tish ships and crews. Meares was an
agandist in promoting British politi-
nomic interests on th Northwest
EWHIRST

ares *Voyages Made in the Ye...s 1788 and*
a to the Northwest Coast of America (1790).

nd, 8477 ha, of remnant coastal rain
Pacific coast tidal areas, is 2 km from
n Clayoquot Sound. The Indian vil-
it is on the island. By oral and botan-
Meares I's resources were long ex-
Clayoquot and Ahousaht bands. It
vestern red cedar trees (a backbone
westcoast crafts and technologies)
ther plant species; salmon runs in
wildlife and waterfowl and abun-
l foods, especially in the extensive
Lemmens Inlet. Two rugged slopes
m) provide water and a scenic back-
o District and, between them, shel-
or intensive shellfish mariculture. It
1862) for John MEARES. Timber li-
ares I were first granted in 1905 and
ull operated there. In 1955 most of
imber was incorporated in 2 Tree
s and massive clear-cutting began in
lowing study by a public planning
llan Bloedel Ltd obtained permits to
es I, but in Nov 1984 protesters
irst loggers, the 2 bands having de-
nd a "tribal park." Court action over
led to a BC Supreme Court trial
claim of aboriginal title to Meares I.
ohibited while the claim is tried.
PETER GRANT

ssing Industry The slaughtering
cessing sector in Canada is made up
engaged in abattoir or packing op-
ucts include fresh, chilled or frozen
meats (smoked, pickled or dry salt-
specialty sausages; canned meat
animal oils and fats; and tank-
ts such as bone, blood, feather and
nd dry rendered tankage.
htering and processing is a highly
ustry. The first regulations in New
assed in 1707 and made it illegal for
ill an animal without first informing
r. The Crown's representative was
rry out an inspection at the time of
lother early law, enacted in Lower
35, was the Act to Regulate the Cur-
and Inspection of Beef and Pork,
d that all beef and pork be inspected
er. Until the early to mid-1800s,
eat processed for human consump-
dled by farm and village butchers,
he meat packer had emerged. Dur-
to mid-1800s, many local packers
ughtering, curing and packing pork
g the winter months (the term
e from the last function). Many
anies in Canada's meat industry be-
1850 and 1870. F.W. Fearman set
, in Hamilton, Ont, in 1852, for sug-

enough to support a sound packing industry. During the 1870s there were 193 packing plants employing 841 people. Annual sales were about $3.8 million.

Pat BURNS initially supplied beef to gangs laying rail and later established P. Burns & Co, later Burns Foods Ltd, western Canada's largest meat-packing company for most of a century. From 1880 to 1890 the industry grew rapidly. The number of plants more than doubled and sales grew from nearly $4.1 million to $7.1 million. Most companies were small but during the 1890s many of them were absorbed into larger operations; by 1900 only 57 packing facilities remained. However, capital investment more than doubled over this period, climbing from $2.2 million in 1890 to $5.4 million by 1900. Employment jumped from 1690 to 2416 and sales climbed to a new peak of $22.2 million.

In 1906 J. G. RUTHERFORD, veterinary director and livestock commissioner for Canada, convened a meeting in Ottawa to discuss federal meat inspection with the major meat exporters. On 3 Sept 1907 federal meat inspection became a reality: the Meat and Canned Foods Act and Regulations required antemortem and postmortem veterinary inspections of all food animals the meat of which would cross provincial or international borders. The law set rigid sanitation standards for plants using the federal inspection service. After 1907 the meat industry grew steadily except for periods following the 2 world wars. In both cases the industry had expanded to meet heavy wartime demand and was left with capacity far exceeding peacetime domestic and export demands. Consequently, some consolidation was needed.

The Modern Industry By 1950 the structure of the industry was firmly in place and 3 classes of companies emerged. Traditional, full-line slaughtering packers slaughter all species and process carcasses into fresh, cured, smoked, cooked and canned meats, sausage products, etc. Nonslaughter processors purchase carcass meat and prime cuts from slaughterers and specialize in one or more secondary processing operations. Purveyors prepare portion-ready cuts, mainly for hotels, restaurants and institutions. There were 157 companies in 1950 and 210 by 1960. Employment increased from 20 522 to 25 946 and annual sales climbed from $757 million to $1.06 billion.

Industry growth continued through to the 1980s. The industry is now represented nationally by the Canadian Meat Council in Scarborough, Ont, with regional offices in Montreal and Winnipeg. All member companies operate federally inspected production facilities. In 1970, 453 plants were in operation; in 1986, 536, distributed as follows: Nfld, 4; PEI, 4; NS, 10; NB, 6; Que, 133; Ont, 195; Man, 38; Sask, 35; Alta, 71; and BC, 40. Since 1970 employment has fluctuated (31 099 in 1970 and 30 836 in 1984). The annual value of shipments has jumped from about $2.1 billion in 1970 to over $8.28 billion in 1984. But the cost of operations has grown equally dramatically; materials and supplies have increased from

the industry processed 3.6 million cattle and 15.5 million hogs at federally inspected plants. Over 95% of all meat and meat products produced in Can...mes from federally inspected plants. The ...try must also comply with provincial legislation and often with municipal health requirements. The main federal agency involved with the meat industry is Agriculture Canada, particularly the Food Inspection Directorate, the Livestock and Poultry Division and the Meat Hygiene Division. ROBERT F. BARRATT

Mechanical Engineering, branch of ENGINEERING that deals with the design, construction and operation of machines. Machines are designed for an enormous variety of purposes, but most fall into 3 broad categories: energy conversion machines, including engines, heat exchangers, refrigerators, heat pumps, furnaces, motors, brakes, windmills and turbines; manufacturing machinery, including lathes, drills, rolling mills, assembly-line robots and hand tools; and transportation machinery, including all vehicles, conveyors and pipelines, with their compressors and pumps. Mechanical engineering plays a role in the production of all goods and commodities; moreover, many consumer goods (eg, domestic appliances) are machines.

History Mechanical engineering can be said to have started with the Industrial Revolution, with the advent of the steam engine. It has evolved as advances in materials, control technology and design methods have led to continued improvements in machines of all kinds. The last 3 decades have seen an acceleration of that evolution, as machines continued to become more efficient, faster, more precise, more economical and capable of performing more functions. The growth in industrial uses of computers in the last decade has increased that acceleration even more. Today, it appears that mechanical engineering stands on the threshold of another revolution, the result of the advent of cheap and reliable microelectronic devices, particularly sensors of various kinds and microprocessors.

Canadian mechanical engineers have made many world-class contributions to technology, including self-propelled combines, harvesting equipment for forest industries, pulp and paper production machinery, and hydroelectric turbine generators. More recent achievements include the CANDU NUCLEAR POWER generating system, the aircraft engines of the PT-6 family developed by Pratt & Whitney Canada, Ltd, the SNOWMOBILES and LRC trains designed by Bombardier, Ltée, and the CANADARM manipulator for the NASA Space Shuttle developed by Spar Aerospace Ltd.

Because mechanical engineering is a very broad branch of engineering, it has developed a number of specialties.

Education and Societies Technical training in Canada probably began in the workshops of railways, factories and some schools. Formal courses in mechanical engineering followed establishment of schools and colleges of engineering or practical science in eastern Canada in the late 19th century. In 1985, 24 Canadian universities offered accredit-

Engineering Institute of Canada. Both the provincial associations and CSME hold technical meetings and produce publications containing ...fessional and technical news. CSME also p... *Transactions* in which research developme... reported. A biennial technical conference, the Canadian Congress of Applied Mechanics, provides a forum for discussion of current research. Canadian mechanical engineers are also active in many foreign and international technical societies. *See also* ENGINEERING, HISTORY OF.

T.A. BRZUSTOWSKI

Mechanics' Institutes Established first in England during the 1820s, Mechanics' Institutes began as voluntary associations of working men seeking self-improvement through education. The community-based institutes offered evening lectures, lending libraries and periodical reading rooms. Members were supposed to learn the underlying scientific principles of their work as well as the general value of "rational information." The concept spread quickly elsewhere, including British N America where the Montreal Mechanics' Institute opened in 1828 and the York Mechanics' Institute in 1830. Other institutes followed, especially in Ontario but also in NS and BC. In 1895 Ontario included 311 institutes with a total of 31 195 members. Internal contradictions, however, as well as the development of the labour movement, public libraries and ADULT EDUCATION prevented the institutes from maintaining a viable identity into the 20th century.

Despite the name, the central figures who developed the Mechanics' Institutes in Canada were rarely manual workers. Rather, the institutes were controlled by shopkeepers, doctors, ministers and small manufacturers who sought activities for themselves, and more importantly, the growing number of urban wage-earners. The institutes emphasized Victorian discipline and morality while refusing to consider social, economic and political questions. Much debate concerned the reading rooms and libraries which most members frequented for newspapers and popular fiction rather than the works of science, art and religion promoted by institute directors. In Ontario, this debate was transferred to communities at large in 1895 when the provincial government used legislation to transform the institutes into public libraries. The Mechanics' Institutes thus reflected important features of 19th-century Canada: the constant anxiety of local leaders about social order and stability; the widespread hope of self-improvement through education; and the increasing popular thirst for reading material. CHAD GAFFIELD

Medal, usually a small metal disc, ornamented in relief, struck or cast, and awarded for merit or issued to commemorate an event or person. Medals have essentially the same significance in Canada as elsewhere in the Western world; little noticed in everyday life, they are nevertheless highly esteemed. A distinction is often made between medals of the military sort, worn on the person, and others that are not intended to be worn, but there is no generally accepted and understood

IN THE CANADIAN ENCYCLOPEDIA, EDMONTON: HURTIG, 1988.