JILTA

ILTA
Since 1950

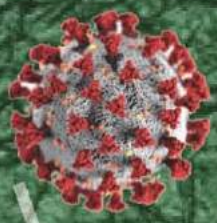
JILTA 2021
2022

Journal of Indian Leather Technologists' Association

VOLUME : LXXII NO : 12 DECEMBER, 2021

Rgtn. No. KOL RMS/074/2019-21
Regd. No. ISSN 0019-5738
RNI No. 2839/57
Date of Publication: 6th

₹ 50.00



Our Activities

- An Association with over 600 members from India and abroad working since last 68 years for the growth and development of Leather and its allied industries.
- Organize seminars, symposiums, workshops in order to share information, knowledge & latest development and interactions for the benefit of all concerned.
- Organize Human Resource Development programmes on regular basis.
- Publish for over 60 years, a technical monthly journal namely "Journal of Indian Leather Technologists' Association" (JILTA), widely circulated through out the World.
- Publish books for the benefit of the students at various levels of study, for the Research Scholar and the Industry.
- Work as interface between Industry and the Government.
- Assist Planning Commission, various Government Institutions, Ministry and autonomous bodies to formulate appropriate policies for the growth of the Industry.
- Assist small and tiny leather goods manufacturers in marketing their products by organizing LEXPOs in Kolkata and different parts of India.

Indian Leather Technologists' Association

[A Member Society of International Union of Leather Technologists' and Chemists Societies (IULTCS)]

'Sanjoy Bhavan', 3rd Floor, 44, Shanti Pally, Kolkata- 700 107, WB, India
Phone : 91-33-2441-3429 / 3459 ✸ WhatsApp +91 94325 53949
E-mail : admin@iltaonleather.org; mailtoilta@rediffmail.com
Website : www.iltaonleather.org

JOURNAL OF INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION (JILTA)

DECEMBER, 2021 VOL.: LXXII NO.: 12 RNI NO.: 2839/57 REGD.NO.: ISSN 0019-5738

Contents

Hony. Editor : Dr. Goutam Mukherjee

Communications to Editor through E-mail :

admin@iltaonleather.org; jiltaeditor@gmail.com

Cover Designed & Printed by :

M/s TAS Associate

11, Priya Nath Dey Lane, Kolkata - 700 036

Published & Printed by :

S. D. Set, on behalf of Indian Leather Technologists' Association

Published from :

Regd. Office : 'Sanjoy Bhavan', 3rd Floor,

44, Shanti Pally, Kasba, Kolkata - 700 107

Printed at :

M/s TAS Associate

11, Priya Nath Dey Lane, Kolkata - 700 036

Subscription :

Annual	Rs.(INR)	400.00
Foreign	$ (USD)	45.00
Single Copy	Rs.(INR)	50.00
Foreign	$ (USD)	4.00

All other business communications should be sent to :

Indian Leather Technologists' Association

'Sanjoy Bhavan', 3rd floor, 44, Shanti Pally

Kasba, Kolkata - 700 107, WB, India

Phone : 91-33-2441-3429

91-33-2441-3459

E-mail : admin@iltaonleather.org;
mailtoilta@rediffmail.com

Web site : www.iltaonleather.org

JOURNAL OF INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION (JILTA)

Indian Leather Technologists' Association is a premier organisation of its kind in India was established in 1950 by Late Prof. B.M.Das. It is a Member Society of International Union of Leather Technologists & Chemists Societies (IULTCS).

The Journal of Indian Leather Technologists' Association (JILTA) is a monthly publication which encapsulates latest state of the art in processing technology of leather and its products, commerce and economics, research & development, news & views of the industry etc. It reaches to the Leather / Footwear Technologists and the decision makers all over the country and overseas.

Advertisement Tariff

Full Page / per month

Black & White	Rs. 5,000.00/-
Colour (full page)	Rs. 10,000.00/-
Colour Insert (One side) (Provided by the Advertisers)	Rs. 5,000.00/-

Full Page / per anum

Front inside (2nd Cover)	Rs. 96,000/-
3rd Cover	Rs. 84,000/-
Back Cover	Rs. 1,20,000/-

Mechanical Specification

Overall size	:	27 cm X 21 cm
Print area	:	25 cm X17 cm

Payment should be made by A/c. Payee Cheque to be drawn in favour of :

Indian Leather Technologists' Association
and Payable at **Kolkata**

Send your enquiries to :

Indian Leather Technologists' Association
'SANJOY BHAVAN'
3rd floor, 44, Shanti Pally, Kasba, Kolkata – 700 107
Phone : 91-33-24413429 / 91-33-24413459
E-mail : admin@iltaonleather.org / mailtoilta@rediffmail.com
Website : www.iltaonleather.org

INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION (ILTA)

(Member Society of International Union of Leather Technologists and Chemists Societies)

Executive Committee (2019-21)

Central Committee

President : Mr. Arnab Jha

Vice-Presidents : Mr. Asit Baran Kanungo
Dr. K. J. Sreeram
Mr. P. K. Bhattacharyya

General Secretary : Mr. Susanta Mallick

Joint Secretaries : Mr. Bibhas Chandra Jana

Treasurer : Mr. Kaushik Bhuiyan

Committee Members:

Mr. Jayanta Chaudhury
Mr. Pradipta Konar
Mr. Subir Datta
Mr. Aniruddha De
Mr. Ratan Chowdhury
Mr. Kunal Naskar
Mr. Alokesh Ray
Mr. Sudagar Lal
(Secretary of Northern Region)
Dr. R. Mohan
(Secretary of Southern Region)

Ex-Officio Member : Dr. Goutam Mukherjee

Regional Committees

Southern Region :

President : Mr. N. R. Jagannathan

Vice-President : Dr. J. Raghava Rao

Secretary : Dr. R. Mohan

Treasurer : Dr. Swarna V Kanth

Committee Members :
Dr. N. Nishad Fathima
Dr. P. Thanikaivelan
Dr. Subhendu Chakrabarti
Dr. S. V. Srinivasan

Northern / Western Region :

President : Mr. Jai Prakash Saraswat

Vice-President : Mr. Rajeev Mehta

Secretary : Mr. Sudagar Lal

Treasurer : Mr. Jaswinder Singh Saini

Committee Members:
Mr. Kamal Sharma
Mr. Mohinder Lal
Mr. Rajveer Verma
Mrs. Sunita Devi Parmar
Mr. Y. D. Mahajan

INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION (ILTA)

(Member Society of International Union of Leather Technologists and Chemists Societies)

Various Sub-Committees of ILTA

1) HRD Sub-Committee :-

Co-Ordinator : Mr. Ratan Chowdhury

2) Seminar Sub-Committee :-

Co-Ordinator : Mr. Subir Datta

3) Regional Activities Sub-Committee :-

Co-Ordinator : Mr. Pradipta Konar (Northern Region)
Mr. Jayanta Chaudhuri (Southern Region)

4) Membership Sub-Committee :-

Co-Ordinator : Mr. Bibhas Chandra Jana
Mr. Pradipta Konar

5) Welfare Sub-Committee :-

Co-Ordinator : Mr. Kaushik Bhuiyan
Mr. Jiban Dasgupta

6) LEXPO Sub-Committee :-

Co-Ordinator : Mr. Asit Baran Kanungo
Mr. Susanta Mallick

7) Placement Sub-Committee :-

Co-Ordinator : Mr. Kunal Naskar

8) Estate Management Sub-Committee :-

Co-Ordinator : Mr. Bibhas Chandra Jana
Mr. Kaushik Bhuiyan

9) Documentation & Filing Sub-Committee :-

Co-Ordinator : Mr. Subir Datta
Mr. Kaushik Bhuiyan

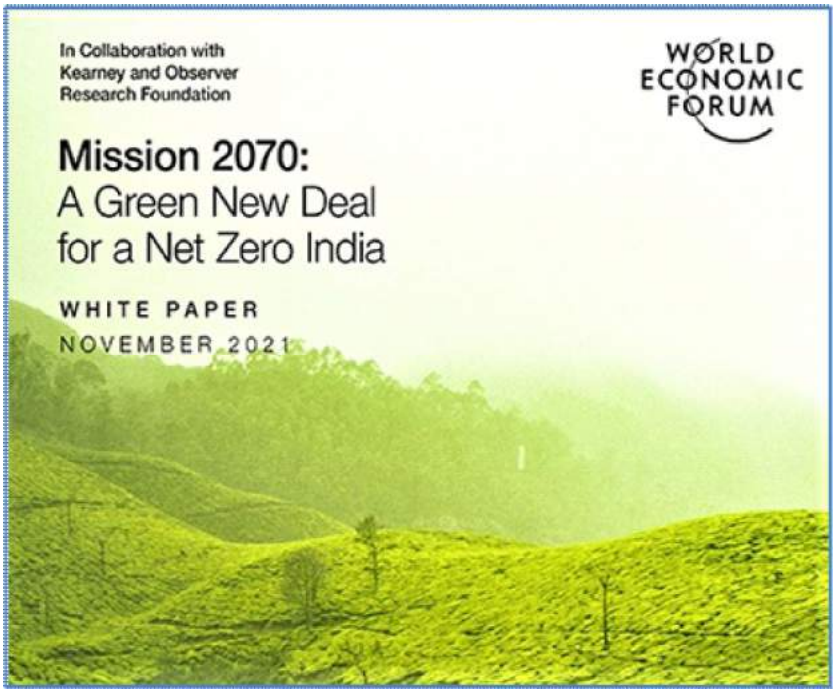
JOURNAL OF INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION (JILTA)

EDITORIAL BOARD OF JILTA


Leather Fraternity 71 years of service to the International

Mission Net Zero of India

India, the world's third-biggest emitter of greenhouse gases, has pledged to achieve net-zero carbon emissions by 2070. The ambitious commitment, made on 1st November at the high-stakes of COP26 climate meeting in Glasgow, UK, brings India in line with other big emitters, including the United States, China, Saudi Arabia and the European Union, which have made similar promises. Although scientists welcome the offering — which could contribute to the world limiting global warming to 1.5^{0}C — they also caution that India's pathway to carbon zero remains uncertain.



"It's an ambitious target," says Apurba Mitra, a climate-policy researcher in New Delhi with non-profit research organization the World Resources Institute. "It has put net-zero on the table."

"It's great; a very bold announcement," adds Vaibhav Chaturvedi, an economist at New Delhi think tank the Council on Energy, Environment and Water, who works with the Indian government on climate modelling.

The surprise announcement came less than a week after some of India's top politicians had said they would not set a deadline for when the nation might achieve net-zero emissions. Even most government officials had no idea it was coming, say researchers. At COP26— Prime Minister Narendra Modi further promised that India would expand its renewable, hydro and nuclear power capacity to 500 GW by 2030, and that half of the nation's power-generating capacity would be based on renewable energy by that year.

India will also reduce by one billion tonnes of carbon it is projected to emit this decade, he said, although the country has not yet made a formal submission to the United Nations Framework Convention on Climate Change.

The promises signal India's commitment and credibility. But the country now needs to lay out a clear road map for how it will achieve net zero — and establish monitoring mechanisms to ensure that emissions are falling. PM Modi did not specify what would be covered in India's pledge — all greenhouse gases, or carbon dioxide alone. That detail has also been missing from some other nations' initial net-zero pledges.

But the details matter, says Joeri Rogelj, director of research at the Grantham Institute for climate science at Imperial College London. Climate modeling shows that the world, on average, has to hit net-zero carbon dioxide emissions by 2050, and net-zero greenhouse-gas emissions by 2070, he says, to limit global warming to 1.5^{0}C above pre-industrial levels — the most aspirational goal of the 2015 Paris climate agreement.

If India's target for 2070 refers to all greenhouse-gas emissions, it will help the world on its path to the 1.5^{0}C goal. But, given India's developmental state, influence of pandemic and its

important needs to still lift large shares of its population out of poverty, this would be a very ambitious net-zero target for India". However, experts think it is more likely that India's plan is to reach net zero only for carbon dioxide by 2070, and not tie itself to commitments on other greenhouse gases. This would make it harder for the world to limit warming to 1.5^{0}C, he says. This would be less ambitious, yet still an important shift in India's perspective and how it visualizes its future. The world could still hit the 1.5^{0}C target if low- and middle-income nations take longer to reach net-zero carbon dioxide, even as long as wealthy nations set targets for even earlier than 2050. Even hitting net-zero for carbon dioxide alone by 2070 is very ambitious for India, say climate-policy researchers who have been working with India's government to model emissions-reductions scenarios.

The modeling is particularly complex and uncertain in the case of India. Most wealthy nations that have net-zero targets have already hit peak carbon emissions; their emissions are now beginning to fall, making it simpler to find downward trajectories. But, India is expanding its economy rapidly and its emissions peak is nowhere near the horizon. Modelers must account for India's emissions growth, find the probable peak and then explore pathways to net zero. All of this depends on how swiftly growing Indian cities will get urbanized, populated and developed. When multiplied out all these uncertainties, we end up with an enormous range of possible trajectories.

A report published last month by Chaturvedi and his colleague Ankur Malyan explores an emissions peak in 2040, followed by net-zero carbon dioxide in 2070. The scenario includes a 99% reduction of coal-based power generation by 2060, an increase in solar capacity to 1,689 gigawatts by 2050 — enough to power hundreds of millions of homes — and the large-scale development of hydrogen as a fuel source, among other drastic shifts. In a February report, the International Energy Agency modeled a scenario in which India hits net zero in the mid-2060s — a feat that, it notes, would require close to 200 gigawatts of battery capacity by 2040 to store solar and wind energy. That kind of capacity is unheard of globally at present. Such choices would require research and development into battery storage, hydrogen technology and smart grids which would signify that India's net-zero announcement is a clear signal to industry that it should invest in decarbonization.

Perhaps the biggest limitation for now is that Indian currently has just a handful of climate modelers. The capability is so limited. Many more expert houses will be required to guide the policies of the state and national governments in coming decades.

Goutam Mukherjee

Dr. Goutam Mukherjee
Hony. Editor, JILTA

As an active proponent of responsible chemistry, Stahl has established the Stahl Campus® training institute in its Center of Excellence for sustainable leather technologies in Kanpur. With our Stahl Campus® Leather Modules, we can offer training and information, such as responsible chemistry and sustainability in leather production. We believe that in this way, we facilitate transparency that inevitably will lead to a better supply chain with responsible chemistry.

Our approach is modular, making it easy to tailor learning programs to specific needs. Stahl Campus® has at its core the drive to unlock human potential and make that new competitive advantage. By providing the possibility of sharing knowledge, we embrace our role in the dynamic leather and chemical industry. Stahl Campus® is a great opportunity to strengthen skills and capabilities in order to make working methods more efficient by sharing experiences and studying products and procedures.

If you're interested to receive more information on Stahl Campus®, please contact Prasanna Maduri **(Prasanna.maduri@stahl.com)**.

If it can be imagined, it can be created.

campus.stahl.com

stahl
campus

Tanners are facing growing environmental challenges as the market increasingly demands that high-quality leathers are produced more responsibly. Contributing to a more ecological leather production process, our responsible beamhouse portfolio helps tanners meet these challenges without compromising on the quality of the leather.

The Stahl BeTan® portfolio consists of a complete range of responsible solutions for every step in the beam house and tanning process, from soaking to liming and bating. Using the best-in-class responsible technologies from the Stahl BeTan® portfolio, tanners can reduce their water consumption and the amount of sulfides, solids and salt used during leather production.

Moreover, it can result in a shorter production process. Building on years of experience in beam house operations and acquiring the best technical experts in the world, Stahl has become the go-to partner when it comes to sustainable beam house and tanning solutions. Our Stahl BeTan® solutions demonstrate Stahl's continuous commitment to Responsible Chemistry, aimed at reducing the environmental impact of leather-making.

If you would like to know more about Stahl BeTan®, and what we can do for your business, visit **stahl.com** or contact **david.sabate@stahl.com**

stahl.com

stahl

THE RENEWABLE CARBON INITIATIVE: LOOKING BACK ON A SUCCESSFUL FIRST YEAR

What a difference a year makes. As the business community steps up its efforts to tackle the climate crisis, at Stahl we're helping to drive the transition from fossil to renewable carbon to create a more sustainable and circular society. As a founding member of the Renewable Carbon Initiative (RCI), we'reflpartnering with leading innovators in renewable raw materials to extract our feedstocks from sustainable sources.

Stahl helped to launch the RCI on 20 September 2020. This first year of the initiative has seen impressive progress: from 11 founding members, the RCI now includes 30 member companies. As the initiative expands, we see opportunities to build direct relationships with more innovative downstream brands as they explore new ways to increase the amount of renewable content in their products. As is the case for the other RCI members, our aim in joining this important initiative is twofold: to dramatically improve our environmental impact, but at the same time, to help our partners and customers achieve their sustainability goals.

Relegating fossil feedstocks to the history books

By actively promoting solutions to enable a shift from fossil-based resources to renewable feedstocks, the RCI helps companies adapt to today's changing regulatory landscape. Soon, larger companies will have to report their greenhouse gas (GHG) emissions and the footprint of their products as part of legislative changes surrounding the European Green Deal. Reporting on GHG emissions will also include Scope 3 emissions, which include the indirect emissions occurring in a company's supply chain where the used raw materials account for a large proportion of the footprint.

This is where the origins of chemicals and plastics come into play as an important contributor to the carbon footprint. Without a shift from fossil to renewable feedstocks (namely bio-based, CO_2-based, and recycled content), a sustainable future and the Paris Agreement's climate targets will almost certainly remain out of reach. That's why Stahl is joining like-minded organizations in championing renewable carbon. Sustainability starts at home, of course, and within Stahl we've begun developing renewable carbon-based products from biomass feedstock and captured carbon. And we're developing innovative techniques to accelerate the commercialization of renewable feedstock-based products achieved through pyrolysis of recycled plastics.

Michael Costello, Group Director of ESG at Stahl: "*If the world is to achieve the 1.5°C global warming targets set at the 2015 Paris Agreement (and updated at the COP26 in Glasgow, in November 2021), we all need to reduce GHG emissions. The chemical industry can do this by de-fossilizing its supply chain, using renewable carbon sources instead of petrochemical-based products. This is our challenge, as a company and as an industry, and it is the reason why the Renewable Carbon Initiative was formed*."

More to come in year two

If year one focused largely on getting the message across to a wide audience and attracting new members, during its second year, the RCI plans to gain a comprehensive understanding of the future political framework conditions in Europe and around the globe. These conditions are likely to play an ever-greater role in determining the future of chemistry and materials. Building on this knowledge, the topic of renewable carbon can then be systematically integrated into new political directives.

For the world's policymakers, much of the focus is on developing a strategy to decarbonize the energy sector. However, this strategy cannot be applied to the chemical and material fields, where fossil resources remain an indispensable central building block. What's more, the demand for carbon in the chemical and materials sectors is expected to more than double by 2050. To meet this demand sustainably, the only option is to shift toward climate-friendly alternatives to fossil carbon.

Signs of progress

But there's good news: for the first time in industrial history, it's possible to decouple chemistry and essential materials from petrochemicals and fully meet demand through biomass and recycled feedstocks. The faster we reduce the use of additional fossil carbon from the ground and the sooner we use alternative feedstocks at scale, the less we'll need to rely on removing huge amounts of CO_2fIfrom the air to meet the world's climate goals.

Having seen the benefits of the RCI first hand, Stahl encourages like-minded organizations to join this unique network of pioneers for renewable chemicals and materials and to bring innovative ideas and further momentum to the renewable carbon strategy. Exciting new developments are in the pipeline, and in the coming weeks, a new business platform will be launched: the Renewable Carbon Community (RCC). Its role will be to further facilitate the communication and networking between member companies so they can sharpen their focus on getting renewable carbon firmly embedded in the political agenda. At Stahl, we look forward to another year of progress in this and many other areas.

(Stahl News – 28/10/2021)

From the desk of General Secretary

LEXPO IN KOLKATA AND SILIGURI

- After a thorough review of the Covid situation and discussion with ILPA (the organizing partner) time to time, the Kolkata LEXPO – XXXXI has been planned to be organized at Kolkata Ice Skating Rink from 8th to 16thJanuary' 2021.38 no. of stalls will be there, out of which 8 stalls will be of 12 sq. mtr. and 30 of 9 sq. mtr. Around 10 stalls have been booked so far at present.

  Members of ours & other associations and quality leather goods manufacturers, traders are exporters are welcome if they are interested to participate in the fair.

- The Siliguri LEXPO – XXVI was proposed to be organized at KanchanjungaKriranganadjacent Ground, Siliguri from 26th December'2021 to 10th January' 2022. Provisional allotment of the ground was obtained a few weeks back. The competent authority for ground allocation has informed us that due to some unavoidable circumstances the ground is not available for the aforesaid period. Still the discussion is going on for the next possible period to organize the event, which is subject to be approved by the Executive Committee.

However, latest progress and status report regarding organizing both the proposed fairs will be informed in due course.

20TH SANJOY SEN MEMORIAL LECTURE

It is proposed that the above will be organized by our association on Friday the 14th January' 2022 as usual.

The details of the programme will be communicated in due course.

4TH PROF. S. S. DUTTA MEMORIAL LECTURE

It is proposed that the above will be organized by our association on Wednesday the 2nd February' 2022 as usual during India International Leather Fair 2022 at Chennai. Last year it was organized on virtual platform due to COVID situation and this time It is under consideration whether it can be organized physically, if the IILF 2022 is going to be organized physically.

The details of the programme will be communicated in due course.

(***Susanta Mallick***)
General Secretary

YOUTUBE CHANNEL & FACEBOOK PAGE OF ILTA

An official **YouTube Channel** namely **ILTA Online** and a **Face Book Page** namely **Indian Leather Technologists' Association** has been launched for sharing the activities of our Association since November' 2020 and July' 2021 respectively.

You may find all the Lives / Video recordings of different Seminar, Symposiums & Webinars on both of these social medias along with our website **www.iltaonleather.org** time to time.

You are requested to kindly do **Like** & **Subscribe** the YouTube Channel and **''Follow**' the FaceBook Page to get regular updates on the activities of our Association.

RECEIVING HARD COPY OF JILTA EVERY MONTH

Members want to have the hard copy of JILTA every month or any particular issue, kindly inform us by email or post, whichever is convenient.

In case we do not receive any communication from you for a hard copy, we will continue sending e-copy of the same to your email id available with us. You may please verify your email id with our office at the earliest.

PUBLISH YOUR TECHNICAL ARTICLE

Faculties, Research Scholars and students of various Leather Institutes may wish to publish their Research / Project papers in an Article form in this monthly technical journal, JILTA.

Interested author may sent their paper (in MS Word format) along with a PP Photograph and Contact details like Email, Mobile etc. to our email IDs : admin@iltaonleather.org / jiltaeditor@gmail.com

Members are requested to :-

a) Kindly inform us your '**E-Mail ID**', '**Mobile No**', '**Land Line No**', through E-Mail ID: admin@iltaonleather.org or over Telephone Nos. : 24413429 / 3459. This will help us to communicate you directly without help of any outsiders like Postal Department / Courier etc.

b) Kindly mention your **Membership No.** (If any) against your each and every communication, so that we can locate you easily in our record.

General Secretary and the Members of the Executive Committee are available to interact with members at 19.30 hrs, over Phone / Conference call on every Thursday

ILTA
Since 1950

INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION

[A Member Society of International Union of Leather Technologists' and Chemists Societies] (IULTCS)]

presents

THE HERITAGE LEATHER FAIR

LEXPO XXXXI

LEXPO-XXXXI

Exhibition cum sale on
Export Quality Leather Products

at

CALCUTTA
ICE SKATING RINK

● Date : 8 - 16 January' 2022 ● Time : 11 am to 8 pm every day

in collaboration with

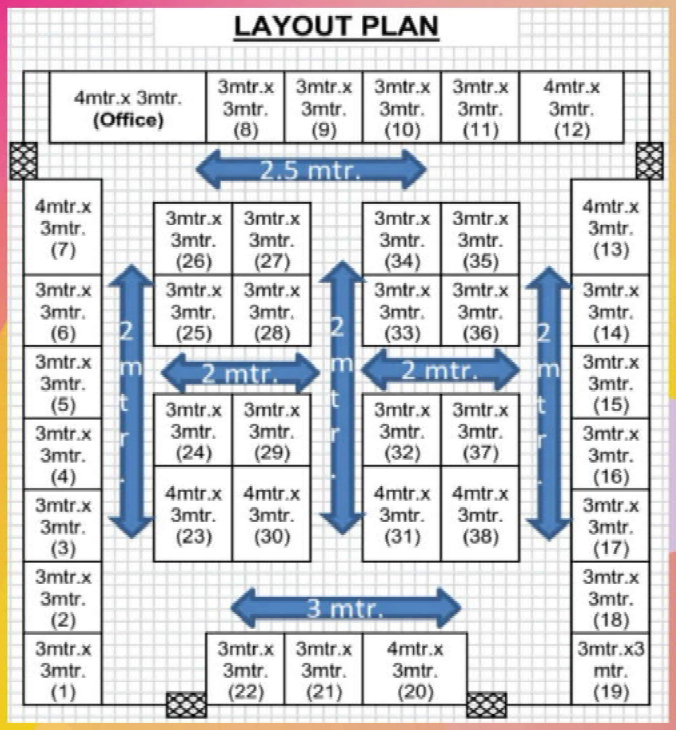
for details please contact

Indian Leather Technologists' Association

'Sanjoy Bhavan', 3rd Floor, 44, Shanti Pally, Kolkata- 700 107, WB, India
Phone : 91-33-2441-3429 / 3459 ✠ WhatsApp : +91 94325 53949
E-mail : admin@iltaonleather.org; mailtoilta@rediffmail.com
Website : www.iltaonleather.org

LAYOUT PLAN KOLKATA LEXPO - XXXXI

LAYOUT PLAN



LEXPO-XXXXI

This year LEXPO is going to be organized by ILTA in collaboration with ILPA at Kolkata Ice Skating Rink from 8th to 16th January' 2022.

Most of the participants will be manufacturer and exporter of genuine leather products to Europe, UK and USA for the top running brands of the World.

Therefor the exhibited products will be of highest quality made of genuine leather produced in a pollution free environment and at quite reasonable cost to clear out their surplus stock.

The visitors will get the opportunity to come across top quality leather made products sold in different corners of the World and will be able to buy at reasonably attractive price.

LEXPO A OVERVIEW

LEXPO – Leather Exposition to reach people interested to know and buy genuine leather products.
ILTA has been organizing LEXPOs to promote and provide marketing facilities to keep pace with the latest design and technology to have better interaction with the domestic buyers of leather goods as well as providing the marketing outlet to the quality leather goods manufacturer. ILTA has been organizing this leather trade fair since 1977 in Kolkata, since 1992 at Siliguri and since 2010 at Durgapur and also in other states like Jharkhand, Orissa, Assam, Sikkim etc.
LEXPO was a total leather exposition in the National level and used to be conducted in star hotels up to year 1981 as Buyer/Seller Meet. In the year 1982, LEXPO was reoriented to reach out to the domestic market along with the export market and was shifted to the open ground of Kolkata Maidan. And thereafter in different grounds like Yuba Bharati Krirangan, Park Circus Maidan & Geetanjali Stadium etc.
Today LEXPO has become a popular people's fair and provides the visitors / buyers a very wide range of options to select the products made of genuine leather as per their taste and budget.

ILTA

Indian Leather Technologists' Association previously known as Leather Technologists' Association (India) was formed in the year 1950, under the Presidentship of Prof. B. M. Das and General Secretaryship of Prof. Moni Banerjee. It was incorporated in the year 1957 under Indian Companies Act' 1956.
The prime motto of the association was to work with all segments of people sincerely devoted to the cause of Leather and allied Technology all around the World. Through the Regional Centers, ILTA strives to bring the Technologists around the country closer together and now have more than 600 members in different categories country and worldwide.
In the past the Association has been headed by many stalwarts, like Padmashri Dr. Y. Nayudamma, Padmashri Nagappa Chettiar, Mr. V. P. Pandit, Mr. S. P. Pandit, Mr. Sanjoy Sen a past IULTCS President who are reckoned with great respect in the Leather Industry.
ILTA represents the country as one of the Member Society of the "International Union of Leather Technologists and Chemists Societies (IUTCS)" the foremost body of its kind in the world since 1956.

ILPA

The Indian Leather Products Association (ILPA), established in 1987, is a premier representative body of manufacturers and exporters of leather and leather products across the country with head office in Kolkata and a Regional Office in Chennai.
ILPA works actively to bring together manufacturer–exporters and merchant-exporters of leather products of India on a common platform to stimulate growth and development of the leather sector.
It strives to develop and maintain a reciprocal relationship with professional bodies, import associations and the Chambers of Commerce abroad in order to support and promote export of leather products.
It regularly undertakes the market surveys / studies in foreign countries, organizing and participating in International and National Trade Fairs / Exhibitions, Workshops and Seminars.
It strives to provide a host of services and activities to the leather goods industry at very reasonable charges.
It provides training and skill-development to the underprivileged youth of rural Bengal and helps them with job placements within the industry.
Kolkata is a major production hub of premium quality leather goods supplying to many renowned brands and retail departmental chains across the world and almost all the major units are the members of ILPA.

Major Activities and Achievements of ILTA

- ILTA has been publishing a technical journal, known as "Journal of Indian Leather Technologists Association (JILTA)" and now getting published on monthly basis since 1959 with a Worldwide circulation.
- Other than publication of Journals & Directories, ILTA has published the following Text & Referral books also for the students of Leather Technology:
  - "Analytical Chemistry of Leather Manufacture" by Prof. P. K. Sarkar,
  - "An Introduction to the Principles of Leather Manufacture" by Prof. S. S.Dutta,
  - "An Introduction to the Principles of Physical Testing of Leather" by Prof. S. S. Dutta,
  - "Practical Aspects of Upper Leather" by Mr. J. M. Dey,
  - "Comprehensive Footwear Technology" by Mr. Somenath Ganguly,
  - "Treatise on Fatliquors & Fatliquoring of Leather" by Dr. Samir Dasgupta,
  - "Synthetic Tanning Agent" by Dr. Samir Dasgupta,
  - "Handbook of Tanning" by Prof. B. M. Das
- ILTA as the pioneer organization in Indian Leather Industry organized few of many events since its inception:

  1956 – First All India Leather & Allied Products Exhibition at Indian Museum, Calcutta.

  1956 – The first symposium on Chrome Tanning under guidance of Prof. B. M Das & Mr. Sanjoy Sen.

  1960 – Published the first All India Leather Directory.

  1999 – The International Congress of IULTCS at Chennai for the first time in any Asian Country in support of CLRI.

  2001 – The first South Asian Conference during Golden Jubilee Celebration.

  2004 –The first initiative to unite the industry into a hub through formation of CLCTA and played an important role, being an integral part of the CLC Implementation Committee formed by the State Govt., for implementation and its inauguration in 2005.

  2010 – The 8th Asia International Conference of Leather Science & Technology at Kolkata during its Diamond Jubilee Celebration.

  2013 – Series of lectures arranged in Kolkata under the title "PrIEST" [Programme for Implementing Emerging and Sustainable Technologies].

  2017 – The International Congress of IULTCS at Chennai for the second time in support of CLRI.

  All these were separate milestones to earn the jewels on its crown.
- ILTA observes its Foundation Day celebration with "Prof. B. M. Das Memorial Lecture" on 14th August, "Sanjoy Sen Memorial Lecture" on 14th January, Prof. S. S. Dutta Memorial Lecture on 2nd February and Prof. Moni Banerjee Memorial Lecture on 15th March, when besides delivering prestigious memorial lectures, our Association felicitates the toppers (1st Class 1st) of M.Tech & B.Tech in Leather & Leather Footwear Technology Examination from different institutes countrywide.
- ILTA has been organizing since 1977, trade fairs & exhibitions of Leather, Leather Goods & Allied Products in different part of country under the trade name of LEXPO, to create mass awareness about utility of leather and leather products and providing a direct window for interaction among the end users and manufacturers for their self-sustainability and development.
- ILTA organizes HRD Programs for Skill Development and Technological Upgradation (STUP) and artisan and skilled manpower training with the objective of making themself-employed and to cater to the industry in a better way.
- In different times ILTA organizes seminars / webinars and workshops to benefit the industry about technological advancements and developments. It also offers services to the Union and State Governments in various advisory capacities and is an integra part of Bureau of Indian Standards.
- The members of our Association are attached to different councils and governing bodies of technological institutions where they have commendable contributions.

ILTA
Since 1950

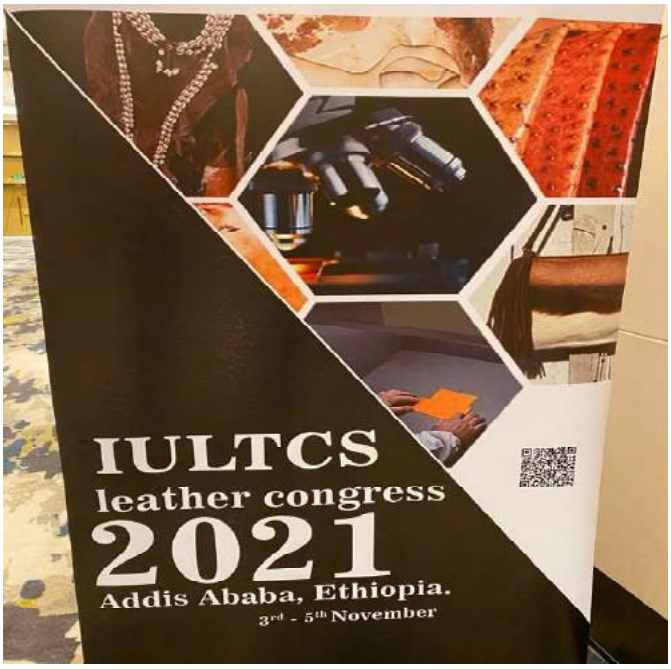
Indian Leather Technologists' Association

[A Member Society of International Union of Leather Technologists' and Chemists Societies]

'Sanjoy Bhavan', 3rdFloor, 44, Shanti Pally, Kolkata- 700 107, WB, India
Phone : 91-33-2441-3429 / 3459 ✠ WhatsApp : +91 94325 53949
E-mail : admin@iltaonleather.org; mailtoilta@rediffmail.com
Website : www.iltaonleather.org

INTERNATIONAL UNION OF LEATHER TECHNOLOGISTS AND CHEMISTS SOCIETIES

THE XXXVI IULTCS BIENNIAL CONGRESS IS SUCCESSFULLY COMPLETED



The XXXVI biennial Congress of the International Union of Leather Technologists and Chemists Society (IULTCS), hosted by Africa Leather and Leather Products Institute (ALLPI) in conjunction with the Ministry of Industry of Ethiopia, from 3rd to 5th November, 2021, has been successfully completed at the Skylight Hotel, Addis Ababa, Ethiopia.

Due to the COVID-19 pandemic limitations, the IULTCS Congress, was conducted in a hybrid mode, with both face-to-face and online participants, for the first time in the Union's 120 years' experience. The three-day Congress was attended by over 240 participants from many countries from all continents. A total of 36 oral and more than 70 poster presentations were made on diverse areas of technology, chemistry and science of leather making and environmental sustainability. The online system also facilitated recordings of all presentations and discussion, which will remain available to registrants for reviewing at their leisure during the next two months.

The Congress was steered by the ALLPI Expert Team led by Professor Mekonnen Hailemariam, with 16 well-known scientists, researchers and professionals in the leather sector as moderators from across the different continents.

At the official opening ceremony of the Congress the IULTCS anthem was played and the Union's flag was raised. Welcome messages and a keynote speech were provided by Mr Ghebregziabher Ghebremedhin, Acting Executive Director, ALLPI, Dr Luis Zugno, President of IULTCS and His Excellency Mr Tekalegn Bululta, State Minister, Ministry of Industry, the Federal Democratic Republic

of Ethiopia. The opening was followed by the presentation of the IULTCS 2021 Merit Award for Excellence in the Leather Industry and then the prestigious keynote lecture of the Congress, the Heidemann Lecture.

IULTCS 2021 Merit Award for Excellence in the Leather Industry was presented to Dr T Ramasami, renowned for his very significant contributions to the chemistry of chromium as a scientist and his leadership in the Indian leather sector for many years.

The Heidemann Lecture was delivered by Professor Anthony Covington, who has authored over 300 technical publications, received the IULTCS Merit Award for Excellence in the Leather Industry in 2009, and the Alsop Award for Outstanding Scientific Contribution to the Leather Industry from the American Leather Chemists Association in 2011.

Following the official opening and the Heidemann's Lecture, the three days were divided into different sessions for oral and visual poster presentation of scientific papers. The scientific papers presenters were from all over the world and participants had the opportunity to ask them questions directly on-line and make comments. All the sessions went smoothly in a hybrid mode. The presenters were also honored with a certificate of merit.

Day 1 had 3 oral and 2 poster sessions. A total of twelve papers were presented in oral sessions; they presented new developments with regards to cleaner technologies for the leather processing, composite

materials and utilization of leather waste resources, and Environmental Management Technologies in the leather industry.

Day 2 followed with 4 oral and 3 poster sessions. The papers presented in the oral sessions were 16 in number and focused on the areas of intelligent manufacturing of leather products, cleaner technologies for the leather processing, leather chemicals. As well as Environmental Management Technologies, leather industry entrepreneurship and progress towards sustainability.

Day 3, the final day, had 2 oral and 2 visual poster sessions. The topics and contents of the orally presented scientific papers, that were 9 in number, focused on the areas of scientific research of leather and fashion, life style leather products and design innovation.

At the closing ceremony of the Congress the IULTCS anthem was played and the Union's flag was handed over to the host of the next Congress, which is the China Leather Industry Association (CLIA). This was followed by a vote of thanks by Dr Wolfram Scholz from Austria. Closing remarks by ALLPI Acting Executive Director Mr. Ghebregziabiher Ghebremedhin, ALLPI Board of Directors Chairperson, Mr Sekandi Abdul Hakim, and closing speeches by the incoming President of IULTCS, Mr Jean-Pierre Gualino and the current President of IULTCS, Dr Luis Zugno.

All the speakers expressed their satisfaction with respect to the level of organization of the Congress, the diversity of the topics discussed and by the in-depth insight gained in the different aspects of the leather making and environmental sustainability. Organisers also thanked the Gold sponsor, TFL; the silver sponsor, Pittard's and the bronze sponsors JICA, Chromogenia, ATC, Buckman and Ethiopian Airlines.

UN environment

International Resource Panel

Green Technology Choices:

The Environmental and Resource Implications of Low-Carbon Technologies

INTERNATIONAL RESOURCE PANEL REPORT

Solidaridad

Solidaridad Network is a global civil society organization providing efficient, scalable and economically effective and innovative sustainability solutions in various agricultural and industrial commodities such as:

Tea | Sugarcane | Soy | Leather | Livestock | Gold | Textile | Fruits & Vegitable | Dairy | Cotton | Aquaculture | Castor | Palm oil

switchasia
GRANTS PROGRAMME

EFFECTIVE WASTE MANAGEMENT AND SUSTAINABLE DEVELOPMENT IN KOLKATA LEATHER CLUSTER(BANTALA)

2020 -2023

Circular Economy

Effective solid waste management

Capacity building programme

Trainings on Occupational Health and Safety

Robust public- private partnership

Efficient water consumption practices

PROJECT PARTNERS IN ASIA

Pradipta Konar, Program Manager-Leather (Kolkata): pradipta.konar@solidaridadnetwork.org
Solidaridad Regional Expertise Centre
158/5, Prince Anwar Shah Road, Kolkata-700045
Contact: 033-40602211, +91-9830279866

GAME THEORY - A HR TOOL FOR HEALTHY ORGANIZATION

Mr. Soumajit Das[1], Mr. A. B. Kanungo[2], Dr. Goutam Mukherjee[3]

1, 3 - Govt. College of Engineering & Leather Technology, Kolkata
2 - Weblec India Ltd., Kolkata & Vice President, ILTA

Abstract :

Game Theory is a well – established key HR strategy all over the world. It is hugely applied in the field of Economics, Computer Science, Political Science, Sports, Psychology, Biology, International Relationship, Military Operations and Managing Levels of every industry to run a proper work – friendly healthy organization. The topic basically is dependent on the way of thinking about strategic interactions between self – interested people. The subject is also thinking about the ways how the interactions should be structured, for example :- Government or the designers always design some improving and updated modern machines to increase the production by leaps and bounds that is completely supported by Game Theory.

Introduction :

Game theory is the study of the ways in which interacting choices of economic agents produce outcomes with respect to the preferences (or utilities) of those agents, where the outcomes in question might have been intended by none of the agents. The meaning of this statement will not be clear to the non-expert until each of the italicized words and phrases has been explained and featured in some examples. Doing this will be the main business of this article. First, however, we provide some historical and philosophical context in order to motivate the reader for the technical work ahead.

In this article, the basic forms of Game Theory – Normal form and Extensive form are described to understand the primary words of the theory. The basics of Nash Equilibrium and the realistic examples of various of games application have got relevance in the industries especially Indian Leather Industry . The modern game theory also consist the importance of Ishikawa Diagram formerly known as Fishbone Diagram. On the basis of risk assumption of the industry a prescription of the solution to recover the limitations of the Indian Leather Industry are also discussed.

John Von Neumann first told about the subject in 1928 . He published " Theory of Games and Economic Behavior " in 1944 .In 1950 , American mathematician John Forbes Nash Jr. discovered Nash Equilibrium ; after that Game Theory got a boom in various sectors.

Discussion :

Game theory in the form known to economists, social scientists, and biologists, was given its first general mathematical formulation by John von Neuman and Oskar Morgenstern (1944). For reasons to be discussed later, limitations in their formal framework initially made the theory applicable only under special and limited conditions. This situation has dramatically changed, in ways we will examine as we go along, over the past seven decades, as the framework has been deepened and generalized. Refinements are still being made, and we will review a few outstanding problems that lie along the advancing front edge of these developments towards the end of the article. However, since at least the late 1970s it has been possible to say with confidence that game theory is the most important and useful tool in the analyst's kit whenever she confronts situations in which what counts as one agent's best action (for her) depends on expectations about what one or more other agents will do, and what counts as their best actions (for them) similarly depend on expectations about her.

Despite the fact that game theory has been rendered mathematically and logically systematic only since 1944, game-theoretic insights can be found among commentators going back to ancient times. For example, in two of Plato's texts, the Laches and the Symposium, Socrates recalls an episode from the Battle of Delium that some commentators

Corresponding author E-mail : soumajitdasapril@gmail.com

have interpreted (probably anachronistically) as involving the following situation. Consider a soldier at the front, waiting with his comrades to repulse an enemy attack. It may occur to him that if the defense is likely to be successful, then it isn't very probable that his own personal contribution will be essential. But if he stays, he runs the risk of being killed or wounded—apparently for no point. On the other hand, if the enemy is going to win the battle, then his chances of death or injury are higher still, and now quite clearly to no point, since the line will be overwhelmed anyway. Based on this reasoning, it would appear that the soldier is better off running away regardless of who is going to win the battle. Of course, if all of the soldiers reason this way—as they all apparently should, since they're all in identical situations—then this will certainly bring about the outcome in which the battle is lost. Of course, this point, since it has occurred to us as analysts, can occur to the soldiers too. Does this give them a reason for staying at their posts? Just the contrary: the greater the soldiers' fear that the battle will be lost, the greater their incentive to get themselves out of harm's way. And the greater the soldiers' belief that the battle will be won, without the need of any particular individual's contributions, the less reason they have to stay and fight. If each soldier anticipates this sort of reasoning on the part of the others, all will quickly reason themselves into a panic, and their horrified commander will have a rout on his hands before the enemy has even engaged.

Long before game theory had come along to show analysts how to think about this sort of problem systematically, it had occurred to some actual military leaders and influenced their strategies. Thus the Spanish conqueror Cortez, when landing in Mexico with a small force who had good reason to fear their capacity to repel attack from the far more numerous Aztecs, removed the risk that his troops might think their way into a retreat by burning the ships on which they had landed. With retreat having thus been rendered physically impossible, the Spanish soldiers had no better course of action than to stand and fight—and, furthermore, to fight with as much determination as they could muster. Better still, from Cortez's point of view, his action had a discouraging effect on the motivation of the Aztecs. He took care to burn his ships very visibly, so that the Aztecs would be sure to see what he had done. They then reasoned as follows: Any commander who could be so confident as to willfully destroy his own option to be prudent if the battle went badly for him must have good reasons for such extreme optimism. It cannot be wise to attack an opponent who has a good reason (whatever, exactly, it might be) for being sure that he can't lose. The Aztecs therefore retreated into the surrounding hills, and Cortez had the easiest possible victory.

These two situations, at Delium and as manipulated by Cortez, have a common and interesting underlying logic. Notice that the soldiers are not motivated to retreat just, or even mainly, by their rational assessment of the dangers of battle and by their self-interest. Rather, they discover a sound reason to run away by realizing that what it makes sense for them to do depends on what it will make sense for others to do, and that all of the others can notice this too. Even a quite brave soldier may prefer to run rather than heroically, but pointlessly, die trying to stem the oncoming tide all by himself. Thus we could imagine, without contradiction, a circumstance in which an army, all of whose members are brave, flees at top speed before the enemy makes a move. If the soldiers really are brave, then this surely isn't the outcome any of them wanted; each would have preferred that all stand and fight. What we have here, then, is a case in which the interaction of many individually rational decision-making processes—one process per soldier—produces an outcome intended by no one. (Most armies try to avoid this problem just as Cortez did. Since they can't usually make retreat physically impossible, they make it economically impossible: they shoot deserters. Then standing and fighting is each soldier's individually rational course of action after all, because the cost of running is sure to be at least as high as the cost of staying.)

Another classic source that invites this sequence of reasoning is found in Shakespeare's Henry V. During the Battle of Agincourt Henry decided to slaughter his French prisoners, in full view of the enemy and to the surprise of his subordinates, who describe the action as being out of moral character. The reasons Henry gives allude to non-strategic considerations: he is afraid that the prisoners may free themselves and threaten his position. However, a game theorist might have furnished him with supplementary strategic (and similarly prudential, though perhaps not moral) justification. His own troops observe that the prisoners have been killed, and observe that the enemy has observed this. Therefore, they know what fate will await them at the enemy's hand if they don't win. Metaphorically, but very effectively, their boats have been burnt. The slaughter of the prisoners plausibly sent a signal to the soldiers of both sides, thereby changing their incentives in ways that favoured English prospects for victory.

These examples might seem to be relevant only for those who find themselves in sordid situations of cut-throat competition. Perhaps, one might think, it is important for generals, politicians, mafiosi, sports coaches and others whose jobs involve strategic manipulation of others, but the philosopher should only deplore its amorality. Such a conclusion would be highly premature, however. The study of the logic that governs the interrelationships amongst incentives, strategic interactions and outcomes has been fundamental in modern political philosophy, since centuries before anyone had an explicit name for this sort of logic. Philosophers share with social scientists the need to be able to represent and systematically model not only what they think people normatively ought to do, but what they often actually do in interactive situations.

Hobbes's Leviathan is often regarded as the founding work in modern political philosophy, the text that began the continuing round of analyses of the function and justification of the state and its restrictions on individual liberties. The core of Hobbes's reasoning can be given straightforwardly as follows. The best situation for all people is one in which each is free to do as she pleases. (One may or may not agree with this as a matter of psychology or ideology, but it is Hobbes's assumption.) Often, such free people will wish to cooperate with one another in order to carry out projects that would be impossible for an individual acting alone. But if there are any immoral or amoral agents around, they will notice that their interests might at least sometimes be best served by getting the benefits from cooperation and not returning them. Suppose, for example, that you agree to help me build my house in return for my promise to help you build yours. After my house is finished, I can make your labour free to me simply by reneging on my promise. I then realize, however, that if this leaves you with no house, you will have an incentive to take mine. This will put me in constant fear of you, and force me to spend valuable time and resources guarding myself against you. I can best minimize these costs by striking first and killing you at the first opportunity. Of course, you can anticipate all of this reasoning by me, and so have good reason to try to beat me to the punch. Since I can anticipate this reasoning by you, my original fear of you was not paranoid; nor was yours of me. In fact, neither of us actually needs to be immoral to get this chain of mutual reasoning going; we need only think that there is some possibility that the other might try to cheat on bargains. Once a small wedge of doubt enters any one mind, the incentive induced by fear of the consequences of being pre-empted—hit before hitting first—quickly becomes overwhelming on both sides. If either of us has any resources of our own that the other might want, this murderous logic can take hold long before we are so silly as to imagine that we could ever actually get as far as making deals to help one another build houses in the first place. Left to their own devices, agents who are at least sometimes narrowly self-interested can repeatedly fail to derive the benefits of cooperation, and instead be trapped in a state of 'war of all against all', in Hobbes's words. In these circumstances, human life, as he vividly and famously put it, will be "solitary, poor, nasty, brutish and short."

Hobbes's proposed solution to this problem was tyranny. The people can hire an agent—a government—whose job is to punish anyone who breaks any promise. So long as the threatened punishment is sufficiently dire then the cost of reneging on promises will exceed the cost of keeping them. The logic here is identical to that used by an army when it threatens to shoot deserters. If all people know that these incentives hold for most others, then cooperation will not only be possible, but can be the expected norm, so that the war of all against all becomes a general peace.

Hobbes pushes the logic of this argument to a very strong conclusion, arguing that it implies not only a government with the right and the power to enforce cooperation, but an 'undivided' government in which the arbitrary will of a single ruler must impose absolute obligation on all. Few contemporary political theorists think that the particular steps by which Hobbes reasons his way to this conclusion are both sound and valid. Working through these issues here, however, would carry us away from our topic into details of contractarian (Contractarianism, which stems from the Hobbesian line of social contract thought, which holds that **persons are primarily self-interested)** political philosophy. What is important in the present context is that these details, as they are in fact pursued in contemporary debates, involve sophisticated interpretation of the issues using the resources of modern game theory. Furthermore, Hobbes's most basic point, that the fundamental justification for the coercive authority and practices of governments is peoples' own need to protect themselves from what game theorists call 'social dilemmas', is accepted by many, if not most, political theorists. Notice that Hobbes has not argued that tyranny is a desirable thing in itself. The structure of his argument is that the logic of strategic interaction leaves only two general political outcomes possible: tyranny and anarchy. Sensible agents then choose tyranny as the lesser of two evils.

The reasoning of the Athenian soldiers, of Cortez, and of Hobbes's political agents has a common logic, one derived from their situations. In each case, the aspect of the environment that is most important to the agents' achievement of their preferred outcomes is the set of expectations and possible reactions to their strategies by other agents. The distinction between acting parametrically on a passive world and acting non-parametrically on a world that tries to act in anticipation of these actions is fundamental. If you wish to kick a rock down a hill, you need only concern yourself with the rock's mass relative to the force of your blow, the extent to which it is bonded with its supporting surface, the slope of the ground on the other side of the rock, and the expected impact of the collision on your foot. The values of all of these variables are independent of your plans and intentions, since the rock has no interests of its own and takes no actions to attempt to assist or thwart you. By contrast, if you wish to kick a person down the hill, then unless that person is unconscious, bound or otherwise incapacitated, you will likely not succeed unless you can disguise your plans until it's too late for him to take either evasive or forestalling action. Furthermore, his probable responses should be expected to visit costs upon you, which you would be wise to consider. Finally, the relative probabilities of his responses will depend on his expectations about your probable responses to his responses. (Consider the difference it will make to both of your reasoning if one or both of you are armed, or one of you is bigger than the other, or one of you is the other's boss.) The logical issues associated with the second sort of situation (kicking the person as opposed to the rock) are typically much more complicated, as a simple hypothetical example will illustrate.

Suppose first that you wish to cross a river that is spanned by three bridges. (Assume that swimming, wading or boating across are impossible.) The first bridge is known to be safe and free of obstacles; if you try to cross there, you will succeed. The second bridge lies beneath a cliff from which large rocks sometimes fall. The third is inhabited by deadly cobras. Now suppose you wish to rank-order the three bridges with respect to their preferability as crossing-points. Unless you get positive enjoyment from risking your life—which, as a human being, you might, a complication we'll take up later in this article—then your decision problem here is straightforward. The first bridge is obviously best, since it is safest. To rank-order the other two bridges, you require information about their relative levels of danger. If you can study the frequency of rock-falls and the movements of the cobras for awhile, you might be able to calculate that the probability of your being crushed by a rock at the second bridge is 10% and of being struck by a cobra at the third bridge is 20%. Your reasoning here is strictly parametric because neither the rocks nor the cobras are trying to influence your actions, by, for example, concealing their typical patterns of behaviour because they know you are studying them. It is obvious what you should do here: cross at the safe bridge. Now let us complicate the situation a bit. Suppose that the bridge with the rocks was immediately before you, while the safe bridge was a day's difficult hike upstream. Your decision-making situation here is slightly more complicated, but it is still strictly parametric. You would have to decide whether the cost of the long hike was worth exchanging for the penalty of a 10% chance of being hit by a rock. However, this is all you must decide, and your probability of a successful crossing is entirely up to you; the environment is not interested in your plans.

However, if we now complicate the situation by adding a non-parametric element, it becomes more challenging. Suppose that you are a fugitive of some sort, and waiting on the other side of the river with a gun is your pursuer. She will catch and shoot you, let us suppose, only if she waits at the bridge you try to cross; otherwise, you will escape. As you reason through your choice of bridge, it occurs to you that she is over there trying to anticipate your reasoning. It will seem that, surely, choosing the safe bridge straight away would be a mistake, since that is just where she will expect you, and your chances of death rise to certainty. So perhaps you should risk the rocks, since these odds are much better. But wait … if you can reach this conclusion, your pursuer, who is just as rational and well-informed as you are, can anticipate that you will reach it, and will be waiting for you if you evade the rocks. So perhaps you must take your chances with the cobras; that is what she must least expect. But, then, no … if she expects that you will expect that she will least expect this, then she will most expect it. This dilemma, you realize with dread, is general: you must do what your pursuer least expects; but whatever you most expect her to least expect is automatically what she will most expect. You appear to be trapped in indecision. All that might console you a bit here is that, on the other side of the river, your pursuer is trapped in exactly the same quandary, unable to decide which bridge to wait at because as soon as she imagines committing to one, she will notice that if she can find a best reason to pick a bridge, you can anticipate that same reason and then avoid her.

We know from experience that, in situations such as this, people do not usually stand and dither in circles forever. As we'll see later, there is a unique best solution available to each player. However, until the 1940s neither philosophers nor economists knew how to find it mathematically. As a result, economists were forced to treat non-parametric influences as if they were complications on parametric ones. This is likely to strike the reader as odd, since, as our example of the bridge-crossing problem was meant to show, non-parametric features are often fundamental features of decision-making problems. Part of the explanation for game theory's relatively late entry into the field lies in the problems with which economists had historically been concerned. Classical economists, such as Adam Smith and David Ricardo, were mainly interested in the question of how agents in very large markets—whole nations—could interact so as to bring about maximum monetary wealth for themselves. Smith's basic insight, that efficiency is best maximized by agents first differentiating their potential contributions and then freely seeking mutually advantageous bargains, was mathematically verified in the twentieth century. However, the demonstration of this fact applies only in conditions of 'perfect competition,' that is, when individuals or firms face no costs of entry or exit into markets, when there are no economies of scale, and when no agents' actions have unintended side-effects on other agents' well-being. Economists always recognized that this set of assumptions is purely an idealization for purposes of analysis, not a possible state of affairs anyone could try (or should want to try) to institutionally establish. But until the mathematics of game theory matured near the end of the 1970s, economists had to hope that the more closely a market approximates perfect competition, the more efficient it will be. No such hope, however, can be mathematically or logically justified in general; indeed, as a strict generalization the assumption was shown to be false as far back as the 1950s.

This article is not about the foundations of economics, but it is important for understanding the origins and scope of game theory to know that perfectly competitive markets have built into them a feature that renders them susceptible to parametric analysis. Because agents face no entry costs to markets, they will open shop in any given market until competition drives all profits to zero. This implies that if production costs are fixed and demand is exogenous, then agents have no options about how much to produce if they are trying to maximize the differences between their costs and their revenues. These production levels can be determined separately for each agent, so none need pay attention to what the others are doing; each agent treats her counterparts as passive features of the environment. The other kind of situation to which classical economic analysis can be applied without recourse to game theory is that of a monopoly facing many customers. Here, as long as no customer has a share of demand large enough to exert strategic leverage, non-parametric considerations drop out and the firm's task is only to identify the combination of price and production quantity at which it maximizes profit. However, both perfect and monopolistic competitions are very special and unusual market arrangements. Prior to the advent of game theory, therefore, economists were severely limited in the class of circumstances to which they could straightforwardly apply their models.

Philosophers share with economists a professional interest in the conditions and techniques for the maximization of welfare. In addition, philosophers have a special concern with the logical justification of actions, and often actions must be justified by reference to their expected outcomes. (One tradition in moral philosophy, utilitarianism, is based on the idea that all justifiable actions must be justified in this way.) Without game theory, both of these problems resist analysis wherever non-parametric aspects are relevant. We will demonstrate this shortly by reference to the most famous (though not the most typical) game, the so-called Prisoner's Dilemma, and to other, more typical, games. In doing this, we will need to introduce, define and illustrate the basic elements and techniques of game theory.

An economic agent is, by definition, an entity with preferences. Game theorists, like economists and philosophers studying rational decision-making, describe these by means of an abstract concept called utility. This refers to some ranking, on some specified scale, of the subjective welfare or change in subjective welfare that an agent derives from an object or an event. By 'welfare' we refer to some normative index of relative alignment between states of the world and agents' valuations of the states in question, justified by reference to some background framework. For example, we might evaluate the relative welfare of countries (which we might model as agents for some purposes) by reference to their per capita incomes, and we might evaluate the relative welfare of an animal, in the context of predicting and explaining its behavioural dispositions, by reference to its expected evolutionary fitness. In the case of people, it is most typical in economics and applications of game theory to evaluate their relative welfare by reference to their own implicit or explicit judgments of it. This

is why we referred above to subjective welfare. Consider a person who adores the taste of pickles but dislikes onions. She might be said to associate higher utility with states of the world in which, all else being equal, she consumes more pickles and fewer onions than with states in which she consumes more onions and fewer pickles. Examples of this kind suggest that 'utility' denotes a measure of subjective psychological fulfilment, and this is indeed how the concept was originally interpreted by economists and philosophers influenced by the utilitarianism of Jeremy Bentham. However, economists in the early 20th century recognized increasingly clearly that their main interest was in the market property of decreasing marginal demand, regardless of whether that was produced by satiated individual consumers or by some other factors. In the 1930s this motivation of economists fit comfortably with the dominance of behaviourism and radical empiricism in psychology and in the philosophy of science respectively. Behaviourists and radical empiricists objected to the theoretical use of such unobservable entities as 'psychological fulfillment quotients.' The intellectual climate was thus receptive to the efforts of the economist Paul Samuelson (1938) to redefine utility in such a way that it becomes a purely technical concept rather than one rooted in speculative psychology. Since Samuelson's redefinition became standard in the 1950s, when we say that an agent acts so as to maximize her utility, we mean by 'utility' simply whatever it is that the agent's behaviour suggests her to consistently act so as to make more probable. If this looks circular to you, it should: theorists who follow Samuelson intend the statement 'agents act so as to maximize their utility' as a tautology, where an '(economic) agent' is any entity that can be accurately described as acting to maximize a utility function, an 'action' is any utility-maximizing selection from a set of possible alternatives, and a 'utility function' is what an economic agent maximizes. Like other tautologies occurring in the foundations of scientific theories, this interlocking (recursive) system of definitions is useful not in itself, but because it helps to fix our contexts of inquiry.

Though the behaviourism of the 1930s has since been displaced by widespread interest in cognitive processes, many theorists continue to follow Samuelson's way of understanding utility because they think it important that game theory apply to any kind of agent—a person, a bear, a bee, a firm or a country—and not just to agents with human minds. When such theorists say that agents act so as to maximize their utility, they want this to be part of the definition of what it is to be an agent, not an empirical claim about possible inner states and motivations. Samuelson's conception of utility, defined by way of Revealed Preference Theory (RPT) introduced in his classic paper (Samuelson (1938)) satisfies this demand.

Economists and others who interpret game theory in terms of RPT should not think of game theory as in any way an empirical account of the motivations of some flesh-and-blood actors (such as actual people). Rather, they should regard game theory as part of the body of mathematics that is used to model those entities (which might or might not literally exist) who consistently select elements from mutually exclusive action sets, resulting in patterns of choices, which, allowing for some stochasticity and noise, can be statistically modelled as maximization of utility functions. On this interpretation, game theory could not be refuted by any empirical observations, since it is not an empirical theory in the first place. Of course, observation and experience could lead someone favouring this interpretation to conclude that game theory is of little help in describing actual human behaviour.

Some other theorists understand the point of game theory differently. They view game theory as providing an explanatory account of actual human strategic reasoning processes. For this idea to be applicable, we must suppose that agents at least sometimes do what they do in non-parametric settings because game-theoretic logic recommends certain actions as the 'rational' ones. Such an understanding of game theory incorporates a normative aspect, since 'rationality' is taken to denote a property that an agent should at least generally want to have. These two very general ways of thinking about the possible uses of game theory are compatible with the tautological interpretation of utility maximization. The philosophical difference is not idle from the perspective of the working game theorist, however. As we will see in a later section, those who hope to use game theory to explain strategic reasoning, as opposed to merely strategic behaviour, face some special philosophical and practical problems.

Since game theory is a technology for formal modelling, we must have a device for thinking of utility maximization in mathematical terms. Such a device is called a utility function. We will introduce the general idea of a utility function through the special case of an ordinal utility function. (Later, we will encounter utility functions that incorporate more information.) The utility-map for an agent is called a 'function' because it maps ordered preferences onto the real numbers. Suppose that agent x prefers bundle a to bundle b and bundle b to bundle c.

We then map these onto a list of numbers, where the function maps the highest-ranked bundle onto the largest number in the list, the second-highest-ranked bundle onto the next-largest number in the list, and so on, thus:

bundle a k" 3
bundle b k" 2
bundle c k" 1

The only property mapped by this function is order. The magnitudes of the numbers are irrelevant; that is, it must not be inferred that x gets 3 times as much utility from bundle a as she gets from bundle c. Thus we could represent exactly the same utility function as that above by

bundle a k" 7,326
bundle b k" 12.6
bundle c k" "1,000,000

The numbers featuring in an ordinal utility function are thus not measuring any quantity of anything. A utility-function in which magnitudes do matter is called 'cardinal'. Whenever someone refers to a utility function without specifying which kind is meant, you should assume that it's ordinal. These are the sorts we'll need for the first set of games we'll examine. Later, when we come to seeing how to solve games that involve (ex ante) uncertainty—our river-crossing game from Part 1 above, for example—we'll need to build cardinal utility functions. The technique for doing this was given by von Neumann & Morgenstern (1944), and was an essential aspect of their invention of game theory. For the moment, however, we will need only ordinal functions.

All situations in which at least one agent can only act to maximize his utility through anticipating (either consciously, or just implicitly in his behaviour) the responses to his actions by one or more other agents is called a game. Agents involved in games are referred to as players. If all agents have optimal actions regardless of what the others do, as in purely parametric situations or conditions of monopoly or perfect competition (see Section 1 above) we can model this without appeal to game theory; otherwise, we need it.

Game theorists assume that players have sets of capacities that are typically referred to in the literature of economics as comprising 'rationality'. Usually this is formulated by simple statements such as 'it is assumed that players are rational'. In literature critical of economics in general, or of the importation of game theory into humanistic disciplines, this kind of rhetoric has increasingly become a magnet for attack. There is a dense and intricate web of connections associated with 'rationality' in the Western cultural tradition, and the word has often been used to normatively marginalize characteristics as normal and important as emotion, femininity and empathy. Game theorists' use of the concept need not, and generally does not, implicate such ideology. For present purposes we will use 'economic rationality' as a strictly technical, not normative, term to refer to a narrow and specific set of restrictions on preferences that are shared by von Neumann and Morgenstern's original version of game theory, and RPT.

Economists use a second, equally important (to them) concept of rationality when they are modeling markets, which they call 'rational expectations'. In this phrase, 'rationality' refers not to restrictions on preferences but to non-restrictions on information processing: rational expectations are idealized beliefs that reflect statistically accurately weighted use of all information available to an agent. The reader should note that these two uses of one word within the same discipline are technically unconnected. Furthermore, original RPT has been specified over the years by several different sets of axioms for different modelling purposes.

Once we decide to treat rationality as a technical concept, each time we adjust the axioms we effectively modify the concept. Consequently, in any discussion involving economists and philosophers together, we can find ourselves in a situation where different participants use the same word to refer to something different. For readers new to economics, game theory, decision theory and the philosophy of action, this situation naturally presents a challenge.

In this article, 'economic rationality' will be used in the technical sense shared within game theory, microeconomics and formal decision theory, as follows. An economically rational player is one who can (i) assess outcomes, in the sense of rank-ordering them with respect to their contributions to her welfare; (ii) calculate paths to outcomes, in the sense of recognizing which sequences of actions are probabilistically associated with which outcomes; and (iii) select actions from sets of alternatives (which we'll describe as 'choosing' actions) that yield her most-preferred outcomes, given the actions of the other players. We might summarize the intuition behind all this as follows: an entity is usefully modelled as an economically rational agent to the extent

that it has alternatives, and chooses from amongst these in a way that is motivated, at least more often than not, by what seems best for its purposes. (For readers who are antecedently familiar with the work of the philosopher Daniel Dennett, we could equate the idea of an economically rational agent with the kind of entity Dennett characterizes as intentional, and then say that we can usefully predict an economically rational agent's behaviour from 'the intentional stance'.)

Economic rationality might in some cases be satisfied by internal computations performed by an agent, and she might or might not be aware of computing or having computed its conditions and implications. In other cases, economic rationality might simply be embodied in behavioural dispositions built by natural, cultural or market selection. In particular, in calling an action 'chosen' we imply no necessary deliberation, conscious or otherwise.

We mean merely that the action was taken when an alternative action was available, in some sense of 'available' normally established by the context of the particular analysis. ('Available', as used by game theorists and economists, should never be read as if it meant merely 'metaphysically' or 'logically' available; it is almost always pragmatic, contextual and endlessly revisable by more refined modelling.)

Each player in a game faces a choice among two or more possible strategies. A strategy is a predetermined 'programme of play' that tells her what actions to take in response to every possible strategy other players might use. The significance of the italicized phrase here will become clear when we take up some sample games below.

A crucial aspect of the specification of a game involves the information that players have when they choose strategies. The simplest games (from the perspective of logical structure) are those in which agents have perfect information, meaning that at every point where each agent's strategy tells her to take an action, she knows everything that has happened in the game up to that point.

A board-game of sequential moves in which both players watch all the action (and know the rules in common), such as chess, is an instance of such a game. By contrast, the example of the bridge-crossing game from Section 1 above illustrates a game of imperfect information, since the fugitive must choose a bridge to cross without knowing the bridge at which the pursuer has chosen to wait, and the pursuer similarly makes her decision in ignorance of the choices of her quarry.

The distinctions described above are difficult to fully grasp if all one has to go on are abstract descriptions. They're best illustrated by means of an example. For this purpose, we'll use the most famous of all games: the Prisoner's Dilemma. It in fact gives the logic of the problem faced by Cortez's and Henry V's soldiers (see Section 1 above), and by Hobbes's agents before they empower the tyrant. However, for reasons which will become clear a bit later, you should not take the PD as a typical game; it isn't. We use it as an extended example here only because it's particularly helpful for illustrating the relationship between strategic-form and extensive-form games (and later, for illustrating the relationships between one-shot and repeated games; see Section 4 below).

The name of the Prisoner's Dilemma game is derived from the following situation typically used to exemplify it. Suppose that the police have arrested two people whom they know have committed an armed robbery together. Unfortunately, they lack enough admissible evidence to get a jury to convict. They do, however, have enough evidence to send each prisoner away for two years for theft of the getaway car.

The chief inspector now makes the following offer to each prisoner: If you will confess to the robbery, implicating your partner, and she does not also confess, then you'll go free and she'll get ten years. If you both confess, you'll each get 5 years. If neither of you confess, then you'll each get two years for the auto theft.

Our first step in modelling the two prisoners' situation as a game is to represent it in terms of utility functions. Following the usual convention, let us name the prisoners 'Player I' and 'Player II'. Both Player I's and Player II's ordinal utility functions are identical :

Go free k" 4
2 years k" 3
5 years k" 2
10 years k" 0

The numbers in the function above are now used to express each player's payoffs in the various outcomes possible in the situation. We can represent the problem faced by both of them on a single matrix that captures the way in which their separate choices interact; this is the strategic form of their game :

		Player II: Confess	Player II: Refuse
Player I	Confess	2,2	4,0
	Refuse	0,4	3,3

Each cell of the matrix gives the payoffs to both players for each combination of actions. Player I's payoff appears as the first number of each pair, Player II's as the second. So, if both players confess then they each get a payoff of 2 (5 years in prison each). This appears in the upper-left cell. If neither of them confesses, they each get a payoff of 3 (2 years in prison each). This appears as the lower-right cell. If Player I confesses and Player II doesn't then Player I gets a payoff of 4 (going free) and Player II gets a payoff of 0 (ten years in prison). This appears in the upper-right cell. The reverse situation, in which Player II confesses and Player I refuse, appears in the lower-left cell.

Each player evaluates his or her two possible actions here by comparing their personal payoffs in each column, since this shows you which of their actions is preferable, just to themselves, for each possible action by their partner. So, observe: If Player II confesses then Player I gets a payoff of 2 by confessing and a payoff of 0 by refusing. If Player II refuses, then Player I gets a payoff of 4 by confessing and a payoff of 3 by refusing. Therefore, Player I is better off confessing regardless of what Player II does. Player II, meanwhile, evaluates her actions by comparing her payoffs down each row, and she comes to exactly the same conclusion that Player I does. Wherever one action for a player is superior to her other actions for each possible action by the opponent, we say that the first action strictly dominates the second one. In the PD, then, confessing strictly dominates refusing for both players. Both players know this about each other, thus entirely eliminating any temptation to depart from the strictly dominated path. Thus both players will confess, and both will go to prison for 5 years.

The players, and analysts, can predict this outcome using a mechanical procedure, known as iterated elimination of strictly dominated strategies. Player 1 can see by examining the matrix that his payoffs in each cell of the top row are higher than his payoffs in each corresponding cell of the bottom row. Therefore, it can never be utility-maximizing for him to play his bottom-row strategy, viz., refusing to confess, regardless of what Player II does. Since Player I's bottom-row strategy will never be played, we can simply delete the bottom row from the matrix. Now it is obvious that Player II will not refuse to confess, since her payoff from confessing in the two cells that remain is higher than her payoff from refusing. So, once again, we can delete the one-cell column on the right from the game. We now have only one cell remaining, that corresponding to the outcome brought about by mutual confession.

Since the reasoning that led us to delete all other possible outcomes depended at each step only on the premise that both players are economically rational — that is, will choose strategies that lead to higher payoffs over strategies that lead to lower ones—there are strong grounds for viewing joint confession as the solution to the game, the outcome on which its play must converge to the extent that economic rationality correctly models the behaviour of the players. You should note that the order in which strictly dominated rows and columns are deleted doesn't matter. Had we begun by deleting the right-hand column and then deleted the bottom row, we would have arrived at the same solution.

It's been said a couple of times that the PD is not a typical game in many respects. One of these respects is that all its rows and columns are either strictly dominated or strictly dominant. In any strategic-form game where this is true, iterated elimination of strictly dominated strategies is guaranteed to yield a unique solution. Later, however, we will see that for many games this condition does not apply, and then our analytic task is less straightforward.

The reader will probably have noticed something disturbing about the outcome of the PD. Had both players refused to confess, they'd have arrived at the lower-right outcome in which they each go to prison for only 2 years, thereby both earning higher utility than either receives when both confess. This is the most important fact about the PD, and its significance for game theory is quite general. We'll therefore return to it below when we discuss equilibrium concepts in game theory. For now, however, let us stay with our use of this particular game to illustrate the difference between strategic and extensive forms.

When people introduce the PD into popular discussions, one will often hear them say that the police inspector must lock his prisoners into separate rooms so that they can't communicate with one another. The reasoning behind this idea seems obvious: if the players could communicate, they'd surely see that they're each better off if both refuse, and could make an agreement to do so, no? This, one presumes, would remove each player's conviction that he or she must confess because they'll otherwise be sold up the river by their partner. In fact, however, this intuition is misleading and its conclusion is false.

When we represent the PD as a strategic-form game, we implicitly assume that the prisoners can't attempt collusive agreement since they choose their actions simultaneously. In this case, agreement before the fact can't help. If Player I is convinced that his partner will stick to the bargain then he can seize the opportunity to go scot-free by confessing. Of course, he realizes that the same temptation will occur to Player II; but in that case he again wants to make sure he confesses, as this is his only means of avoiding his worst outcome. The prisoners' agreement comes to naught because they have no way of enforcing it; their promises to each other constitute what game theorists call 'cheap talk'.

But now suppose that the prisoners do not move simultaneously. That is, suppose that Player II can choose after observing Player I's action. This is the sort of situation that people who think non-communication important must have in mind. Now Player II will be able to see that Player I have remained steadfast when it comes to her choice, and she need not be concerned about being suckered. However, this doesn't change anything, a point that is best made by re-representing the game in extensive form. This gives us our opportunity to introduce game-trees and the method of analysis appropriate to them.

First, however, here are definitions of some concepts that will be helpful in analyzing game-trees :

Node : a point at which a player chooses an action.

Initial node : the point at which the first action in the game occurs.

Terminal node : any node which, if reached, ends the game. Each terminal node corresponds to an outcome.

Subgame : any connected set of nodes and branches descending uniquely from one node.

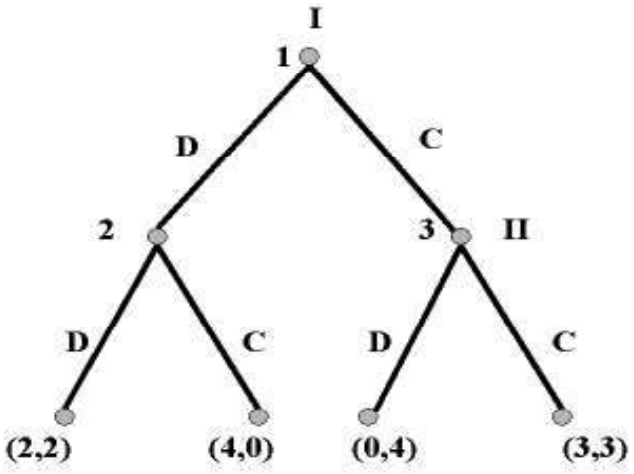
Payoff : an ordinal utility number assigned to a player at an outcome.

Outcome : an assignment of a set of payoffs, one to each player in the game.

Strategy : a program instructing a player which action to take at every node in the tree where she could possibly be called on to make a choice.

These quick definitions may not mean very much to you until you follow them being put to use in our analyses of trees below. It will probably be best if you scroll back and forth between them and the examples as we work through them. By the time you understand each example, you'll find the concepts and their definitions natural and intuitive.

To make this exercise maximally instructive, let's suppose that Players I and II have studied the matrix above and, seeing that they're both better off in the outcome represented by the lower-right cell, have formed an agreement to cooperate. Player I is to commit to refusal first, after which Player II will reciprocate when the police ask for her choice. We will refer to a strategy of keeping the agreement as 'cooperation', and will denote it in the tree below with 'C'. We will refer to a strategy of breaking the agreement as 'defection', and will denote it on the tree below with 'D'. Each node is numbered 1, 2, 3, …, from top to bottom, for ease of reference in discussion. Here, then, is the tree :



Look first at each of the terminal nodes (those along the bottom). These represent possible outcomes. Each is identified with an assignment of payoffs, just as in the strategic-form game; with Player I's payoff appearing first in each set and Player II's appearing second. Each of the structures descending from the nodes 1, 2 and 3 respectively is a subgame. We begin our backward-induction analysis—using a technique called Zermelo's algorithm—with the sub-games that arise last in the sequence of play. If the subgame descending from node 3 is played, then Player II will face a choice between a payoff of 4 and a payoff of 3. (Consult the second number, representing her payoff, in each set at a terminal node descending from node 3.) II earns her higher payoff by playing D.

We may therefore replace the entire subgame with an assignment of the payoff (0,4) directly to node 3, since this is the outcome that will be realized if the game reaches that node. Now consider the subgame descending from node 2. Here, II faces a choice between a payoff of 2 and one of 0. She obtains her higher payoff, 2, by playing D. We may therefore assign the payoff (2,2) directly to node 2.

Now we move to the subgame descending from node 1. (This subgame is, of course, identical to the whole game; all games are subgames of themselves.) Player I now faces a choice between outcomes (2,2) and (0,4). Consulting the first numbers in each of these sets, he sees that he gets his higher payoff—2—by playing D. D is, of course, the option of confessing. So Player I confess, and then Player II also confesses, yielding the same outcome as in the strategic-form representation.

What has happened here intuitively is that Player I realizes that if he plays C (refuse to confess) at node 1, then Player II will be able to maximize her utility by suckering him and playing D. (On the tree, this happens at node 3.) This leaves Player I with a payoff of 0 (ten years in prison), which he can avoid only by playing D to begin with. He therefore defects from the agreement.

We have thus seen that in the case of the Prisoner's Dilemma, the simultaneous and sequential versions yield the same outcome. This will often not be true of other games, however. Furthermore, only finite extensive-form (sequential) games of perfect information can be solved using Zermelo's algorithm.

As noted earlier in this section, sometimes we must represent simultaneous moves within games that are otherwise sequential. (In all such cases the game as a whole will be one of imperfect information, so we won't be able to solve it using Zermelo's algorithm.) We represent such games using the device of information sets. Consider the following tree :

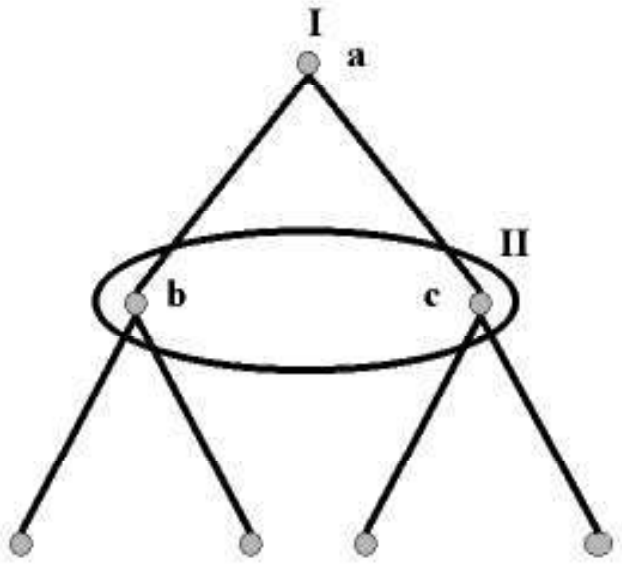


FIGURE 5

The oval drawn around nodes *b* and *c* indicates that they lie within a common information set. This means that at these nodes players cannot infer back up the path from whence they came; Player II does not know, in choosing her strategy, whether she is at *b* or *c*. (For this reason, what properly bear numbers in extensive-form games are information sets, conceived as 'action points', rather than nodes themselves; this is why the nodes inside the oval are labelled with letters rather than numbers.) Put another way, Player II, when choosing, does not know what Player I has

done at node *a*. But you will recall from earlier in this section that this is just what defines two moves as simultaneous. We can thus see that the method of representing games as trees is entirely general. If no node after the initial node is alone in information set on its tree, so that the game has only one subgame (itself), then the whole game is one of simultaneous play. If at least one node shares its information set with another, while others are alone, the game involves both simultaneous and sequential play, and so is still a game of imperfect information. Only if all information sets are inhabited by just one node do we have a game of perfect information.

(To be continued in the next issue ....)

THIS COUNTRY SETS A LEATHER EXPORT GOAL : IT WILL REACH 10 BILLION U.S. DOLLARS BY 2025

According to foreign media reports, Indian Minister of Industry and Commerce Piyush Goyal (Piyush Goyal) said at the event that the government will support the innovative development of the leather industry. Goyal said: "I am satisfied that the Indian leather industry will grow to at least US$10 billion by 2025, with a growth rate of 15-17%. Our goal is more than that."

Goyal called on the leather industry to be self-sufficient and not to wait passively for government plans. He assured that the government will help the leather industry achieve its set goals by establishing a BIS standard laboratory near the leather cluster.Goyal said: "The leather industry has always been in innovation. Through high-quality products and designs, it has been well recognized by the world market."

India's leather exports increase by 400% from April to May 2021. According to a report by the Indian Press Information Bureau (PIB), India is currently the world's second largest producer of footwear, the second largest exporter of leather garments, the fifth largest exporter of leather products, and the third largest exporter of saddles and harnesses. The country has also been identified as the country that will drive global export growth in the next ten years.

The leather industry in India is developing rapidly, and its advantages include accounting for 20% of the world's cattle and buffalo breeding; as it is open to innovation, it can easily apply new technologies and has a skilled labor force. The country also has strict environmental standards, from production to consumption; all departments comply with these standards.

With many international companies investing in the Indian market, the stock price of the industry has also risen sharply. The close cooperation among various stakeholders including government agencies, scientists, entrepreneurs, designers and retailers can maintain stable growth.

This year, India's exports of leather and leather products have surged. In just two months from April to May 2021, India exported leather goods worth US $641.7 million. Compared with the export value of only 1467.9 million U.S. dollars in the same period last year, this is an increase of four times. The reason for this substantial increase comes from the blessing of e-commerce. India has been trying to promote a wider variety of export products through different channels such as Amazon, Alibaba or eBay and other e-commerce platforms in order to achieve a diversified trade mix.

These new approaches have proved successful, and Indian exporters have seen their products sold all over the world, including the United States, the United Kingdom, and even Australia. These emerging trade channels also help small and medium-sized companies to enter foreign markets and use them as a springboard to go international.

(Source : INF News.com – 29/11/2021)

IILF - INDIA INTERNATIONAL LEATHER FAIR 2022

IILF - India International Leather Fair - is a platform for global manufacturers and exporters including national players engaged in the leather industry, to come forward and get together to display their products and services and conduct business. The event will showcase the widest possible range of leather products such as finished leather, shoes, fashion accessories,

travel-ware, belts, gloves, saddlery and harness to ancillary and auxiliary, chemicals, machinery and equipment, etc. Concurrent to the fair, seminars on topical interests and a fashion show presenting the latest trends, colours and styles were organised.

ITPO will organize India International Leather Fair (IILF) 2022, from 1st - 3rd February at Chennai Trade and Convention Centre, Chennai. The fair will be inaugurated on 1st Feb 2022 and will open to business visitors from 01 Feb to 03 Feb 2022. IILF has all along been a vivid presentation of the leather industry. Latest expressions of the trends, styles, designs and colours in world fashion are shown. The business visitors will surely be attracted to exhibits displayed by more than 400 companies, including over 100 from more than 20 foreign countries.

(Source : Indian Trade shows.com – 08/11/2021)

INDUSTRY DEMANDS LEATHER PARK SCHEME TO BOOST GROWTH

The Council for Leather Exports (CLE) on Saturday urged the government to bring a leather park scheme for boosting production amid expectations that many large brands and manufacturers may increase sourcing from India. CLE Chairman Sanjay Leekha also said that the benefits of the Production Linked Incentive Scheme (PLI) should also be extended to the leather sector.

"A leather park scheme could provide the needed impetus. Hence, the leather sector may be covered in a leather park scheme on similar lines of scheme announced for textile parks, as there is substantial similarity between textile andleather industry," he said in a statement.

To enhance exports, reinstatement of the Basic Customs Duty exemption on wet blue, crust and finished leathers was also requested by the chairman. "In order to meet the additional working capital requirements of the industry to meet their export commitments, additional credit with lower interest rates and flexible repayment options may be considered," he added. He was speaking at an event where Minister of State for Commerce and Industry Anupriya Patel laid the stone for the International Testing Laboratory for leather sector in Kanpur, an initiative aimed at helping the testing requirements of export products as per the stipulations of the overseas buyers.

The minister assured all kinds of support and redressal of concerns as raised by the leather fraternity, the council said. Kanpur is the largest manufacturing base of industrial safety boots, saddlery and harness items in the country and it is also a major production centre for finished leather and value added products and footwear.

The leather industry in Kanpur cluster has taken a significant step for increasing production levels by taking initiatives for establishment of mega leather, footwear and accessories development cluster (MLFAC).

Speaking at the occasion, P R Aqeel, Chairman, Leather Sector Skill Council, said that the council is playing a vital role to facilitate development of skilled human resources required for sustained growth of the leather and leather products industry. The council's key initiative includes development of the ecosystem, content, training of trainers, training programmes, placement and certifications, Aqeel said.

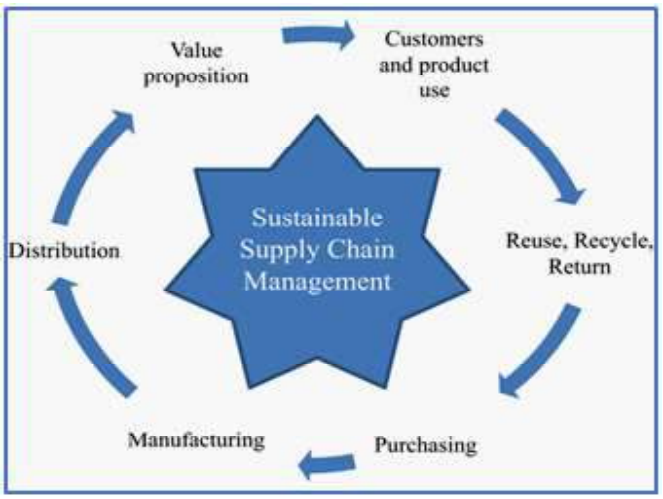
(Source : Economic Times – 25/10/2021)

PRACTICAL TRACEABILITY IN THE LEATHER SUPPLY CHAIN

ILM hosted a superb webinar on traceability in the leather supply chain, one of the best I have attended during the Covid-19 webinar floods. The chosen speakers explained what traceability was all about and showed what tools they had created to enact a functional traceability system from farm to shop.

Full traceability works perfectly in the EU and some other countries such as Brazil, Uruguay, New Zealand, Australia, South Africa, Botswana and others because these countries have set up an identification system of their meat producing animals for food safety. The main identification system is the ear tag with

barcode which contains the animal's data, which if updated for vaccinations, illnesses and change of proprietor, tell the life story of the animal.



Once the animal is processed, the ear tag ID can be associated with the meat and the hide or skin. The seminar showed different tools that can mark the hides and skins at slaughterhouse level in a permanent way so that they can be traced throughout the whole production process. If the buyer of the finished leather transfers the ID of the leather to his final product, we have the ideal situation of a pair of shoes, bags or a leather couch, that can be traced back to the birth of the animal. This farm to shop traceability was once the dream of brands and now is becoming the reality. With the existence and capability to trace the leather goods back to the farm, brands now want to source their leather only from suppliers that offer fully traceable leather.

Leather benefits from food industry technology

The fact that the consumer is moving more towards adopting the requirement of purchasing materials that can be traced, and which they can ascertain are produced in a responsible and sustainable way, will have a very positive effect on the environment and the social aspect of the workforce as well as the quality of the goods.

In certain places, Europe for instance, traceability is required by legislation for food safety and in fact each piece of meat can be traced back to the animal. The expansion of meat industry traceability to hides and skins was just a matter of time and the available technology. The trick was to make the marking permanent and readable in spite of the chemical and mechanical processes.

In other places, where there is no legislation for compulsory identification of meat animals, it will be a long and difficult process, particularly in developing and emerging countries. Not only there, as I have been told that in the USA the majority of cattle farmers have no intention to identify their cattle with tags, presumably for fiscal reasons.

Development aid

Our tax money is granting some US$100 billion plus per year in development aid to developing countries. Some of that money reaches the leather industry and some progress has been made considering that less and less raw materials are exported and more and more value is added by exporting wet-blue, crust and from some countries fully finished leather.

If brands and distribution chains decide to buy exclusively fully traceable leather, the money that was spent over decades of development aid to the leather industry in Africa is wasted, because if the slogan is no traceability, then for them there are no sales. Tanneries will be forced to close, hundreds of thousands of people will lose their jobs and return to the poverty of the past. Such a scenario is not compatible with sustainability, responsibility, ethics and humanity.

Animal ID in the developing world

There is a lot of talk about the identification of cattle, goats and sheep in countries where there is no individual identification system, logically aimed at food security rather than hide and skin traceability, but after several years it remains just talk around the table. Some NGOs, the UN and government organisations that are involved in these talks are merely justifying their jobs with the usual projects and workshops but, in reality, nothing seems to be moving.

The situation on the ground at this moment is that an animal can be born in Libya and sold to a herder in Chad who walks the animal over the border to Nigeria. The Nigerian owner sells the animal to a butcher in Cameroon. The butcher in Cameroon sells his hide to a local trader.
Up to this point, nothing is official; no identification of the animal and border crossings are casual without certification. The first documented operation is the export of the hides to say, India, where the hide is tanned and sold as finished leather to a handbag manufacturer in China, who produces bags for export to Europe. This may sound extreme, but it is a realistic

scenario and the more instable the political situation, the less controls. Traceability in the developing world is currently just wishful thinking.

Adding a traceability system

Everybody will agree that it would be totally unethical to deprive the upstream actors in developing and emerging countries of their livelihoods but, on the other hand, traceability should be introduced if these suppliers want to remain on the radar. So, we need to find a solution. The solution is not with the NGOs or the UN, but with the governments of the exporting countries and the import requirements of the purchasing countries.

Leather associations in those countries that have no traceability system for their livestock need to lobby their respective governments to introduce legislation that all animals for the food industry must be identified with an ear tag or embedded RFID tag like in Botswana, whether on professional farms and feedlots or "at home", warning the operators of the prospect that without ear tags and connected traceability, the country risks that exports of hides and skins and leather, may drastically be impacted over the years.

Buyers of the hides and skins and leather from developing and emerging countries on their part need to give incentives for those lots that are traceable. Money talks, people listen! An ear tag costs pennies, and their application can easily be controlled and recorded by the veterinary services of the respective countries, which are extensively present even in rural areas.

Who should finance this? The brands of course! They are the ones that demand traceability, and they are the ones that make billions in profits and talk about sustainability and ethics. So, let's hope they come forward and actively participate in practical traceability systems.

(Source : internationalleathermaker.com – 15/10/2021)

INDIAN LEATHER EXPORTS UP 400% APRIL-MAY

According to a report by the Press Information Bureau, India is now the second-largest producer in footwear, second-largest exporter in leather garments, fifth-largest exporter in leather goods, and third-largest exporter in saddlery and harness in the world. The country has also been identified as one that will be driving global growth for exports over the next decade.

The Indian leather industry is growing in leaps and bounds, with its advantages including 20% of the world's cattle and buffalo; skilled manpower that can easily access new technology due to their open-mindedness towards innovation. The country also has strict environmental standards which keep up compliance across all sectors from production through consumption.

The sector has also seen a sharp rise in its share value with many international firms investing in this lucrative market. Collaborations between various stakeholders including government agencies, business leaders, scientists, entrepreneurs, designers, and retailers will be key to sustaining this growth trajectory for years.

This followed the general trend where India's exports of leather and leather products soared in 2021. In just two months, from April to May 2021, India exported US$641.72 mn worth of these goods.

This is a fourfold increase from the previous year when they only exported US$146.79 mn worth during this same period. One reason for this dramatic increase could be that India has been trying to diversify its trade portfolio by promoting more exportable products through different channels such as e-commerce platforms like Amazon, Alibaba, or eBay.

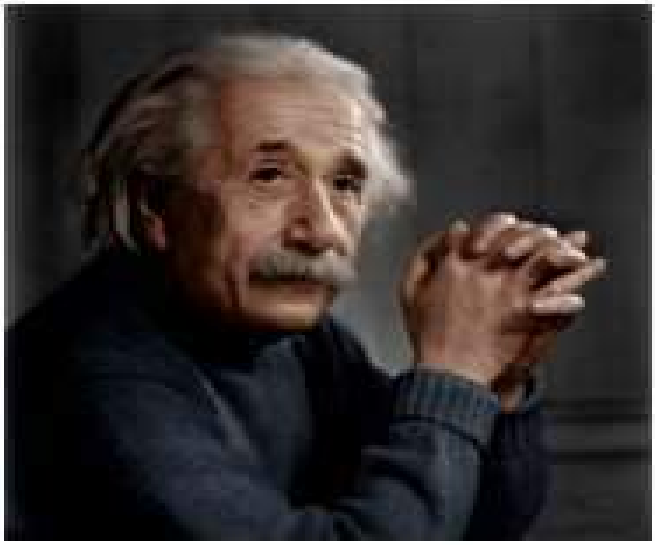
These new avenues are proving successful with Indian exporters seeing their goods go all over the world including the United States, the United Kingdom, and even Australia. These emerging trade avenues are also helping small and medium scale companies enter foreign markets by using them as a launchpad to go international.

(LeatherMag.com – 22/11/2021)

Some Aspects of Atomic Phenoma - An Overview

Dr. Buddhadeb Chattopadhyay

Former Principal, Government College of Engineering and Leather Technology, Kolkata. and MCKV Institute of Engineering, Howrah.



Let us make some shear magic, which might be interesting to look into the homogeneity of the radical concepts; which at a glance appears as disjointed. But we shall see that there is a string which connects all of them. The credit of this understanding is certainly due to Prof. Albert Einstein, who dreamt of Unification of Physical laws: -

Let us imagine a free falling particle from a height h, having a mass m. Then the kinetic energy of the particle T = ½ m$\mathbf{v}^2$ (assuming $\mathbf{v} << \mathbf{c}$).

Then, dT/dt = d/dt (½ m$\mathbf{v}^2$) = $\mathbf{v}$. d/dt (m$\mathbf{v}$) = $\mathbf{v.F}$.....(1). This is the definition of power.

Now for a free falling particle, we know that $\mathbf{F}$ = m$\mathbf{g}$ and $\mathbf{v}$ = – (dh/dt) ..... (2)

Substituting both values in (1), we get : -

- d/dt (mgh) = $\mathbf{v.F}$ = – (dh/dt).m$\mathbf{g}$..... (3)

or, we may write dT/dt = - d/dt (mgh) (assuming v<<c; so m is constant).

See the miracle, we got the expression of potential energy (U = mgh)

Hence, dT/dt = dU/dt .....(4)

By integrating bothsides of equation (4) with respect to time,

We right, T + U = Constant. This is the law of conservation of energy.

Now for a free particle (not, free falling particle), the necessary and sufficient condition is that its potential energy must be zero. Therefore, we may write now,

The total energy for that particle E = T (since, by assumption U = 0)

Or, dE/dt = dT/dt (assuming now, $\mathbf{v}$ is relativistic i,e. $\mathbf{v} \cong \mathbf{c}$); also now E = m$\mathbf{c}^2$.

Therefore, d/dt (m$\mathbf{c}^2$) = $\mathbf{v.F}$ [by substituting with equation (1)]

Or, $\mathbf{c}^2$(dm/dt) = $\mathbf{v}$. d/dt(m.$\mathbf{v}$) [since, $\mathbf{c}$ = velocity of light in vacuum is constant and by substituting $\mathbf{F}$, with Newton's second law of motion.

Or, 2m$\mathbf{c}^2$dm/dt = 2m$\mathbf{v}$ d/dt m$\mathbf{v}$; by multiplying both side by 2m. We may note since we assumed already that the velocity is relativistic, we cannot take it granted that the mass would be constant.

Now, by integrating both sides with respect to t, we get : -

$m^2\mathbf{c}^2 = m^2\mathbf{v}^2 + k$ (where, k is the integration constant).....(5).

If, we now assume at $\mathbf{v}$ = 0; m = m_0 and put this relationship in the equation (5), we can derive the value of k.

Thus, $k = m_0^2\mathbf{c^2}$.....(6) {where m is called moving mass ; while m_0 as rest mass}

By substituting the equation (6) in equation (5), we get :- $m^2\mathbf{c^2} = m^2\mathbf{v^2} + m_0^2\mathbf{c^2}$.

By rearranging m^2. $(\mathbf{c^2} - \mathbf{v^2}) = m_0^2\mathbf{c^2}$ .....(7)

Or, $m^2 = m_0^2\mathbf{c^2}/(\mathbf{c^2} - \mathbf{v^2})$

Or, $m^2 = m_0^2/(1 - \mathbf{v^2/c^2})$

Therefore, $m = m_0/[1 - \mathbf{v^2/c^2}]^{1/2}$.....(8)

This is the derivation of Einstein's special theory of relativity, which he discovered at the age of 21 only.

Here is the historical photograph at the German Physical Society Prof. Einstein appearing to present the special theory of relativity which was revolutionary and found limitations of Newtonian Mechanics.

We can come to three consequences as given under : -

a) Can any particle, having a finite mass (however insignificant, it might be) move at the velocity of light? Answer is no, for, if, we take $\mathbf{v} = \mathbf{c}$, and put it in the equation (8), we get the moving mass m is infinite. Which is absurd for a real particle.

b) Photon is also a light particle. How does photon particles move at the speed of the light? Because, photon has $m_0 = 0$ and in this case, since $\mathbf{v} = \mathbf{c}$, equation (8) tells us that the moving mass of photon is undefined. So, if, we stop a photon, say, inside a black hole, it would disappear.

c) Can a real particle have $\mathbf{v >> c}$? No, since, again equation (8) tells us that in such a hypothetical case, the moving mass, m is becoming imaginary. That is an absurdity.

Now, let's have a look again on equation (8), which can be rewritten as : -

$m = m_0.[1 - \mathbf{v^2/c^2}]^{-1/2}$

Expanding RHS with Binomial Equation, we can write as : -

$m = m_0.[1 + \frac{1}{2}\,\mathbf{v^2/c^2} + 3/2.\,\mathbf{v^3/c^3} + ...]$ .....(9)

By multiplying both sides by $\mathbf{c^2}$, we get : -

$m\mathbf{c^2} = m_0\mathbf{c^2} + \frac{1}{2}\, m_0\, \mathbf{v^2} + 3/2\, m_0.\, \mathbf{v^3/c^3} + ...$(10)

Now total Energy is $m\mathbf{c^2}$ is in the LHS of the equation. The second term of LHS is also the kinetic energy, other terms are also some form of energies. What about the first term ($m_0\mathbf{c^2}$) of RHS? This is known after Einstein as mass energy, which is a radical departure from classical mechanics. Suppose, there exist a tiny particle in the Universe just doing nothing. Because the work done is always equated with the energy spent in classical mechanics; the energy of that tiny particle should be zero. But low! The relativistic mechanics nullifies it; on the contrary predicts that still due to its shear existence in the Universe, that tiny particle of insignificant mass, would contain a huge energy, amounting $m_0\mathbf{c^2}$ this is no less significant; for, $\mathbf{c^2}$ = 3*10^16 $m.s^{-1}$.

Now let us look at the common thread with which the fundamental quantum mechanical laws are bound in a chain.

We know the Plank's equation $E = h\nu$.....(11). Max Plank is known as the father of the quantum theory. Where h is the Plank's constant and ν is the frequency in Hz.

So, we can write, $E = h\mathbf{c}/\lambda$ ..... (12) or, $\mathbf{c} = E\lambda/h$ where $\lambda$is the wave length.....(13)

We now write Einstein's equation: $E = m\,\mathbf{c^2}$

Or, $E = m\mathbf{c}.\mathbf{c}$

or, $E = \mathbf{p}.\mathbf{c}$ [where $m\mathbf{c}$ is the momentum = p].....(14)

By substituting equation (14) by equation (13), we get :

$E = \mathbf{P}.E\lambda/h$

Or, $h = \mathbf{p}.\lambda$ .....(15). This is the famous de-Broglie's wave-particle duality equation.

Now, let us take a closer look of the old quantum mechanics and assuming electron wave in the Bohr's first orbit of H-atom, when in his second hypothesis he quite arbitrarily postulated that the angular momentum of the orbiting (de-Broglie's wave-particle duality was discovered after Bohr's success in explanation of line spectra of Hydrogen atoms) electron around the nucleus cannot take any value but it must have quantised values in the form of $nh/2\pi$.

If, according to the de-Broglie, if, the electrons are consider as waves (actually electrons are neither fully wave nor fully particle) in the Bohr's first orbit, then $n\lambda$ must be equal to the circumference of the circular orbit as defined and calculated by Neils Bohr (where n = 1, 2, 3, 4, ...).

Otherwise, the waves ultimately dies down due to superposition. There cannot be fractional waves. It must be either λ or 2λ, 3λ, 4λ ..... and never $\frac{1}{2}\lambda$, $1/3.\lambda$, $\frac{3}{4}.\lambda$ etc.

So we then write $n\lambda = 2\pi\mathbf{r}$.....(16)

Or, $\lambda = 2\pi\mathbf{r}/n$.....(17)

Putting this value of λ in equation (15), we get

$h = \mathbf{P}.(2\pi\mathbf{R}/n)$

or, $nh/2\pi = \mathbf{p}.\mathbf{r} = m\mathbf{v}\mathbf{r}$.....(18) Bohr's second postulate is established.

Again, we can fairly guess that both the **p** and **r** of equation (18) are measurable quantities. So, the highest uncertainty with regard to the measurement could be maximum in the same order of the determined values.

And, therefore, it is easy to argue $\Delta\mathbf{p}.\ \Delta\mathbf{r} \geq h/2\pi$ (considering n = 1).

This is known as Heisenburg's Uncertainty Principle in the Quantum Mechanics.

It tells us an important insight that all of these apparently disjointed rules, can be easily connected with each other. Prof. Albert Einstein worked throughout his life in search of some unified theory dedicatedly; in spite of the fact that he initially was resistant to accept the uncertainty principle.

This article was originaly published in Vol.-12, No.-4 April' 1962 issue of JILTA.

IMPROVEMENTS ON THE TECHNIQUES OF THE MANUFACTURING PROCESS OF PICKING BAND LEATHER—(REVIEW)

P. Bhattacharya & J. K. De

College of Leather Technology,

(Continued from March-1962)

Depickling :

Depickling is an important operation in the manufacture of combination sulphur-oil-vegetable tanned picking band leather. In this operation when hypo is used for depickling, sulphur in colloidal state is deposited on the fibres of the hide giving sulphur-tannage. In the case of chrome tanned picking band, depickling also plays an important part of controlling proper acid content of the pickled hide before it enters the chrome tanning bath. In the latter case it actually serves the function of depickling but in the former case the operation cannot be truly called a depickling process. By treating the pickled hide with hypo, sulphur is deposited all throughout the thickness depending also on the number of treatments with hypo bath given to the hide, the concentration of the hypo solution, and the manner in which the hide is handled.

Due to deposition of sulphur by this process an extremely flexible leather of very good tensile strength is obtained which enables it to withstand the sudden shocks.[5 8]

In the combination tannage of picking band leather about 2.5 to 3.5% of H_2SO_4 is used for the pickling process, and 20% hypo is used for the depickling process.[5] The amount of hypo used is about 3 times the theoretical amount required for reacting with sulphuric acid. If lesser quantity of hypo is used, the leather will be casehardened in the vegetable tanning bath due to high acidity of the pelt. It is, therefore, necessary to have an excess of hypo in the acid bath.[5 9]

Tanning :

As already stated, picking band leather is manufactured by various types of tannage such as, 1) Full vegetable,[3] 2) Full chrome,[3] 3) Combination sulphur and chrome,[4] 4) Combination sulphur-oil-vegetable ;[5] and 5) Combination Alum-oil-vegetable.[6] Combination chrome and vegetable tanning is seldom followed in this case probably due to low tensile strength produced by this Combination process.

Vegetable tannage :

In the case of vegetable tanning the strength of the leather is maximum at a moderate degree of tanning, because moderate tanning causes formation of cross

linkages between the protein chains to be oriented by stress while this ability is lowered by too many cross linkages.[60]

Tanning of a hide in vagetable tan liquor is taken as complete only when the hide is fully penetrated by tannin. The rapidity of the diffusion of tanins cannot, however, be correlated with the astringency of the vegetable liquor because diluted solutions of astringent tannins of chesnut and ordinary quebracho penetrate more rapidly than those of mild tannin of sumac.[61] The speed of penetration is influenced by several factors other than astrigency such as temperature, concentration, pH of the liquor, condition of the skin, presence of electrolytes and degree of dispersion of the tannin.[63] Stäther[63] has also expressed slmilar opinion. He has found that penetration is roughly proportional to the square root of the time particularly at the beginning and at the lower concentrations of tannin. He has also found that there is no relationship between penetration and the ratio of tan to nontan. The importance of the temperature in the vegetable tanning has been known for a long time. The rate of diffusion of tannin considerably falls below 21°C and increases rapidly above 27°C. The result produced in the leather is, however, undesirable.[15] It has been found by Thomas and Kelly[64] that increasing temperature increases the amound of fixed tannin particularly between 25°C and 37.5°C. The irreversibility of tannin fixation also markedly increases with the rise of temperature.[65]

The pH of the tan liquor and quantity of the acid play an important part both in the nature and quality of the leather, tannin fixation, and the rate of diffusion. It has been found that penetration of tannin increases with rise of pH, whereas fixation is increased with decrease of pH.[66]

Thomas and Kelly[67] have studied the influence of the concentration of various tanning materials on the fixation of tannin by hide powder. Maximum fixation occurs at a concentration of about 20 grams of tannins per litre (depending on the material) but if the concentration is more, fixation is lowered.

Regarding the water-soluble matters present in vegetable tanned leather Page and Holland[68] have stated that it reaches to a constant figure at the end of six months tannage. At earlier stage the percentage of water-solubles goes on increasing with the time. They have also reported that water-solubles increase with the duration of liming period of the hide but liming has no effect on irreversibly fixed tannin.[69] Liming, however, increases the uptake of vegetable tannin by collagen[44] and degree of vegetable tannage.[43] The salts present in the nontannin matter of a tan liquor also considerably influence on the qualities of the leather such as, solidity, degres of tannage, colour, strength etc. The addition of large amount of both NaCl and Na_2SO_4 greatly reduces tannin fixation, the sulphate being more effective.[70] Salt of organic acids like acetate, on the contrary, increases in uptake of tannins upto a certain concentration:[71]

It has been found that lignosulphonates behave differently from other materials in some respects. The fixation of ligonosulphonates increases with lowering of pH and increasing temperature and concentration.[74]

It has been observed that a high ratio of salt/acid in a tan liquor produces a mellow and soft leather whereas a high ratio of acid/salt tends to induce firmness to the finished leather.[73]

In the case of picking band having high tensile strength and flexibility, accompanied by moderately low elongation, the degree of tannage has been found to be not so high as in the case of sole leather.[74]

Chrome tannage :

Chrome tanning in the case of band leather is generally done either by one bath or by two bath process.

In the one bath process a basic chrome sulphate solution is prepared by the tanner himself or purchased from the market. In the later case basic chrome sulphates of standard basicities are available. But when the tanner prepares it, the basicity of the liquor varies with purity of the materials used, the concentration of the solution, the rate of the addition of reducing material etc.

SO_2 is a common reducing agent employed in the manufacture of basic chromium sulphate extract, whereas the reducing agents vary when the chromel iquor is prepared at the tannery. The various reducing agents used are sodium sulphite sodium bisulphite, hypo, glucose, cane sugar, molasses, glycerin, cellulose extract, spent vagetable tanning materials, starch, farina, saw dust etc.([75], [18])

Molasses and glucose reduced liquors are reputed for producing plumper and fuller type of leather than produced by other reducing agents.[76]

In the one bath chrome tanning the concentration of chrome, the basicity of the chrome liquor used, the pH of the liquor, the temperature, the float and the rotation of the drum, play very important parts in determining the strength, the stretchiness and other qualities of the leather. The concentration of organic acids and salts of organic acids produced by the reducing agents such as molasses, glucose etc., also play equally important parts in determining fullness, resiliency, tightness, elongation, strength, fineness of the grain, chrome content and other characteristics of the leather.[77]

Pelts tanned in the fallen state tend to produce soft and pliable leather.[75] The amount of fixed chrome increases with increasing basicity and pH of the chrome liquor and decreases with ircreasing acidity, low pH,[65] increasing concentration of salt and increasing dilution of chrome liquor.[78]

In the one bath process the chrome liquor is generally added in concentrated form to the drum containing pelts and exhausted pickle liquor. Sometimes the

exhausted pickle is run out and a separate salt solution is prepared for the tanning bath. A very small volume of highly concentrated chrome liquor is used in a dry tanning method.

The addition of sodium sulphate[79] and sodium chloride[75] lowers the chromium fixation. Kuntzel, Kinzer, and Stiasny[78] have found that the presence of neutral salts in the chromium sulphate liquor at first increases the chrome uptake which then falls gradually as the concentration of the salt increases. Too much common salt tends to give a flat and hard leather whereas a moderate addition of sodium sulphate leads to the production of full leather.[75]

The salts of organic acids added to a chrome liquor raise the precipitation point and act as buffers in controlling the pH of the tanning bath. These are krown as masking salts. Moderate concentration of the masking salts increases the chrome fixation but a high concentration considerably lowers it.[80] Masking salts also increase the rate of penetration of the chrome liquor[81] and impart fullness and tightness to the leather,[77] Sodium formate is widely used for this purpose. Sodium acetate causes less fixation of chrome than the formate, and oxalate causes still lesser fixation.[82]

A rise in temperature increases the hydrolysis, the amount of free acid, the degree of olation and the molecular size,[75] thereby helping more fixation of chrome.[83]

In the two bath process of tanning, pickling prior to chrome tanning increases chrome uptake by the pelt.[84] The chrome uptake is also increased with the increasing concentration of bichromate solution upto 6%, and the uptake reduces when HCL used exceeds 3%. The absorption of chromic acid from the first bath reaches its maximum within one hour. The addition of sodium sulphate lowers the shrinkage temperature of tfie tanned leather.[85] Giving a pre-reduction dipping bath to the pelt with hypo and acid before the actual reduction helps to maintain higher chrome content of the leather. Addition of masking salts to the reducing bath brings a more even distribution of Cr_2O_3 in the leather than obtained by lower pHs, but it reduces the fixation of chromium to some extent.[84]

Leather tanned with anionic chrome has a lower tensile strength and that done with cationic chrome lowers the grain smoothness of the leather but tanning with a combined cationic and anionic chrome, as suggested by Belavsky and Hrebicek,[89] gives a fine smooth grain with a fairly high tensile strength.

Regarding the effect of liming on chrome fixation and other characteristics of chrome leather Theis and Steinhardt[45] have found that varying method and period of liming have practically no effect on Cr_2O_3 fixation or on the shrinkage temperature of the leather. Gustavson and Widen[48] have, however, reported that increased liming time upto 2 weeks progressively increases the chrome binding capacity of collagen compared to unlimed hide. Stather and Schmidt,[7] on the other hand, have

found that the tensile strength is very little affected by the chrome content of the leather. But Dey and Chakrabarty[8] are of opinion that tensile strength of chrome tanned picking band decreases with the increase of Cr_2O_3 content of the leather and also with the higher basicities of the chrome compounds.

A chrome content of 2.5% in terms of Cr_2O_3 on the weight of pelt has been found to be the optimum in respect of the tensile strength and other characteristics of the leather.[9] The chrome content does not, however, alter many of the physical porperties of the leather such as, angle of weave, splitting of fibres, and the compactness of the fibre bundles.[87] Although chrome tanned leather has a good tensile strength but at the same time possesses a high elongation figure which is regarded as a drawback for a good quality picking band leather.[6]

Combination tannage :

Of all the combination tannages, sulphur-oil-vegetable process is more common than the others.

In this combination process the pelt after deliming is heavily pickled with larger quantity of acid than what is normally used for ordinary pickling. The pelt is then run in a concentrated hypo solution containing 20-22% hypo on the weight of the hide. The object of treating with hypo is not only depickling, that is, removal of the acid from the pelt, but also for the deposition of colloidal sulphur on the fibres and fibrils, as extensively as possible. Treatment with hypo is continued ors hould be continued until the pH in the central part of the pelt reaches the isoelectric point of collagen that is, collagen is made entirely free from acid. In commercial practices, the pH is generally kept within the range 4.0-4.5. If necessary, the treatment with hypo is repeated in separate bath, dividing the hypo in two lots so that the pH of the pelt comes upto pH 4.5 in the second treatment with hypo. The pelts are then piled up for 24 hours or more to effect maximum liberation and fixation of sulphur.[88] Sulphur deposited inside the fibre may remain there both as free as well as in combinep form. The most important effect of sulphur deposition or sulphur tannage as it is called, is remarkable splitting of fibres which is not achieved by any other tannage. By this method an extremely flexible leather of high tensile strength is obtained which enables it to withstand the sudden shocks.[85]

As regards the pH value on the deposition of sulphur, it has been observed that high pH lowers the amount of sulphur deposited in the leather. Low pH causes an uneven deposition of sulphur in various layers of the thickness of the leather.[84]

Regarding the effect of the concentration of hypo and the ratio of hypo to acid it has been observed that an excess of hypo or a high concentration of hypo in the bath with a low acidity of the pelt decreases the amount of sulphur deposition but enables an even distribution of the sulphur.[84]

Regarding the oil tanning for the combination tanned picking band leather, two methods[88] of treatment are generally followed. In one of the methods, after

deposition of sulphur and samming, the leather is treated with 10-12% of fish oil or cod oil in a drum. In the second method the treatment is done with a mixture of tallow and oil, instead of oil alone. The oil is allowed to penetrate throughly into the pelt by proper samming and drumming. The second treatment is claimed to have the following advantages :

1) More quantity of fat can be introduced.
2) The resulting leather is full and more compact.
3) The leather is softer due to the presence of a non-drying fat (tallow).
4) The yield of leather on the weight of the pelt is more.

In order to facilitate the penetration of tallow and oil, the stuffing drum is preheated to a temperature of 100°F or a little above to keep the mixture in a fluid condition.[88]

As regards the characteristics of cod and fish oil suitable for oil tanning purpose, it has been found that there is a close relationship between acid value and tanning property of cod and fish oil. Cod oil with an iodine value between 120 and 160, and with an acid value above 10 is generally used. Oil with a high acid value and a high iodine value, should be carefully used so that a rapid oxidation may not take place, otherwise it becomes difficult to control the process. Oil with a moderately low iodine value and a higher acid value has better tanning effect than that of an oil with high iodine value and low acid value. It has been observed that the tanning does not commence until the pH value of the pelt has come down below 5.5.[89] Stather,[90] however, has stated that cod oil tanning is independent of the acid value of the oil.

Sometimes, alum tanning is also done along with the sulphur tanning. Alum tanning is characterised by high tensile strength and ability to resist strains but it is reported to be lacking in durability under moist condition.

The oil tanning is generally followed by vegetable tanning with a liquor made from sulphited quebracho. Other tanning material can be used but they are not so commonly applied as the quebracho tannin, because quebracho tannin can hold more amount of grease in the leather than other tannins. The durability of picking band leather depends on the amount of grease it is able to retain after continuous working. Larger quantity of grease retained by the leather helps in the lubrication of the fibres and prevents a major distortion of the normal fibre structure of the leather. Combined effect of higher tensile strength and grease holding capacity of the leather than any one of the above properties alone, increases the durability of the picking band.[88] Sulphited quebracho is preferred also for small particle size and high tannin nontannin which other tannins do not possess.[91] Bose[91] has found that sulphited cutch extract properley prepared can be used as a substitute for quebracho extract in the vegetable tanning.

Working on the different types of combination tanned picking band in respect of tensile strength Selvarangan, Nayudamma and Das[6] have found that Alum-oil-gambier tanned leather possesses maximum tensile strength (6,700-10,500 lb/sq inch). Alum, oil and a blend of babul & myrabolan produce a leather of somewhat lower strength than the above (6,000-10,00 lb/sq inch) followed by alum-oil tannage (about 6, 200 lb/sq. inch). Leathers tanned with alum-oil-quebracho, and alum-oil-cutch have lower strengths (4,500-5,500 lb/sq. inch and 3,500-5,00lb/sp. inch respectively).

Cutch and quebracho give a harder type of leather with a low degree of elongation (8-10%), whereas babul gives a leather of higher tensile strength with more elongation (10-25%). The elongation of the babul tanned leather is comparable with that of chrome tanned leather.[6]

Neutralisation

Neutralisation of tanned hide is resorted to only when tanning is done with mineral salts like chrome, alum etc. The object of neutralisation is to remove the free acid and part of the combined acid present in the leather to such an extent that the leather turns out soft, pliable and strong, after fatliquoring and stuffing. The leather is washed before and after neutralisation to remove the salt and uncombined chrome contained in it. Removal of the free acid and part of the combined acid from the outer surfaces of the leather enables more uniform dyeing and fatliquoring of leather. Practical experience has shown that even slight variations of the alkali employed may have far-reaching effect upon the finished leather.[15]

Various neutralising alkalies, which are generally weak alkalies, taken on chemically equivalent quantities may differ in the extent to which they penetrate the leather and remove acid from different layers of the leather. Very weak alkalies like sodium bicarbonate and ammonium bicarbonate act more slowly but uniformly.[15] They bring about neutralisation of deeper layer than borax which neutralises more of the superficial acid. Borax is, therefore, useful in the case of thicker leather which are required to have tighter grain. Sodium bicarbonate and ammonium bicarbonate are more suitable for thinner leather which have to be made soft.[17] But according to Nayudamma and Theis,[9] aquous ammonia gives a soft leather because of its more penetrating power than borax and sodium bicarbonate giving a firmer leather. Hypo is also used specially in the case of picking band leather within certain limits. Hypo produces a little firm leather with a smooth grain and tight break. Sodium phosphate and sodium phthalate are rather unsatisfactory as neutralising agents, as they do not act uniformly ; the flanks are apt to be empty and coarse, the shoulders are not as tight in break as when other neutralising agents are used.[17] Stiasny[98] has recommended the use of ammonia/ammonium salt buffers. These buffers may be adjusted to a low alkalinity so that they act slowly and do not overneutralize the surfaces of the leather.

Schindler, Klanfer and Flaschner[94] have studied the effect of neutralisation with 1-4% sodium bicarbonate, 1-2% sodium carbonate, 2% sodium hydroxide, 2% ammonia, all percentage being expressed on split leather weight. The amount of acid of the leather neutralised at the end of two-hour period has been found the same for all the reagents employed.

Over neutralisation reduces the chromic content of the leather, tends to give a harsh feel and tightness of grain and adversely affects the dyeing operation (especially pastel shades). With insufficient neutralisation, there is a danger of precipitation the dye, breaking up the soap in the fatliquor with the free acid remaining on the grain causing greasiness and stains on the leather.[95]

The pH of the neutralised and washed leather should not be less than 5.5: Some tanners prefer a slightly higher figure.[18]

Fatliquoring and stuffing : The process of fatliquoring comes next. The object of fatliquoring is to introduce oils and fats in a finely dispersed phase i.e. in the form of an emulsion, into the leather for coating the fibres, with a thin layer of oil or fat or their fatty acids.

Stuffing is another process of introducing the oils and fats, in which fats in the molten state, sometimes along with molten waxes and hot oils, are introduced into the leather at a temperature ranging from 45° to 60°C depending on the type of the tannage of leather.

Very little information is available as to the mechanism of reaction between fatliquoring materials and the leather, or between the stuffing materials and the leather. The type of oils, their characteristics, the nature of the emulsion, the emulsifying agent, the state of subdivision of the oil and fat particles, the pH of the fatliquor, the degree of sulphation of fatliquoring materials etc., all play very important parts in contributing to the leather the different characteristics.

In the case of picking band and other industrial leathers the type of oil and other fatliquoring materials, the quantities of those materials and other factors, as stated before, combined together are responsible for proper softness, stretchiness, strength and other characteristics of the leather.

In the process of fatliquoring, a mixture of raw oils, sulphated oils and sometimes soft fats are mixed together and used. The proportions and percentages of fatliquoring materials on the weight of the leather vary according to the conventions and experiences of a tanner. Much importance is attached in the fatliquoring process for other types of leathers than the heavy industrial leathers. In the latter

cases, the main object is to introduce right types of oils in right quantities and under proper condition of the leather. But in the cases of other leather, the effect of fatliquors on the tightness, feel, the break of the grain and other characteristics are also looked into. Though the quality of the leather depends much on the characteristics of the fatliquoring materials, very little is known about their selections and adjustments.

The common fatliquors are the anionic fatliquors. They are mostly preparations of sulphated oils in which the fatty portions exist as negatively charged ions forming salts of sodium, potassium and ammonium.

The type and degree of tannage has also a great influence on the shrinkage, stretch, and tensile strength of the leather apart from the parts played by the fatliquors.[15]

Regarding the effect of degree of sulphation aud fineness of the particle size, on the penetration and absorption of oil and fat from a fatliquor, it is found that a highly sulphated oil used in a fatliquor gives finest particle size and has more penetrating power. Such type of fatliquor, however, is absorbed to a lesser extent than one having bigger particle size and low degree of sulphation of the oil.[96]

Regarding the effect of temperature it has been found that increased temperature diminishes the absorption of fat from soap, or sulphated oil and mineral oil fatliquors.[97]

Theis and Hunt[98] have found that change of pH has a considerable influence on the absorption of oils and fats from emulsions but Stather and Lauffmann[99] are of opinion that pH has but little effect on the uptake of fat.

The deposition of fat in the leather occurs predominently in the outer layer. Increase in the amount of fat leads finally to penetration into the interior of the leather.[100, 101]

The drying[102] and the machanical operation[96] have also great influence in the distribution of fat within the leather.

In a fatliquor a sulphated fatty oil acts as an emulsifying agent but does not assist very much in the lubrication of the leather. It combines readily with leather and changes into solvent-insoluble products. The chemical combination of this type accounts, almost entirely, for the combined oil of chrome leather fatliquored with sulphated fatty oils. The free fatty acids and unsulphated oils, however, are capable of lubricating the leather.[96]

Now-a-days cationic fatliquors are also largely used in the case of mineral tanned leather along with tanning chemicals or immediately proceeding it. Cationic fatliquors are highly stable in strong acid media while the nonionic fatliquors possess good stability in the presence of salt solutions. Hence a mixture of cationic and nonionic fatliquor is used in the chrome tanning bath which simultaneously functions as a fatliquoring bath also. Such type of process produces a good tensile strength and smooth grained leather. The mixed fatliquor of this type is not suitable in the case of vegetable tanned leather because in the latter case most of the oil is deposited on the superficial layers of the leather.[103]

Apart from excellent lubrication of leather fibre, stuffing also helps finer splitting of the fibres. The extent of splitting depends on the viscosity of the oil and interfacial tension existing between the stuffing mixture and the sammed leather fibres.[104] Conabere[87] has pointed out that leathers containing 3% or more of grease produce much splitting, low angle of weave and low compactness of weave. These physical characteristics have got no relation with grease content of the leather below 3%.

The effect of stuffing grease in increasing the tensile strength of the leather has been studied by Whitmore, Hart and Back.[105] They have found that petrolium-paraffin mixture is quite as effective as cod oil-tallow mixture. But Bowker and Churchill[106] have stated that when the percentage of stuffing grease exceeds a certain limit, the tensile strength does not increase any more. Wilson[30] has also found similar effect. He has observed that when the percentage of stuffing grease is above 21, the tearing strength decreases instead of increasing.

Neither the effect of various types of oils and fats used individually or in mixaure on the tensile strength, stretchiness and other characteristics of picking band leather nor the effect of non-drying or semidrying type of oils on the keeping quality of the leather has been studied. In the case of picking band leathers which are sometimes stored and kept for a long time in the tannery by piling up the leathers one over another, it is essential to know the effect of various types of oils on the quality of the leather and its tensile strength with progress of time and with the variations of atmospheric temperature. It is also necessary to study the rate and extent of oxidation of the drying and semidrying types of oils and their effect on the tensile strength of the leather after storing.

Finishing :

Finishing of picking band leather is much simpler than that of any other variety of heavy leather. The leathers after stuffing are allowed to dry up completely.

Before complete drying the leathers are sometimes set to remove folds and rinckles from the grain surface in order to make the leather look better. Picking bands with hairs on are, however, not set. The hair is sometimes scoured with a solution of soap or other detergents to remove the dirts and greases adhering to the hairs. In order to make the hairs shinny sometimes dry saw dust or sand in a moderately hot state is sprinkled on the hair side, rubbed over the hairs and kept in a pile for a day to absorb superficial greases from the hairs. Hairs are sometimes clipped to make them uniform in size.

REFERENCES

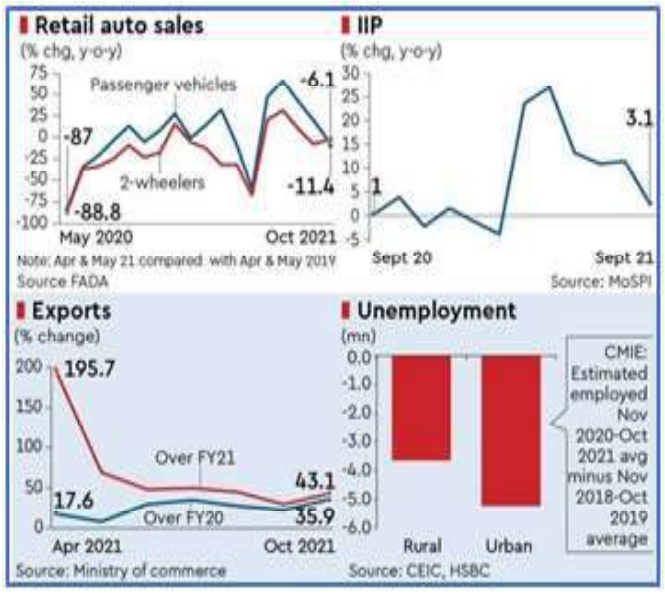
1-57) See JILTA, March 1962, P. 110-111
58) Holden, Leather Trades Review, 547 (1954)
59) Dohogne, Le Cuir Tech 30, 117 (1941)
60) Kutyanin, J. A. L. C. A. 754 (1952)
61) Mezey, Collegium No. 662, 305 (1925)
62) Mezey, Cuir Tech, 14, 105 (1925)
63) Stather, Collegium No. 753, 9 (1933) ; No. 758. 316 (1933)
64) Thomas and Kelly, J. A. L C. A. 24, 282 (1929)
65) Stather and Herfeld, Ges, Abhandl deut. Leder inst. Feiberg/Sa 3, 3 (1950)
66) Wilson, J. A. L. C. A. 31, 449 (1936)
67) Thomas and Kelly, Ind. Eng. Chem 14, 292 (1922) ; 15, 928, 1148 (1923)
68) Page and Holland, J. A. L. C. A. 26, 143 (1931)
69) Page and Holland, J. A. L. C. A. 27, 432 (1932)
70) Thomas and Kelly, Ind. Eng. Chem 15, 1262 (1923)
71) Ma, Pierlie and Lollar, J. A. L. C. A. 41, 281 (1946)
72) Pound and Quinn, J. S. L. T. C. 25, 90 (1941)
73) Leather Trades Review- 685, Feb. (1951)
74) Bravo, J. I. L. T. A. 53 (1958)
75) Merry "The chrome tanning process"
76) Lamb "The manufacture of Chrome Leather"
77) B. Thorstenser, "Chemistry and Technology of Leather" edited by O 'Flaherty Roddy & Lollar
78) Stiasny, Kunzel and Kinzer, Collegium No. 679, 213 (1934)
79) Wilson and Gallum, J. A. L. C. A. 15, 273 (1920)
80) Gustavson, J. A. L. C. A. 18, 568 (1923)
81) Wudich, Leder, 4, 82 (1953)
82) Holland. "Chemistry of Leather manufacture" (McLaughlin & Theis)
83) Merill and Schroeder, Ind. Eng. Chem, 21, 1225 (1929)
84) Klanfer and Kenedi J. A. L. C. A. 46, 78 (1951)
85) Theis and Kalb, J. A. L. C. A, 33, 120 (1938)
86) Belavsky and Hrebicek, Leather Trades Review, 369 (1956)
87) Conabere, J. I. S. L. T. C. 232 (1945)
88) Naik, J. I. L. T. A. 218 (1958)
89) Klenew, J. S. L. T. C. 67 (1951)
90) Stather, J. S. L. T. C. 280 (1951)
91) Bose, J. I. L. T. A. 247 (1958)
92) Nayudamma and Theis & Kritzinger, J. A. L. C. A. 220 (1951)

93) Stiasny, Collegium 11, 293 (1912) ; 420 (1926)
94) Schindler, Klanfer and Flaschner-Collegium 714, 472 (1929)
95) Smith, J. A. L. C. A, 87 (1945)
96) Koppenhoefer and Retzsch, J. A. L. C. A. 35, 78 (1940)
97) Schindler, Flaschner, Klanfer, Koal. Beihefte, 31, 157 (1930)
98) Theis and Hunt, Ind. Eng. Chem 24, 799 (1932)
99) Stather and Lauffmann-Collegium 745, 391 (1932)
100) Merill, Ind. Eng. Chem 20, 181 (1928)
101) Merill, Ind. Eng. Chem 20, 654 (1928)
102) Schindler, Collegium, 790, 77 (1936)
103) Retzsch, Tanner, 120 (1960)
104) Balfe and Urash, J. I. S. L. T. C. 23, 347, 436 (1939)
102) Whitmore, Hart and Beck, J. A. L. C. A, 14, 128 (1919)
106) Bowker and Churchill- "Effect of oils, greases and degree of tannage on the physical properties of Russet, Harness Leather"- Bureau of standards, Technologic paper No. 160 (1920)

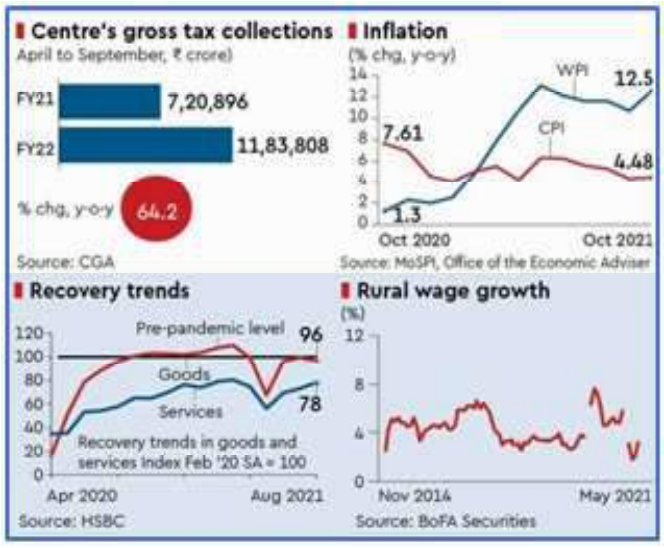
INFLATION COULD IMPEDE NASCENT ECONOMIC RECOVERY

Rising prices and high input costs could hit demand slowing the pace of recovery over the next few months. This is worrying for sectors such as two-wheelers where demand is even otherwise subdued.

Indeed, the sharp drop in sales of tractors in Octobers raises concerns about the conditions in the rural economy. An analysis by Bank of America reveals the increase in rural wages has been slowing, averaging 2.7% y-o-y in the April – July period compared with a much better raise of 7.4% y-o-y in the same period last year. Also, the deceleration has been steeper for non-Agri wages rather than Agri wages.



Driven by a rise in rural unemployment which jumped to 7.91% in October from 6.06% in September, overall unemployment rose to 7.75% from 6.86%, CMIE data showed.



Meanwhile, with favourable base effects fading, the growth in factory output moderated sharply to 3.1% y-o-y in September from 12% y-o-y in August, with manufacturing leading the decline, something of a reality check.

Indeed, while much of the organised corporate sector is doing very well, having negotiated the supply disruptions — reflected in the robust tax collections — one is less sure about the state of the rest of the economy.

The good news is that exports are on a roll; Merchandise exports grew for the 11th consecutive month to $35.65 billion, up 43% y-o-y in October and a good 36% over October,2019. Moreover, non-oil and non-gems and jewellery, accounted for a significant share in imports in both September and October reflecting a pick-up in business activity.

(Source : Financial Express – 29/11/2021)

CGCL PARTNERS WITH UNION BANK OF INDIA TO HELP MSMES

Capri Global Capital Limited (CGCL), a NBFC focused on MSMEs, and affordable housing finance segment has entered into a co-lending agreement with the Union Bank of India (UBI), to offer MSMEs loans. Through this collaboration, CGCL and UBI aim to disburse MSME loans across 100+ touch points pan-India. The loan disbursement under this arrangement would commence from December 2021.

This agreement is signed under the guidelines issued by the RBI in November 2020 for co-lending to the Priority Sector. The collaboration will be helping MSMEs to avail customized lending solutions at a competitive rate of interest with a significant reduction in turn-around time. The agreement aims to enhance last mile credit and drive financial inclusion to MSMEs by offering secured loans between Rs 10 lakh to Rs 100 lakh. The co-lending arrangement will entail joint contribution of credit to the prospective MSME customers in Tier II and Tier III markets.

In a statement, Rajesh Sharma, Managing Director, Capri Global Capital Limited, said, "Through this partnership, the aim is to reach out to a large section of society by offering easy, convenient, and efficient credit solutions and empowering them to be key contributors to fiscal growth. Our focus is to support the grassroots entrepreneurship that creates economic value."

"The partnership with CGCL is part of UBI's strategy to support the MSMEs by providing tailor-made financial solutions and accelerating the growth of MSMEs to contribute to the country's economic development," said Rajkiran Rai G, MD and CEO, Union Bank of India, in a statement.

(Source : Economic times – 24/11/2021)

INDIAN ECONOMY IN BETTER SHAPE THAN A YEAR AGO, SAYS ECONOMIST PINAKI CHAKRABORTY

The wholesale price-based inflation spiked to 5-month high of 12.54 per cent in October, mainly due to rise in prices of manufactured products and crude petroleum, while retail inflation inched up to 4.48 per cent in October due to an uptick in food prices.

India's macroeconomic situation is certainly better than what it was a year ago, eminent economist Pinaki Chakraborty said on Monday, while expressing hope that the country will be back on the path of economic growth if there is no major third wave of the COVID-19 pandemic.

In an interview with PTI, Chakraborty, who is the director of the National Institute of Public Finance and Policy (NIPFP), said that inflation may remain at an elevated level as there was a significant fiscal and monetary expansion in the last 18 months.

The current macroeconomic situation is certainly much better than what it was one year back. We are seeing recovery in most sectors," he said.

Chakraborty noted that COVID-19 vaccination has been going on at a very fast rate in India."And hopefully if there is no third wave, we will be back on a path of economic growth which will be sustainable and increasing," the eminent economist added.

According to Chakraborty, COVID-19 vaccination brings a sense of health security and should help resumption of normal economic activity, particularly in the services sector, which contributes more than 50 per cent of India's GDP.The Reserve Bank of India (RBI) has lowered the growth projection for the current financial year to 9.5 per cent from 10.5 per cent estimated earlier while the IMF has projected a growth of 9.5 per cent in 2021 and 8.5 per cent in the next year.

Noting that GST collections have been quite good in the last couple of months, Chakraborty said, "And if we are able to manage our deficits in a manner that does not become a problem later, recovery will be sustainable and durable".Asked what fiscal measures are necessary to support households in distress, he opined that "So fiscal programmes targeted to improve the household budget is important. However, we have to recognise what is possible within the limited resources."He further said that in this context, the issue of growth and private-sector job creation becomes very important.On fiscal challenges, Chakraborty observed that there is a need to look at the deficit of centre and states together.

The eminent economist pointed out that in the fiscal year 2020-21, the deficit of all levels of governments is estimated to be 14 per cent of GDP and the same is estimated to be around 10 per cent of GDP in 2021-22."The deficit levels are high, global debt has increased and the pressure to provide immediate resources for the Covid response for health and livelihood has not declined," he said, adding that in a situation like this, medium to long term planning becomes a very difficult task.

Chakraborty opined that data shows that globally, governments are faced with complex challenges related to resource allocation for three priorities: life, livelihood and economic recovery."How much resources to each of these components, would depend on the country-specific need and how it is done will determine the pace of recovery. It is easier said than done and is a continuous process as we navigate the pandemic," he said.

According to Chakraborty, the state government's revenue in India had contracted by 16 per cent in 2020-21 while the health expenditure increased by 24 per cent.Asked if high CPI and WPI inflation are a concern, he said high inflation is always a concern but it is also important to recognise that managing inflation is also a phenomena that is to be fought on multiple fronts. "Inflation may remain at an elevated level as there was significant fiscal and monetary expansion in the last 18 months," he said.

The wholesale price-based inflation spiked to 5-month high of 12.54 per cent in October, mainly due to rise in prices of manufactured products and crude petroleum, while retail inflation inched up to 4.48 per cent in October due to an uptick in food prices. On the stock market boom at a time when economic growth has slowed down, he noted that it is important to recognise that the market is always forward looking."But over time, we would require broad-based recovery….I think formal sector employment will increase only when we have a broad based economic recovery," the economist said.

(Source : Business Standard – 25/11/2021)

3 KEY CHALLENGES FOR SMES IN MAKING THE MOST OF THEIR INVESTMENT PORTFOLIOS AND HOW TO ADDRESS THEM

Credit and Finance for MSMEs: Data integration is vital to performance, risk, and compliance. Small and mid-sized organizations should ensure they have a plan in place to maintain data quality.

Credit and Finance for MSMEs : As small and mid-sized companies build more complex portfolios that blend public and private assets, they need to take a holistic view of all investments to quickly assess risk and make informed decisions.

For some organizations, a more complex portfolio may mean rapidly adding public and private debt, bank loans, real estate, and other vehicles, while others may be just starting with floating rates or derivatives. Regardless of the organization's unique situation, there will almost surely be an equally unique and evolving landscape of obligations and compliance concerns.

Unfortunately, many small and mid-sized companies are unable to effectively meet these responsibilities because of outdated processes and data systems. The majority of small and mid-size companies still rely exclusively on the traditional back-office accounting book of records (ABOR) which treats positions as accounting entries that are not investment-centric. The outdated practice of using this type of static information is the foundation of three of the most common challenges that small and mid-sized organizations face.

Receiving Complete and Timely Data

Generating accurate positions and cash flow projections for the front office before the start of the trading day can be difficult, especially if it involves investments that are spread across regions and asset classes. Data obtained from external sources are not always timely and requires consolidation and normalization to create a real-time investment book of records (IBOR) that investment managers and traders can confidently rely on.

For smaller teams, adding headcount to process this data isn't an option. For organizations to seize opportunities, they need to invest in IBOR systems that are purposely built to deliver timely and accurate views of performance, exposure, liquidity, and risk to the front office with the ability to scale with the organization's needs.

Moreover, without a holistic, real-time view of cash flow projections that take into account the day's trading activity, subscriptions, redemptions, accruals, and maturity opportunities will be lost. Portfolio managers could be left with uninvested cash or overdraft due to a lack of synchronized data between back-office source systems.

Performance Analytics and Benchmarking

Without a holistic view of their portfolio, successful portfolio managers will be unable to understand if the investor's success is the result of allocating their portfolio's assets to various segments, selecting specific securities within a given segment, or the combined effect of both allocation and securities selection within a segment.

If you are responsible for managing or monitoring investment portfolios, then you probably already know that your performance and attribution analysis is only as good as the data it is built upon. When it comes to portfolio data, the last thing you want is to have incomplete or inaccurate data to use for your analysis. You need to be able to have confidence in your data so you can have confidence in the conclusions you reach.

Data integration is vital to performance, risk, and compliance. Small and mid-sized organizations should ensure they have a plan in place to maintain data quality. With the same data and analytics at the heart of each, organizations can optimize data integration from performance measurement to supporting compliance and risk workflows.

Compliance Risk

Investment compliance policy is crafted to ensure clarity about how the assets should and should not be invested by an investment manager. A typical investment compliance policy includes what types of assets the account will invest in and what investments are off-limits. It also contains the rules around the spread of credit ratings that the portfolio manager needs to maintain. Additionally, a compliance policy includes risk guidelines and rules about when the investment manager should notify the client of issues.

Many investors simply rely on the manager to inform them of any breaches. The conflicts of interest here is obvious and due to the manual nature, managers or investors only check compliance on a monthly or quarterly basis – therefore creating a risk.

Focused IBOR solutions have inbuilt daily compliance checks that alert the investors and portfolio managers of any violations and breaches, thus eliminating any potential issues. They also provide pre-trade and post-trade compliance.

Quickly Assessing Risk and Making Informed Decisions

The institutional investment world, especially for small and mid-sized organizations, has been a place of balkanized data and a lack of a holistic view at a portfolio level. As a result, institutions have been unable to seize opportunities.

The technology exists to improve enterprise-wide visibility to risk and to enable more informed decision-making. However, too many organizations are still hampered by legacy technology and the use of manual processes to aggregate data. The solution is to invest in an investment accounting and analytics solution that aggregates disparate data sources, applies analytics, and delivers information to decision-makers in real-time.

(Source : Financial Express – 28/11/2021)

AT RS 1.31 LAKH CR, NOV'S GST MOP-UP IS 2ND HIGHEST SINCE ROLLOUT

Goods and Services Tax (GST) collections jumped to over Rs 1.31 lakh crore in November, the second highest since its implementation in July 2017, in line with the trend in economic recovery, the finance ministry said on Wednesday. "The gross GST revenue collected in the month of November 2021 is Rs 1,31,526 crore of which CGST is Rs 23,978 crore, SGST is Rs 31,127 crore, IGST is Rs 66,815 crore (including Rs 32,165 crore collected on import of goods) and Cess is Rs 9,606 crore (including Rs 653 crore collected on import of goods)," the ministry said in a statement.

CGST refers to Central Goods and Services Tax, SGST (State Goods and Service Tax) and IGST (Integrated Goods and Services Tax). The GST revenues for the month of November 2021, are 25 per cent higher than November 2020, and 27 per cent higher over November 2019. "The GST revenues for November 2021 have been the second highest ever since introduction of GST, second only to that in April 2021, which related to year-end revenues and higher than last month's collection, which also included the impact of returns required to be filed quarterly.

"This is very much in line with the trend in economic recovery," the ministry said. In October 2021, the revenues were Rs 1,30,127 crore, while in April 2021, it was the highest at over Rs 1.41 lakh crore. The recent trend of high GST revenues has been a result of various policy and administrative measures that have been taken in the past to improve compliance. A large number of initiatives undertaken in the last one year like, enhancement of system capacity, nudging non-filers after last date of filing of returns, auto-population of returns, blocking of e-way bills and passing of input tax credit for non-filers has led to consistent improvement in the filing of returns over the last few months, the ministry added.

(PTI – 01/12/2021)

INDIA-CHINA TRADE DEFICIT STANDS AT USD 30 BN DURING APRIL - SEPTEMBER

India's exports to China during the April-September 2021 period was USD 12.26 billion, while imports were aggregated at USD 42.33 billion, according to data given by Minister of State for Commerce and Industry Anupriya Patel in a written reply to the Lok Sabha.

Trade Deficit between India and China stood at USD 30.07 billion during April – September' 202, Parliament was informed on 30th November.

India's Export to China during the period April – September'2021was USD 12.26 billion, while Imports were aggregated at USD 42.33 billion, according to data given by Minister of State for Commerce and Industry Anupriya Patel in a written reply to the Lok Sabha.

She said the imports from China have increased from USD 60.41 billion in 2014-15 to USD 65.21 billion in 2020-21, exhibiting an increase of 7.94 per cent over six years.

However, the imports were static between 2019-20 and 2020-21, she said. "The government has made sustained efforts to achieve a more balanced trade with China, including bilateral engagements to address the non-tariff barriers on Indian exports to China," Patel said.

Schemes like the production-linked incentive scheme will help promote domestic manufacturing capacities and attract investment and reduce dependency on imports from China, the minister said.

Major items of import from China include telecom instruments, computer hardware, fertiliser, electronic components, chemicals and drug intermediates.

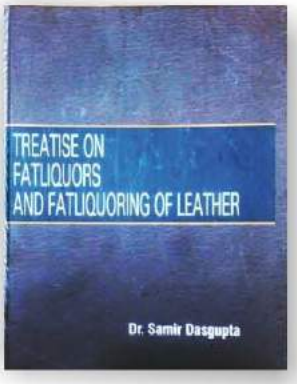
(Financial Express – 01.01.2021)

-: JILTA :-

***Owner**: Indian Leather Technologists' Association, **Publisher & Printer**: Mr. S. D. Set, **Published From**: 'Sanjoy Bhavan', (3rd floor), 44, Shanti Pally, Kasba, Kolkata - 700107, West Bengal, INDIA and **Printed From**: M/s TAS Associate, 11, Priya Nath Dey Lane, Kolkata- 700036, West Bengal, INDIA*

ILTA PUBLICATION

Now available



Title of the Book
Treatise on Fatliquors and Fatliquoring of Leather

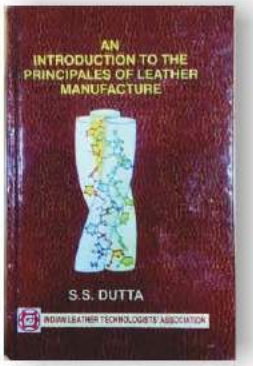
Author
Dr. Samir Dasgupta

Price per copy*
₹1500.00 / $ 60.00

Title of the Book
Comprehensive Footwear Technology

Author
Mr. Somenath Ganguly

Price per copy*
₹500.00 / $ 50.00



Title of the Book
An Introduction to the Principles of Leather Manufacture

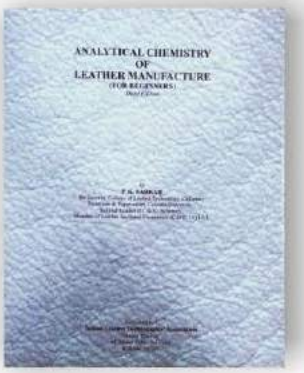
Author
Prof. S. S. Dutta

Price per copy*
₹800.00 / $ 50.00

Title of the Book
Analytical Chemistry of Leather Manufacture

Author
Mr. P. K. Sarkar

Price per copy*
₹300.00 / $ 10.00



Title of the Book
Synthetic Tanning Agents

Author
Dr. Samir Dasgupta

Price per copy*
₹900.00 / $ 30.00

Title of the Book
Hand- Book of Tanning

Author
Prof. B. M. Das

Price per copy*
₹750.00 / $ 25.00

*Packing and forwarding charge extra

Send your enquiries to :

Indian Leather Technologists' Association

'Sanjoy Bhavan', 3rd Floor, 44, Shanti Pally, Kolkata- 700 107, WB, India
Phone : 91-33-2441-3429 / 3459 ✹ WhatsApp +91 94325 53949
E-mail : admin@iltaonleather.org; mailtoilta@rediffmail.com
Website : www.iltaonleather.org

Registration No. KOL RMS/074/2019-21

History and Activities of Indian Leather Technologists' Association

The Indian Leather Technologists' Association (ILTA) was founded by Late Prof. B. M. Das, the originator of Das-Sisaney theory and father of Indian Leather Science on 14th August 1950.

The primary objectives of the oldest Leather Technologists' Association which celebrated its Diamond Jubilee year in the 2010, are :

- To bring all concerned with the broad spectrum of the leather industry under one umbrella.
- To organize seminar, symposium, workshop in order to create information, knowledge and latest development for the benefit of all concerned. To offer a common platform for all to interact with each other in order to understand each other's problems and prospects.
- To publish monthly journal as a supplement to those above objectives. The monthly journal of ILTA is known as journal of Indian Leather Technologists' Association and is the most widely circulated technical journal concerning leather technology.
- To publish text books for the benefit of students at various levels of study, for the researchers and industry.
- To have interface between urban and rural sector.
- To assist Planning Commission, various Government Institutions, Ministry and autonomous bodies to formulate appropriate policies acceptable and adoptable to the industry.
- To organize practical training and to provide skilled manpower and to motivate good students for study.
- To conduct activities related to the growth of the export of leather and leather goods from India.
- As the part of many social activities ILTA has donated Rs. 1 lac to Consul General of Nepal towards relief of earthquake effected of Nepal on 15th Sept, 2015.

INTERNATIONAL & NATIONAL SEMINAR

- ILTA is the Member Society of International Union of Leather Technologists & Chemists Societies (IULTCS), a 115 years old organization and for the first time the IULTCS Congress was organized in January 1999 outside the developed countries in India jointly by ILTA and CLRI.
  2017 IULTCS Congress is scheduled to be held in India again.
- 8th Asian International Conference on Leather Science & Technology (AICLST) was organized by ILTA in 2010 during its' Diamond Jubilee Celebration year.

SEMINAR & SYMPOSIUM

ILTA organizes Seminar & Symposiums on regular basis to share information, knowledge & latest development and interactions for the benefit of all concerned. Few are as under :

- Prof. B. M. Das Memorial Lecture every year during the Foundation Day Celebrations on 14th August every year.
- Sanjoy Sen Memorial Lecture on 14th January every year, the birthday of our late President for several decades.
- Prof. Moni Banerjee Memorial Lecture on 15th March every year, the birthday of this iconic personality.
- Seminar on the occasion of India International Leather Fair (IILF) at Chennai in February every year.

It has also organized :

- Prof. Y. Nayudamma Memorial Lecture.
- Series of Lectures during "Programme on Implementing Emerging & Sustainable Technologies (PrIEST)".
- Seminars in occasion of India International Leather Fair, 2014 and 2015 at Chennai etc. Many reputed scientists, industrialists and educationists have delivered these prestigious lectures. Foreign dignitaries during their visits to India have addressed the members of ILTA at various times.

PUBLICATION

ILTA have published the following books :

- An Introduction to the Principles of Physical Testing of Leather by Prof. S. S. Dutta
- Practical Aspects of Manufacture of Upper Leather by J. M. Dey
- An Introduction to the Principles of Leather Manufacture by Prof. S. S. dutta
- Analytical Chemistry of Leather Manufacture by P. K. Sarkar
- Comprehensive Footwear Technology by Mr. Somnath Ganguly
- Treatise on Fatliquors and Fatliquoring of Leather by Dr. Samir Dasgupta
- Synthetic Tanning Agents by Dr. Samir Dasgupta
- Hand Book of Tanning by Prof. B. M. Das

ILTA has a good Library & Archive enriched with a few important Books, Periodicals, Journals etc.

AWARDS OF EXCELLENCE

- ILTA awards Prof. B. M. Das Memorial, Sanjoy Sen Memorial, J. M. Dey Memorial and Moni Banerjee Memorial Medals to the top rankers at the University / Technical Institute graduate and post graduate levels to encourage the brilliants to evolve with the Industry.
- J. Sinha Roy Memorial Award for the author of the best contribution for the entire year published in the monthly journal of the Indian Leather Technologists' Association (JILTA).

LEXPOs

To promote and provide marketing facilities, to keep pace with the latest design and technology, to have better interaction with the domestic buyers, ILTA has been organizing LEXPO fairs at Kolkata from 1977, Siliguri from 1992 and Durgapur from 2010. To help the tiny, cottage and small-scale sectors industries in marketing. LEXPO fairs give the exposure for their products. Apart from Kolkata, Siliguri & Durgapur, ILTA has organized LEXPO at Bhubaneswar, Gangtok, Guwahati, Jamshedpur and Ranchi.

MEMBERS

The Association's present (as on 31.03.2018) strength of members is more than 600 from all over India and abroad. Primarily the members are leather technologists passed out from Govt. College of Engineering & Leather Technology, Anna University, Chennai, Harcourt Butler Technological Institute, Kanpur, B. R. Ambedkar National Institute of Technology, Jalandhar and Scientists from Central Leather Research Institute.

ESTABLISHMENTS

In order to strengthen its activities, ILTA have constructed its own six storied building at 44, Shanti Pally, Kasba, Kolkata – 700 107 and have named it "Sanjoy Bhavan".
This Association is managed by an Executive Committee duly elected by the members of the Association. It is absolutely a voluntary organization working for the betterment of the Leather Industry. None of the Executive Committee members gets any remuneration for the services rendered but they get the satisfaction of being a part of this esteemed organization.

ILTA
Since 1950

Indian Leather Technologists' Association
[A Member Society of International Union of Leather Technologists' and Chemists Societies]
'Sanjoy Bhavan', 3rd Floor, 44, Shanti Pally, Kolkata- 700 107, WB, India
Phone : 91-33-2441-3429 / 3459 WhatsApp +91 94325 53949
E-mail : admin@iltaonleather.org; mailtoilta@rediffmail.com
Website : www.iltaonleather.org