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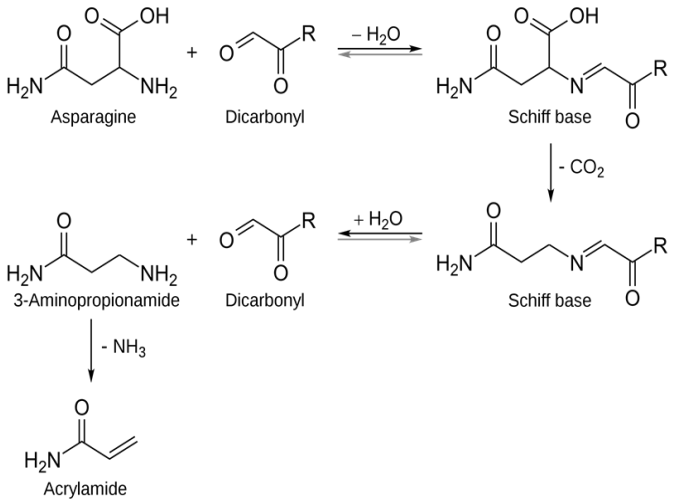
11 May, 2024

Maillard Reaction

Context: *The Maillard Reaction elucidates the intricate chemical processes behind the development of flavours, aromas, and textures in foods.*

- **Overview of the Maillard Reaction:**
  - The Maillard reaction occurs between amino acids and reducing sugars, resulting in the creation of melanoidins, which impart the distinctive flavour and brown colour to foods.
  - Foods like seared steaks, fried dumplings, cookies, breads, and toasted marshmallows undergo this reaction.
  - Named after Louis Camille Maillard, who described it in 1912 during attempts to replicate biological protein synthesis.
- **Chemical Mechanism of Browning:**
  - Heating sugars and proteins lead to the formation of an unstable Schiff base, which rearranges and dehydrates to form intermediate compounds.
  - These intermediates further react to produce flavour compounds, while some rearrange to form stable products, precursors of melanoidins.
  - Melanoidins, nitrogen-containing compounds, give food its brown colour.
- **Factors Influencing the Reaction:**
  - Temperature, acidity, moisture content, and types/concentrations of proteins and sugars influence the rate and extent of the Maillard reaction.
  - Ideal temperatures range from 110°C to 170°C, higher temperatures may lead to burning and bitterness.
  - Higher temperatures accelerate the reaction, while acidic conditions and water presence can inhibit it.
  - Foods brown more rapidly at higher temperatures, and dry foods develop deeper brown colours during baking.
- **Food Products and Culinary Applications:**
  - The Maillard reaction contributes to the browning of meats, fried onions, baked goods, French fries, malted barley, dulce de leche, chocolate, roasted peanuts, and more.
  - Specific compounds like 6-acetyl-2,3,4,5-tetrahydropyridine create biscuit-like flavors in baked goods, while 2-acetyl-1-pyrroline gives cooked rice and pandan their characteristic smells.
  - Roasting or searing meat involves complex browning reactions, primarily Maillard browning.
- **Health and Safety Considerations:**
  - Acrylamide, a potential carcinogen, can form at high temperatures during the Maillard reaction.
  - Techniques such as heating at lower temperatures, adding asparaginase, or injecting carbon dioxide can help mitigate acrylamide formation.



2024 Work Trend Index

Context: *The 2024 Work Trend Index, jointly released by Microsoft and LinkedIn, explores the impact of AI in the workplace.*

- **AI Integration in the Workplace:**
  - Use of generative AI has nearly doubled in the last six months, with 75% of global knowledge workers now utilising it.
  - Employees are incorporating AI into their work routines, citing benefits such as time savings, increased focus, creativity, and job satisfaction.
  - Despite recognition of AI's importance by leaders, many organisations lack a clear plan to implement AI effectively and demonstrate tangible ROI.
- **Employee Adoption and Self-Directed AI Use:**
  - 78% of AI users bring their own AI tools to work, especially prevalent in smaller companies.
  - Despite its benefits, some users are hesitant to admit to using AI for important tasks, fearing it may make them appear replaceable.
  - This self-directed approach to AI adoption risks missing out on strategic benefits and exposes company data to potential security threats.
- **Impact of AI on Workload and Career Dynamics:**
  - AI adoption is driven by the need to manage overwhelming workloads, with many employees experiencing burnout.
  - Professionals are considering career changes, with concerns about job loss balanced by opportunities for skill development and career advancement in AI-related roles.
- **Shift in Hiring Priorities and Skills Development:**
  - Leaders prioritize hiring candidates with AI skills, recognising the importance of AI aptitude in remaining competitive.

- However, there's a gap in providing AI training, with only a quarter of companies planning to offer training on generative AI.
- Professionals are taking initiative to upskill in AI, recognising its importance in remaining competitive and advancing their careers.

➢ **Emergence of AI Power Users and Organisational Impact:**

- AI power users, who integrate AI extensively into their work routines, experience benefits such as increased productivity, creativity, and job satisfaction.
- Organisations that support AI training and encourage experimentation with AI usage see greater adoption and positive outcomes.
- AI power users provide insight into future work patterns and organisational culture, highlighting the potential of AI to drive transformation and innovation.

Turnouts, delays, Form 17C

Context: *The Election Commission of India strongly denied Congress president Mallikarjun Kharge's allegations of result manipulation due to delayed voter turnout data.*

➢ **Initial and Final Turnout Figures:**

- Initially, voter turnout in the first phase was estimated to be over 60% at 7 pm, which later confirmed to be 65.5%.
- Similarly, in the second phase, the initial turnout was reported as 60.96% at 7 pm, later finalised at 66.71%.
- The Election Commission of India (ECI) released the final turnout figures for both phases on April 30.

➢ **Reasons for Difference:**

- The initial numbers provided by the ECI are preliminary estimates and are subject to change.
- The final figures often increase due to updated data from Returning Officers (ROs) after further verification and collation

➢ **Timing of Official Releases:**

- Official turnout figures were released 11 days and 4 days after the completion of the first and second phases of voting, respectively
- The ECI asserts that there was no unusual delay in releasing the official turnout figures, citing similar timelines in past elections.

➢ **Process of Data Collection:**

- Verification and collation of data take time, especially from remote areas with limited connectivity.
- Data entry and publication occur after thorough scrutiny by ROs in the presence of candidates or their representatives.

➢ **Form 17C:**

- Form 17C is issued to polling agents at the close of polling and contains crucial information such as EVM identification, total electors, and votes recorded.
- It is considered final and is crucial for any legal challenges or verification of election results.

➢ **Demand for Transparency:**

- There is a growing demand from activists for the public availability of Form 17C data to ensure transparency in the electoral process.
- However, the ECI states that it is not legally obligated to publish aggregate turnout data, emphasising the provision of Form 17C to candidates and parties.

➢ **Verification on Counting Day:**

- On counting day, the counting supervisor certifies that there are no discrepancies between the counted and recorded votes in Form 17C.
- Candidates or their representatives have the right to challenge any discrepancies observed during the verification process.

News in Between the Lines

World Migratory Bird Day

World Migratory Bird Day is observed on May 11.

About World Migratory Bird Day:

- World Migratory Bird Day (WMBD) is an **annual global campaign** that aims to raise awareness about the **conservation of migratory birds** and **their habitats**.
- It is celebrated on the **second Saturday of May** and **October.**
- The theme for 2024 is "**Insects**".
- The United Nations established World Migratory Bird Day in **2006** as part of its **Agreement on the Conservation of African-Eurasian Migratory Waterbirds**.
- The concept of raising awareness about the threats to migratory birds originated in the **United States** in **1993**.
- Recently, **Flamingos** have been seen at a **pond in Navi Mumbai** at the end of their migratory season.

Sonai Rupai Wildlife Sanctuary

Recently, the National Green Tribunal (NGT) has launched an investigation into the construction of polling stations, schools, and other structures within Assam's Sonai Rupai Wildlife Sanctuary.

About Sonai Rupai Wildlife Sanctuary:

- Sonai Rupai Wildlife Sanctuary is a **protected area in Assam**.
- It is located in the foothills of the Great Himalayan Range.
- The sanctuary was established in **1998** and is known as the "**Jewel of Assam**" for its diverse wildlife, unique landscape and scenic beauty.
- The sanctuary is home to a variety of flora and fauna, including **Indian bison**, **elephants** and deer.
- The sanctuary's subtropical climate is prone to heavy rains and flooding from rivers like **Burhi Dihing** and **Namchang**.

About National Green Tribunal:

- The National Green Tribunal is a **statutory body in India** that was established in **2010** to handle environmental cases.
- It is a specialized judicial body that can **handle environmental disputes** with multi-**disciplinary issues.**
- The Tribunal has a **Chairperson**, **Judicial Members** and **Expert Members**, who serve for **5 years** and **cannot be reappointed**

Defence Research and Development Organisation

Recently, the Eighth Technology Council Meeting was organized by the Defence Research and Development Organisation (DRDO) in New Delhi with the primary objective of reviewing the current status of the integration of DRDO technologies within the Central Armed Police Forces, Police and National Disaster Response Force (NDRF).

About the Defence Research and Development Organisation:

- The Defence Research and Development Organisation (DRDO) is a **government agency** that designs, **develops** and **produces defense equipment**, **weapon systems** and sensors for the Indian Defense Services.
- It works under the **administrative control of Ministry of Defence,** Government of India.
- It was established in **1958 by combining three major defense organizations**: Defence Science Organisation (DSO), Defence Technical Development Esta blishment (DTDE) and Directorate of Technical Development and Production (DTDP).
- It is **headed by the Secretary**, **Department of Defence R and D**, who is also the Director General.
- Notable contributions include the development of **LCA Tejas**, **Agni, Prithvi**, **Akash**, **BrahMos missiles**, **sonars** like **Humsa**, **Nagan**, **Arjun Tank** and **Pinaka MBRL**.
- Its headquarter is in **New Delhi.**

Swadesh

Recently, a unique exhibition titled 'Swadesh' was held in Dubai, showcasing the diverse and vibrant folk and tribal art traditions of India.

About Swadesh:

- Swadesh is an exhibition which was **organised under the banner of Vidisha's Creations** with the **objective of promoting lesser-known folk** and **tribal art** forms (**Manjula's art and Gond art**) of India on a global platform.
- The exhibition featured a wide array of art forms including the vibrant **Mithila paintings from Bihar,** intricately designed **Kolam artworks from Tamil Nadu**, striking **Warli tribal art from Maharashtra** and **Kerala's renowned mural art tradition**, among others.

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Place in News

Palestine

Recently, India voted in favour of a draft UN General Assembly resolution that said Palestine is qualied and should be admitted as full member of the United Nations and recommended that the Security Council "reconsider" the matter "favourably".

Palestine (Capital: Ramallah)

Location: Palestine, officially known as the State of Palestine is a country in the Levant region of West Asia.

Boundaries: Palestine shares its borders with **Jordan** (East), **Israel** (West and North) and **Egypt** (Southwest).

Physical Features:

- The highest point in Palestine is **Mount Gerizim,** located near the city of Nablus in the northern West Bank.
- Palestine lacks major perennial rivers, with only seasonal streams and wadis like **Jordan River**, **Wadi al-Far'a** and **Wadi Gaza** providing water flow during the rainy season.
- Palestine has limited mineral resources, with some deposits of **limestone**, **clay, gypsum** and possibly small reserves of natural gas and oil.
- Palestine generally experiences a Mediterranean climate.

Membership: Palestine **holds observer status** in several international organizations, including the **United Nations (UN)**, and is a member of various regional bodies such as the **Arab League**, **the G77**, the International Olympic Committee and the Union for the Mediterranean.

POINTS TO PONDER

- Aravalli Range is one of the world's oldest fold mountains stretching over about 350 miles. Which period did the Aravalli Range form during? **– Precambrian period**
- UNESCO recently celebrated the 70th anniversary of the adoption of which convention for the protection of cultural property in the event of armed conflict? **– Hague Convention**
- The National Green Tribunal has taken notice of construction activities in which wildlife sanctuary? **– Sonai Rupai Wildlife Sanctuary**
- India recently contributed $5,00,000 to which UN fund, reaffirming its commitment to the global fight against terrorism? **– UN Counter-Terrorism Trust Fund**
- Which organization was officially launched in 2002 to replace the Organization of African Unity (OAU)? **– African Union (AU)**