrangement requiring prior notification of all price changes and the withholding of certain lines. Uniformity standards were used to insure a matching of both products and prices. Even profitable lines were sometimes eliminated to decrease variety and potential competition among manufacturers. In 1958, eleven companies pleaded guilty to restraint of trade, were fined \$110,000 and ordered to terminate the price-fixing agreement.

While standards writing organizations were not directly

*One provision of the Combines Investigation Act directs that "the court shall not convict the accused if the conspiracy, combination, agreement or arrangement related only" to defining of trade terms, standardization of products, exchange of statistics, etc. However, such an agreement must not be used as a device for breaching the fundamental prohibition against conspiracies.

involved, they were mentioned in the Restrictive Trade Practices Commission report. A letter between manufacturers discussed weight standardization for 19" Selvage Roofing:

"At present, two manufacturers make N.I.S. at a weight of 125# per square selling \$5.80 per square while all the others produce N.I.S. at 110# per square selling at \$5.40 per square. The idea is to try to bring all manufacturers to a single weight so that an industry standard could be presented to the Standards Committee of CGSB at Ottawa.

Nobody knows why the two different weights were offered in the first place. But it is a fact that manufacturers who use the Underwriters label service must apparently make the 125# weight to qualify for the label. . ."13

The letter indicates that SWOs not only affected the type of product produced, but thought was given to using them to help solidify the conspiracy.

The manufacturers correctly emphasized the benefits of standard lines.

". . . The establishment of minimum specifications under government sponsorship or the sponsorship of such an institution as the Canadian Standards Association is an effective way of promoting good roofing for the homeowner. It makes it more difficult for sub-standard materials to be sold without being immediately recognized as such. . ."

(Standards) benefit the public in another way. I think it benefits the public price-wise. If manufacturers make a series of standard products instead of a multitude of non-standard varieties, the machines will be kept busy without change for longer periods of time, and this decreases costs resulting in lower prices."14

The benefits of standardization, however, do not justify a price-fixing and withholding conspiracy. The Commission did not object to the standards, but to the collective

agreement to adhere to them, and thus prevent competition.

The Commission concluded that the trade association's

"practice of establishing minimum specifications so that no type of bonded roof may be secured at lower cost from one manufacturer than from another has been disadvantageous to the public." 15

The general effect of the arrangement between sellers

"has been to maintain uniform prices, terms and conditions of sale for the products of the asphalt roofing industry regardless of the source of such products in Canada. The Commission has no doubt that this has been the objective of members of the Association." 16

Standards may restrain trade by facilitating price-fixing conspiracies among established firms. A second method by which standards may decrease competition is by helping to exclude rival firms from the market. In the United States, antitrust attacks against this latter practice are often brought by the aggrieved parties. In Canada, there apparently has not been a single private suit directly involving standards or standards-writing organizations. This is not due to any extra precautions taken by Canadian SWOs to prevent the improper use of standards. Instead it seems caused by more lenient antitrust and liability laws, the outlawing in many provinces of the contingency fee payment system for attorneys, and general court conservatism. Prior to 1976 when an explicit section providing for the recovery of damages was introduced, no private action for damages was available with respect to breaches of the Combines Act. This arose out of the jurisprudence rather than directly out of the statute.

Several cases were attempted, but the courts decided against the parties seeking private damages.

The very few legal suits involving SWOs have dealt with their certification rather than their standardization activities. ULC and CGA have never been sued, but the Canadian Standards Association recently settled out of court in a case dealing with the collapse of CSA-certified glulam timber arches. A second potential liability suit by consumers over aluminum wiring led the Ontario government to establish a one-man inquiry board.

In the United States, antitrust law "poses only the mildest threat to the drafting and implementing of industry standards."¹⁷ Since Canadian anticompetitive and liability law has been so much weaker than America's, it is possible that in the past there have been insufficient safeguards to prevent standards from sometimes being used for anticompetitive purposes.

VII. The Consumer Interest

It is often claimed that certain important interests - the consumer, small business, labor, and the nebulous public interest - are usually underrepresented in standards writing. This is a serious concern in both the United States and Canada. In recent years there have been some attempts to ameliorate the situation (e.g. Consumer Advisory Panels) but many feel these efforts have been insufficient. Canada may be somewhat behind the U.S. in dealing with this problem. Their initiatives in the voluntary standards arena have mainly been copies of existing American approaches.

This section focuses on the consumer interest. There are few consumer organizations in Canada. The principal one is the Consumers' Association of Canada (CAC) with about 90,000 members. CAC staff is primarily women volunteers. Since 1971 CAC has published the magazine Canadian Consumer which contains product test results from their small laboratories as well as general articles of interest to consumers.

The CAC finds many problems in the standards area. They believe that funding for consumer representatives is inadequate; consumers are fortunate to have even one representative on many of the technical committees. CAC representatives sit on only 45. Consumers argue that there is also tokenism at the policy level. The CAC testing director, for example, sits on the CSA Standards Policy Board. He is one of the two consumer representatives out of some 30 members.

The CAC believes that improvements are often needed in

existing standards. While Canada has strong safety requirements, more performance standards are warranted. Many CGSB standards for consumer products such as paints, soap and carpets are created specifically for government purchase, and are not very useful to the consumer. And many Canadian standards do not benefit the consumer simply because s/he is unaware of their existence.¹⁸

The CAC strongly supported the creation of the Standards Council of Canada. The Council set up a twelve member Advisory Committee on Standards for Consumers (ACC), composed only partly of consumers - manufacturers, retailers, government, university and SWO representatives form the majority. The committee is purely advisory, and its direct impact thus far has been small. It suggested areas for standards, such as carpets and mattresses, but no standards have yet been written. It was also instrumental in the formation of a consumer panel to discuss standards problems.

In general, the Standards Council has not caused large improvements in consumer representation or consumer standards. It does not provide financial support for consumers; that is entirely a SWO decision. It has not given training to consumer or public interest representatives who sit on technical committees. It has not pushed for a large increase in standards writing in the consumer goods area.

The individual SWOs vary in their response to the consumer problem. While CGSB does not subsidize consumer participation, CSA, interestingly, sometimes does. The Canadian Standards

Association also created a Consumer Advisory Panel (CAP) in 1975. Like U.S. consumer sounding boards*, CAPs meet to discuss draft standards of interest with technical committee chairmen. The sounding board concept is strongly supported by the SCC Advisory Committee on Standards for Consumers.

*Such as those used by ANSI to give consumers a stronger voice in standards development.

VIII. Metric Conversion

In January, 1970 the Ministry of Industry, Trade and Commerce issued a White Paper on metric conversion concluding that it was both inevitable and desirable that Canada go metric. The government confirmed this policy decision the following year by establishing the Metric Commission.

The Metric Commission is comprised of ten steering committees representing the various areas of economic activity: primary metal manufacturing, petroleum and mining, construction, food, clothing, wood products, electrical products, education, and service industries. Each steering committee is further subdivided into sector committees, of which there are approximately one hundred. Sector committees are composed of representatives from both public and private interests, and are responsible for devising voluntary metric conversion plans. About 40 plans had been produced by the spring of 1977. Each plan discusses twelve specific issues; two issues of interest are measurement units and standards.

The decisions as to measurement units are relatively straightforward and simple: e.g. is length to be measured in centimeters or kilometers? In the standards area the choices are more difficult and more important : e.g. is there to be soft conversion* or hard conversion**? Will there be rationalization***

*Soft conversion is a change of measurement language to Systeme International d' Unites (SI) which does not involve physical changes (except those permitted by former measurement tolerances).

**Hard conversion represents a change to SI involving physical changes.

***Rationalization means the reduction in number of sizes, or rearrangement of sizes, generally to simplify production or minimize inventories.

When do the standards need to be ready? The SCC has the ultimate responsibility for ensuring that the National Standards System is represented on these committees.

The SCC felt that the salient features of metric conversion with respect to standards are that

- (1) it affects nearly all standards
- (2) the time frame is short
- (3) it is generally accomplished by the emergence of a new organization (the Metric Commission in Canada).

Metric conversion is a unique experience. It forces an intense examination of standards. Because so many are examined in a short time period, the interrelationships become clearer, and it is easier to see the gaps and overlaps. Metric conversion compels a type of systems approach to standards which were originally created in a fragmentary fashion.

Former ASTM President and CGSB Executive Committee Chairman Robert Legget called the metric conversion decision "the most significant development in the whole history of standardization in Canada."¹⁹ Metric conversion really creates a unique opportunity to increase the benefits and uses of standards. Many of the improvements could be achieved without conversion - e.g. examination, updating and rationalization of standards - but they probably wouldn't be. By forcing an increase in interest and awareness about standards, metric conversion can serve as a catalyst to beneficial change.

Compared to the United States, Canada has both drawbacks and advantages as regards metric conversion. One minor problem is

that while the Canadian government was ahead of the U.S. in promoting conversion, the Canadian private sector was initially behind the United States. More important is the Canadian interrelationship with and dependence on American standards, and the American economy, which is still primarily on the imperial system of measurement. In the Canadian lumber industry, for example, where 60% of the business is exports to the United States, the metric conversion is decidedly influenced by what happens in the American market. Gas appliance manufacturers are also forced into a position of wait-and-see what U.S. component manufacturers do.

A principal advantage the Canadian system enjoys is the centralized forum provided by the Standards Council. An officially recognized, centralized tracking agency appears most useful in the successful coordination of the metric conversion of standards. This is something the United States currently lacks.

The metric conversion thus far has had varying impacts on the standards-writing organizations. By the spring of 1977 few ULC or CGA standards had been converted. At CGSB, on the other hand, metric conversion is requiring a large percentage of the workload. CGSB sits on 69 sector committees representing the National Standards System. Over 800 CGSB standards have been identified for conversion. Work is proceeding rapidly in the construction area, where the Board is heavily involved. Building construction is one of the largest industries in Canada, an area where standards are vital, and one of the first industries to convert to metric in both Canada and Great Britain.

Assessment of the Canadian metric conversion, and the use of the opportunity it presents for the rationalization of standards, is not undertaken here. That would require a great deal of additional research, and should probably wait until the process has progressed further.

IX. Evaluation of the Standards Council

The Standards Council of Canada is a small and young organization. It already has accomplished a number of important objectives, though much more remains to be done. It is not without its problems. But there seems common agreement that its staff is capable, and trying hard to make the new system work.

A principal accomplishment of the SCC has been the pronounced increase in Canadian participation in the international standards arena. Further improvements are needed. The harmonization of national and international standards work, for example, is only beginning.

The Standards Council has contributed heavily to the process of metric conversion. Its very existence has provided a much needed focal point for the coordinated conversion of measurement sensitive standards. The absence of such an officially recognized, centralized standards tracking agency may create problems for U.S. conversion.

The Council has increased communication and an exchange of ideas among SWOs. This is helpful. It has also brought increased order to the system, though it must be recognized that there was little actual duplication of activities before the creation of the SCC.

The SCC has also forced some standards writers to re-examine their activities and improve their procedures. There are now more rigorous due process safeguards, and users of National Standards, including governments, can be more assured that the standards are both fair and technically sound.

The Council also promotes standards and standards-writing organizations. In this respect it acts like a trade association; it is a spokesman for the standards system, and gives the system a unified front. It provides the focal point for contact with all parties - government, foreign SWOs, metric commission, et

The Council has not been active without cost. The direct cost to the taxpayer, however, has not been exorbitant. Council staff remains small, and annual expenditures still run only about \$2 million. But there are the usual problems associated with any form of regulation.

There are those who believe that the creation of the SCC imposed an unnecessary organizational layer on an already workable structure. CSA, CGA and ULC standards and certification were already accepted by the regulators who mattered. And there is no doubt but that the Council has created a bureaucratic burden for SWO staff. It takes time and expense to participate in SCC activities. To cite one case, over four years were spent in negotiation, principally between CSA and the SCC, before agreement was reached on the boilerplating (how the cover will look) of National Standards.

There has been friction between the Standards Council and the Canadian Standards Association. Many feel that CSA would be happier if the Council were eliminated. For while the SCC increased the status of CGSB, and helped transfer standards writing areas to CGA and ULC, it has been of little benefit to CSA. Indeed, its very existence invalidates previous CSA assertions that it represented the Canadian

standards system. The Canadian Standards Association has submitted very few standards for SCC approval as National Standards of Canada.*

While the SCC has accomplished some things, at some costs, one can question whether it has yet lived up to original expectations. It is, for example, hard to discern a vast increase in standards activity, or interest in standards, except what is due to metric conversion. There is not really a National Standards System - there are only about 130 national standards. The SCC has no catalog of standards, no standards library, and an embryo information service.** Standards writing organizations do not seem more sensitive to antitrust issues, and have made only minor advances in the consumer area. There is no accreditation program for either certification of testing laboratories (and it is unknown whether such programs would be beneficial).***

*UPDATE: Over time, many of the differences between CSA and the Standards Council have been resolved. In 1977 CSA's Board of Directors issued this policy statement: "It is considered that in time most CSA standards will be published as National Standards of Canada."

**UPDATE: The SCC Standards Information Service, inaugurated in January 1977, has already begun building up a standards library. The first edition of the SCC catalogue of standards was published in August 1977; the first supplement came out the following May.

***UPDATE: The Council is now prepared to call for applications for accreditation in the area of certification. Work is progressing on the criteria for accreditation of testing laboratories.

This does not mean that the creation of the Standards Council was a mistake, or that the Council has been a failure. It merely indicates that much remains to be done. The Council still has great promise, and its future actions and decisions will determine its ultimate success.

X. Case Studies

There does not seem to have been a careful economic examination of standardization, certification, accreditation, grading or metric change in Canada. No one appears to have written an in-depth case history of a single voluntary standard. Therefore, what follows is merely a list of a few such areas which might prove suitable for future research.

Mobile Homes:

The mobile home situation in Canada may provide an especially interesting case study given growing U.S. regulation of this industry.

The great boom in mobile homes ended by the mid-1960s, and the industry had entered a more moderate growth phase. In 1967 a group of manufacturers approached CSA to help develop a set of industry standards. Why did industry desire standards? "The first reason was because the quality of the product had to be upgraded. There were also rumours of government intervention into our industry. If each province passed their own legislation for mobile homes it would require manufacturers to build different units for every province."²⁰

The Canadian Mobile Home Association (CMHA) currently requires certification by CSA as a condition of association membership. The Association claims that 90% of mobile home manufacturers meet the CSA standards. The CMHA has also requested that all provincial governments make these standards mandatory. By 1975, British Columbia, Alberta, New Brunswick

and Prince Edward Island had complied. Only CSA approved mobile homes can be sold in these provinces.

Mobile home manufacturers credit industrywide standards with helping industry credibility. This has resulted not only in increased consumer acceptance but also improved financing and decreased insurance prices. Consumers, however, argue that the standards, combined with high import taxes, have protected the domestic Canadian market. Moreover, they say, the standards have not solved many of the problems. For example, while CSA sets minimum construction and safety standards, it does not address the quality of interior workmanship or craftsmanship. From 1972 to 1975 the Department of Consumer and Corporate Affairs Box 99 received close to 1,000 complaints from mobile home owners.²¹

Helmets and Face Masks:

Hockey helmet standards are often cited as a Canadian success story. The standard provides the basic criteria for all hockey helmets. Studies were initially undertaken to determine the nature and frequency of the various types of head injuries that could be expected from hockey. Then the standard was written in a way to insure that the end product could be light, attractive, and within the price range of the vast majority of consumers. "Obviously trade-offs had to be made as is the case in all standards activities."²²

Who would benefit from the standard?

"Obviously the hockey officials who could recommend helmets that meet the standards; the

manufacturers' also benefited because those that made a good product would not be faced with unfair competition in the form of inadequate products; but, most important of all, our young hockey players benefited because they had access to helmets that would afford a reasonable degree of protection. This is really the key to success of a product or materials standard - it provides the ultimate user with something better than what would have been provided in the absence of the standard."²³

Hockey face mask standards may provide an interesting example of U.S.-Canadian differences. Canada already has a standard that forbids stick penetration. ASTM, on the other hand, is in the process of writing a standard that will only reduce the probability of penetration to a very low level.

Bicycles:

Bicycles provide another recreational safety problem area. Canada did not have a voluntary standard for bikes until 1974 when the CSA standard was approved. The standards committee was formed as the result of a jury recommendation and at the request of the Ontario Traffic conference. Since most bicycles sold in Canada are imported, it is important that there be conformity among foreign, international and Canadian standards.²⁴

Windows:

The CGSB publishes excellent short synopses of specific standardization activities.²⁵ For example, one significant action in '74-75 for the technical committee on metal windows was the resolution of the problem concerning safety in high-rise residential buildings.²⁶

After investigating the death of a child who had fallen from an apartment window in the Toronto area, an Ontario Coroner's jury recommended that the CGSB standards for windows be reviewed to determine whether some safety factors could be incorporated to eliminate this potentially hazardous situation. It was also revealed that several children had died in similar circumstances during the past few years.

The CGSB committee reached consensus that the most effective solution would be to restrict the opening of the window to make it impossible for a child to get through, and to make certain requirements for the attachment of screen to window.

The Ontario Housing Authority adopted these requirements, the Ontario Ministry of Consumer and Commercial Relations planned to make reference to them, and the Associate Committee on the National Building Code had them under consideration for incorporation in the code.

One point of interest in both the bicycle and window standards is the impetus for standards coming from jury investigations of accidents.

Industrial Safety Footwear:

This CSA safety standard is cited as an example of a standard providing high benefits at low cost. In one province the standard led to a reduction in lost manhours due to foot injuries, resulting in a direct savings of \$3.5 million for a six-year period. The direct return on investment is estimated

to be over 20 to 1.²⁷

Building Sealants:

The showcase area for CGSB is construction, and its building sealants standards are recognized world-wide. They are due in large part to the work of a CGSB standards officer.

Nickel:

This is a crucial area for Canada. Canada is a major producer, and it holds the ISO technical committee secretariat.

Mandatory Standards:

While there are no case studies describing the creation of voluntary standards, there have been a number of recent, excellent, cost/benefit analyses of (proposed) mandatory standards written by economists at the Treasury Board and the Department of Consumer and Corporate Affairs. Four studies are listed:

Bruce Montador, Treasury Board, "A Case Study: The Proposed Insulation Requirements for Ceilings and Opaque Walls," 1977.

Andre Morin and Michel Proulx, Treasury Board, "A Case Study of Proposed School Bus Standards under the Canadian Motor Vehicle Safety Act," 1977.

Lee McCabe, Consumer and Corporate Affairs, "A Case Study of Consumer Products Safety Glazing Regulations under the Hazardous Products Act," 1977.

Ron Hirshhorn, Consumer and Corporate Affairs, "A Case Study of the Proposals for Energy Consumption Labelling of Refrigerators," 1977.

A nice overview to these studies is provided by Treasury Board economists Harry Baumann and Bruce Montador in a paper

entitled "Government Intervention in the Marketplace and the Case for Social Regulation." (These might be obtained by contacting Harry Baumann at the Planning Branch, Treasury Board, Place Bell Canada, 160 Elgin St., Ottawa, Ontario, K1A0R5.)

XI. Government Use of Standards

The Canadian government commonly uses standards in mandatory regulations. It often makes "reference to standards" - drafting a regulation in such a way that the detailed statement of technical specifications is replaced in the text by reference to one or more standards. Internationally, the Canadian government endorses the principle though it has yet to establish such a policy at the domestic level. Sometimes the federal government references dated standards, sometimes it references standards without a date, sometimes it copies the standards exactly, sometimes it makes minor or major modifications, sometimes it doesn't use a standard at all. There is no interdepartmental group to either establish or ensure a coherent policy with respect to governmental use of voluntary standards.

In 1974 the federal government made a comprehensive study of references to standards in their acts and regulations.²⁸ It was found that 530 standards were referenced, on 986 occasions, in 8 acts and 84 regulations. About 60% of federal technical regulations use reference to standards to some degree.

Table III summarizes the results of the survey. Four federal departments, Transport, Labor, Agriculture, and Consumer and Corporate Affairs were responsible for about 80% of all references. Standards of United States origin were equally numerous as those of Canadian origin. The Society of Automotive Engineers was the source of 63 stand-

ards, most appearing in the Motor Vehicle Safety Regulations of the Transport Department. The 48 standards of U.S. government origin were mostly agricultural product and commodity standards referenced by the Canadian Department of Agriculture.

The largest source of Canadian Standards was CGSB. The majority of the 92 standards were referenced in the National Trade Mark and Garment Sizing regulations of the Department of Consumer and Corporate Affairs. The references to the 46 CSA standards appeared primarily in the safety regulations of the Canadian Labor Code.

Half of "other foreign" standards were of British origin. Most references were in various regulations pertaining to ship and safety construction issued under the Canada Shipping Act. Only one ISO standard was referenced.

Of the total, 37% of the references were to a standard of definite date, 63% to an undated standard.

It should be emphasized that voluntary standards have an even greater impact on governmental regulations than indicated by Table III. First, the survey did not include provincial and local governments which also make frequent use of voluntary standards. And second, many voluntary standards that are not referenced outright nonetheless form the basis of, or influence, the resulting mandatory requirements.

Table III

ORIGIN AND NUMBERS OF STANDARDS REFERENCED BY DEPARTMENTS AND AGENCIES

Department or Agency	Canadian					America					Other Foreign				International or Regional				Miscellaneous			Total No. of Standards
	Federal Govern- ment	Provincial Govern- ment	CSA	CGSB	Other	U.S. Govern- ment	ANSI	ASTM	SAE	Other	Other			Other Inter- national			Test Methods	Company Standards	Other			
											British	Europe	Japan	Other	ISO	national				ECB	Other	
Agriculture	...	...	...	1	1	39	1	...	3	...	2	...	...	...	...	...	9	...	2	58
MECB	1	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
Communications	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	3
C&CA	1	...	4	85	...	1	...	6	1	3	...	...	...	...	...	...	4	11	...	116
EM&R	1	...	4	1	1	...	...	2	...	2	...	...	...	...	1	...	5	...	...	17
Environment	7	...	...	2	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	9
I&NA	...	1	3	...	1	...	1	...	1	2	...	...	...	...	...	...	...	...	...	9
IT&C	...	...	...	...	...	...	1	1	2	6	1	1	...	...	4	...	...	...	1	17
Justice	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1
Labor	6	27	32	...	2	1	...	10	1	...	10	6	...	...	...	...	...	...	...	95
MH&W	...	...	...	1	1	...	...	...	...	3	2	1	...	...	...	2	3	...	...	13
National Revenue	...	...	...	...	...	...	...	3	3	5	1	...	...	...	...	...	5	...	1	18
Public Works	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Supply and Services	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	2
Transport	8	...	2	2	2	7	...	1	10	57	15	21	27	2	...	1	1	5	2	168		
Total	25	28	46	92	8	43	2	12	27	63	49	31	29	2	...	1	8	5	2	530		

ASTM Standardization News, February 1976 (Reprinted by permission of the American Society for Testing and Materials, Copyright.)

FOOTNOTES

¹Francis LaQue, Chairman, Report of the Panel on Engineering and Commodity Standards of the Commerce Technical Advisory Board, U.S. Department of Commerce, 1965.

²Standards Council of Canada, "Criteria and Procedures for Accreditation of Standards Writing Organizations," CAN-P-1A.

³Robert F. Legget, Standards in Canada, Economic Council of Canada, December 1970, p. 111.

⁴Canadian Gas Association, Approvals and Standards, 1.4.76, p. 2.

⁵Specifications Board, "Policy and Procedures: Preparation of Standards," July 1976, pp. 13-14.

⁶Standards Council of Canada, National Standards System of Canada - The Second Five Years, 1976/1980.

⁷Library of Congress, Voluntary Industrial Standards in the United States, A Report to the House Committee on Science and Astronautics, July 1974, p. 56.

⁸Robert F. Legget, Standards in Canada, Economic Council of Canada, 1971, p. 219.

⁹Dr. Vrethem interview, Consensus, Vol. 3, #1, Jan. 1976, p. 15.

¹⁰CGSB, "Role and Operations," March 1976, p. 17.

¹¹Economic Council of Canada, Interim Report on Competition Policy, July 1969, pp. 51-72.

¹²Ibid., p. 64.

¹³Restrictive Trade Practices Commission Report Concerning an Alleged Combine in the Manufacture, Distribution and Sale of Asphalt and Tar Roofings and Related Products in Canada, Department of Justice, Ottawa, 1955, p. 173.

¹⁴Ibid., p. 243.

¹⁵Ibid., p. 246.

¹⁶Ibid., p. 239.

¹⁷John F. Graybeal, "Product Safety: Law and Administration," National Commission on Product Safety, Supplementary Studies, Vol. III, p. 97.

¹⁸CAC and Standards, memo from Jessie Current of CAC, May 26, 1976.

¹⁹Robert F. Legget, Standards in Canada, 1970, p. 228.

²⁰Dan Johnson, President of Neonex Shelter Ltd., quoted in CSA Quarterly Review, Vol. 16, #2, July 1976, p. 6.

²¹Ann McCorquodale, "Castle on Wheels?", Canadian Consumer, Vol. 5, #3, June 1975, p. 15.

²²John Kean of CSA, in SCC Consensus, Vol. 3, #1, January 1976, p. 4.

²³Ibid.

²⁴"First Standard on Bicycles," CSA Quarterly Review, Vol. 14, #1, May 1974, p. 8.

²⁵CGSB, Report of Annual Meeting of Review Board; The Year in Review.

²⁶CGSB, The Year in Review 1974-75, pp. 12-13.

²⁷John Kean, "Benefits and Efficiencies of Standardization," SCC Consensus, Vol. 3, #1, Jan. 1976, p. 12.

²⁸Federal Department of Industry Trade and Commerce, "References to Standards in Federal Government Acts and Regulations." This report is aptly summarized by Paul R.W. Webb in ASTM Standardization News, February 1976, 25-30.

PART TWO: THE BRITISH STANDARDS SYSTEM

I. Britain and the United States

Britain has one-fourth the population of the United States, living in an area smaller than Oregon. While it is an advanced, industrialized nation, its per capita income is only one-half that of the United States. Great Britain has not nearly the natural resources of America, and depends heavily on trade. This is reflected in its standards activity, where two-thirds to three-fourths of its work is devoted to regional and international standardization. The decision to convert to the metric system was strongly influenced by the importance of its international trade.

Britain and the United States share similar beliefs, the same language (English) and the same cultural heritage (British). But Britain is older, and tradition plays a more important role; more faith is put in established institutions. British industrial purchasers tend to buy more by reputation than by standard specifications. There is less of a tendency to "go out for tender," and more reliance on the supplier's own certification rather than certification by independent third parties.

The common law basis of the British legal system also diminishes the use and importance of standards and certification. Compared to the United States, British standards are rarely called forth in legislation or regulations. Requirements are generally permissive rather than prohibitive. Products are allowed on the market, and the court system decides after-the-fact whether they were unsafe or harmful.

Britain is more of a welfare state than the United States, slightly more "socialized." The central government has a greater direct impact on the day to day lives of its citizens. But its antitrust, consumer protection and liability laws are weaker than America's. There is less legal conflict in Britain between producers and consumers.

The British Standards Institution is the principal standards writer in the United Kingdom. BSI standards-writing procedures are strikingly different from those of U. S. institutions, and perhaps would not be suitable in America. Three rules not found in the United States are:

- (1) no company or individual representatives. There is an attempt to keep committee memberships limited to trade associations, professional, consumer, labor and governmental institutions;*
- (2) no balance requirements, other than that all important interests should have at least one representative; and
- (3) no voting. Consensus means unanimity in the sense that no one objects.

These, and other aspects of BSI are examined in the next section.

*There are two principal exceptions. Firms with large market share ("monopolies") may be represented and experts in specific fields can serve in an individual capacity.

II. The British Standards Institution

The British Standards Institution is the source of "British Standards." It has been granted a monopoly on the use of that term. There are, however, other organizations that produce some intercompany and interagency specifications. In Britain, as in the United States, a central government department writes agricultural standards. The Department of Prices and Consumer Protection also creates a few supplementary specifications for the public sector (called "Public Authority Standards"). In the private sector, the Shirley Institute in Manchester writes methods of testing for fabrics. The professional association of electrical engineers writes the wiring regulations. A few trade associations, such as the carpet manufacturers, still produce some specifications which can be regarded as equivalent to standards. But BSI has a major drawing card, specific exemption from registration under the Restrictive Trade Practices Act granted to agreements to use British Standards. Most intercompany product specifications are now created as standards through the British Standards Institution.

An important kind of industrywide standard written outside of BSI is the self-regulatory code of conduct. As is the case in the U. S., such codes are usually created by the trade association. A spate of new codes have emerged in the last few years, encouraged by the central government Office of Fair Trading. Codes of conduct now cover advertising, electrical appliances, travel, new and used cars, and shoe repairing. Thus the Vehicle Builders and Repairs Association requires that guarantees be given for at

least six months or 6,000 miles. The Code of Advertising Practice states that ads for alcoholic drinks should not be based on a dare.¹ These attempts at industry self-regulation will not be covered in this report.

A. History:²

In January 1895 a letter to the Times quoted the case of a frustrated contractor whose order for iron girders had been passed from one British supplier to another, and none had been able to meet his specification. The order was eventually supplied from Belgium. John Skelton, a London iron merchant replied:

"Rolled steel girders are imported into Britain and Germany because we have too much individualism in this country, where collective action would be economically advantageous. As a result, architects and engineers specify such unnecessarily diverse types of sectional material for given work that anything like economical and continuous manufacture becomes impossible."

Five years later John Skelton gave a paper on standardization to the British Iron Trade Association. The speech impressed Sir John Wolfe Barry, past president of the Institution of Civil Engineers, and he persuaded the Institution to set up the first standards committee.

On April 26, 1901 the Engineering Standards Committee held its first meeting. The specific purpose was the standardization of iron and steel sections, but the committee quickly expanded in both scope and function. Within five years it had established standards for a wide variety of industrial goods, including locomotives, portland cement, electrical generators, pipe flanges

and telegraph material. A major achievement of the early standards work was the agreement on standards for rails.

The Committee received its first government grant -- 3000 pounds -- in 1903. But it was not until 1929 that it was given a Royal Charter. The Committee changed its name in 1918 to the British Engineering Standards Association; in 1931 it integrated chemical standards into its program and was renamed the British Standards Institution. In 1942 BSI was officially recognized by the government as the sole organization for issuing standards having a national application.

BSI standards writing has gradually grown into more and more fields. In 1951 a Women's Advisory Committee was formed (now called the Consumer Standards Advisory Committee), and in the 1960s BSI played a major role in the metric conversion.

The early 1970s found BSI running a significant budget deficit. This was caused in part by a reduction in the governmental grant as metric conversion work diminished. BSI responded by rationalizing and making more efficient its sales and subscription systems; it also reduced staff by over 20%. The staff reduction resulted in a proportional decrease in standards development activity. By the mid 1970s the budget had been successfully balanced.

BSI entered the Quality Assurance arena at an early date. The BSI Kitemark was first registered as an ordinary trademark for tramway rails in 1903. The mark gained real practical value in 1919 when the Trade Marks Act was amended to permit certification on the evidence of tests conducted on samples.

rather than total production. In 1959 BSI's in-house test center was built at Hemel Hempstead, outside of London. Seven years later its Technical Help to Exporters service was established, also with headquarters at Hemel. In 1976 BSI celebrated its 75th anniversary.

B. Finances:

The British Standards Institution is the nationally recognized standards organization of the U. K. It is incorporated under Royal Charter, but remains an independent, non-profit making institution. Its employees are not civil servants. Total BSI budget in '75-'76 was a little over 6 million pounds. It boasted 15,500 subscribing members, 28,000 committee members, and employed more than 900 people.

There are three distinct areas of activity within BSI, each with a separate budget: standards, quality assurance and technical help to exporters. The standards area is the largest. In '75-'76, income in the standards and publications area totalled 4.5 million pounds. Of this, 26% came from membership dues, 23% from government grants, and 51% from sale of standards. The government grant matches dues raised from members the previous year. In addition, from time to time there has been a supplementary grant; the last one was to help with the extra work during the period of metric conversion. There is currently a staff of about 650 working in the standards area.

The Quality Assurance branch receives all its revenues from testing and certification fees. These totalled 1.3 million pounds in '75-'76. There were 226 employees. Income of .45

million pounds for Technical Help to Exporters came half from the government and half from subscriptions and fees. Staff was 57.

C. Standards Development:

BSI is governed by a 27 member Executive Board. Under the Board are six Divisional Standards Councils (and a Quality Assurance Council). Under the Divisional Councils are some 80 Standards Committees. And under these Standards Committees are about 1,000 active technical committees. There are over 3,000 technical committees currently inactive pending the revision of their standards.

The Executive Board is responsible for overall BSI policy. Membership on the Board is a mixture of elected individuals and persons nominated from a variety of national interests including the Trades Union Congress, the Confederation of British Industry, BSI's Consumer Standards Advisory Committee, the nationalized industries (who collectively nominate one representative), a representative nominated by the Institution of Civil Engineers, and three government departments.

BSI divides the responsibility for standards writing among six Divisional Standards Councils in the areas of building, chemical, engineering, electrotechnical, textiles and services. The electrotechnical and engineering councils are the largest; textiles is the smallest. Standards drafted for consumer products will usually be found under the Divisional Council for services.

The Divisional Councils are composed of the chairmen or elected members of the standards committees in the area, plus members nominated from certain designated organizations such as

These Councils review the work of the Division. They report to the Executive Board, and their chairmen are appointed by the Board

The 80 Standards Committees are composed of the chairmen of the technical committees plus such representatives of other interests as the Councils may decide. They meet once a year and review the work of the technical committees. They are responsible for authorizing the initiation of standards projects, and deciding the broad program and priorities for work in their fields. They allocate resources of staff time to the technical committees. Standards Committee chairmen are appointed by the Executive Board.

Standards are prepared by the technical committees. BSI staff serve as secretaries on all committees, and are considered full committee members. They are responsible for detailed drafting and editorial work, and the task of preparing and approving final drafts is usually delegated to them by the Standards Committee. Committee chairmen are usually elected by the technical committees themselves, though they can be appointed by the Standards Committees. The chairman can be a member of a trade association, though he is supposed to act impartially rather than to represent that association in the committee during his tenure of office.

The aspects of British standards writing that are most different from the U. S. system involve a) committee members, b) balance requirements and c) voting procedures.

1. Committee members:

BSI tries to avoid having individuals, or representatives of individual companies as technical committee members. The emphasis is on membership by trade association. In "A Standard for

"The committee structure of BSI is firmly based on the principle of bringing together all those with interest in particular projects, wherever possible through organizations representing the views of an industry, sector, trade, or other interest. This achieves, economically, a wide measure of consultation and support in standards work.

It is open to trade associations and others to seek representation on technical committees handling work in their sphere of influence. Individual experts may also be co-opted on occasion. BSI attaches particular importance to securing representation of user needs and consumer opinion in standards work."³ (emphasis added)

BSI technical committees are less open for membership than American committees. What is wanted are "men of good repute" which means association backing. An individual can't walk off the street and expect to be accepted on a technical committee. Academics have less of a problem since they can be co-opted as recognized experts.

The membership list of a BSI technical committee is presented below. This was chosen at random and seemingly depicts a typical example.

CMS/27 Projection

<u># Members</u>	<u>Affiliation</u>
Chairman	No affiliation
1	Association of Cinematographic, Television and Allied Technicians
3	Association of Independent Cinemas
1	British Amateur Cinematographers Central Council
1	British Broadcasting Corporation
1	British Film Institute
4	British Kinematograph, Sound and Television Society
2	Cinema Exhibitors Association of Great Britain and Ireland
1	Council for Educational Technology in the U. K.
2	Electrical Engineers Association

<u># Members</u>	<u>Affiliation</u> (cont'd.)
1	Illuminating Engineers Society
2	Independent Television Companies Association
1	Institute of Amateur Cinematographers
1	Co-opted (Individual expert)
4	Lighting Industries Federation Limited
2	Ministry of Defense
1	National Association of Theatre, Television and Kinematograph Employees
1	National Council for Audio-Visual Aids in Education
1	National Illumination Committee of Great Britain
1	RCA Ltd.
1	Royal Photographic Society
1	BSI

A problem for BSI is that British trade associations are neither comprehensive nor knitted into an orderly and logical pattern. The 1972 Devlin Report on trade associations disclosed that:

"in many industries there is duplication and confusion. Even in those industries in which there is a single powerful organization representative of a large part of that industry, there is a residue of small weak and disconnected bodies. The picture contrasts very strongly with that shown in other countries in the EEC."⁴

Of the 4,100 small businesses belonging to the Confederation of British Industry, some 30% were not members of any employers organization or trade association. BSI sometimes deals with this problem by co-opting as experts individuals from companies that are not association members. However they would much prefer to be able to deal solely with the association.

2. Balance requirements:

BSI's stated principles are that it "should carry out its

task in the national interest, take account of all significant viewpoints, secure a balanced representation at all committee levels, and...have an authoritative body of opinion behind every British standard."⁵ (emphasis added) In practice, however, BSI is more concerned that all interests have some representation than that there be any kind of numerical balance. An ASTM executive summarized the BSI situation:

"Though a fair balance of interests is recognized as desirable, it is not required that there should be a numerically equal representation of different interests."⁶

BSI has no specific rules on balance, and it is not unusual to find manufacturing interests dominating technical committees. The reason why balance is not considered as crucial is because there is no formal voting.

3. Voting procedures:

An unusual feature of the British system is that there is not any voting. BSI has always avoided voting, which they feel tends to polarize the minority. A standard is approved when it is acceptable to all. This seems more like unanimity than consensus. But each member does not need to be fully in favor of the particular draft. He must only find it acceptable.

Numerical balance on the technical committees is not considered crucial at BSI since one member can theoretically block any standard. In practice, of course, numbers do matter. It becomes quite difficult to hold a position against an overwhelming majority. When a dispute does arise at the technical committee level, it can be referred to the Executive Board for arbitration. Before this happens, the staff exerts a great deal of energy and

pressure to resolve the problem. In the last twenty years, only a score of disagreements have reached Executive Board arbitration.

D. Standards:

BSI standards cover a wide spectrum. There have been standards for Christmas trees, country stiles, and even for the preparation of tea. However most standards are for industrial products.

BSI has some 7,000 standards on issue. The French and Japanese national standards writers have produced about the same number of standards. Germany has written more. BSI would argue that such comparisons are not very relevant since standards vary in scope and significance.

BSI has been continually devoting more of its resources to the international area. As much as 75% of its work may now be for international and regional standardization. BSI is increasingly following director general Feilden's philosophy of "Do it once; do it right; do it internationally."

III. Certification and Accreditation

A. Certification:

Third-party certification schemes are not as important in the U.K. as they are on the Continent. Much of British industry is traditionally wedded to self-certification. Even the government in its role as purchaser and regulator makes little use of independent certification.⁷

BSI feels that third-party certification is also less centralized in Britain than in Europe, though probably not so decentralized as in the United States. There are a large number of organizations involved in certification in the U.K. In the electrotechnical field, for example, there is BSI, the British Electrotechnical Approvals Board, the British Approvals Service for Electric Cables (administered by BSI), the Association of Short-Circuit Testing Authorities, and the British Approval Service for Electrical Equipment in Flammable Atmospheres. By contrast, VDE* has a virtual monopoly in electrical equipment certification in Germany.

The principal BSI certification scheme is the Kitemark, which covers all classes of goods. The mark is used in connection with about 250 British Standards. For some years it was BSI policy to encourage standards committees to require certification marking as a compulsory requirement to show compliance with certain standards, notably those affecting health and safety. When it became questionable whether a policy of compulsory marking would stand up in court, it was abandoned in favor of a strong recommendation for Kitemarking where appropriate.⁸ Virtually all BSI certification is against British Standards.

*Association of German Electrical Engineers

There are some 800 manufacturers using the Kitemark, about 100 of which are overseas - principally from Japan, Germany and Ireland. For these foreign producers, there is often an agency agreement for factory inspections, but BSI almost always tests the product itself since "national standards don't travel well."⁹

About 90% of the products covered by the Kitemark are in the area of industrial equipment - zinc alloy diecastings, copper tubes, flameproof electric motors, portable tools, industrial eye protectors, etc. The mark seems to have been of principal value to large scale purchasers.¹⁰

Except for two mandatory schemes, for vehicle seat belts and motorcycle helmets, all Kitemarking is voluntary. However government regulations have had important influence on certification since the Kitemark can be used as evidence of compliance. In fiscal year 1975, for example, BSI reported a significant growth in the demand for Kitemark licensing for personal safety equipment as a result of health and safety legislation.¹¹

Kitemarking of final goods is rare. If a demand for a certification scheme came from the consumer, BSI would have to talk to the manufacturers to determine if anyone would use it. The Quality Assurance branch of BSI is self-supporting; it receives no government grant and consumer groups have little money. If manufacturers don't voluntarily come forward for licensing, the certification would not be financially viable, and would not work. Except for those instances of government regulation, only industry pressure has ever gotten a Kitemark

scheme off the ground.¹²

Kitemarking is relatively inexpensive. Payments to BSI by licensees represent only 0.07% of production costs.¹³ The total value of British products using the Kitemark is about 500 million pounds.* While this is a large figure, it represents only about 1/2 of 1% of U.K. gross national product. Compared to European certification, the Kitemark is not widely used. "Publicity for the Kitemark has never really been sufficient to create a strong demand for it."¹⁴

BSI recently introduced the Safety Mark** to appear on products which conform to British Standards for Safety. The Safety Mark was designed in part to be a recognized form of certification under the EEC Low Voltage Directive. At the end of 1976 only two product categories had been included in Safety Mark schemes - lighting fittings and domestic gas appliances - and about fifty companies licensed.

An approval scheme about which BSI is quite proud is the comprehensive Burghard scheme for the electronics components industry based on BS 9000. It provides a unified series of specifications for electronic parts for both civil and military purposes, but allows for the rapid introduction of new component designs. It forms the basis for multilateral trade within western Europe. There is no certification marking, though components are issued against certification.

*UPDATE: In a letter dated July 20, 1978, J.W. Charter of BSI said that a "conservative estimate" now would be about double the 500M-pound figure.

**UPDATE: Now called "The Safety Standards Mark" to indicate emphasis on compliance with British Standards covering all aspects of safety for the product.

B. Accreditation:

BSI has recently inaugurated two new accreditation schemes one for test houses and the other for the quality assurance capabilities of individual firms.

1. Registration of Test Houses¹⁵:

While BSI has its own facilities at Hemel Hempstead, it often uses outside test laboratories to carry out the tests for its Kitemark and Safety Mark schemes. (Indeed, the BSI test house competes for Quality Assurance business on the same basis as any other test house). Until recently BSI acted as an ordinary client in commissioning outside test work. Although it was satisfied with the quality of these test houses, it never gave formal approval to any of them.

In 1977 BSI created a formal procedure for the registration of test houses. The system is intended as a guide to potential clients of testing firms; those using the services of registered firms will have an assurance of quality. The demand for this new system of accreditation came not only from users of testing facilities, but also from certain of the test houses themselves. In addition there has been some pressure from the European Economic Community to fall in line with their more centralized methods of operations.

The BSI system is low-key; there is no desire to tread on anyone's toes. BSI does not pressure any of the test houses to come into the scheme. But there has been a lot of interest, especially from manufacturers with testing facilities who want to operate on a commercial basis.

The system is just getting started. By mid-1977 only four test houses had been approved. The attitude of BSI is that this is a learning situation, and they seem ready to make adjustments should the situation warrant.*

2. Registration of Firms¹⁶

BSI is also beginning to assess manufacturers on the basis of their quality assurance capability. The system is intended as a guide to potential purchasers. If a firm is registered, the buyer will have the assurance, not that the particular product it manufactures is of high quality, but that the firm has the capability of producing a high quality product. The system is thus designed as a complement rather than a substitute to the Kitemark and Safety Mark certification systems.

The system is new. As of mid-1977 only a few firms had been registered, all in the area of pre-cast concrete. The firms were assessed in terms of the British code of practice for concrete as well as other specifications.

*UPDATE: However, the Test House Registration Scheme is slowing down "to a dead stop," according to J.W. Charter of BSI, while everyone waits to see what the government might do in this area.

IV. Technical Help to Exporters

British legislation is generally "permissive." In general, any product may be sold in the United Kingdom unless it is shown to be unsafe or harmful. There is rarely a requirement that a product's safety or suitability must be proved in advance. Vehicle glass, for example, is simply required to be safety glass without precise definition. No British standard is called forth here, or in most legislation and regulation.

By contrast, other countries generally have "prohibitive" legislation. A manufacturer must declare or prove that his product meets the requirement before it can be sold, or sometimes even exhibited. A West German regulation, for example, states that all equipment "shall be safe," and that compliance with specified German standards will satisfy the requirement. In Sweden, domestic electric equipment offered for sale must carry the SEMKO type approval mark.¹⁷

The different legislative philosophy makes it more difficult for U.K. manufacturers to sell abroad than for foreign producers to invade the British market. To aid British exporters somewhat unused to prohibitive legislation and faced with a variety of foreign national standards, BSI established Technical Help to Exporters (THE) in 1966. THE identifies overseas government requirements and provides assistance to exporters in meeting them.

THE is located at Hemel Hempstead. Its small professional staff is composed entirely of engineers. The proportion of its

revenues coming from its government grant is falling -- from 55% in 1975 to 25% by 1978. To avoid hurting the small firm, it charges only 60 pounds for membership in the U.K., and membership fees are assessed for each factory location. Membership entitles certain services, but detailed enquiries, projects and consultancy visits are charged for. These charges not only raise revenue but serve as a rationing device to help limit unnecessary informational requests.

THE provides information primarily in the electrical, mechanical (especially motor vehicle and pressure vessel) and construction areas. Its service is of three types:

- (1) identification ("I have a contract here that requires ASTM B...", or "I export X to Germany; what are the regulations?");
- (2) supply of documents (Translations of standards are most helpful. One of the biggest American sellers is the ASME Boiler Code);
- (3) interpretation (or what the document really means. Here THE acts as a consulting service. It sometimes even inspects the product to determine if it will pass the requirements).

THE can certainly aid exporters, and it feels it would be even a greater help if it were used more by British manufacturers. It possesses a great deal of technical knowledge and information about technical requirements and their application and interpretation in other countries.

V. International and Regional Standardization

A. International Standards:

The United Kingdom is a trading nation; about one-fourth of its gross national product is exported. About 70% of BSI's standards work is devoted to regional and international standardization. Britain is one of the mainstays of the International Organization for Standardization (ISO). In 1977 it had the secretariat for 26 technical committees, 90 subcommittees, and 165 working groups. This was 60% more secretariats than ANSI, and second only to France's AFNOR. Interestingly, BSI is trying to cut down on the number of technical committee secretariats. It feels that the secretariats for subcommittees and working groups are more cost effective.

The U.K. is a leader in its commitment to international standards. BSI is increasingly trying to follow its oft-stated philosophy of "Do it once; do it right; do it internationally." While ISO members are under no obligation to adopt international standards, BSI has recently reaffirmed its intention to use ISO standards if it voted for them. "It is generally expected that a positive vote on a draft International Standard will be followed by substantial incorporation of the published International Standard in an existing national standard or its publication unchanged as a new national standard."¹⁸

The stated policy cannot always be followed. British standards, for example, are often more stringent and comprehensive than international ones. Yet many international standards have

already been adopted unchanged as dual numbered British Standards, and it is expected that increasingly more will be adopted in this way in the future.

ISO standards are usually less detailed than British standards. They are largely testing and measurement standards rather than quality standards. Moreover, they take a very long time to produce. BSI's policy is not to permit "essential national standards to be compromised or delayed unacceptably by the slower pace of international work."¹⁹ BSI sometimes believes it an advantage to get the British standards out first. That standard can then serve as the basis for international agreement.²⁰

BSI has been highly successful in harmonizing its domestic and international standards committees. Every international committee in which the U.K. participates has an equivalent BSI committee which appoints, briefs and debriefs the British delegation. The delegation represents the British viewpoint, agreed upon in committee.

The British delegation is composed of a maximum of five members, with usually two or three considered sufficient. Financing is normally provided only for the leader of the delegation, so the other members are generally from the business sector. Balance in international representation is not considered crucial. If the domestic committee is composed of all important interests, BSI feels that problems will be minimal.

Though BSI national and international committees are harmonized, and British international representation is more comprehensive than either the Canadian or American, many still

feel it is not adequate.²¹ Some sectors believe that other nations field stronger delegations. A suggested cause of this is the limited financial support, especially when combined with an unwillingness of some firms to release technical experts for standardization work.

B. Regional Standards:

Intercountry standardization is also being actively pursued at the regional level, through the European standards organizations and the European Economic Community (EEC). The European standards organizations are CEN (European Committee for Standardisation) and its electrotechnical counterpart CENELEC (European Committee for Electrotechnical Standardisation). These were set up in the early 1960s to bring together Europe's national standards organizations which had been divided into two economic groups by the Treaty of Rome.

CEN provides a forum for Western Europe to harmonize its standards. Its original intention was to publish unification documents to identify areas of existing harmonization and to explain national variations in standards. The emphasis has since shifted to writing standards that can be referenced in EEC technical directives.

CEN's output has been small; only 47 European standards had been published by mid-1977, with another 200 in the pipeline. There seems to have been enormous starting friction. Additionally, the U.K. has often found itself "odd man out" in pushing for tougher safety standards. Of 32 priority standards in draft form in 1976, the U.K. had returned negative notes on eleven due to safety considerations.²²

At the EEC, decisions are made by statesmen rather than by engineers. The emphasis is thus more on the political rather than the technical. Solutions attractive on technical grounds are often rejected due to the expected commercial consequences for member states.

Not surprisingly, the EEC harmonization program has had limited success. In 1969 the Council of Ministers authorized a program for removing technical barriers to trade; the goal was to complete over 200 technical directives in three years. In fact, only 24 directives were adopted during this period, and by 1977 fewer than 50 had come into force. Of these, 12 went through as a package deal in which member states gave up their reservations on individual directives as part of an overall agreement. Only one CEN standard has so far been referenced in an EEC directive!

VI. Consumer and Labor Interests

A. Consumers:

The Consumers' Association (CA) and the National Federation of Consumer Groups (NFCG) are two of the principal grass roots consumer organizations in Britain. CA is patterned after Consumers Union, with 700,000 subscribers to its product-testing magazine. NFCG is less well known and is an offshoot of CA, formed from local groups set up in 1963. NFCG is a completely voluntary organization, with about 6,000 members, mostly from the middle class.

CA and NFCG are two of the over thirty consumer organizations composing BSI's Consumer Standards Advisory Committee (CSAC). Other members of CSAC include the British Federation of University Women, the Women's Liberal Federation, the Scottish Co-operative Women's Guild, the National Labour Women's Advisory Committee and the National Council of Women of Great Britain. CSAC was established in 1951 as the Women's Advisory Committee. In 1973 it received its present name, and admitted its first male representative.

CSAC is not only a consumer spokesman within BSI, but it also helps ensure consumer representation at technical committee meetings. The 400 British standards concerned directly with consumer products are written by some 200 technical committees. CSAC tries to recruit one, and perhaps two consumers to serve on these committees. CSAC may provide some training through mock standards sessions, and occasionally reimbursement for traveling

expenses or even luncheon. If the consumer representative is unable to attend the meeting, someone from CSAC generally takes his/her place.

British consumer groups are far from satisfied with the current standards system. In a London speech in September 1976, CA's deputy director stated that, in general, standards were too few, too low, took too long to produce and were not sufficiently used. Consumers did not have a strong voice in the preparation of standards. There were not enough consumer representatives, and those there were were laymen, likely to be at sea among the technical experts.²³

The NFCG also issued a Green Paper on standards in late 1976. It claimed that "few consumers know what British standards are." It argued that the current Pass/Fail standards should be replaced by a grading system which would provide more and better consumer information. It claimed that the BSI's "unanimity rule" should sometimes be modified, so that producers could not veto the issue of a beneficial standard. In some cases it might even be appropriate for consumer standards to be prepared entirely by consumers and civil servants, though usually BSI should be given the opportunity first.²⁴

Overall, consumers in Britain, as in the United States, are not well organized and have difficulty obtaining adequate representation in standards meetings. While British consumer groups may not be so vocal as the American, they feel the same frustrations at being unable to mold the standards system to meet their needs.*

*UPDATE: The Department of Prices and Consumer Protection has since allocated \$10,000 per year to pay travel expenses of consumer representatives to standards meetings in the UK and overseas.

B. Labor:

Britain's national labor organization, the Trade Union Congress (TUC), is a member of BSI's executive board, and its representatives participate on numerous technical committees. Nonetheless, as is the case in the United States, labor is not well represented in Britain's voluntary standards system.

The Trades Union Congress is presently incapable of providing large numbers of technical experts to represent labor's interests; moreover it tends to regard BSI as something of an employer's organization. While BSI would definitely welcome greater labor participation, it does not seem to have actively pursued that objective. Unlike the consumer, labor does not have an organization within BSI to promote its interests.

VII. Metric Conversion

In May 1965 the U.K. officially decided to "go metric." The government decision was supported by British industry, already on the record as favoring the adoption of the metric system. Given the importance of standards in the conversion process, BSI was designated as the focal point for the coordination of planning activities.

The bulk of BSI work in the late 1960s concerned metrication. In the standards area, a ten year plan was established. While it was not expected that all standards could be changed by 1975, 1,200 basic standards were selected for rapid conversion and this task was completed by 1971. Although some standards have not yet been converted, all BSI work in the past seven years has been in metric units.

BSI feels that the opportunity provided by metric change to update and rationalize standards was taken, that variety reduction did occur and that entrenched historical practices were modernized. Of course in the areas where imperial or U.S. practices dominate, such as the petrochemical field, there was only soft conversion. Hard conversion was also not always practical when interchangeability aspects predominated, such as for pipethread and housing wiring.

In 1969 the Metrication Board was created and assumed the responsibility for sector coordination. BSI continued to play the central role in the standards conversion process and was represented on all eight of the Board's steering committees.

The Metrication Board probably should have been established in the very beginning. BSI was never given large amounts of funds for the needed conversion work. Moreover, BSI tends to be industry oriented. It really did not have the machinery for coordinating conversion in the retail area, and careful planning was needed for going metric in the "everyday world."

Nevertheless, metric conversion was pretty much on schedule until 1971. Since then, the political environment has not been as conducive to metric change. Many aspects of everyday life, such as road signs and petrol measures are still in imperial units. And progress has also lagged badly in the engineering industries. "The engineering industries are still faced with the need to manufacture and stock to dual in many cases. This is due to delays in the legislative programme."²⁵

VIII. Antitrust and Liability

Arrangements among competing firms to fix prices or divide the market have been illegal in the United States since the Sherman Act of 1890. In Britain, on the other hand, such agreements were not only legal, but in some ways legally enforceable until after World War II. Convergence of British and American philosophies toward restrictive practices did not really begin until 1956 when Parliament passed the Restrictive Trade Practices Act. That act required agreements in restraint of trade to be registered. It authorized the Registrar to challenge any agreements that appear contrary to the public interest. And it established a Restrictive Practices Court composed of both judges and laymen to hear the cases.²⁶

The Restrictive Practices Court places the burden of proof on the defense to show that the agreement provides positive benefits covered under one of more of seven specified "gateways," and that these benefits outweigh the potential harm. The most frequently used gateway states that "the removal of the restriction would deny to the public as purchasers, consumers or users of any goods other specific and substantial benefits..." Several successful defenses have centered on the advantages of standardization agreements and the need to support them with price-fixing arrangements. Thus in the Blanket Manufacturers' Association's Agreement (1959), a specification which laid down a minimum quality standard for certain blankets was upheld. The

Court was convinced that there were specific and substantial benefits to the public which outweighed the disadvantage that cheaper blankets of poorer quality were hard to find.²⁷

British standards are specifically exempted from the Restrictive Trade Practices Act. Section 9(5), 1976, states:

"In determining whether an agreement is an agreement to which this Act applies, no account shall be taken of any term by which the parties or any of them agree to comply with...

- (a) standards of dimension, design, quality or performance,
or
- (b) arrangements as to the provision of information or advice to purchasers, consumers or users, being either standards or arrangements for the time being approved by the British Standards Institution or...the Secretary of State...."²⁸

Standardization in Britain is thus largely protected against successful antitrust attack. There do not seem to have been any instances where the courts held voluntary standards setting to be illegal. BSI has never been hit with an antitrust suit. Additionally, America's product liability wave has yet to reach Britain. Liability for consumer goods still resides primarily with the retailer, though this is changing.

*There is currently a draft EEC directive which, if approved, would substantially alter the product liability rules.

IX. Case Studies

British economists, like their American counterparts, have yet to provide careful case studies of standardization or certification. However, in three recent governmental investigations, various aspects of standards have been discussed. The three products that were examined are:

- (a) electric lamps
- (b) intruder alarms, and
- (c) contraceptive sheaths.

A. Electric Lamp Life:

For over half a century the life of the commonly-used electric light bulb in Britain has been fixed at a standard 1,000 hours. Longer life bulbs can be manufactured at almost no increase in cost, but at a loss in lighting efficiency. The longer-life bulbs provide lower light-output per unit of electricity consumed. The manufacturers claim that the life span chosen has been calculated to give the best compromise from the point of view of the user.²⁹

British economist S.J. Prais has shown that industry calculations are in error. Given their assumptions, bulb life should be standardized at about 1,500 hours. Additionally, Prais argues, the manufacturers' have ignored many of the replacement costs - the annoyance of finding yourself without light, the time spent buying a bulb and changing it, the cost of replacing a fuse, of breaking the bulb, and of injuring yourself. Including these costs substantially lengthens optimal bulb life.³⁰

Most important, any single standard for all bulbs will be inefficient. The optimal life of a 40 watt bulb is longer than that for a 100 watt bulb. High priced special purpose bulbs should last even longer. The best solution is not simply to lengthen the standard life of all bulbs, but also to abolish the single standard, "in favour of a greater variety of lives, and requiring that they be made widely available to the public."³¹

B. Intruder Alarms:

In 1971 the first edition of BS 4737, "Intruder Alarm Systems in Building," was published, covering the installation and maintenance of systems by intruder alarm firms. In the same year, the National Supervisory Council for Intruder Alarms (NSCIA) was created to improve the practices in the industry. Companies who are approved installers of the NSCIA should conform with the requirements of the British standard. NSCIA keeps a register of installations by those approved firms, who are required to issue Certificates of Status and Competence for every installation.

Insurance companies play an important role in this industry. Many users are obliged to install an intruder alarm as a condition of insurance. Many additional users seek their insurance companies' advice before acquiring a system. Insurers normally require that installers be affiliated with NSCIA. Police forces also often confine their recommendations to NSCIA approved installers. The British standard thus significantly influences industry practices.

A Price Commission study published in 1977³² reported anti-competitive problems caused by BS 4737. The standard specified

that maintenance be carried out by the original installer. The user was thus tied to the installation company for all subsequent maintenance. The Price Commission concluded that this provision "inhibits competition and the user's freedom to change firms if he is dissatisfied with the quality of maintenance."³³ The revised 1977 edition of standard BS 4737 eliminates this requirement.³⁴

The 1971 British standard also stipulated routine service visits at intervals normally of three months, and never to exceed four. The Price Commission questioned the necessity for such frequent inspections, and the 1977 revised standard now requires routine maintenance visits only once every six months. This "should mean considerable savings for the user."³⁵

The Price Commission study also reported problems caused by the absence of standards. "Contracts for the installation and subsequent maintenance frequently lack clarity. There is no standard form of contract."³⁶ The Commission recommended that NSCIA take the initiative in creating the needed standard contract forms.

C. Contraceptive Sheaths:

There is one dominant producer in the British market for contraceptive sheaths. LR Industries Ltd. (LRI) manufactures the condom "Durex" and controls 90% of the domestic market. The remaining 10% of sales are supplied by imports.

The government rationalisation program of 1939 firmly established LRI in its monopoly position. Scale economies in production, combined with brand reputation advantages, helped LRI

maintain its dominance. A Monopolies Commission report issued in 1975 concluded that LRI had fully exploited its monopoly power.³⁷ Its domestic prices were substantially higher than its export prices. It also practiced price discrimination within Britain, selling cheap when substitutes were available or entry possible, and dear in the protected part of its market. Other, more questionable, business practices had been specifically designed to impede entry.

Standards and certification are important in the British condom market. The Monopolies Commission report described the role they play, but did not come to any definite conclusions concerning their effect on competition.*

In 1964 the first British standard for rubber condoms was written. At that time LRI was the only U.K. manufacturer, but it did not press for the creation of a standard. However, by 1967, the company policy was to try to raise the requirements

*

Codes of practice have also affected the market. The advertising and sale of contraceptive sheaths has sometimes been forbidden. Ads and other forms of promotion by retail chemists are governed by the Pharmaceutical Society of Great Britain. Before 1953 the Society did not permit any reference to family planning, and until 1970 all direct and indirect advertising of contraceptives was prohibited, except the display of a notice with the words "Family Planning Requisites." Since 1970 pharmacists have been free to display condoms, provided that this does not detract from the professional appearance of the pharmacy. Thus, until quite recently, the only display of brands of sheaths was by surgical stores, mail order houses, and barber shops.³⁸

The voluntary British Code of Advertising has not prohibited the promotion of condoms. However, the television Code of Advertising Standards and Practice, based on the Independent Broadcasting Authority Act of 1973, specifically forbids the television advertising of contraceptives. Additionally, few magazines or periodicals will accept ads for sheaths; none did before 1969.

of the standard. "It was thought that the resulting improvement in the quality of the company's products would make it more difficult for other manufacturers (of imported products) to compete."³⁹ In 1972 BSI revised the standard, raising acceptable quality. However, the Monopolies Commission found that condom standards in Japan and the U.S. were basically similar to the British although the tests required differed.⁴⁰

As the only domestic sheath manufacturer, LRI was the only British producer on the technical committee. BSI said that there were other committees where the industrial interests were represented by one manufacturer who was the sole supplier. It was something BSI watched closely. The Monopolies Commission examined the technical committee records. It found that LRI's views were, on occasion, unacceptable to the majority, and that some differences were resolved by BSI consulting or calling in outside experts.⁴¹ The membership list of the 1975 technical committee is given at the end of this section.

BSI operates a certification mark scheme in conjunction with the standard. From 1964 to 1973 LRI was the only firm using the Kitemark. In 1973 Akwell Industries, Inc. of the United States also became a licensee. Akwell products are distributed by Ortho Pharmaceutical Limited (Ortho), a British subsidiary of Johnson and Johnson.

The Kitemark matters. The Family Planning Association (FPA), a charity that runs nearly one thousand family planning clinics, receives most of its income from the sale of contraceptives. FPA will not buy sheaths which are not Kitemarked, and this is also

true of many other distributors. The Kitemark thus gives firms meeting the British standard a strong competitive advantage.

However, it is not clear whether the certification scheme helps erect entry barriers. Before the British standard was created LRI maintained its monopoly position by virtue of its established reputation. LRI argues that rather than raising barriers, the kitemark tends to facilitate entry since it diminishes brand name advantages, and it is not difficult for a technically competent manufacturer to obtain certification. Yet, LRI has not lost its market share since 1964, and it continues to charge high prices and reap monopolistic rewards.⁴²

BSI Technical Committee on condoms

- 3 representatives of the FPA
- 1 representative of the Ministry of Defense
- 1 representative of the LR Industries, Ltd.
- 1 representative of the Ortho Pharmaceutical, Ltd.
- 4 individual members co-opted because of expert knowledge
- 4 BSI staff members.

D. Suggestions for Additional Research:

Given the time and resources, very illuminating cross national case studies of American and British standards could be undertaken. For example, the coal industry in the U.S. is composed of large numbers of small firms while in Britain it is a government monopoly. Examining the differences in product and purchasing standards might provide important insights into the role of seller concentration in standards creation.

X. Government and Standards

A. Government Departments:

There are a number of federal government departments directly involved with standards and standardization. The Ministry of Agriculture, Fisheries and Food is concerned with the safety and quality of food. It has certain responsibilities for the creation of composition standards and for ensuring public health standards in food preparation and handling. The National Physical Laboratory, one of five government laboratories under the Department of Industry, has primary responsibility for the national system of measurement. It also carries out research into novel uses of computers.

The Department of Prices and Consumer Protection is the sponsoring department of BSI. It has responsibility for weights and measures and operates the British Calibration Service which provides authenticated certification of the accuracy of measuring instruments. It also has responsibility for the Price Commission, the Monopolies and Mergers Commission and the Metrication Board. The Secretary of State for Prices and Consumer Protection appoints the Director General of Fair Trading. The Director General is concerned with both competition policy and consumer affairs. He has encouraged trade associations to publish and adopt voluntary codes of conduct.

B. Government Use of Standards:

Compared to most developed countries, the U.K. has few product regulations. Standards are not generally laid down by law. Britain relies more on voluntary compliance with British standards, codes of conduct or government recommendations. The legislation that does exist is usually permissive rather than prohibitive, leaving it to the courts to determine acceptability.⁴³

Britain is not without some health and safety legislation. Under the Road Traffic Act of 1972, for example, it is illegal to sell crash helmets for motorcyclists unless they comply with the appropriate British Standard. Cars may not be sold unless they measure up to the Motor Vehicles Regulations.

Formerly, each new regulation required a new act of Parliament. This was changed in 1961 with the passage of the Consumer Protection Act which gave the Home Secretary a general power to make regulations about any goods in order to protect the public from death, injury or disease. However, the Home Secretary has made few regulations.⁴⁴

Although BSI often favors the mandatory adoption of its health and safety standards, and while the principle of using voluntary standards as the basis for requirements is generally accepted,⁴⁵ British standards are rarely cited in regulations. The report which formed the basis of the 1974 Health and Safety at Work Act recommended that "more use should be made of voluntary codes and standards."⁴⁶ But over two years after the law was enacted Sir Frederick Warner found that little progress had been

made in this direction:

"Specific references under the Health and Safety at Work Act cover only a comparatively small proportion of relevant items, like safety guards, clothing and equipment. The emphasis has traditionally been on the common law principle that it is for the courts, not the executive, to decide whether the safety requirements of the legislation have been met by any particular item of equipment. This imposes problems of interpretation on manufacturers and users...The problem is the lack of relationship to well-defined standards."⁴⁷

As of 1976, less than 50 British standards had been referenced in central government regulation. A breakdown of references made was as follows:⁴⁸

Acts governing health and safety at work	10
Road Traffic Acts	12
Consumer Protection Act, etc.	10
Electricity Supply Acts	4
Building and construction regulations	3
Other	4

These numbers do not include the many British standards cited as "deemed to satisfy" in the Building Regulations.*

Although there are Kitemarking requirements for seat belts and motorcycle helmets, in general, government regulations rarely require independent certification. As purchasers, federal bodies, including the nationalized industries, make little use of third party certification. A notable exception is the Ministry of Defense recognition of the BS 9000 system for electronic components.⁴⁹

The degree to which federal purchasers use British standards is difficult to determine. Government departments are instructed to specify national standards wherever appropriate. A 1967

*UPDATE: According to BSI, more than 300 British Standards are currently cited in regulations. Half of these are standards deemed to satisfy the Building Regulations and the Scottish Building Regulations. (Letter from G.M. Strawbridge, BSI, to L.D. Eicher, NBS, March 23, 1979.)

White Paper stated that "Departments would continue in all suitable cases to buy types conforming to British standards."⁵⁰ But a 1969 report of the Institute of Purchasing and Supply concluded that, in practice, many government departments almost ignore British Standards.⁵¹ And the Warner Report expressed disappointment at the situation a decade after the publication of the White Paper.⁵²

Britain does have a Public Sector Standardisation Team, composed of government departments, nationalized industries and local authorities. It was set up in 1970, and is now under the auspices of the Department of Prices and Consumer Protection. When common purchasing specifications are thought desirable and either there is no British standard or the existing one is inappropriate, a Public Authority Standard is formulated after consultation with the manufacturers. However, only a score or so Public Authority Standards have been created in such fields as floor polish, detergents and office stationery.⁵³

XI. Some Concluding Observations

There has never been any systematic assessment of the extent to which British standards are adopted by industry, or the economic results of their adoption.⁵⁴ Therefore, the comments that follow are highly impressionistic.

One of Britain's industrial problems at the turn of the century was the lack of standardization. Historian David Landes sums up the situation:

"Most British firms of this period were caught in a vicious circle: output was not big or uniform enough to warrant heavy outlays for specialized precision equipment and a reorganization of plant layout; yet this was the only way to achieve the lower costs and prices that would yield increased demand and justify longer production runs...

The Americans had been the first to adopt uniform shapes and sizes, imposing them by fiat on manufacturing clients and customers from the eighties on. The Germans had followed suit....Lagging British sales, both in these countries and in other markets, and the increased concern of technicians finally led in 1901 to the creation in Britain of an Engineering Standards Committee...⁵⁵

BSI has written large numbers of excellent standards in the past 76 years. Domestically, there are few areas where foreign standards dominate; the exceptions are in such specific fields as film sizes, petroleum standards, smog standards, and standards for envelopes and pipe dimensions.⁵⁶ Internationally, many overseas nations, particularly Commonwealth countries, base their standards on the British.⁵⁷ And the U.K. is a leader in the international standards arena.

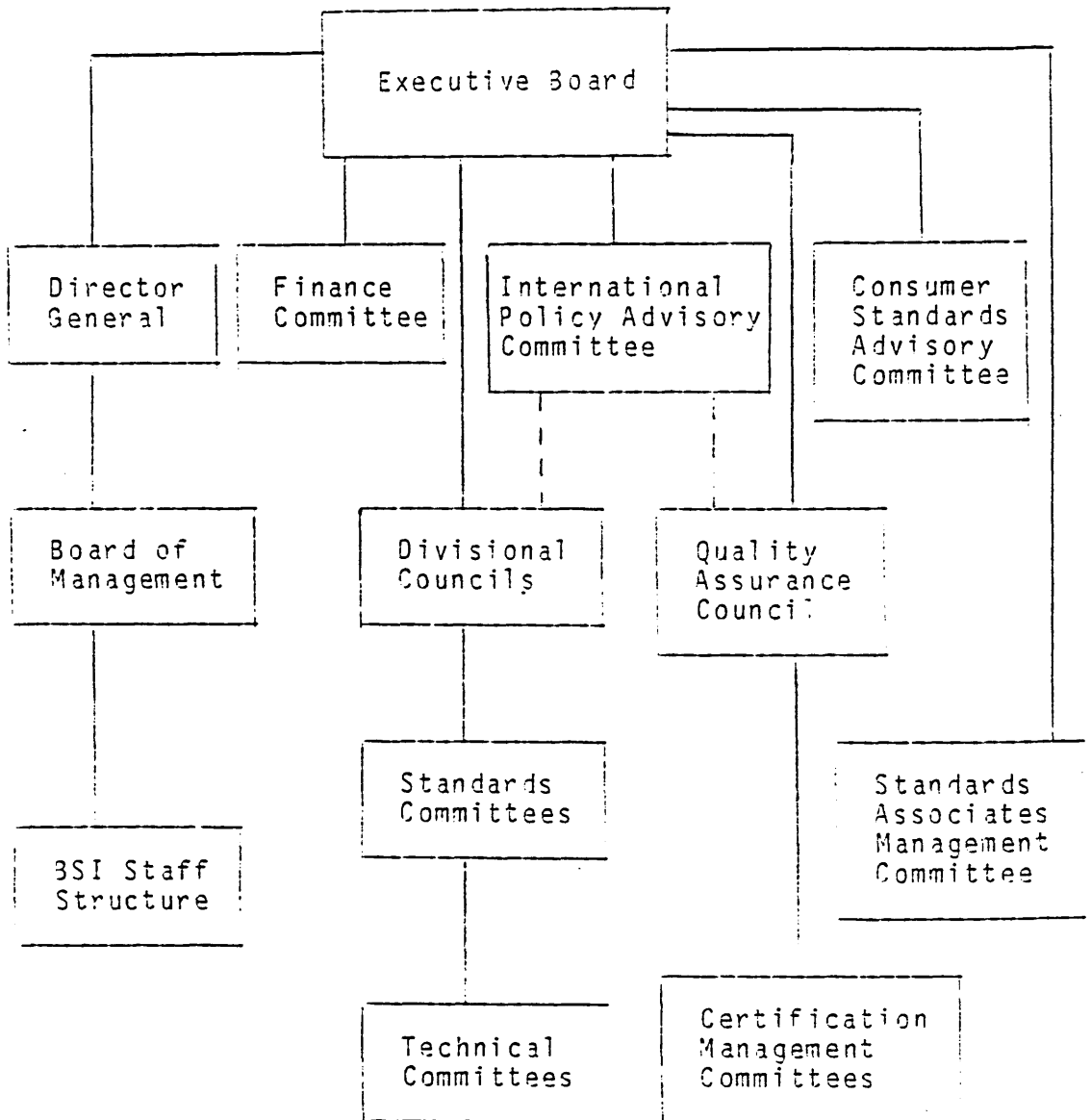
Yet, Britain is still faced with problems caused by inadequate standardization. The Warner Report concluded that:

"In the U.K., there is a tendency for a proliferation of purchasing specifications for similar engineering components, materials and products. A good deal of evidence is available from Sector Working Party reports to demonstrate this proliferation, which in some areas appears to be greater than in other comparable industrial countries."⁵⁸

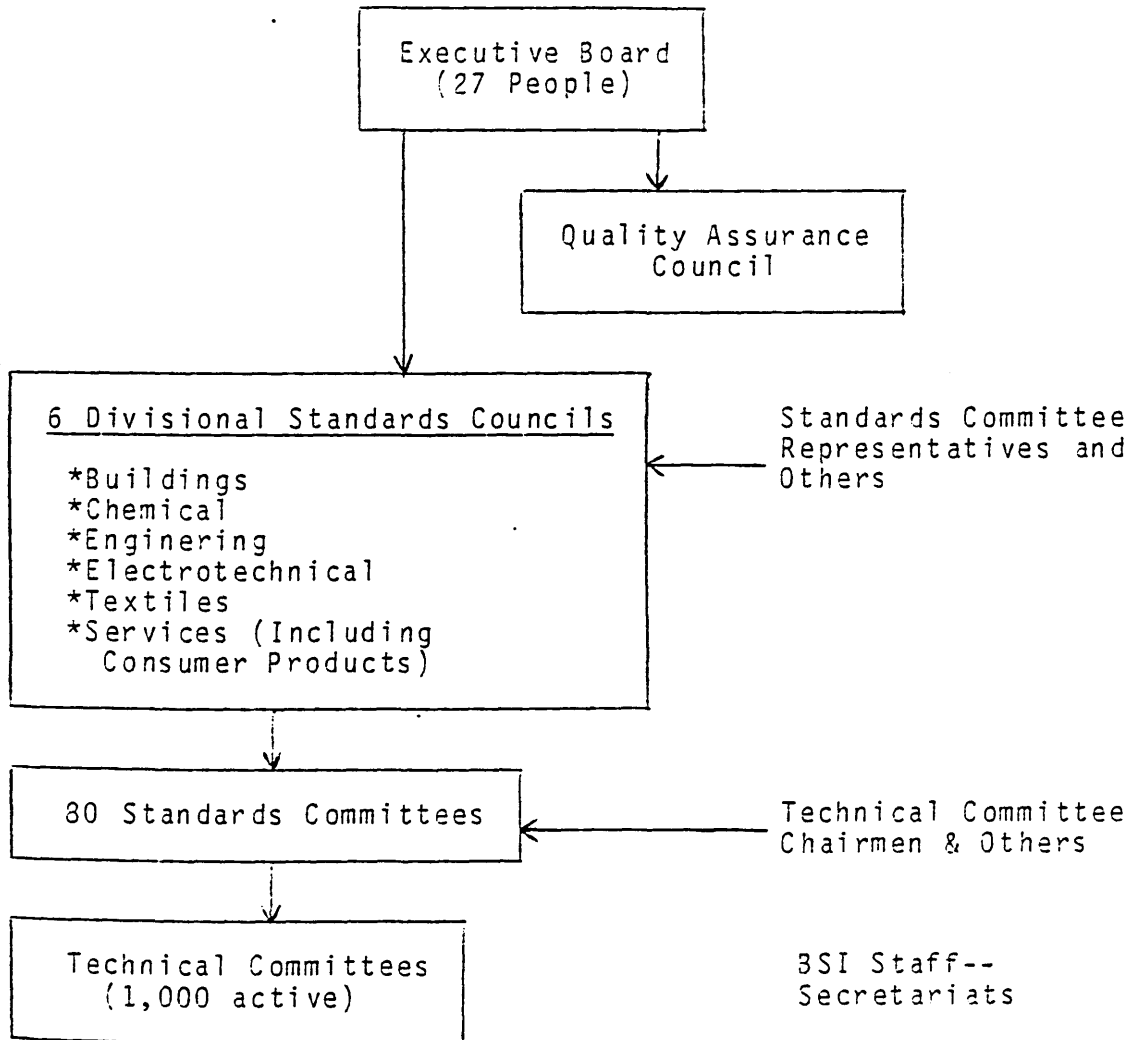
The steel industry seems to be a particular problem. "It is common for different customers making the same item each to demand their own specifications for steel."⁵⁹ Currently, for example, there are over two thousand tinplate specifications. The British Standards for steel are not always that helpful. BS 970 gives 93 different possibilities over the same range of carbon content, an "incredible state of affairs."⁶⁰ The nationalized industries, of which steel is one, also stand accused of writing purchase specifications that are often incompatible with export requirements.⁶¹

Most of the other problems of the British standards system seem chronic to all voluntary systems - e.g., the length of time it takes to write a standard,⁶² the lack of standards for many consumer products,⁶³ and the difficulties in finding adequate representation for consumer, labor and small business interests.

Structure of BSI



Structure of BSI



Footnotes

¹Linda Christmas articles in the Guardian.

"Better deal from car repairers"	Nov. 12, '75
"A fair trade wind blowing"	Dec. 31, '75
"Fair deal"	Mar. 10, '76
"Standard bearers"	July 21, '76
"Ads which infringe code"	Aug. 12, '76

²C. Douglas Woodward, BSI: The Story of Standards, London: British Standards Institution, 1972 contains an extensive and excellent history of BSI. See also "From Candlesticks to Concorde - 75 Years of British Standards," BSI News, December 1976.

³BS O: Part 3: 1974 "A standard for standards: BSI committee organization and procedures."

⁴Report of the Commission of Inquiry into Industrial and Commercial Representation. Published by the ABCC/CBI, November 1972.

⁵BS O: Part 3: 1974 "A standard for standards."

⁶J.W. Caum memo on BSI, 1971.

⁷Sir Frederick Warner, Standards and Specifications in the Engineering Industries, National Economic Development Office, February 1977, chapter 8.

⁸Woodward, BSI: The Story of Standards, p. 80.

⁹Interview with John Charter, Group Manager, Quality Assurance Department, July 1977.

¹⁰Woodward, BSI: The Story of Standards, pp. 79-81.

¹¹BSI Annual Report, 1975 to 1976, p.6.

¹²John Charter interview.

- 13 BSI "A Businessman's Guide to the Kitemark Scheme."
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John Charter interview.
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- 30 S.J. Prais, "The Electric Lamp Monopoly and the Life of Electric Lamps," Journal of Industrial Economics, V 23, #2, December 1974, 153-158.
- 31 Ibid., p. 157.
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- 35 Ibid.
- 36 Price Commission Report, p.2.
- 37 Monopolies and Mergers Commission, Contraceptive Sheaths (H.M.S.O. 1975), p.70.
- 38 Ibid., p. 13.
- 39 Ibid., p.19.
- 40 Ibid., p. 9.
- 41 Ibid., p.20.
- 42 Ibid., pp.34-38, 51, 73-76.
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- ⁵¹Dennis Dwyer "British Standard Ignored," The Guardian, April 5, 1969.
- ⁵²Warner Report, pp.28-29.
- ⁵³Ibid., p.29.
- ⁵⁴Woodward, BSI: The Story of Standards, p. 36.
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- ⁵⁷Mr. Lewis R. Goodman of Marks and Spencer, "Reflections on British Standards in the Textile and Clothing Industries," British Standards for Good Design, p. 61.
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- ⁵⁹Ibid., p. 21.
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PART THREE: THE WEST GERMAN STANDARDS SYSTEM

I. The Federal Republic of Germany

The Federal Republic of Germany (West Germany) is about the same size as the United Kingdom in both land area and population. In other words, it is not quite as large as Oregon, and has over 25 times the population. There were 61.5 million inhabitants in 1976.

Germany is a highly advanced, industrialized nation. Like the United Kingdom, nearly 30 percent of its Gross National Product is traded internationally. Given current exchange rates, this represents over twice the dollar value of British trade.

II. The German Standards Institution--Deutsches Institut für Normung (DIN):

A. History:

The Deutsches Institut für Normung (DIN) was established in 1917 by interested parties of industry and the Verein Deutscher Ingenieure (VDI--Society of German Engineers) as the Standards Committee for General Mechanical Engineering. In 1926 the committee was converted into Deutscher Normenausschuss (DNA--General Committee for Standardization) since standardization had grown beyond the narrow industrial field. The name was again changed in 1975 to comply with the well-known mark of German Standards: DIN. In 1975 a Standards Treaty was signed between the federal government and DIN. This contract will be examined later in the paper.

B. Organization and Finances:

DIN is a private, non-profit, autonomous, registered association. In 1977 there were 5,837 members, principally firms and unions. Only a small number of all German corporations belong to DIN. At the general assembly meeting the annual report and the acts of the President are approved. The assembly (mitgliederversammlung) also elects the presidium.

The presidium (Präsidium) consists of about forty representatives from all important economic interests in Germany--manufacturers, retailers, banks, public utilities, consumers, unions, state and federal government, etc. Members are elected for six-year terms, with the provision that one-third of the presidium are discharged every two years. The presidium generally meets once

a year, and members work on an honorary basis. The presidium prepares the guiding principles of DIN, and approves the budget. It elects a president and two vice presidents from among its members, and also appoints the director.

There are four principal advisory committees reporting to the President and the Presidium: an election committee (wahlausschuss), finance committee (finanzausschuss), a consumer council (verbraucherrat), and a type of standards review council (normenprüfstelle). The review council or examining office checks all standards before issue to insure that the basic rules of standardization have been followed. Its responsibilities include seeing to it that DIN standards have a uniform structure, are compatible with each other, and are clear and unambiguous. The basic rules and principles of standardization are contained in DIN 820 Parts 1-29.

The director of DIN heads the permanent staff. In 1977 staff size was 585. Another 200 work for organizations such as VDE (Association of German Electrical Engineers) that work with DIN. DIN and VDE have signed a treaty to publish DIN standards in the electrical field. They therefore founded the German Electro-technical Committee (DKE--Deutsche Elektrotechnische Kommission im DIN und VDE).

DIN revenues in 1977 were 42.5 million deutsche marks (about 21 million dollars). Close to 60% came from sale of standards and handbooks, 19% from membership fees, 13% from both state and federal government contributions, and 5% from services including certification. An income statement is given on the following page.

	1977	
Revenues	million DM	%
Sales of standards	24.9	59
Membership fees	8.2	19
Government contributions	5.4	13
Services (including certification)	2.1	5
Other	<u>1.7</u>	<u>4</u>
	42.3	100%
Expenditures		
Personnel	26.4	62%
Printing	4.8	11
Administration	11.0	26
Building	<u>.3</u>	<u>1</u>
	42.5	100%

C. Standards Development:

DIN is less centralized than the British Standards Institution. Where BSI technical committees invariably meet in London, DIN committees have headquarters throughout West Germany. The 120 technical committees of DIN have more autonomous power than do their BSI counterparts. Each committee has its own council that establishes the working program and determines the budget.

Some technical committees are sponsored by organizations outside of DIN. Most notable of these is the Deutsche Elektrotechnische Kommission sponsored by VDE. Others receive direct support from particular promoting groups, including government agencies. But all follow DIN rules, and revenues from sales of standards go to headquarters, where they are redistributed.

DIN believes its relatively decentralized structure allows for the speed and flexibility essential in standards writing. It fears the bureaucracy and red tape that can accompany overly centralized planning. It wants decisions to be made at the lowest possible level. Yet it believes, when necessary, that the central headquarters has enough power to successfully push through high priority items.

There are currently about 2,000 working bodies that do the actual drafting of DIN standards. Membership on these committees is generally limited to 20 or 25 participants. Unlike BSI which seeks trade association representatives, DIN approaches individual companies directly. The approach is similar to that in most American standards-writing organizations, where participants are expected to represent their particular firms rather than the entire industry. Formerly, Federal Government employees could act in a purely personal capacity. In the Standards Treaty it was agreed that they are now to be representatives of government and granted decision-making authority by the agencies who appoint them.

DIN does not have any explicit balance requirements. Technical committees are supposed to try to get appropriate representation of all interests. But DIN has no explicit rules describing what it considers as appropriate. It does not prohibit manufacturing interests from having majority representation or prevent producers from serving as chairman. DIN rarely subsidizes the travel or other expenses of consumer, labor or

small business interests. An actual committee membership list is given in the Appendix.

Like BSI, DIN tries to avoid formal voting. Its guide to standardization procedure states:

"The content of a standard shall be determined by a process of mutual understanding and agreement with the objective of achieving a common view--preferably with formal voting avoided."¹

An earlier version of the guide explained that

"Voting leads easily to faulty results because the number of collaborators at committee meetings can depend on many contingencies and need not be in keeping with the importance of the bodies represented by them."²

Voting is rare, meetings are not public, and minutes are generally intended only for committee members.

DIN does require that the public be notified of draft standards, and that time be made available for comment. There is now also a formal appeals procedure, established during treaty negotiations between the DIN and the federal government. The procedure has been in existence about four years, and DIN has averaged around one appeal per year.

D. Standards:

DIN is Germany's principal voluntary standards writer. There are some three hundred other organizations that produce standard-like documents such as "recommendations on bells and bell towers," "information for the use of concrete," and

"standards of the Postal Authority." But DIN is the nationally recognized standards organization, and is the only organization that creates nationally recognized voluntary standards.

DIN is one of the world's largest standards writers. There are currently over 17,000 DIN standards, plus another 3,800 draft standards. In 1977 DIN produced close to 2,000 final standards.

German engineers are said to be standards-minded, and it is claimed that DIN standards are widely used. Over 95% of the technical regulations cited in German building codes are supposedly DIN standards. And a study by the large manufacturer Siemens, a financial supporter of German, European and International Standardization, estimates that over half of their total purchases are of standard products.³

III. The Standards Treaty

Most industrialized nations have formalized the relationship between the central government and the dominant standards organization. Some have accomplished this by law (e.g. Belgium, France, Austria). Others have opted for a contractual or semi-contractual agreement (e.g. Denmark, U.K., Sweden). Germany joined this latter group in 1975 when the Federal Government and the German Standards Institution (DIN) signed the Standards Treaty.

The treaty provided official recognition of DIN "as the competent Standards Organization for the Federal Territory and Berlin (West), and also as the National Standards Body in non-governmental International Standards Organizations."⁴ This confirmed and guaranteed the centralization of standardization under DIN.

The treaty advanced the trend toward an integrated and consistent set of German standards. An important step had already been taken in this direction by the 1970 agreement between the VDE and the DVGW* Gas Division and DIN. Since 1975 further arrangements have been made to bring technical specifications within the official standards system. The 200 standards written by the Hydrochemistry group of the German

*German Association of Gas and Water Engineers

Chemists Association are now included in the body of DIN standards. Agreements have also been reached with the German Commission for breathing apparatus, the German Commission for mine rescue operations, the Nuclear Commission of the Federal Home Office, the DVGW Water Division, and the German Association of Scientific Unions. The formal recognition of DIN as the institution representing the Federal Republic of Germany was of considerable help in all these discussions.⁵

The Treaty also confirmed the principle of referring to DIN standards in legislation and administration. DIN standards were already referenced before 1975 in such areas as the Road Traffic Permit Code, the Law on Technical Equipment and the states (Länder) Building Regulations. It seems too early to tell whether the Treaty has made any significant difference in this area.⁶

The treaty has, however, increased the exchange of information between the Federal Ministries and DIN. There is more possibility for experts from the private sector to participate in government advisory committees.⁷ And governmental departments appear better represented in DIN administration. Currently two members of the DIN Executive Board are from the Federal Diet, another is a state Senator, and there are representatives from two other federal departments. "The Treaty has at least contributed to making DIN better known in Bonn ministerial offices as a partner with whom one can cooperate."⁸

The Treaty affirmed the commendable nature of DIN standards and recognized the private status of DIN. But it also imposed certain requirements on the German Standards Institution. DIN, for example, will

"...give preferential treatment to requests from the Federal Government to carry out work on standards projects which the Federal Government considers to be in the public interest."⁹

Thus far, requests from the federal government have not been overwhelming. But this requirement does decrease DIN autonomy and does presume sufficient central control within DIN to push things through.

The treaty also provided that "DIN undertake to consider the public interest in all its work in the preparation of Standards."¹⁰ Both the Arbeitsgemeinschaft der Verbraucher (Consumers' Union) and the Federal Government felt that a Consumer Council within DIN was an absolute necessity. Such a council was formed by DIN before the treaty was signed. It is composed only of consumer representatives (no manufacturers) and has a secretariat of five full-time professionals. The Council is fully funded by the government.¹¹

In addition to the Consumer Council the government funds various other special projects. But total governmental financial support of DIN remains low, about 13% of revenues in 1977. DIN would like that figure to remain under 15% in order to continue to preserve its autonomy and flexibility.¹²

IV. International Standardization

Germany, the United Kingdom and France have been the three main pillars of the International Organization for Standardization. In 1977 DIN had the ISO secretariat for 258 technical committees, subcommittees and working groups. This was 50% more than ANSI, about the same number as BSI, and one-third less than AFNOR*. DKE represents DIN and Germany in the International Electrotechnical Commission (IEC).

DIN guesses that perhaps 15%, and at most 25% of its resources are devoted to international standardization. This stands in stark contrast to British estimates that BSI spends at least 70% of its budget internationally. But DIN feels there is not such a great difference in focus between the organizations and the differential must be caused largely by dissimilar bookkeeping.

DIN strongly advises its own technical committees to implement ISO standards, particularly if Germany voted affirmatively. But the headquarters does not force adoption, and might not have or want sufficient centralized power to do so.

The working committees are responsible for ISO participation. DIN tries to get the best experts to attend international meetings, but rarely subsidizes anyone. Balanced representation on international committees is not a major concern.

*Association Francaise de Normalisation

V. Certification

DIN derives only a tiny portion of its revenues from certification. It has no testing facilities of its own and only recently became directly involved in product certification. In the past, the DIN mark (an acronym for Das ist Norm-- "that is standard") was merely a sign of company self-certification, a claim by the manufacturer that its products met German standards. Reliance was placed principally on competitive surveillance. Rival producers could complain to the authorities if certification claims were untrue.

Self-certification is no longer considered sufficient in the health and safety area. In this field, certification to German standards now uses a special mark and requires DIN registration, which involves licensing. About one-quarter of the 800,000 items that are DIN-marked are currently licensed by DIN.

VI. Legal Aspects

Like BSI, DIN enjoys a specific antitrust exemption. The government has decided that DIN standards serve the market. The occasional problems they might cause are far outweighed by the great benefits they provide. Thus DIN standards are not required to be registered at the federal cartel office (Bundeskartellamt). Standards of other organizations are not necessarily granted this exemption.

The Bundeskartellamt (BKT) recently set forth certain guidelines for standards committees. One emphasized the necessity of making draft standards available for public comment. Thus even though DIN need not officially register any standards with the cartel office, all drafts are readily available for inspection by the BKT. Another BKT requirement is that standards should contain only technical requirements and no behavior rules for buyers or sellers.

DIN has never been sued by public officials, but it has been the defendant in a few private cases. One involved a mistake in a standard for roofing shingles. More recently, a suit was settled out of court when DIN agreed to withdraw a proposed standard which chalk brick manufacturers felt would hurt their industry.

VII. Social Science Research

A group of social scientists at the independent Wissenschaftszentrum: International Institute for Management and Administration, Griegstrasse 5-7, 1000 Berlin 33, has just begun a study of the effects of standards on innovation. Two members of the group are Pierre Guillet de Monthoux and Gerhard Mensch.

Footnotes

- ¹DIN 820 Part 4, 6 Standardization Procedure: Working Procedure, February 1974.
- ²DIN 820, Part 1, 5.2.1, Standardization Procedure: Fundamental Concepts, June 1960.
- ³Peter von Siemens, "Standardization as a Factor in Technical and Scientific Development" DIN Assembly, November 9, 1977.
- ⁴Contract between the Federal Republic of Germany and DIN (Standards Treaty), 1975, Article 1(1).
- ⁵H. Reihlen, "The Effects of the Standards Treaty on DIN," IFAN International Conference Normenpraxis, Berlin, May 1977, pp.2.2-2.3.
- ⁶Ibid., p.2.1.
- ⁷F. Pokorny, "The Effects of the Standards Treaty between the Federal Republic of Germany and the German Institute for Standardisation (DIN) on the German economy." IFAN International Conference Normenpraxis, May 1977, pp.1.5-1.6.
- ⁸Reihlen, "Effects of the Standards Treaty", p.2.2.
- ⁹Standards Treaty Article 4(1).
- ¹⁰Ibid., Article 1(2)
- ¹¹Reihlen, "Effects of the Standards Treaty," pp.2.3-2.4.
- ¹²Interview with Curt Mohr, DIN, April 1978.

AppendixDIN Standards Committee: Transportation Chain
Technical Committee on TerminologyChairman

G. Herrmann

1.	F. Beisteiner	Inst. f. Fördertechnik Univ. Stuttgart	University
2.	P. Funck	Henkel & Cie GmbH Ingenieur-Verwaltung	chemical firm
3.	G. Herrmann	Neubauabt. der Bundesbahndirektion	federal railroad
4.	A. Heydler	Siemens AG, Zentr. Abt. f. Bauten. u Anlagen	Siemens
5.	P. Jakoby	Langnese-Iglo GmbH Distributionsdirektion	Soft Ice Firm
6.	I. Junker	NA Eisen-, Blech- und Metallwaren im DIN	industrial hardware
7.	A. Köhler	Dt. Rettungsflugwacht e.V.	Coast Guard
8.	Kuhn	Lehrstuhl f. Förder-u. Lagerwesen Univ. Dortmund	university
9.	H. Kuhne	DB, ZTL, AA 5201	federal railroad
10.	Längle	Dornier GmbH	aircraft firm
11.	J. Meyer	TUV Rheinland, Stabsstelle Forschungs-u. Projektbegleitung	test house
12.	L. Petzoldt	NA Kraftfahrzeuge	Standard com- mittee for motor vehicles
13.	Purtauf	DB, BZA München, Dez. 48	federal railroad

14.	L. Raumer	Kaufhof AG Organisation u. Logistik	retailer
15.		MBB, Unternehmensbereich Verkehr, Abt. VT 21	aircraft industry
16.	L. Smiatek	DB, BZA Minden, AA 4911	federal railroad
17.	Scoppe	DB, BZA Minden, DEZ. 44	federal railroad
18.	G. Tegen	BWB, LG I 3/	Department of Defense
19.	K. Thielen	Zentrale Informations- stelle fürVerkehr (ZIV)	Federal Minist Transportation
20.	H.F. Wagner	AEG-Telefunken Z 5123	General Electr Company
21.	Walter	Bundesvbd. des Dt. Güterfernverkehrs (BDF) e.V.	"Sea Land" type firm
22.	Weiss	Hamburg-Consult Ges. f. Verkehrsberatung u. Verfahrenstechniken mbH	consultant
23.	N. Kloidt	DB, ZTL, Dez. 520	federal railroad
24.	Schneider	Bundesverband Material- wirtschaft und Einkauf e.V.	purchasing association
25.	F. von Stackelberg	Inst. f. Verkehrswissenschaft an der Univ. Münster	university
26.	J. Rietz	GASAG, Abt. Materialwirt- schaft, Bereichsleiter Einkauf	public utility

PART FOUR: THE DANISH STANDARDS SYSTEM

I. Denmark .

Denmark is a small country. Its five million inhabitants live on 17,000 square miles of land. Denmark is about half the geographic size of Ohio, with less than half the population.

Denmark lives through trade. Over one-third of its gross national product is exported. Before World War II, Denmark was a decidedly agricultural nation. Today, the export of industrial goods--machinery, chemicals, ships, etc.--constitutes the chief source of its national income.

Denmark is an advanced, industrialized nation, but it is small. In 1975, it had only 6,700 industrial firms. Only 837 employed more than 100 workers. The number of persons employed in industry totalled less than 410,000. The value of industrial production was about 90 billion kroner, or on the order of \$15 billion. The entire Danish industry is about the size of a single, large multinational firm.¹

II. The Danish Standards Association (Dansk Standardiseringsråd)

A. History:

The need for standard specifications was first felt in the Danish machine industry. An independent committee, created by a private firm tried to establish certain specifications for bolts, nuts and accessories. This committee was later transferred to the Danish Society of Chemical, Civil, Electrical and Mechanical Engineers (Dansk Ingeniørforening). Lacking official recognition, the committee, together with the Federation of Danish Industries (Industrirådet) asked the Ministry of Commerce to establish a national organization for standardization in Denmark. In January, 1926 the Dansk Standardiseringsråd (DS) was created as an independent, non-governmental organization.

Due to Denmark's small size, limited resources and dependence on trade, DS in 1971 decided to put the major part of its efforts into international rather than national standardization. This decision received wide backing from Danish industry.

B. Management:

Dansk Standardiseringsråd is an independent, non-profit organization managed by a Board of Representatives, a President, an Executive Committee and a Director.

The Board of Representatives is composed of about 50 members appointed by Denmark's principal economic interests, -- trade, industry, banking, unions, consumers, government agencies, etc. The Board generally meets twice a year to consider the accounts

and accomplishments from the previous year, the budget and plans for the coming year. The Board selects a President, Vice President, and the Executive Committee.

The Executive Committee is composed of at least eight members, a minimum of three of whom are common members of the Board. There are also the President and Vice President, and at least three chairmen of the technical divisions (who may also be board members). The Executive Committee meets about six times a year, and ensures the smooth running of the administrative work of DS. It forms technical committees and approves standards. It is the final forum for appeal within the organization.

The Board of Representatives and the Executive Committee are assisted by a secretariat. This staff is headed by a director. The DS staff is small. There are currently, besides the director, 15 engineers and one architect. Total staff numbers 50.

The technical activities of DS have been grouped into various categories. Currently there are 13 Technical Divisions in the following areas:

- .Basic concepts and verification
- .Basic processing standards and mechanical basic elements
- .Metallic materials (including welding and protection against corrosion)
- .Chemical products and related industries
- .Mechanical finished products
- .Consumer areas (including the textile industry)
- .Transportation, distribution and packaging
- .Administration and information processing
- .Building construction
- .Hospitals and health
- .Gas and oil products
- .Safety and environment

The chairmen (as well as the members) of these Technical Divisions are elected in their personal capacity, and their

decisions are advisory. The thirteen chairmen elect from among themselves, the allotted three members of the Executive Committee.

C. Finances:

DS is heavily subsidized by government. Of its 1978 budget of 10.6 million kroner (about \$2 million), over half is expected to come from government coffers. A break-down of revenues sources for the most recent year is as follows:

Government grant	56%
Subscriptions	11%
Sale of publications	22%
Certification, testing and inspection	10%
Other	1%

Part of the government grant goes for administration. ISO membership fees are fully funded. In the standards development area, the 13 Technical Divisions are provided with support that varies inversely with the specialization of the field. Staff requirements for the consumer area, for example, are fully funded, the metallic materials field is half supported, and mechanical finished products about one-third. In effect, the government funding provides technical staff man-hours. Although the agency that is responsible for the principal governmental support of DS is not represented on the board or on any other of the committees, the extent of government funding makes it easy for government to influence the choice of priorities among the various standards activities.

D. Standards Development:

DS is not the only standards organization in Denmark. The Danish Electrotechnical Committee holds the Danish membership to the IEC, and the Danish Engineering Association produces codes

of practice within the building field. However both organizations follow the same rules as DS, and both present their standards to DS for approval as Danish standards.

The actual standards writing within DS is done in 300 technical committees and subcommittees. Development rules are broadly similar to those of other countries. Like the British Standards Institution, DS tries to get association rather than company or individual representation. The membership list of a randomly chosen committee is given below:

S12 Standardiseringsudvalget for tekstilvarer til sygehusbrug
(Committee on Hospital Textiles)

- | | |
|---|--|
| 1. Direktør, civilingeniør
Erling Franck | Dansk Textil Institut
(an independent institute
with government support) |
| 2. Oldfrue
Ulla Nielson | Oldfrueforeningen
(Matron's Association:
administration of practical needs) |
| 3. Overlaege, dr. med. (M.D.)
Poul Franch | Foreningen of Suggehusoverlaeager
i provinsen
(Society of the Chiefs of
Medicine of the Hospitals in
the Province) |
| 4. Inspektør (non-medical
administrator)
P. Frederiksen | Rigshospitalet
(Main Government Hospital) |
| 5. Konsulent
O. Klaschka | Vaskerikonsultationen
c/o Teknologisk Institut
(laundry specialist from an
independent institute) |
| 6. Vaskerichef (Head of Hospital
Laundry)
Anders Kristensen | Amtsrådsforeningen i Danmark
(Association of Counties --
hospitals under county
jurisdiction) |
| 7. Direktør
Poul Larsen | Erhvervsvaskeriernes
Brancheforening
(Private Association of
Laundries) |

- | | | |
|-----|---|---|
| 8. | Inspektør
Vagn Nielsen Lund | Foreningen of Sygehus--
administratorer i Danmark
(Association of Inspectors) |
| 9. | Direktør
Poul Petersen | Textilfabrikantforeningen
(Association of Textile
Manufacturers) |
| 10. | Cand. merc. (economist)
Sune Vinderslev Petersen | Dansk Sygehus Institut
(Institute dealing with the
rationalization of Hospital
Administration) |
| 11. | Sygeplejerske (Nurse)
Hanne-Mette Sørensen | Dansk Sygeplejeråd
(Association of Nurses) |
| 12. | Civilingeniør, fr.
Merete Wichfeld | Dansk Textil Institut |

E. Standards:

As a small country, Denmark makes frequent use of other countries' standards. German standards are most often cited, followed by Swedish and English. With the English there are sometimes metric problems. The use of foreign standards seems not to pose severe problems. Denmark has close technical ties with Germany, and most Danes are multi-lingual. With French standards, however, there appears something of a language barrier.

There are currently some 1,400 Danish standards. A lot of these are directly approved ISO standards or translations of ISO standards, and the percentage is growing. Of course, like all standards, ISO's are discussed in domestic committees and published for comments before acceptance.

In 1976-77, Denmark produced 142 new standards. The origin of these standards is given on the following page. As can be seen, while Denmark emphasizes international work, the shift to it

has not been complete.

'76-'77 Standards

National	24
Nordic	17
European	6
ISO	60
IEC	18
Other	17
translations	<u>142</u>

There seems less interest in standardization in Denmark than in either Germany or Britain. This is probably due to Denmark's late industrialization and its small size. There are few big plants in Denmark to push for standards; those that might provide the impetus are accustomed to using German standards. Danish exporters tend to be small, and thus aim at market niches, focusing on the non-standard aspects of the field.

For some time DS has offered an interesting service to Danish industry. It will provide a consultant to help small companies set up their own standards systems. Only about thirty firms have taken advantage of this opportunity. Of course there are only about 800 firms in Denmark that even have a technical staff. (In addition, before the start of the consultive service the local Standards Engineering Society already had about 50 members, and some 150 engineers had been trained at three-day seminars.)

III. International Standards

DS puts most of its small resources into international standardization. In 1977 it held the secretariat for three ISO technical committees, four subcommittees, and eight working groups. These fifteen secretariats are slightly more than provided by Finland or Norway, and 20% of Sweden's total. The four Scandinavian countries collaborate to insure adequate Scandinavian representation in the administrative groups of ISO and CEN

In 1977 DS had participating memberships on 49 of the 167 ISO Technical Committees. Denmark only asks for active membership on a Technical Committee or Subcommittee when a national Danish committee on the subject already exists. Membership in an ISO working group is personal.

DS has a travel fund, but it is quite limited. In 1977 there were 400,000 Danish crowns available for staff travel, only 80,000 for the travel expenses of other representatives. When asked how DS might use additional funds if these were available, DS director Leif Norgård replied that they would probably try to increase Danish representation in ISO (for example, Denmark is not currently a member of the ISO plastics committee). In general, Mr. Norgård felt that Danish industrial buyers were not sufficiently represented in standard setting, and he would like to see their influence increased.²

IV. Certification

DS runs a small certification system, organized along the lines of the ISO/IEC code. DS does no testing itself, but generally chooses test houses that have been accredited under the new government program.

DS certification has been growing rapidly. In 1971, DS's own income from certification was only 15,000 Danish crowns. In the forecast for 1979 this had risen to 500,000 (or about \$90,000). DS certifies about three hundred companies in the following areas:

- Beer bottles
- Cotton cloth
- Rubber rings for sewerage pipes
- Plastic tubes for gas and water (an international standard)
- Safety belts for cars
- Surgical sewing
- Protection helmets for highway and industry
- Fish boxes (for fish export)
- Bottles for poison
- Dimensions for doors (modular coordination)
- Fire requirements for doors and building components
- Sound reducing doors
- Ink for archival purposes
- Ladders (safety)
- Fire extinguishers
- Steel for reinforcement of concrete
- Safes

Although a Scandinavian system is in existence, certification is still principally used for domestic purposes. The push for certification usually comes from government or other big buyers (e.g., safes, surgical thread, plastic tubes). DS will only certify to standards. It hopes eventually that there will be complete international product standards to certify against.

V. Miscellaneous

.There is a single building code in Denmark, which references standards (even English language standards).

.While the principle of reference to standards is generally accepted, referencing does not always occur in practice, especially if government agencies have their own technical staffs. There seem to be particular problems in the labor area where authorities tend not to get involved in the voluntary standards-writing process. They discuss the standard only after consensus has been reached.

.Consumers in Denmark are somewhat organized, but are not as strong as in Sweden. There is no national governmental consumer agency, though there is an ombudsman. There is also a large government laboratory which tests consumer products. The head of that organization sits on the DS executive committee. The DS technical division for consumer goods has no members that are manufacturers.

.DS has never been sued. However it does carry liability insurance.

Footnotes

1. H. Bøcher, "The Kind of International Standards Needed--
The Problem of Their National Implementation: Danish
comments." IFAN International Conference Normenpraxis,
Berlin, 1977.
2. Interview with Leif Nørgård, April 28, 1978.

PART FIVE: SUGGESTED FURTHER RESEARCH

There are many topics in the standards area where social science research would be rewarding. Ten topics are listed below. Most would require some additional investigation of the U.S. situation, but studies of other nations could be particularly illuminating.

(1) Certification, Testing and Accreditation

The Canadian report discusses a number of crucial economic issues concerning certification that require further exploration-- the integration of standards writing and certification; the optimal number of certifiers; and the pricing and testing policies of certifiers. The question of accreditation is especially important in this industry. DoC*, ANSI, SCC (Canada) and NATA (Australia) are, or are going to begin, accrediting certification and/or testing institutions. BSI is also starting to approve test houses. No one seems to have studied the economic consequences of accreditation. Is the DoC scheme in the public interest? Should it be expanded?

This is an important topic with clear public policy implications. It is one where a cross national approach should be quite helpful. At minimum, it would be useful to examine the established Australian system, and talk to the Canadians who for some years have been discussing the creation of an accreditation scheme for both certifiers and test houses. An economist is invaluable for this research.

*Department of Commerce

(2) Case Studies

There is a great need for case studies of standards. Many of the current examples are merely potential horror stories from various governmental hearings. They deal in charges and rebuttals concerning standards procedures, but do not delve into the real economic effects of the standards.

After reading the draft of the "British Standards System," economist S.J. Prais made this comment:

"If you had time, it would be very useful if you could make more detailed international comparisons. For example, taking the three case studies (in your chapter 9), could you compare in some detail the nature of the standards that apply in the U.S. and the U.K? Could you then venture some general comparisons over broad industrial sectors of the number of standards issued in the two countries, and the fraction of output covered by standards? I appreciate the difficulties; if you don't want to do this, perhaps it is worth saying explicitly that you do not propose to answer these questions at this stage, but that it would be useful for someone to attempt to do so at a later stage."

Careful case studies will not only provide a great deal of information about particular standards, but will also increase our general knowledge about the economic causes and consequences of standards. The studies' investigations should initially be of products with a few important standards (e.g. light bulbs or intruder alarms) rather than products having many standards (e.g. steel) or of broad industrial areas (e.g. building standards). Cross national studies of such standards could focus on the effects of antitrust laws, market structural characteristics, or committee composition and procedures upon the resulting standards. Economists must do these studies, or be integral members of the study teams.

(3) Surveys of Additional Standards Systems

A continuation of the kind of work done in this contract would be worthwhile. Clear descriptions of additional foreign standards systems should be written and made widely available. Increased knowledge of other systems would be especially useful for determining whether and where cross national comparisons should be undertaken. There is much to learn from the experiences of Sweden (how they handle consumer concerns), Australia (accreditation of test houses), Japan (their export inspection law), etc.

The project continuation, like the initial contract, would not be very expensive.* It should be undertaken by an independent expert familiar with standards, someone without strong vested interests. The investigator might spend two to three weeks in each country, interviewing not only standards writers but also regulators, consumer organizations, unions, social scientists, test houses, etc. to determine how well the system is working. It might be helpful for the investigator to be an economist, but it is not crucial.

(4) Government Personnel on Standards Committees

Before 1975, federal government employees in Germany could act in a purely personal capacity on DIN technical committees. In the 1975 DIN-central government Standards Treaty it was agreed that federal government personnel would henceforth be representatives of government, and granted decision-making authority by the agencies who appoint them. How has this policy been implemented? What effect has it had?

*The contract price for this report was \$25,000. Most of this was spent on the Canadian, British, and German studies, including two weeks in Canada, two weeks in the UK, and one week in West Germany and Denmark.

(What has been the effect of the 1972 NBS declaration that its employees should promote the public or general interest in standards committees?) Research in this area would probably not require an economist.

(5) A National Standards Policy

In 1929 the British Standards Institution was given a Royal Charter; in 1942 it was officially recognized as the sole organization for issuing standards having a national application. In 1970 the Standards Council was created by the Canadian government. In 1975 DIN signed the Standards Treaty with the German government. Most countries now have a clearly articulated national standards policy. The United States does not. Do we need one? If so, what should it be? We need an unbiased, careful analysis. And we need to examine the experience of other nations. This report is a beginning step.

(6) Helping Exporters

In 1966 BSI established Technical Help to Exporters (THE) to identify overseas technical requirements and provide assistance to exporters in meeting them. Would U.S. exporters benefit from similar assistance? Should NBS consider creating a THE equivalent? A study in this area would require some economic expertise.

(7) International Representation

Is U.S. representation in the IEC and ISO adequate? Do all important interests have sufficient input? It seems that Britain, Germany and France may be better represented than we

are. Is this true? Does it matter? Should the U.S. government provide financial support or in other ways try to improve U.S. participation in international standards writing?

(8) Metric Conversion

Britain and Canada are both ahead of us in metrication. When we seriously decide to "go metric" their experience should help us determine what approaches to follow, and the pitfalls to avoid.

(9) Staff Involvement

At BSI, staff members serve as secretaries to every technical committee. Is this kind of staff involvement helpful? Is it too expensive? Should staff help prepare the initial draft of standards?

(10) Voluntary Standards and Government Regulation

Canadian regulations often cite undated standards. BSI standards are rarely referenced in British legislation, but Kitemark certification is sometimes officially accepted for administrative purposes as evidence of compliance with the law. What are the advantages and problems of various approaches to using standards in legislation and regulation? A cross national approach in this area could nicely complement the recent study by Philip Harter on regulatory use of voluntary standards.

(Regulatory Use of Voluntary Standards: Implications for Standards Writers, report to NBS/OSIAD, forthcoming.)

List of Acronyms

Association française de normalisation

American Gas Association

American National Standards Institute

American Society for Testing and Materials

American Society of Mechanical Engineers

Bundeskartellamt (Federal Cartel Office - Germany)

Bureau de normalisation du Quebec

British Standards Institution

Consumers Association (UK)

Comité européen de normalisation (European Committee for Standardisation)

Comité européen de normalisation électrotechnique (European Committee for Electrotechnical Standardisation)

Canadian Gas Association

Canadian Government Specifications Board

Canadian Mobile Home Association

Canadian National Committees

Canadian Standards Association

Consumer Standards Advisory Committee (UK)

Deutsches Institut für Normung (German Standards Institution)

Deutsche Elektrotechnische Kommission (German Electrotechnical Committee)

Deutscher Normenausschuss (General Committee for Standardization)

Department of Commerce (U.S.)

Dansk Standardiseringsraad (Danish Standards Association)

Deutscher Verein Gas und Wasserfaches (German Association of Gas and Water Engineers)

EEC European Economic Community
 GOST Gosudarstvennyj Komitet Standartov (USSR)
 IBN Institut belge de normalisation
 IEC International Electrotechnical Commission
 IGAC Interprovincial Gas Advisory Council (Canada)
 ISI Indian Standards Institution
 ISO International Organization for Standardization
 JIS Japanese Industrial Standards
 JISC Japanese Industrial Standards Committee
 NATA National Association of Testing Authorities (Australia)
 NBS/OSIAD National Bureau of Standards/Office of Standards Information Analysis and Development (U.S.)
 NFCG National Federation of Consumer Groups (UK)
 NNI Nederlands Normalisatie - Instituut (Netherlands)
 NRC National Research Council (Canada)
 NSCIA National Supervisory Council for Intruder Alarms (UK)
 ON Österreichisches Normungsinstitut (Austria)
 SAC Standards Advisory Committee (Canada)
 SCC Standards Council of Canada
 SFS Suomen Standardisoimisliitto r.y. (Finland)
 SI Systems International d'Unites (metric)
 SIS Swedish Standards Institution (Sveriges Standardiseringskommission)
 SNV Association suisse de normalisation
 SWO Standards Writing Organization
 THE Technical Help to Exporters (UK)
 TUC Trades Union Congress (UK)
 ULC Underwriters' Laboratories of Canada
 ULI Underwriters' Laboratories, Inc. (U.S.)

UNI Ente Nazionale Italiano di Unificazione

VDE Verband Deutscher Elektrotechniker (Association of German
Electrical Engineers)

VDI Verein Deutscher Ingenieure (Society of German Engineers)

EEC European Economic Community
 GOST Gosudarstvennyj Komitet Standartov (USSR)
 IBN Institut belge de normalisation
 IEC International Electrotechnical Commission
 IGAC Interprovincial Gas Advisory Council (Canada)
 ISI Indian Standards Institution
 ISO International Organization for Standardization
 JIS Japanese Industrial Standards
 JISC Japanese Industrial Standards Committee
 NATA National Association of Testing Authorities (Australia)
 NBS/OSIAD National Bureau of Standards/Office of Standards Information Analysis and Development (U.S.)
 NFCG National Federation of Consumer Groups (UK)
 NNI Nederlands Normalisatie - Instituut (Netherlands)
 NRC National Research Council (Canada)
 NSCIA National Supervisory Council for Intruder Alarms (UK)
 ON Österreichisches Normungsinstitut (Austria)
 SAC Standards Advisory Committee (Canada)
 SCC Standards Council of Canada
 SFS Suomen Standardisoimisliitto r.y. (Finland)
 SI Systems International d'Unites (metric)
 SIS Swedish Standards Institution (Sveriges Standardiseringskommission)
 SNV Association suisse de normalisation
 SWO Standards Writing Organization
 THE Technical Help to Exporters (UK)
 TUC Trades Union Congress (UK)
 ULC Underwriters' Laboratories of Canada
 ULI Underwriters' Laboratories, Inc. (U.S.)

UNI Ente Nazionale Italiano di Unificazione

VDE Verband Deutscher Elektrotechniker (Association of German
Electrical Engineers)

VDI Verein Deutscher Ingenieure (Society of German Engineers)

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APPENDIX:

SCC, BSI, DIN AND DS COMMENTS ON THIS REPORT



Standards Council
of Canada

350 Sparks Street
Ottawa, Ontario
K1R 7S8

(613) 238-3222
Telex 053-4403
Cable Stancan

1979-03-20

SCC 604-80

Dr. L.D. Eicher, Chief
Office of Standards Information
Analysis and Development
United States Department of Commerce
National Bureau of Standards
Washington, D.C. 20234
U.S.A.

Dear Dr. Eicher:

Thank you very much for affording us an opportunity to comment on Dr. David Hemenway's report Standards Systems in Canada, the UK, West Germany, and Denmark: An Overview. Our remarks are necessarily limited to Part One: The Canadian Standards System. We understand that each of the Canadian standards-writing organizations described in the study have had an opportunity to review and comment on their own right.

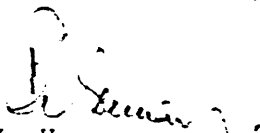
In general, we find Dr. Hemenway's treatment of the Standards Council of Canada and the National Standards System both perceptive and objective. He has identified problem areas where they existed at the time of his research, and you have judiciously cautioned the reader "that changes may have occurred since the information was originally collected". Indeed, Dr. Hemenway has made an effort to update his text wherever possible.

It is perhaps important to emphasize that Canada's National Standards System, while under the general co-ordination of the Standards Council, has been created by and continues to evolve through the "consultative" process. That is, the accredited organizations have direct involvement and input at every step and in every decision affecting the origin and development of the System - this includes the establishment of criteria and the accreditation processes for standards preparation, certification and testing. The "harmonization" of national and international standardization work to which Dr. Hemenway refers on Page 43 is another practical illustration of this principle.

.../

The Standards Council of Canada is barely ten years old - a relatively short period of time when compared to the British, West German and Danish national standards institutions. It was conceived by Parliament as a non-governmental agency to work with and through those organizations concerned with voluntary standardization in Canada and internationally. The National Standards System has therefore been fashioned as a response to Canadian needs and, as Dr. Hemenway points out, it faces a number of challenges which will undoubtedly affect its evolution over the coming years. For these reasons, perhaps the experiences of the Standards Council and the National Standards System provide an ideal "laboratory" situation for those engaged in comparative studies of national standards systems. We hope that these experiences make a positive contribution.

Yours most sincerely,



R.L. Hennessy
Executive Director



Incorporated by Royal Charter

2 Park Street
LONDON W1A 2BS

Telephone: 01-629 9000

Telex: 266933 (BSILON G) Head Office
23215 (STANLN G) Sales & Accounts

Mr L D Eicher
National Bureau of Standards
United States Department of
Commerce
Washington DC 20234
USA

Your ref

Our tel ext/ref U4/1

Date 23 March 1979

Dear Mr Eicher

Following Miss Wilkes' letter to you of 6 March, I attach comments on the final draft of Dr Hemenway's report. Thank you for giving us this further opportunity to review his findings. As you see, there were a few minor errors which we had failed to pick up earlier, and I have tried to clarify various statements which might otherwise mislead the uninformed reader. In addition, I have indicated where the report has been overtaken by developments which have taken place in the two years since it was compiled. I hope that you will find my notes helpful. You may wish to incorporate some of them into the report, if you are indeed planning to publish it.

You may on the other hand have second thoughts about the value of promoting in mid 1979, a selective report of the standards scene based on a study undertaken two years ago. Dr Hemenway's comparisons will have been helpful and enlightening, but this kind of survey ages very quickly in its coverage of topical issues. It would in our view be inappropriate for your staff and others to use the chapter on the United Kingdom as their basic reference on the current activities and organization of BSI. Here the right document to start with is PD 4845, 'BSI - its activities and organization'. Just in case you are unfamiliar with this, I am sending you a copy under separate cover, together with the statement of principles on British Standards and the law which we now sent to our committee chairmen, and our latest Annual Report.

We were interested in the topics Dr Hemenway suggested as possibilities for further research, particularly the idea of an international study of the advantages and problems of various approaches to using standards in legislation and regulation. You may not be aware that detailed research is already being carried out in this field by Mr E H Hitchcock, formerly Chief Technical Adviser with the Standards Association of New Zealand, at the University of Auckland. Mr Hitchcock is now

approaching the end of his project and hoping to put it to good use.

If you would like to contact him, his address is :

Mr E H Hitchcock
c/o School of Engineering
University of Auckland
Private Bag
Auckland
New Zealand

Yours sincerely

G M STRAWBRIDGE
Senior Administrative Officer
GMS/OM

DIN Deutsches Institut für Normung e.V. Postfach 1107 D-1000 Berlin 30

United States Department
of Commerce
National Bureau of Standards
Att. Mr. Lawrence D. Eicher
Chief Office of Standards
Information, Analysis and
Development
Washington, D. C. 20234
USA

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Ihre Zeichen, Ihre Nachricht vom

Dear Mr. Eicher,

I confirm the receipt of your letter dated February 21, 1979 with the draft-report on Standards Systems in Canada, the U.K., West Germany and Denmark.

I should like to congratulate Dr. Hemenway on an excellent job. I have carefully read the part concerned with DIN and I am happy to say that it is a full and competent description of our status.

There is one addition I want to make. Whereas the process of standards writing and its legal and economic context is explained in detail, one aspect of our work has not been mentioned - probably because it was out of the scope of the study. DIN places great emphasis on the implementation of its standards in the economy. For that purpose we operate various institutions

- Training courses

Training courses in three levels are held several times in the year in different parts of our country. They are attended by engineers working in the standards departments both of industry and public administration

- Standards Engineers

DIN operates a unit called Standards Engineers (Ausschuß Normenpraxis) which meets every month in 15 major cities of the country. Every second year there is a major conference. Standards Engineers involves about 1500 engineers. They exchange experience on the implementation of DIN-standards and submit critical comments to the standards committees that are responsible for possible mistakes or they propose improvements for the next review of the standard.

- 2 -

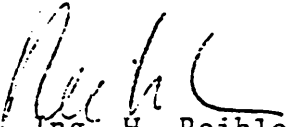
- Standards scrutiny board (Normenprüfstelle)

This board which is equipped with about 15 engineers from major companies and from government checks on the compatibility of the new standards on their formal presentation etc.

These institutions secure that DIN-standards are readily accepted by the economy and that DIN-activities follow the elementary needs of the economy.

Very truly

Yours



Dr. Ing. H. Reihlen

C: D. Peyton
C.Mohr
K.G. Krieg

Lawrence D. Eicher, Chief
Office of Standards information,
Analysis, and Development
Washington D.C. 20234
U.S.A.

Deres/Your ref.

Vor/Our ref.

Dato/Date

LN/EH

1979-04-09

Dear Mr. Eicher,

Thank you for your letter of Feb. 21st and the enclosed draft report.

I have with interest studied the section dealing with standardization in Denmark, and I may express my admiration for the preciseness with which the information we have given Dr. Hemenway are reflected and the editorial form they have got.

If the other sections are of the same quality my future study of this report will be a very giving exercise.

Concerning the content of the report I do not find much to add.

If I was asked today, one year later, I would perhaps have offered more attendance to the lucky development of the collaboration with the consumers as a contrast to problems we seem to face in our relations to the trade unions in the field of workers' protection and environmental improvements.

Today I would certainly also have mentioned the expectations and hopes we - with a stain of doubt - have to the new canvass method originally suggested by ANSI, as it fits so well into the Danish system.

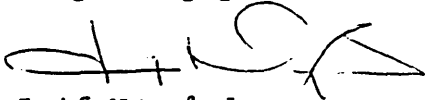
Since the visit of Mr. Hemenway our Minister of Commerce have instructed all ministries and governmental agencies to use the method of reference to standard as far as possible. I could also have mentioned that our consultant service is under development especially in offering its service for establishing systems of retrieval and elaboration of administrative standards in small firms.

But as mentioned at the beginning I find the report excellent and I think this compilation of different systems is a source of

inspiration which is most useful at a time when the international integration of our technology becomes more and more evident, and when our trade pattern seems to have a possibility of reaching an optimalization through the signing of the new GATT-agreements.

I hope these remarks cover what you ask for in your letter.

Very truly yours,

A handwritten signature in black ink, appearing to be 'L. Nørgård', written in a cursive style.

Leif Nørgård
Director

Encl.

About OSIAD

The Office of Standards Information, Analysis, and Development (OSIAD) is part of the NBS National Engineering Laboratory's Office of Engineering Standards. OSIAD has established a Standards Impact Analysis (SIA) project to provide NBS decision-makers with information that will help them better understand the national and international standards systems and the economic, social, and other impacts of standards. It is hoped that this information will increase the effectiveness of NBS's participation in voluntary standards work and will contribute to the development of more rational and cost effective standards.

Functions of the SIA program include:

- *Identifying needs for research: 1. on the impacts of standards; and 2. on standards systems and how they operate, and making these known to the academic, economic, and standards communities;
- *Conducting or contracting for needed research of specific interest to NBS programs; and
- *Maintaining close liaison with NBS and outside groups involved in standards impact or system assessment and developing a collection of studies in this area.

Some areas in which SIA has sponsored research are:

Regulatory use of standards
Standardization in France
Economic principles applied to standards-writing
Economics of certification

For information on this report and other SIA studies, contact Joan Koenig or Carol Chapman (telephone: 301-921-2092; address: Tech B162, National Bureau of Standards, Washington, D.C. 20234).

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16. ABSTRACT (A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here.) This report provides an overview of the voluntary standards systems of Canada, the UK, West Germany, and Denmark. The immediate purpose is to identify areas where further research might be useful. Ultimately, the aim is to gain a better understanding of national standards systems in other highly industrialized countries. Based on interviews and other research, the author discusses these aspects of the four standards systems: (1) history; (2) organization and finances; (3) standards development; (4) certification and accreditation; (5) international standards work; (6) consumer and labor participation; (7) metric conversion; (8) antitrust aspects; (9) research into economic impacts; (10) the government's use of standards and its role in standards work; and (11) other activities. The author concludes that further research is needed into standards systems of these and additional countries -- for example, Australia, Japan, and Sweden.			
17. KEY WORDS (six to twelve entries; alphabetical order; capitalize only the first letter of the first key word unless a proper name; separated by semicolons) Antitrust; Canada; certification; Denmark; economics of standards; government policy; international standards; laboratory accreditation; standards systems; United Kingdom; West Germany			
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