

Jamal Ara



LARSEN
& TOUBRO
LIMITED

1979

*When a song is unlocked in the heart of a bird
and leaves are refreshed with dew drops
studding the green like shattered crystals,
the moment holds a promise...
the promise of renewed life revitalised into
activity by the energy of the sun.*

*This is the moment
of awareness, when
creative minds
become conscious
of what is yet to be
in every field of
human endeavour.*



We wake up to the same sense of awareness as the dawn of 1979 touches the horizon with gold. And we look into the future with a firm knowledge that the best is yet to be. For the view we command is far wider than it has ever been—encompassing not only every field of engineering from dairy to nuclear power, but a totally different sphere of activity as well—cement manufacture.

Each year, people at L&T work towards the realisation of a new idea; a new technological challenge that lights up larger areas in the dark recesses of the unknown and marks out for L&T a future of brilliant opportunities and achievements.



Sales

GROUP I



EARTHMOVING AGRICULTURAL & MATERIAL HANDLING EQUIPMENT

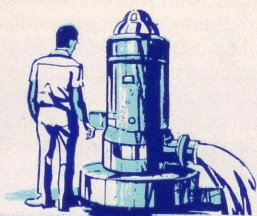
Caterpillar track type tractors, bulldozers, rippers, pipelayers, Traxcavators, wheel type tractors, loaders, scrapers, dump trucks, motor graders, Diesel and natural gas industrial and marine engines, diesel electric sets; **Poclair** hydraulic excavators and hydraulic systems; **John Deere** wheel type tractors, combine harvesters, agricultural implements. **Athey** hauling units; **Hyster** compactors and towing winches, diesel lift trucks and mobile cranes. **Kelly** rippers; **Domor** elevating graders; **Balderson** dozer blades; **F&G** side dump buckets. **Rome** plows; **Fleco** land clearing equipment; **Albaret** vibratory and other compactors; **Perkins** industrial diesel engines; **Oshkosh** heavy duty vehicles and **Hyster** trailers; **Henschel** locomotives; **Brookville** locomotives; **Link-Belt Speeder** truck cranes; **Manitowoc** crawler shovels and cranes; **Southwest** compactors and sprinklers; **Wagner** low profile loaders, dump trucks; **Robbins** raise borers; **Voith** torque converters, transmissions and high capacity gear units; **Orienstein & Koppel** bucketwheel excavators, stacker reclaimers, spreaders, mobile transfer conveyors/ore handling plants, coal handling plants, unloaders, deck cranes, dredgers, floating cranes, bow thrusters and spare parts. **Becker & Van Hullen (BVH)** belt manufacturing presses, metal working, forging and piercing presses; **Aalborg** marine and stationary boilers—exhaust gas/oil and composite water tube type; **Rasmussen/**

Svendborg electrohydraulic steering gears; **Wagener & Co.** belt manufacturing presses, vulcanizers, repair workshops and portable repair presses; **International Hi-Pres** airconditioning and ventilation equipment for ships and axial flow fans; **Compagnie Francaise D'Enterprises** construction services for canals; **Mak** large diesel engines for marine propulsion auxiliary equipment and stationary engines for power generation (large horse power engines).



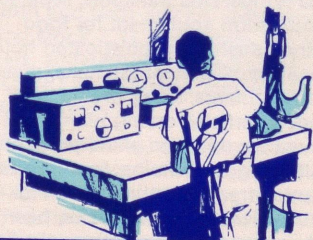
PETROLEUM AND DRILLING EQUIPMENT

L&T diamond core drills, conventional drilling accessories, wireline equipment, diamond bits and T.C. bits; **L&T** water well drills, rotary and down-the-hole operating equipment and accessories; **Longyear** diamond core drills, conventional and wireline coring equipment; **Failing** water well drills, blast hole drills and equipment; **Walker-Neer** percussion and combination-rotary-percussion drilling rigs and equipment; **Bowen** fishing tools; **Camco** oil production equipment; **Christensen** diamond bits for mining/oil drilling, core barrels and drill collars; **Continental EmSCO** tubulars; **Eastman Whipstock** directional drilling services; **Gardner-Denver** mud pumps, air compressors, oilfield/mining equipment; **Gray Tool** well heads, X-mas trees and **Gray-Loc** connections; **Halliburton** cementing and testing equipment and services; **Kleber** offshore hoses, **Lufkin** oil well pumps; **Martin-Decker** oilfield rig instrumentation; **NL Control Systems "Kooomey"** BOP control systems, testing units and water makers; **Reed** rock roller bits, hole openers and tool joints; **TRW Mission** fluid-end pump parts; **Varco** handling tools; **Vetco** offshore drilling and production equipment, tubular inspection.



PUMPS

Johnston make vertical turbine, mixed flow and propeller pumps with solid shaft, hollow shaft or submersible motor drive; **SU** make horizontal as well as vertical pumps for handling any corrosive and/or volatile liquids, effluents, sludge and slurries, mixtures. . . Positive displacement pumps of various types like internal gear, external gear, shuttle block, screw type for handling pumpable liquids of almost any viscosity. Vacuum pumps for vacuum up to 5×10^{-3} mm Hg and metering pumps in plunger/piston or diaphragm construction for any service; **Svanhoej** make marine pumps and systems for on board service subject to inspection by any agency—Lloyds Register of Shipping, ABS, DNV. . . Other special pumps manufactured indigenously or by our foreign principals. Glandless pumps by **Crane**, U.S.A., is an example.

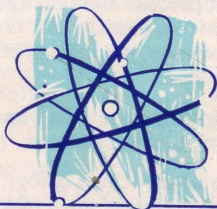


SPARE PARTS & SERVICE

The complete line of equipment supplied by us is supported by our spare parts service in Bombay, Delhi, Madras and Calcutta. Our main service centres in these cities are staffed with specialists

who use modern techniques in reclaiming worn out components. Under-carriage parts for instance are rebuilt by submerged arc and other modern welding techniques. The centres are also equipped with the finest fabrication facilities necessary to meet the spare parts needs of our customers. Factory trained field specialists stationed at strategic locations provide on-the-iron-at-the-work-site service. In addition, our spare parts operations are being computerised. **L&T** service centres are also responsible for delivery of equipment, implementation of manufacturer's warranty field repairs and major overhauls.

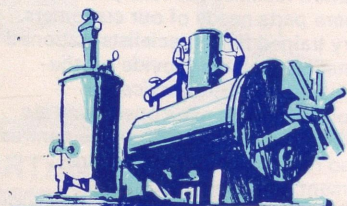
GROUP II



NUCLEAR

L&T contributed to nuclear energy development by manufacturing critical reactor equipment like calandria, steam generators, end shields, end shield rings for Rajasthan Atomic Power Project (RAPP) Unit II and Madras Atomic Power Project (MAPP) Unit I. Similar equipment is under fabrication for nuclear plants at MAPP II and Narora Unit I. For the heavy water plant at Baroda and projects under construction at Kota and Talcher, **L&T** supplied pressure vessels, heat exchangers, distillation trays and cartridges. . . . **L&T's** capabilities cover design and manufacture of pressure vessels, ultra high pressure vessels including Multiwall vessels, heat exchangers, high pressure heat exchangers and high pressure heaters, for nuclear power and research reactors, thermal power plants and heavy water projects. Applications

include steam and process water, sea water and heavy water. **L&T** has also developed the technology to manufacture equipment to exacting tolerances, for India's space programme.



CHEMICAL PLANT

L&T specialises in the manufacture of pressure vessels, ultra high pressure vessels including Multiwall vessels, heat exchangers, high pressure heat exchangers, high pressure heaters and other unit process and unit operation equipment like evaporators, crystallisers, reaction vessels, columns, distillation units, dryers...

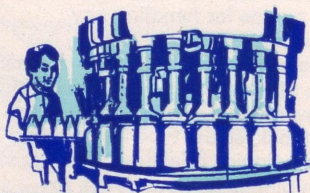
This equipment is designed and fabricated to customers' specifications.

Materials used include carbon steel, low alloy steel, stainless steel, nickel, monel, aluminium, copper. . . In this field **L&T** caters to the chemical, petrochemical, petroleum, fertiliser and synthetic fibre industries.

L&T undertakes design, engineering, supply, erection and commissioning of complete process plants for sulphuric acid, superphosphate and liquid sulphur. **Struthers Scientific & International Corporation**, a subsidiary of **Struthers Wells Corporation**, U.S.A., are collaborators for ultra high pressure vessels including Multiwall vessels; **Whiting Corporation (Swenson Division)**, U.S.A., for evaporators and crystallisers; **Niro Atomizer Ltd.**, Denmark, for suspended particles drying plants (spray drying, fluid-bed drying, flash drying, vibro fluid-bed drying) and **De Danske Sukkerfabriker**, Denmark (**DDS**), for cane and beet sugar diffusers.

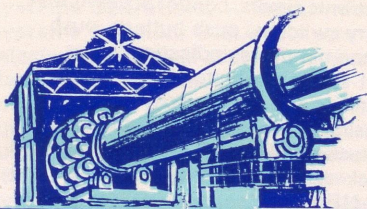
L&T also supplies **DDS-Kroyer** continuous conversion plants for glucose

and dextrose; thin film evaporators and dryers and chemical process equipment of **Luwa Ltd.**, Zurich; **Josef Meissner** organic process plant including explosive manufacturing equipment; **Funda** rotary leaf filters, fermentors, foam breakers, agitators of **Chemap AG**, Zurich; **Buhler** grain mills, provender mills, grain silos and warehouses, paste goods factories, chocolate factories, breweries, oil mills, mechanical and pneumatic conveying installations, garbage-utilisation plants; **Simon-Vicars** biscuit plants; **G&R Gilbert & Co.** bakery plants.



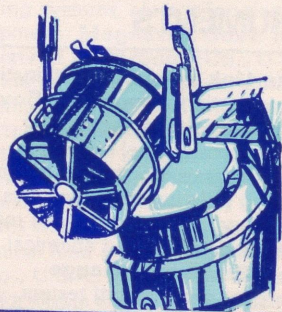
FOOD PROCESSING

L&T undertakes design, supply, installation and commissioning of complete dairies for processing and packaging of liquid milk, manufacture of milk products, plant and equipment for fruit processing, egg processing, breweries, yeast factories, accelerated freeze drying, fish meal, slaughter-house, meat and poultry processing, refrigeration, fish freezing, grain drying and dry rendering. Other equipment includes refrigerated transport, separation and clarification equipment for food and dairy industries, sophisticated hotel and large establishment kitchens, grass dehydration plants, spray drying and suspended particles drying plants and equipment for milk and allied products, tea, coffee, eggs, proteins, food products and plant extracts, bottling plants for milk, fruit juices, aerated waters, beer and other beverages. Facilities exist for the local manufacture of a wide range of the above equipment. Main principals are **Paasch & Silkeborg**, **Niro Atomizer**, **UDEC**, **Thimonnier**, **Wright Hargreaves**, **Westfalia**, **Rannie**, **SIG**, **Fords**, **Hoyer**, **Gascoignes**, **Gerber**, **Atlas**, **LINCO**, **Benham**, **Hobart**.



CEMENT

L&T manufactures all types of plant and equipment for the cement industry in collaboration with **F. L. Smidth & Co. A/S**, Copenhagen, Denmark. Rotary kilns are also manufactured for metallurgical industries —lime, alumina, iron ore, magnesite, bauxite, dolomite.



STEEL PLANT

GHH-UTMAL plant and equipment for iron and steel works, complete blast furnace installations, pig casting machines for iron and ferro-silicon, steel plant rolling stock, L.D. converters, hot metal mixers, sintering plants and spares; **VACMETAL-UTMAL** metallurgical process plants.

UTMAL crushing, screening and conveying equipment for minerals and ores, grey iron, alloyed iron, steel and alloyed steel, casting, coke oven machines, machined components, structures and plate work. **GHH** steam and gas turbines, turbo screw and **Esslingen** reciprocating compressors, **GHH-Lectromelt** electric smelting furnaces for pig-iron, ferro alloys carbides and precious metals; **KIC-UTMAL** metallic recuperators for foundry, iron and steel, non-ferrous,

glass and ceramic industries; **Link-Belt** material handling and process equipment conveyors and components, drives and bearings.

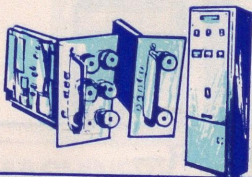
SALA equipment for mining, mineral dressing, agglomeration and environmental control; **SALA** services for ore-testing and project engineering, mineral dressing and pelletising.



PAPER AND PULP

L&T offers pulp, paper and board machinery, hydraulic gates, and butterfly valves fabricated by its subsidiary **Utikal Machinery Limited (UTMAL)**, to the design of **Voith** of Germany. **L&T's** collaboration agreement with **Voith** enables it to manufacture continuous digesters and head boxes for the pulp and paper industry. **L&T** manufactures black liquor evaporation plants in collaboration with **Whiting International** of U.S.A. As sole selling agents for **Voith** in India, **L&T** offers pulp and paper plants, newsprint machines, water turbines and pump storage plants.

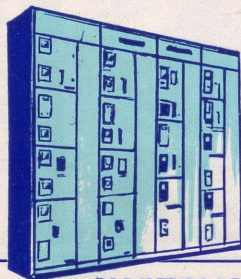
GROUP III



ELECTRONIC CONTROLS

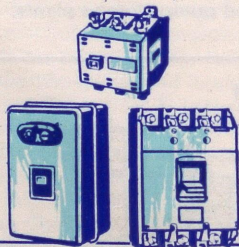
L&T power electronics equipment for industrial controls, thyristor converter panels for DC motor control — standard equipment up to 2000 hp, and tailor-made designs for higher ratings, multi-

sectional co-ordinated drive control systems, operator control desks, thyristor inverter panels up to 40 kVA single phase sine wave output for no-break power supplies, static switching logic panels for process sequence control, electronic relays for voltage current and other physical parameters, e.g. pressure temperature.



SWITCHGEAR— CONTRACTS

L&T low tension sheet steel enclosed switchboards, air circuit breaker boards, power control centres, fixed and drawout type motor control centres, control panels, and a wide range of custom-built switchgear for power plant auxiliaries, steel, fertiliser, petrochemicals, heavy engineering and other industries. Cast iron clad switchboards are also available. Composite electrical projects including supply and erection of H.T. and L.T. equipment undertaken.



SWITCHGEAR— STANDARD PRODUCTS

L&T motor starters and contactors, thermal overload relays, switch, switchfuse and fuse switch units, HRC fuses, flameproof enclosed moulded case circuit breakers, starters, rotary switches and push buttons; thermal and

electronic timers, control accessories—rotary switches, push buttons, push button pendants, indicating lamps, start-stop push button stations, loom switches and foot switches, single phasing preventers, thermistor motor protection relays, **LT-Unelec** air circuit breakers, moulded case circuit breakers, **LK-NES** high tension and low tension switchgear including instrument transformers, **General Industrial Controls** synchronous timers.



INSTRUMENTS

AMF Sea-Link for acoustic navigation systems, acoustic transponders; **Boyle Industrial Gauging Systems** for gauging systems in steel industry, moisture and basis weight measurement in paper and pulp industry, core loss testers, surface defect systems for metal, paper, plastics, rubber and chemical industries; **Budenberg Gauge Company** for dead weight testers, standard test gauges, differential pressure gauges, mercury in steam and vapour pressure thermometers, draught and receiver gauges; **Electronic Associates Inc.**, for analog and hybrid computers, power plant monitoring systems, power plant simulators, power systems, dynamic network analysers, data logging systems; **Emile-Haefely & CIE AG** for coupling capacitors, condenser bushings, wave traps, kraft paper; **Fisher Controls Co.** for control valves, gas regulators, electronic instrumentation, both analog and digital control including computer control instrumentation systems, control valves, butterfly valves, etc. gas regulators; **Foss Electric, Denmark** for milk testing instruments, grain quality control instruments, grain silo temperature measuring systems; **GEC-Elliott Control Valves, UK/GEC-Elliott Automation, France** for control valves, safety relief valves, butterfly valves, vee-ball valves, gas regulators, etc.; **Geophysical**

Systems Operations – Electronic Systems Division, U.S.A. for seismic detectors, digital field acquisition systems; **Hasler AG**, Switzerland for telecommunication and telegraphy equipment, electronic telex exchanges, automatic message switching systems; **TOR & TOM High Voltage Test Systems**, Switzerland for high voltage test equipment; **Kay-Ray Inc.**, U.S.A., for density measuring systems, continuous level measuring systems, belt weighing systems; **L&T** petrol dispensing pumps, solid state audio visual fault analysers, logic inter-lock systems, trip systems, control panels, petroleum metering units; **Land Pyrometers**, U.K. for non-contacting temperature sensors, infra-red pyrometers, two colour ratio pyrometers, radiation pyrometers; **Log Master Services Inc.** for electrical logging systems, electric logging equipment; **Magnavox Govt. & Industrial Electronics Co.**, U.S.A., for satellite navigation systems, land survey systems, drill rig positioning systems; **Milltronics Limited**, Canada, for grinding control systems; belt weighing systems, motion sensors, level detecting systems; **Milton Roy Co.**, U.S.A., for control volume pumps, packaged chemical feed systems; **Samuel Moore & Co.**, U.S.A., for dekoron instrument tubing, single and multicode dekoron extension wire; **Storno Limited**, U.K., for VHF, VAR equipment; **Sub-Sea Systems Inc.**, U.S.A., for underwater TV systems.

Southern Instruments & Electronic Corporation (SIETEX), Madras for electronic process control instruments for measurement, recording, display and control of all process variables; **Southern Transducers (SIETEX)**, Madras for sensors, transmitters and transducers for process measurements; **Sieger Ltd.**, U.K., for gas alarms, toxic gas detectors; **Schiltknecht**, Switzerland for meteorological instruments for measurement of small flowmicro pressure gauges, instruments for measurement of wind velocity and direction; **Teledyne Farris**, U.S.A., for safety relief valves; **Tettex**, Switzerland for precision electrical measuring instruments; **Topsil**, Switzerland for semiconductor grade silicon, orientation measuring devices.

GROUP IV



BOTTLE CLOSURES

Alu Capsules (aluminium foil adhesive coated capsules) to seal and decorate bottled products like cosmetics, inks, beer, country liquor, aerated waters, fruit juices and milk. Tear-off vial caps, foil cups with lids for food and dairy products.

Crown Corks plain or printed in one or more colours, assembled with cork PVC or aluminium spotting for soft drinks, beverages, country liquor, beers and sauces. **Metal Printing** on tinplate or aluminium sheets in one or more colours to customers' designs. **RO** and **ROPP** aluminium seals for bottles in a wide variety of sizes and decorations. **Sealing Machinery** for pilfer and non-pilferproof caps and vial caps. Also automatic and semi-automatic capsuling machinery for **Alu Capsules**. **Consultancy Services** undertake installations of new packaging lines and systems to suit individual requirements.



MACHINERY

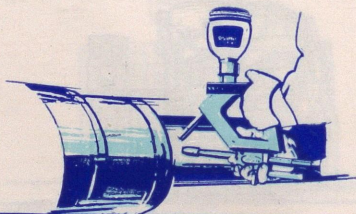
McNeil Akron and **L&T-McNeil** rubber machinery for tyre plants; **L&T** packaging machines to suit conventional and high speed lines, including shrink-wrap systems, blister packing, pouch filling and cartoning machines. Also

tailor-made systems for packaging various products; **Gyrox** geared motors and speed reducers; **Bakshi** pneumatic and hydraulic tyre dismantlers; **Disamatic** flaskless moulding machines for foundries; **Hydrel** fine blanking presses; **Fluid Energy** Jet-O-Mizer fine grinding mills and Jet-O-Driers; **Buhler** die casting and injection moulding machines; **L&T** die casting dies, **AMF** and **SIO** tyre retreading machines; **Fahr Bucher** compression moulding machines, **Voith-Fischer** blow moulding machines.



VALVE

Audco lubricated taper plug valves in cast iron, austenitic iron and cast steel; **Audco** type H valves for high pressure applications on oil field installations; **AIL** gate, globe and check valves in forged steel, cast steel, alloy steel and stainless steel for the hydrocarbon processing industries. Butterfly valves in cast iron, cast steel and fabricated steel; **Bailey** goggle, hot blast and other steel plant valves; **Grove** pipeline valves. Special valves from overseas principals.

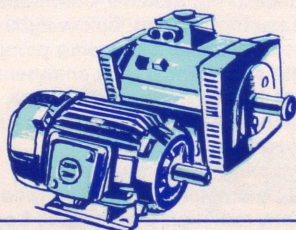


EUTECTIC

Eutectic + Castolin low heat input welding alloys, electrodes, gas rods and fluxes to prolong the life of critical components and spare parts and ensure lower inventory and cost reduction. Patented powder spray processes such as

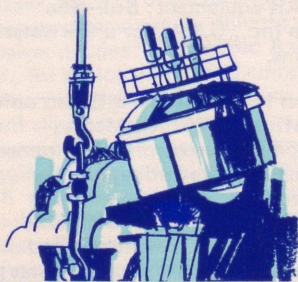
Eutalloy® and **RotoTec®** systems. Expert advice on preventive and repair maintenance welding techniques. **Eutectic** offers advanced courses at the Centres for Documentation and Training on Preventive Maintenance Welding in Bombay, Calcutta, Delhi and Madras.

GROUP V



ELECTRIC MOTORS

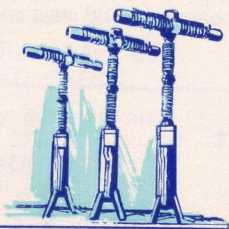
Hindustan Brown Boveri 3-phase electric motors in squirrel cage and in slip ring execution up to 125 hp, including a wide range of special purpose motors for dual speed drives, crane duty textile machinery, marine duty, increased safety installations, weather and hose-proof applications, anti-corrosive atmospheres, special flange mountings. **Tonum** fractional horsepower single phase electric motors, manufactured by **Stone Platt Electrical (India) Ltd.**



ELECTRIC FURNACE

Hindustan Brown Boveri electric arc melting furnaces, mains frequency and medium frequency coreless type induction furnaces for melting and super-heating, channel type induction holding furnaces, mains frequency and medium frequency bar and billet heaters, resistance furnaces for melting non-ferrous metals, pit type furnaces for

gas carburising and hardening bogie-hearth belt-type and various other furnaces for heat treatment and cremation furnaces.



BROWN BOVERI

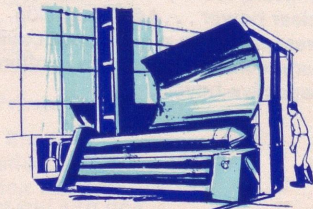
Hindustan Brown Boveri high tension air blast circuit breakers, CTs, coupling capacitors and CVTs up to 400 kV, 11/22 kV medium voltage indoor type metal clad drawout switchgear cubicles, MOCBs for 6.6 kV/11 kV, high voltage isolators up to 400 kV, 25 kV traction duty ABCBs and tap changers for electric locomotives, high current generator busducts, control and relay boards and transmitter antennas.

Hindustan Brown Boveri PLCC, telemetering and load despatching equipment, wave traps and float chargers.

Hindustan Brown Boveri power and distribution transformers up to 66 kV 10 MVA and furnace duty transformers.

Brown Boveri generation transmission, transformation and utilisation equipment, AVR's, static excitation equipment, gas turbines, heavy mill drives and controls, turbo chargers, ships' automation equipment.

Manufacture, Project Execution and Service & Spares



Chemical plants including unit operation equipment such as pressure vessels, heat exchangers, evaporators, and

crystallisers, distillation units, reaction kettles and columns, driers, autoclaves, etc. Equipment for pharmaceutical and food processing industries, petroleum and fertiliser industries; and distilleries and breweries. Sulphuric acid and superphosphate plants, containers for liquefied gases and chemicals. Cement plants for dry and wet process; kilns for burning lime, dolomite, bauxite . . .

Ultra high pressure vessels, including Multiwall vessels, high pressure heat exchangers and high pressure heaters for chemical and fertiliser projects, petroleum and petrochemical complexes, thermal power and heavy water plants, etc.

Nuclear plant fabrication, feed milling plants, garbage milling plants. Sugarcane and beet diffusers. Dairy equipment including milk storage tanks, road milk tankers, can washers, bottling plants, batch pasteurisers, plate heat exchangers, butter churns, cheese making machinery, refrigeration equipment, milk pumps. Slaughterhouse and meat processing plants. Spray drying plants and suspended particles drying plants for milk powder, egg powder, chemicals and plastics. Headboxes for paper mills, Sheepfoot tamping rollers, vibratory rollers, bulldozer blades for crawler tractors, hydraulic excavators, water well and diamond core drilling equipment and accessories and diamond bits. Motor starter and contactors, switch and fuse switch units, HRC fuses, low tension air circuit breakers, moulded case air circuit breakers, timers, single phasing preventers, control accessories, switchboards – cast iron and sheet steel type, static control gear. Petrol dispensing pumps.

Aluminium foil decorative bottle capsules RO and ROPP caps as also other types of bottle and vial closures, aluminium cups and lids for confectionery, etc., crown corks and a range of packaging machinery.

L&T's project engineering, execution, erection and commissioning services include project requirement analysis, plant layout, complete engineering for civil, mechanical, electrical, instrumentation and control systems and pipeline design.

L&T service and spare parts facilities are available from four main depots – Bombay, Madras, Delhi and Calcutta. These facilities are also available from strategically located Branch Offices, Distributors and Residential Representatives. The services rendered include technical consultancy, assistance to customers in upgrading existing plant facilities and selection of modern equipment, assembly, delivery and operation, periodic inspection of equipment, training of customers' operators and maintenance staff.

Civil Engineering, Mechanical Erection, Electrical Installation & Instrumentation



Through its wholly owned subsidiary **Engineering Construction Corporation Limited, L&T** undertakes design and construction of major industrial structures in India and abroad. Projects include chemical and fertiliser plants, refineries, cement factories, thermal and atomic power stations, cooling towers, reservoirs, chimneys, silos and prill towers using slipform technique, water treatment plants, ports and maritime structures, bridges, multi-storied buildings, pre-fab housing projects, industrial storage sheds and workshops . . . with emphasis on high strength precast and prestressed concrete construction, bored piles with Bentonite process, precast piling and nuclear containment structures. **ECC** also undertakes mechanical and electrical equipment erection, heavy lifts up to 600 tonnes capacity with their own imported tackle, process piping, fabrication and installation of large diameter steel pipes for water

supply systems, cross country pipelines . . . apart from instrumentation as well as electrification of industrial plants, chemical, pharmaceutical and dyestuff industries, oil refineries, sugar plants, fertiliser complexes and steel and power plants.

Export



L&T exports a wide variety of equipment like switchboards, motor starters, contactors, air circuit breakers, feeder pillars, brewery equipment, CO₂ absorbers, heat exchangers, bottling plants, reactor vessels, sugar diffusers, petrol dispensing pumps, welding electrodes, diamond bits, jigs and tools, garage equipment, road milk tankers, rotary kilns . . . ROPP seals, crown corks, aluminium adhesive capsules and sealing machines. As an export House, **L&T** also exports various products manufactured by reputed Indian manufacturers. **L&T** has the technical talent and fabrication facilities to design, manufacture and instal plant and equipment for every vital industry – cement, steel, fertiliser, power, petrochemicals, food, paper and pulp, nuclear power . . . **L&T** has wide representation in a number of countries where technical assistance is offered to prospective buyers.

LARSEN & TOUBRO LIMITED

REGISTERED OFFICE AND HEAD OFFICE

L&T House, Ballard Estate
P. O. Box 278,
Bombay 400 038
Telephone : 268181
Telegram : LARSEN BRO
TLX 011-2246, 3528 & 5511

Group IV Divisions:

Bottle Closures, Eutectic,
Machinery, Valve:

'Bakhtawar', Ground Floor,
Nariman Point,
P. O. Box 304,
Bombay 400 021
Telephone : 230506
Telegram : LANDTISALE
TLX : 011-2669 & 5704

Group V Divisions:

Brown Boveri, Electric Furnace,
Electric Motors:

'Bakhtawar' 9th Floor, Nariman Point,
P. O. Box 304,
Bombay 400 021
Telephone : 230506
Telegram : LANDTISALE
TLX : 011-2669 & 5704

Paper & Pulp, Steel Plant Divisions:

3B, Shakespeare Sarani
P. O. Box No. 619
Calcutta 700 071
Telephone : 442301
Telegram : LARSEN BRO
TLX : 021-7331 & 2762

Vice President (Delhi):

Gulab Bhavan
6 Bahadur Shah Zafar Marg
P. O. Box 7025
New Delhi 110 002
Telephone : 272391
Telegram : LARSEN BRO
TLX : 031-2315

POWAI WORKS WEST

Saki Vihar Road, P. O. Box 8901
Bombay 400 072
Telephone : 581401
Telegram : POWAIWORKS
TLX : 011-2693 & 2698

POWAI WORKS EAST

Saki Vihar Road, P. O. Box 8901
Bombay 400 072
Telephone : 581401
Telegram : POWAIWORKS
TLX : 011-2694 & 2695

MADH WORKS

Near Custom House, Versova Creek
Madh Island
Bombay 400 058
Telephones : 695231/32
Telegram : CHRISLONG
TLX : 011-2003

BANGALORE WORKS OFFICE

38 Cubbon Road
Bangalore 560 001
Telephones : 56179, 57028
Telegram : LANDTWORKS
TLX : 0845-476

FARIDABAD WORKS

12/4 Milestone
Delhi Mathura Road
Faridabad 121 003
Telephone : 825314
Telegram : LANDTWORKS
TLX : 0343-208

REGIONAL OFFICES

'Bakhtawar' 8th Floor, Nariman Point
P. O. Box 304,
Bombay 400 021
Telephone : 230506
Telegram : LANDTISALE
TLX : 011-2669 & 5704

3B Shakespeare Sarani
P. O. Box 619
Calcutta 700 071
Telephones : 442301/8 lines
Telegram : LARSEN BRO
TLX : 021-7331 & 2762

32, Shivaji Marg
P. O. Box 6223
New Delhi 110 015
Telephone: 582644
Telegram: LARSEN BRO
TLX: 031-2207 & 2327

9/10 Club House Road
Mount Road
Post Bag 5247
Madras 600 002
Telephones: 82141/8
Telegram: LARSEN BRO
TLX: 041-270 & 7611

BRANCH OFFICES

20, Promenade Road, Frazer Town
P. O. Box 5098
Bangalore 560 005
Telephones: 577581/3
Telegram: LARSEN BRO
TLX: 0845-275

206 'Yash Kamal'
Lokmanya Tilak Road
Baroda 390 005
Telephone: 65419
Telegram: LARSEN BRO
TLX: 0175-252

Shri Guru Tegh Bahadur Complex
P. O. Box 329
Bhopal 462 003
Telephones: 64077/8
Telegram: LARSEN BRO
TLX: 0705-205

No. 32, Sector 26, Madhya Marg
Chandigarh 160 026
P. O. Box 14, Chandigarh 160 017
Telephones: 22350/1
Telegram: LARSEN BRO
TLX: 039-221

Ravipuram Junction
P. O. Box 1723, Ernakulam
Cochin 682 016
Telephones: 31513, 32786
Telegram: LARSEN BRO
TLX: 0885-225

E-61 Bidhan Nagar
Durgapur 713 212
Telephone: 5852
Telegram: LARSEN BRO
TLX: 020-208

5-10-173 Fateh Maidan Road
P. O. Box 12
Hyderabad 500 004
Telephones: 32488, 32489, 32480
Telegram: LARSEN BRO
TLX: 0155-201

B-17 Shiv Marg, Bani Park
P. O. Box 110
Jaipur 302 006
Telephone: 61064
Telegram: LARSEN BRO
TLX: 036-371

Speed Buildings, 3 Shahnajaf Road
P. O. Box 149
Lucknow 226 001
Telephones: 31261/2/3
Telegram: LARSEN BRO
TLX: 0535-210

E-139, D. B. Bandodkar Marg
Miramar, P. O. Box 109
Panaji, Goa 403 001
Telephone: 2077
Telegram: LARSEN BRO
TLX: 0194-234

L&T House, Public Sector
Rourkela 769 005
Telephones: 5005, 5816
Telegram: LARSEN BRO
TLX: 063-201

REPRESENTATIVES

At Ahmedabad, Bhilai, Bhubaneshwar,
Bokaro, Coimbatore, Dehra Dun,
Faridabad, Gauhati, Jabalpur, Jammu,
Jamshedpur, Kota, Madurai, Nagpur,
Patna, Pune, Ranchi, Trivandrum,
Udaipur, Varanasi and Visakhapatnam.

SUBSIDIARY COMPANIES

Engineering Construction
Corporation Limited
L&T-McNeil Limited
Utkal Machinery Limited

ASSOCIATE COMPANIES

Audco India Limited
Eutectic Welding Alloys of India Limited
Hindustan Brown Boveri Limited
Tractor Engineers Limited

POSTAL INFORMATION

Personal Memoranda

Name Jamal Ara,

Address M/7 (Single), P.O. Hasmu Housing Colony

Ranchi - 834012

Telephone No. Office _____ Residence _____

Telegraphic Address _____

Motor Car No. _____

Motor Licence Renewal Due _____

Life Insurance Policy No. _____

Premium Due _____

Wireless Licence Due _____

General _____

January 1979

Thousands of Birds threatened

3 wednesday Copenhagen, Jan. 23 (AP).

Thousands of birds were threatened today as an estimated 500 tons of heavy fuel oil from a Swedish tanker drifted towards the ice-rimmed shores of the Djursland peninsula on the east coast of Jutland.

Ornithologists estimated some 1,000 or more than 100,000 birds in the area had already died or were dying as the oil spread in the water and penetrating to the beaches in a few places.

London Express - 24-1-79

4 thursday

DECEMBER

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January 1979

5

All the sanctuaries and N. Parks are created by executive order only. It appears that not even the Forest Department have taken any steps to persuade Government to convert all the sanctuaries and N. Parks by enacting legislation. Until that is done the legal position is rather precarious

News letter for bird watchers vol. 9, number 9, Sept. 1969-

6

Avifauna of Sikkim p. 3. Saturday

Large green-tailed Malkoha (Rhopodytes tristis) A shy long-tailed member of the cuckoo family. This bird which can be recognised easily because of its long black tail spotted with four pairs of large white patches, the rest of the bird looks black, especially because

- - - The poor light in which it is generally seen.

Dalma hill

FEBRUARY						
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PTO

January 1979

7

sunday N. L. F. Bird Watcher.
Vol XIX NO 1 January 1979
Green-billed Malkoha.

No birds in Palma Hill by A. Kumar

Mr. P. K. Sen Gupta had some
bird watching notes on
Bihar birds e.g. Birds of Monegkys
(Foot-), Palna, Sand' island of
Palna Ganeps (reached by
boat-), & Dhanbad.

1972
weekly memo

DECEMBER

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January 1979

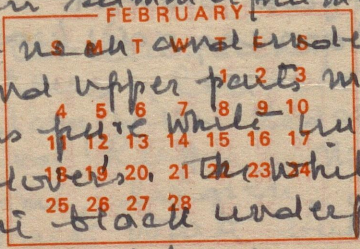
P. K. Sen Gupta

Monday

8

During the yrs. 1948-1951 when he was posted in Palna, he had occasion to examine different live species of migrant waders which were snared in winter by the bird catchers of Gutzembergh, a suburb of Palna and hawked daily during the season to the residents of Palna. By arrangement with these dealers their birds used to be brought to his residence and various specimens were purchased by him for detailed study and identification since he had to go out of Palna on tour some time, the records are not continuous but are rather important as regards the occurrences of various species & the dates of their arrival.

1, Grey plover - Collected 25 Sept. 1948, 21 Sept. 1949. The specimens were shot in summer plumage, with cheek, sides of neck and underparts up to vent black, and upper parts mottled grey. The vent was pure white. Unlike the Asiatic Golden Plover, the white band bordering the black underparts from forehead up to abdomen was noted in his specimen but in some birds this is illustrated



January 1979

10 wednesday as partly concealed under the wing. Fisher's Bird Recognition has correctly illustrated the full band.

2. Eastern Golden Plover (*Pluvialis dominica*) the specimen came into his hand on 30 August 1950 was still in summer plumage. The bright gold, white and black coloration was unmistakable. another bird was seen with the hawkers on 9 Sept. 1948, also in summer dress.

3. Eastern Curlew, (*Numenius arquata*) the bird with marine habitat came in the catcher's bag on 26 Sept. 1950,

11 ^{thursday} along with green shank, Red shank, and Eastern Knot. It was in winter plumage and its wing pattern was as shown in Witherley's HANDBOOK, plate 108. Its tapered and decurved bill was 5 inches and body 14 inches. total 19 inches. Height of leg 6 inches.

This bird occurs commonly in winter in Bengal on the sea front of the Sunderban area and it is often brought to Calcutta from Port-^{DECEMBER} Canning ^{air} head.

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January 1979

4. Black-tailed Godwit, (*Limosa limosa*) 12
 Collected 21 Sept. 1949, 30 Aug. 1950.
 These were in winter plumage without
 any chestnut on lower parts. The birds
 are snared in considerable numbers
 around Palra.

5. Turnstone, (*Arenaria interpres*)
 A male was procured on 19 Sept. 1950,
 and it remained captive with him for
 a week in his garden, with its feet
 tied lightly with a string fastened to
 a tree. Size about a inches. It was
 interesting to watch the bird turn over
 stones and small impediments in its
 beak - in search of insects, as it does
 in the wild. 13

6. Eastern Knot, (*Calidris tenuirostris*)
 Obtained in 1950 on 30th and 31
 August, and 26 Sept. The first 2 birds
 were in partial summer plumage
 with chestnut breast. The third
 bird was a female in winter plumage.

7.

FEBRUARY						
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 Little Sandpiper, (*Calidris testaceus*).
 Collected on 23 Sept. 1949,
 along with the Red Shank, Greenshank,
 and R. Its beak (37 mm) was
 faintly bluish, and decurved. Under
 parts white but breast faintly

January 1979

14 sunday streaked brown. Size 7 1/2 in. The rump being white, the specimen was not a Dundin which it resembles.

8. Red-necked phalarope, the single specimen collected on 20 Sept. 1950 was in winter plumage, 7 in. long. It was daintily and sprightly bird with slender pointed bill which adorned the handsome black and white head.

The phalaropes have webbed toes, fringed with skins, and when the bird was put by him in a bath-tub it swam buoyantly. It remained alive for 2 days. Unlike other birds, it is the female of the species which rather aggressively courts the male and so the male has been described by a poet as follows:—

"The Phalarope, besides Red-necked, is also horribly hen-pecked."
Liliput, May 1949.

DECEMBER

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January 1979

Other Waders: —

monday

15

Other Common Waders which were snared and shown to him were winter year in early winter, were mostly in winter plumage: —

Little Ring Plover (27. 20. 51.) spotted Redshank (14. 9. 50); Common Redshank (marginal white crescent in wing) 3. 8. 49; Green shank (31. 7. 50); Green sandpiper (3. 8. 49); Wood Sandpiper (19. 8. 51); Common Sandpiper (30. 8. 50); Little stint (26. 9. 50); Temminck's stint (31. 7. 50); Ruff and Reeve (31. 7. 50); Blackwing ^{tuesday} still (Resident & local migrant) 6. 10. 49.

16

Previous Records

In J. Bombay Nat. Hist. Soc. Vol. 40, p. 338, P. D'Abreu reports that while at Palna bird catches brought to him Turnstone (a young male) in Sept. 1937, and a Red necked

Phalarope (female) in Nov. 1937, both in winter plumage. Earlier in the same journal he reports (Vol. 39: 419) from Chaugach (Palna) the

FEBRUARY													
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January 1979

17 wednesday occurrence of different species of Waders of Patna Dist.

Mr. D'Abreu has listed all the birds mentioned by Sen Gupta besides Whimbrel, Bar-tailed God-wit; Avocet; Eastern Broadbilled Sandpiper, Marsh Sandpiper; and Common Sandpiper. Patna is on the river route connecting the sea front it is possible that Waders favouring marine habitats straggle in land along this route. It will be seen that

18 we had come across some very rare thursday and interesting species which in their wintering ground, generally frequent coastal areas and rarely visit inland, e.g. Red-necked Phalarope, Turnstone.

DECEMBER

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January 1979

19

Describing the calls of birds, Friday
and think about how to convey them
in words. One way would be to
tabulate the descriptions: ~~For~~ As for
ex. ampl: —

Tailor Bird call	Salim	Whistler	Terdan	J. Ara

Some bird sounds are extremely
difficult to describe, but the challenge
must be accepted. Similarly, describing
the flight-patterns would be
fascinating.

20

FEBRUARY

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