

International
Marketing Information
Series



Foreign Economic Trends and Their Implications for the United States

MARCH 1984

CANADA

FET 84-31
Frequency: Annual
Supersedes: 83 47

PREPARED BY
AMERICAN EMBASSY OTTAWA



**U.S. DEPARTMENT OF COMMERCE
International Trade Administration
Washington, D.C. 20230**

Available by subscription from the Superintendent of Documents, GPO, Washington, D.C. 20402. Annual subscription, \$90. Foreign mailing, \$22.50 additional. Single copies, \$1.75, available from Publications Sales Branch, Room 1617, U.S. Department of Commerce, Washington, D.C. 20230.

INDICATOR	Actual 1982	Actual or Estimated* 1983	Percent Change	Forecast* 1984	Percent* Change
OUTPUT, PRODUCTION, EMPLOYMENT (Re.1983 Figures: E = Estimated; A = Actual)					
GNP (Current Prices, C\$ Billion)	356.6	390.1 E	9.4	429.5	10.1
GNP (Constant 1971 C\$ Billion)	130.1	134.0 E	3.0	140.0	4.5
Industrial Production (1971=100)	122.8	129.0 E	5.1	132.5	5.5
Unit Labor Costs In Mfg. ^{1/}	263.1	260.0 E	-1.2	-----	-----
Wage Settlements (%) ^{2/}	10.0	5.5 E	-----	5.5	-----
Employment (000's)	10,644	10,734 A	0.9	11,035	2.8
Avg. Unemployment Rate (%)	11.1	11.8 A	-----	11.2	-----
Housing Starts (SAAR, 000's)	130	165 A	27.0	175	6.1
MONEY AND PRICES					
Exchange Rate: 1 C\$ = US¢:	81.03	81.15 A	-----	81.00	-----
Interest Rates:					
Bank of Canada Rate ^{3/}	13.96%	9.50% A	-----	9.50-10.00%	-----
Chartered Bank Prime Rate	15.80%	11.00% A	-----	11.00-11.50%	-----
Price Indices:					
All-Items Consumer Price Index (1981=100)	110.8	117.2 A	5.8	123.3	5.2
Industry Selling Price Index (1971=100) ^{4/}	272.4	288.8 A	6.0	299.5	3.7
BALANCE OF PAYMENTS AND TRADE					
Official International Reserves (US\$ Millions)	3,793.2	4,204.2 A	-----	-----	-----
Balance of Payments (C\$ Billion)					
Current Account Balance	3.0	2.2 E	-----	0.4	-----
Merchandise Trade Balance	+18.3	+17.7 E	-3.3	+18.4	4.0
Services Balance + Net					
Transfers	-16.8	-16.6 E	-1.2	-18.0	8.4
Merchandise Exports (U.S. Share, % of Total)	84.6 (69.0)	90.4 E (68.0)	6.9 -----	100.1 (67.0)	10.6 -----
Merchandise Imports (U.S. Share, % of Total)	66.3 (70.3)	72.7 E (69.0)	9.7 -----	81.7 (68.0)	12.4 -----

Main Imports from the U.S. (1982): Automotive vehicles and parts, C\$13.8 billion; equipment and tools, C\$6.7 billion; industrial machinery, C\$4.1 billion; agricultural machinery, C\$1.6 billion; chemical products, C\$2.6 billion.

Footnotes: * Consensus of major Canadian forecasters published by the Conference Board of Canada.

1/ Labor income per unit of output (1971=100).

2/ Compound average annual increase in base rates (%). Wage settlements in all industries, without a "cost of living" clause.

3/ Floating bank rate set .25 percentage points above Thursday's 91-day treasury bill tender rate.

4/ Essentially a producer price index.

Sources: Statistics Canada; Bank of Canada Review; Conference Board of Canada.

GROWTH

In 1983, the Canadian economy was in the recovery stage from its most severe recession since the 1930's. Following a 4.4% decline in real GNP growth in 1982, growth in 1983 was in the three percent range, and a consensus of major Canadian forecasters has projected real GNP growth at 4.5% in 1984.

Inflation, as measured by the All-Items Consumer Price Index, averaged 5.8% in 1983, and is projected to remain in the five percent range in 1984. This marks a significant improvement over the average 12.5% inflation rate in 1981, and 10.8% in 1982. Increases in wage settlements in both the public and private sectors should continue their downward trend due in part to the federal government's two-year "Six and Five" wage restraint program, and comparable provincial programs. (The "Six and Five" program, now in its second year, restricted federal civil service pay hikes to 6% in the first year of new contracts, and 5% in the second. It is scheduled to expire this summer.)

Energy prices are expected to remain stable through December 1984 as a result of the energy pricing agreement reached June 30, 1983 between the federal and Alberta governments. The agreement freezes wellhead oil prices at their current level of C\$29.75 per barrel through December 1984, unless there are major fluctuations in world prices.

The dramatic inventory liquidation of 1982 ended in mid-1983, and growth has resumed in industrial production and capacity utilization. However, unemployment levels will remain high, reflecting, in part, the normal lag between a pick-up in economic activity and actual declines in unemployment. While some employment growth is anticipated in accordance with higher levels of output, the unemployment rate, which averaged 11.8% in 1983, is expected to remain in the 11% range in 1984.

Real spending on business investment continued to decline during the first half of 1983, but began to recover in the second half of the year. This recovery should continue into 1984, as clearer signs of a broad economic recovery strengthen business confidence.

Canada is expected to record a C\$2.2 billion surplus (balance of payments basis) on its current account in 1983, down from the C\$3.0 billion surplus recorded in 1982. This surplus is expected to erode further in 1984, as demand for imports increases with the expected expansion of the domestic economy, and also from a widening of the services deficit generated by increasing interest and dividend payments, and a larger tourism deficit.

FISCAL POLICY

The federal government's "Special Recovery Program" announced last April, and which included C\$4.8 billion in new direct government spending over four years, got off to a slower start than expected. As a result, the government will probably not reach its target of at least C\$1.4 billion in new spending by the end of the current fiscal year (March 31, 1984).

This program was to be financed through higher sales, excise and personal income taxes beginning in 1984. Some provinces have similarly adopted budgets that seek to stimulate depressed sectors of the economy, while financing that stimulus through tax increases. In the Ontario budget tabled in May 1983, for example, sales tax reductions on home furnishings are offset by increases in personal and corporate taxes.

The federal budget deficit for Canadian fiscal year 1983-84 is estimated at C\$31.3 billion, some C\$7 billion higher than the deficit in FY 1982-1983. The federal deficit is expected to narrow in the fiscal year beginning in April 1984.

MONETARY POLICY

Since its decision in November 1982 to discontinue targeting M1, the Bank of Canada has not yet found another monetary aggregate it considers suitable for target-setting. However, the central bank's basic monetary policy goals remain unchanged, i.e., monetary expansion that will permit sustained economic growth without renewed inflation.

U.S. interest rates will tend to set a floor under Canadian rates, due to Canada's somewhat higher rate of expected inflation, and to the Canadian authorities' desire to protect the Canadian dollar's exchange value vis-a-vis the U.S. dollar. As in the U.S., nominal interest rates have eased substantially from their 1982 peaks, although "real" interest rates (i.e., adjusted for inflation) remain quite high by historical standards.

IMPLICATIONS FOR U.S. BUSINESS

In 1983, a year when U.S. exports worldwide decreased by five percent, U.S. exports to Canada increased by 13.4 percent. Canada is our largest growth market, a market receptive to American products and services. Canada continues to look to the U.S. for a wide range of goods, services, technology and risk capital. U.S. firms offering attractive financial terms, delivery times and after-sales service should be successful in the Canadian market.

Areas of particular strength for U.S. exporters are those involving advanced technology for modernizing and improving the productivity of Canadian industry: computers and electronics; telecommunications and information services; medical and scientific controlling instruments; and advanced capital equipment. U.S. industry strength in these areas assures that Canada will remain the largest market for U.S. goods and services.

The strong U.S. dollar is a challenge to the U.S. suppliers' ability to remain competitive. Greater economies of scale and productivity help to meet this challenge. However, product quality is the best insurance in facing up to domestic competition. This is also the best defense against third-country suppliers, especially those enjoying lower producer costs. European, Japanese and other Asian suppliers are paying increasing attention to the Canadian market, and frequently

are able to offset the geographic advantage of American companies by offering favorable prices and financial and delivery terms.

Canada is a vast geographic region. No one area is truly representative of the entire country. Readers should therefore review the narratives on the various regions that follow in this report in order to obtain a better sense of the market for their particular goods and services.

ATLANTIC PROVINCES

The economies of Nova Scotia, New Brunswick, Prince Edward Island and Newfoundland in Canada's Atlantic Region are being adversely affected by two factors. The first of these is the likelihood that the federal government will reduce or eliminate entirely the transportation subsidies paid to shippers in the region that enable Atlantic Canadian-produced goods to compete in central and western Canadian markets. It has been estimated if the subsidies are removed, producers would have to bear an additional C \$67 million, which would seriously affect existing industry as well as any new investment in the region.

The second factor is the uncertainty in the Atlantic fishery brought on by the federal government's plan to restructure deep sea operations. Although no firm decisions have been made, rumors have persisted that the five big offshore companies in Nova Scotia and Newfoundland will be reorganized into two companies, one based in Nova Scotia and the other in Newfoundland, with the federal government a major shareholder in both. Negotiations among the private companies, their creditors and the federal government have been long and difficult. Plant closures and loss of thousands of jobs may be inevitable in this restructuring process.

NOVA SCOTIA: Individually, Nova Scotia is poised to be a regional as well as the national leader in economic recovery, due primarily to offshore exploration activity. The estimated three percent growth in 1983 is expected to accelerate in 1984. The activity offshore has produced encouraging spin-off effects in several other sectors, including construction. However, the manufacturing sector remains quite depressed, as does the important fishing industry, whose future is very uncertain.

NEWFOUNDLAND: The energy sector has produced some signs that Newfoundland's economy also is turning around, although the failure of the province to reach an accord with the federal government over jurisdiction of the offshore, and failure to come to terms with its neighbouring province of Quebec over recall of power from Churchill Falls, are hampering full development of Newfoundland's energy resources. Recently, the three major fish processing companies in Newfoundland went into receivership as a result of creditors calling in outstanding loans. The outcome of this process and the effect on this very important part of the economy are uncertain at this time. Economists in Newfoundland predict that a recovery of the forestry and mining sectors, along with rationalization of fishing industry and a solid offshore agreement with the federal government, must take place before any significant improvement is seen in that province's economy.

NEW BRUNSWICK AND PRINCE EDWARD ISLAND: Preliminary information indicates that the province of New Brunswick is still waiting for effects of the turnaround in the economy to filter down to that province. Although the province's resource-based industries have benefitted to a degree from this recovery, there still remains a great deal of room for improvement in the forestry and mining sectors. In the province of Prince Edward Island, growth in 1983 was in the two percent range. Beneficial to both Prince Edward Island and New Brunswick was the decision made by the U.S. Department of Commerce not to impose import penalties on Canadian potatoes entering American markets.

Wage settlements in the Atlantic Region in the second quarter of 1983 averaged 5.4 percent, slightly less than the 5.9 percent national average for the same time period. Increases in Nova Scotia during the second quarter of 1983 were running at 6.1 percent, those for New Brunswick at 8.7 percent, Newfoundland, 4.6 percent, and Prince Edward Island, 2.1 percent.

The best U.S. export prospects in the Atlantic region are still in the ever-expanding energy sector, concentrated in Nova Scotia and Newfoundland, although Prince Edward Island and New Brunswick have recently entered the picture with preliminary offshore exploration drilling. In Nova Scotia, Mobil Oil Canada Ltd. and its partners are expected to move into Phase I (engineering and design) on the C\$3 billion Venture offshore natural gas field. In addition, the planning and development of a pipeline for Venture gas will create opportunities in all sectors.

Other export prospects exist elsewhere in the region as well. Newfoundland will see a C\$42 million fisheries and marine institute built, and, in Prince Edward Island, plans are underway for a C\$36 million veterinary and marine college.

Investment prospects in the manufacturing sector can be found in Saint John, New Brunswick, whose shipyard recently was awarded the contract for the construction of six frigates for the Canadian Department of Defense. Although only three of the ships will actually be constructed in Saint John, the shipyard is acting as the overseer of the project.

New Brunswick also holds opportunities for investment in mining. Plans are underway to develop the second potash mine at Sussex. There is also the possibility that design work, which had to be shelved last year, for a new zinc smelter there may be resumed. There is also potential for investment in the proposed expansion of the small but thriving peat moss industry in that province.

Finally, in the agricultural sector, there could be investment prospects in Nova Scotia, since farmers there pulled through the recession in a healthy state and are expected to expand their operations. In Prince Edward Island, there may be an opportunity in the meat processing area, since the Island's only meat plant is due to be closed in April 1984.

QUEBEC: Quebec remained essentially recession-stricken during the first half of 1983, with unemployment hovering around the 14 percent mark. However, forecasters estimated real gross domestic product to be in the one percent range for the year as a whole. Housing investment, assisted by provincial, federal, and labor federation programs, has picked up. Increased U.S. demand for Quebec's exports is helping such vital industries as lumber, where first quarter production increased 16.4 percent. Newsprint production, which accounts for 15 percent of Quebec's exports, increased 1.2% in 1983, and is projected to increase 3.0% in 1984, after dropping 5 percent in 1982. The food processing industry, which accounts for some 19 percent of the province's manufacturing shipments, was least affected by the recession, and the outlook, as national inflation recedes and consumption rises, is good. In August, Hydro-Quebec lengthened the horizon for electrical energy surpluses when it revised its 1980-98 demand projection downward, to 3.0 percent a year, from its 1982 forecast of 3.7 percent.

Improved U.S. demand will continue to aid Quebec exports in such important areas as aluminum and electrical energy. Alcan and Reynolds already have large expansions underway, and the French firm, Pechiney, appears to be close to signing an agreement with the provincial government for construction of a C\$1.5 billion aluminum smelter in Quebec. Inexpensive hydroelectric power should continue to be a major drawing card for investment in Quebec by companies requiring large amounts of power. Surplus electrical energy will also act as an incentive for the government to negotiate additional power supply contracts with utility companies in the north-eastern United States.

With economic growth expected to be considerably better in 1984, consumer spending and business investment should pick up. This will be accompanied by an improved market for a wide range of U.S. products and services, particularly in such high growth areas as safety and security equipment. Demand for such equipment as burglar alarms is expected to increase in all sectors and income levels.

Two large government projects may also get underway in 1984. The federal government has under active consideration a proposal for a major expansion of the Port of Montreal. The expansion could include construction of a new port facility some 48 km downstream from the present port. In addition, the provincial government has announced the start of a major computer literacy campaign in Quebec's schools. The five-year C\$150 million plan would include the purchase of over 42,000 microcomputers and development of the related educational software. Although the program was to have begun last fall, Ministry of Education officials are now talking of postponing implementation until the fall of 1984 in order to permit better planning.

ONTARIO: Ontario's gradual economic recovery in 1983 should lead to broadbased expansion and relative prosperity in 1984. Gross provincial product is expected to rise about five percent in real terms, supported by increases in retail sales, substantial improvement in residential construction, and the first expansion in non-residential investment since 1981.

Critical to this recovery is continued growth in the United States, since the U.S. market takes about a quarter of gross provincial product. Ontario's key industry, motor vehicles, benefits especially from U.S. demand for the larger cars, which are produced in greater proportion in Ontario than in the parent plants in the United States.

Looking at longer term development, the University of Toronto expects Ontario industrial output to average 2.9 percent real growth for the years 1981 through 1990 -- 50 percent higher than the 1974-1980 period. In general, basic heavy manufacturing industries will grow at rates lower than the average, but raw materials and service sectors such as communications, finance, and insurance will grow faster.

For the year 1983, real GDP growth in Ontario was in the two percent range, too little to absorb all excess plant capacity and unemployment. Consequently, industrial investment will continue to decline slightly and industries closely linked to business investment, such as primary metals, machinery, metal fabricating, and industrial electrical equipment, can expect little improvement until mid-1984.

Poor weather and poor prices despirited Ontario farmers and their suppliers in 1983. The forest products sector, however, is on the rebound, with the exception of newsprint production, troubled by over-capacity. Mining is not prospering, but major installations that were completely shut down at times in 1982 are operating again, and recent gold mining developments show considerable promise.

Ontario imported C\$33 billion of goods from the United States in 1982, according to Canadian statistics, making Ontario a far larger market for U.S. exporters than Japan or any single country in Europe. American companies considering entering this market can assume that almost anything sold at home will sell in Ontario, but they should request U.S. Commerce Department advice on how to proceed. Looking a year or two into the future, the fastest growing demand will be in advanced technology equipment such as computers, CAD/CAM and robotics systems, and advanced food processing equipment. Services and franchising will also grow and, on the construction side, do-it-yourself/renovation materials and hardware and safety and security equipment will expand.

MANITOBA: Economic signals in Manitoba are mixed. On the one hand, revitalized housing starts are stimulating the economy, and retail sales have been rising faster than in most other provinces. On the other, poor cereal crops, especially barley, have lowered prices, to the detriment of producers.

The Manitoba government is interested in attracting new investment, but its new pension reform bill, 1.5 percent employee tax, and union certification policies are being perceived as onerous and discouraging to investment. The province has invested in an industrial technology center to help small businesses improve production and introduce economies, although it has done little so far to publicize this service. Manitoba's small oil patch at Wiscada has mushroomed in the last year, but does not have the potential to rival its western neighbors.

SASKATCHEWAN: Saskatchewan's economy weathered the recent economic downturn relatively well. Throughout the recession, the province consistently showed the lowest unemployment rate in Canada. The Conference Board of Canada is forecasting a strong performance for the province in 1983 and 1984.

As in the past, the predominant sector of the provincial economy is its agricultural sector. It provides jobs for one-fifth of the work force and accounts for 25 percent of all public and private investment in the province. There are nearly 70,000 farms in the province, with an average area of 950 acres. Saskatchewan has traditionally produced 60 percent of Canada's wheat, 40 percent of its rapeseed (canola), and 30 percent of its oats and barley.

In addition to its strong agricultural base, the province is blessed with an abundance of mineral wealth. It is the world's second largest potash producer, produces over 30 percent of the uranium mined in Canada, and ranks second in oil production in Canada. The provincial government recognizes that further development of this sector will help diversify and strengthen the economy. To this end, they have fashioned an "Energy Recovery Program" to stimulate activity in oil exploration and production. Recently, a heavy oil upgrader project was announced for the province, and another upgrader project is being negotiated. An executive for one major Canadian oil company estimated that the heavy oil production potential in the province could range in excess of 100,000 barrels per day for 20 years. This figure depends, however, on a more efficient enhanced oil recovery technology.

Saskatchewan is hoping to develop its tourist industry. The provincial government is actively seeking, and willing to assist, individuals who are willing to set up hunting or fishing camps and lodges in the province. The provincial government has declared that the province is open for business, and is eager to help bring in and support new investment.

ALBERTA: Alberta was Canada's fastest growing province during the decade 1971-1981. This rapid growth was fueled by Alberta's oil- and gas-based economy. The province produces more than 85 percent of Canada's oil and gas. However, by early 1983 it was evident that Alberta had entered a sharp recession, and that the boom years were finally coming to an end. Unemployment levels rose from a modest 3.8 percent in early 1982 to well above 10 percent in 1983. The value of building permits issued by mid-year 1983 in both Calgary and the provincial capital, Edmonton, was 50 percent below the same period in 1982.

Of the 41 major projects planned or underway in the province during 1982 through mid-year 1983, three, worth C\$12.3 billion, had been cancelled; fourteen, worth C\$26.1 billion, were delayed or shelved; only 24, worth C\$8.4 billion, were proceeding.

The value of total construction put in place in Alberta began to decline in 1982 for the first time in seven years. Alberta had surpassed all Canadian provinces in construction activity for the first time in 1981, but 1983 saw a decrease in activity in the 12 percent range. The long lead times required for major projects has protected the province's construction industry from the brunt of the recession; the industry will probably not "bottom out" until early 1984.

Alberta's economy experienced no growth in 1983, and most observers forecast modest economic growth during 1984, probably on the order of one or two percent. Subdued recoveries are expected in the manufacturing and service industries, and the oil and gas sector will probably increase production and exploration activity. Some signs that the decline has ended in a number of sectors have begun to appear: the unemployment rate has dropped slightly; vacancy rates in industrial and commercial real estate have stabilized, and demand is beginning to improve; land lease sales -- a closely watched indicator of oil and gas exploration intentions -- have begun to increase; drilling rig utilization is climbing again; and, most importantly, three major projects, worth C\$1.7 billion, to extract oil from tar sands were announced in mid-1983, the first new major projects announced in over a year. Even with this forecast for modest economic growth in 1984, there are still good market prospects for U.S. products, including: special purpose construction equipment and tools; builders' hardware; electrical and plumbing fittings; advanced exploration and development equipment for the oil and gas industry; steel buildings for agricultural use, and grain and feed handling equipment.

BRITISH COLUMBIA: Due to 1982's poor performance, the estimated three percent growth in 1983 will still leave the B.C. economy about five percent below 1981 levels. B.C.'s high unemployment rate in 1983 (i.e., 13 percent range) is expected to fall only marginally in 1984. The average rate of inflation was in the six percent range in 1983, as measured by the All-Items Consumer Price Index, and is forecast to remain in the six percent range in 1984. Of concern is the fact that capital expenditures are not increasing. B.C. firms are still recovering from the disastrous profit performance of 1982, when the fifty largest B.C. companies collectively lost C\$935 million.

The forest products industry led the recovery in 1983. Logging output increased an estimated 14 percent, and lumber production increased in the ten percent range. The pulp industry, however, still showed signs of weakness, with output eleven percent below 1982 levels. Mining activity has not increased. Exports of coal, zinc, copper and aluminum remained depressed due to reduced international demand. British Columbia continues to offer good opportunities for U.S. manufacturers of specialty consumer goods, logging equipment and materials handling equipment. Construction equipment and commercial equipment such as data processing machines, office furnishings and computers are also in demand.

ARE YOU EXPORTING BLINDFOLDED?



You might be, if you don't have current, up-to-date information on the countries to which you are marketing. **Overseas Business Reports** and **Foreign Economic Trends** and their Implications for the United States offer country-by-country reports with the information you need to succeed in overseas business.

Overseas Business Reports (OBR's)

bring you detailed information on overseas trade and investment conditions and opportunities. They'll bring you the latest marketing information on countries offering good potential as sales outlets for U.S. goods. You'll find information on:

- trade patterns
- industry trends
- distribution channels
- natural resources
- population
- transportation
- trade regulations
- market prospects for selected U.S. products
- finances and the economy

The OBR World Trade Outlook Series gives you a twice-a-year analysis of U.S. export prospects to all major trading companies.

Foreign Economic Trends and their Implications for the United States

focus closely on current economic developments and trends in more than 100 countries. This series is essential for analyzing new elements and trends to help you plan and evaluate your commercial or investment programs overseas. Each report:

- is prepared on the scene by U.S. Foreign Service and Foreign Commercial Service experts
- pinpoints the economic and financial conditions of the country, and how they could affect U.S. overseas business
- describes the principal influence of current conditions and future trends on the economy

Use the order form below to start your subscription to both series today.

U.S. Department of Commerce • International Trade Administration

ORDER FORM To:

Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

Credit Card Orders Only

Total charges \$_____ Fill in the boxes below.

Credit
Card No.

Expiration Date
Month/Year

Enclosed is \$ _____ check,
 money order, or charge to my
Deposit Account No. -

Order No. _____



Enter my subscription to: Overseas Business Reports at \$44 per year (\$55 overseas)
 Foreign Economic Trends at \$90 (\$112.50 overseas)

Company Name

Individual's Name—First, Last

Street address

City

State ZIP Code

(or Country)

For Office Use Only

Quantity Charges

..... Enclosed

..... To be mailed

..... Subscriptions

Postage

Foreign handling

MMOB

OPNR

..... UPNS

..... Discount

..... Refund

PLEASE PRINT OR TYPE

Looking for an overseas **BUYER? AGENT? DISTRIBUTOR?**

*Find one
in the New
Commerce
Department
Trade List
for
**Computers and
Peripherals***



To receive a free
Trade Lists index
or find out about
the full range of Com-
merce export aid
products, write
to Commerce in
Washington, D.C. or
contact your nearest
Commerce district office.

The Washington address is:

U.S. Department of Commerce,
International Trade Administration,
Trade Lists, Room 1324,
Washington, D.C. 20230.

Trade Lists: The indispensable overseas marketing tool

Trade Lists: Names and addresses of overseas buyers, agents, distributors

Trade Lists: Names provided by U.S. Government foreign commercial officers

Ask about some of the other Commerce export aid products such as credit reports on overseas companies, foreign market research surveys, agent searches and computer database retrievals.

