PCFA SCHOLAR MAGAZINE

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Message From Editors

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We are pleased to present the second volume of PCFA Magazine, where we continue our commitment to providing practical wisdom, scientific knowledge, and discussions on morals and ethics. Our goal remains unchanged: to offer an abundant source of wisdom dedicated to our community. This edition focuses on highlighting the scientific and general achievements of our community, shedding light on crucial issues that demonstrate why we are a valuable asset.

We believe that by showcasing our collective accomplishments and contributions across various fields, we can dispel misconceptions and demonstrate the immense potential within us. When we celebrate and elevate our achievements, we not only empower individuals but also inspire future generations to strive for excellence.

Our emphasis on the value and worth of our community aims to foster greater appreciation and recognition of our collective potential, both within our community and in wider society. The Community and Scholars Initiative (PCFA Magazine) serves as a cornerstone of universal wisdom, unveiling an authentic portrayal of Pakistan, its people, and its culture that goes beyond conventional symbols such as anthems and green flags. We strive to redefine our identity as a thriving and harmonious community, regardless of our geographic locations.

The Magazine is dedicated to scientific inquiry and intellectual pursuits, seeking to reshape perceptions of the Pakistani identity. In the future, we also plan to release a special supplement addressing the issue of "Identity."

While shuffling the pages of this volume, as usual, you will find an array of voices, messages, reflections, and activities that exemplify the values of peace and wisdom. We hope that during your leisure hours, coffee breaks, or whenever you find a small window of time to relax, you will enjoy a delightful and enlightening reading experience.

About Us

In this edition of PCFA Scholar's Magazine, we continue our mission to promote Pakistani culture and foster integration within Austrian society. Our focus remains on connecting and engaging with the Pakistani diaspora in Europe, particularly in Austria, while also extending our reach to individuals from diverse backgrounds who have an interest in Pakistani culture.

As a community and diverse Pakistani diaspora, we believe in the value of scholarly endeavors. In this edition, we will continue to showcase the intellectual accomplishments of our community members and highlight their contributions. We aim to enlighten our readers through the stories and achievements of Pakistani scholars.

Culture and integration go hand in hand for us. We are committed to provide a comprehensive understanding of Pakistani culture, traditions, and values, not only to Austrian society but also to our children and future generations. We want to create a lasting impact and leave behind a legacy of cultural appreciation and understanding.

Alongside scholarly views and achievements, we will also provide glimpses of notable events and celebrations from past as a representation of our community's presence. Our goal is to present a vivid and lively perspective of our community in Vienna, showcasing the cultural richness and vibrancy of our traditions.

We recognize the importance of building bridges and fostering connections within the community. Therefore, we will continue to feature stories and interactions of individuals and families from various backgrounds, fostering a sense of unity and understanding among different communities living in Vienna.

Whether you are a resident of Austria or living abroad, whether you are from Pakistan or have a keen interest in Pakistani culture, our magazine serves as a valuable resource. It is a platform where you can explore and learn about Pakistan, its people, and their contributions to society.
We look forward to providing you with an enriching and insightful experience in this volume of PCFA Scholar's Magazine.

Seasonal Affective Disorder (SAD)

JAVERIA PERVAIZ
PhD Scholar (Medical University of Innsbruck Austria)

I graduated from University of Agriculture, Faisalabad (UAF), Pakistan with specialization in Microbiology. During Masters (M.Phil.) in Microbiology, I took advanced studies in Genetics, Biochemistry, Immunology, Clinical Microbiology, Biotechnology & Virology. I am proficient, solutions-focused and result-oriented with passion for improving societal health. I seek state of the art and competitive environment to prepare for career in research and science.

Seasonal affective disorder (SAD) is a type of depression that's related to changes in seasons. It begins and ends at about the same times every year. Symptoms start in the fall and continue into the winter months, sapping your energy and making you feel moody. Less often, SAD causes depression in the spring or early summer.
Treatment for SAD may include light therapy (phototherapy), medications and psychotherapy.

Symptoms

In most cases, seasonal affective disorder symptoms appear during late fall or early winter and go away during the sunnier days of spring and summer. Less commonly, people with the opposite pattern have symptoms that begin in spring or summer. In either case, symptoms may start out mild and become more severe as the season progresses.
Signs and symptoms of SAD may include:

- Feeling depressed most of the day, nearly every day.
- Losing interest in activities you once enjoyed
- Having low energy
- Having problems with sleeping
- Experiencing changes in your appetite or weight
- Having difficulty concentrating
- Feeling hopeless, worthless or guilty

Symptoms specific to winter-onset SAD, sometimes called winter depression, may include:

- Oversleeping
- Appetite changes, especially a craving for foods high in carbohydrates
- Weight gain
- Tiredness or low energy
- Symptoms specific to summer-onset seasonal affective disorder, sometimes called summer depression, may include:
- Trouble sleeping (insomnia)
- Poor appetite
- Weight loss
- Agitation or anxiety

It's normal to have some days when you feel down. But if you feel down for days at a time and you can't get motivated to do activities you normally enjoy, see your doctor.

Seasonal changes in bipolar disorder

In some people with bipolar disorder, spring and summer can bring on symptoms of mania or a less intense form of mania (hypomania), and fall and winter can be a time of depression.

When to see a doctor

It's normal to have some days when you feel down. But if you feel down for days at a time and you can't get motivated to do activities you normally enjoy, see your doctor. This is especially important if your sleep patterns and appetite have changed.

Causes

The specific cause of seasonal affective disorder remains unknown. Some factors that may come into play include:

- Your biological clock (circadian rhythm). The reduced level of sunlight in fall and winter may cause winter-onset SAD. This decrease in sunlight may disrupt your body's internal clock and lead to feelings of depression.
- Serotonin levels. A drop in serotonin, a brain chemical (neurotransmitter) that affects mood, might play a role in SAD. Reduced sunlight can cause a drop in serotonin that may trigger depression.
- Melatonin levels. The change in season can disrupt the balance of the body's level of melatonin, which plays a role in sleep patterns and mood.
- Risk factors
- Seasonal affective disorder is diagnosed more often in women than in men. And SAD occurs more frequently in younger adults than in older adults.
- Factors that may increase your risk of seasonal affective disorder include:
- Family history. People with SAD may be more likely to have blood relatives with SAD or another form of depression.
- Having major depression or bipolar disorder. Symptoms of depression may worsen seasonally if you have one of these conditions.
- Living far from the equator. SAD appears to be more common among people who live far north or south of the equator. This may be due to

decreased sunlight during the winter and longer days during the summer months.

Complications

Take signs and symptoms of seasonal affective disorder seriously. As with other types of depression, SAD can get worse and lead to problems if it's not treated. These can include:

·Social withdrawal

- School or work problems
- Substance abuse

- Other mental health disorders such as anxiety or eating disorders
- Suicidal thoughts or behavior

Treatment can help prevent complications, especially if SAD is diagnosed and treated before symptoms get bad.

SAD can be effectively treated in several ways, including light therapy, antidepressant medications, talk therapy or some combination of these. For some people, increased exposure to sunlight can help improve symptoms of SAD.

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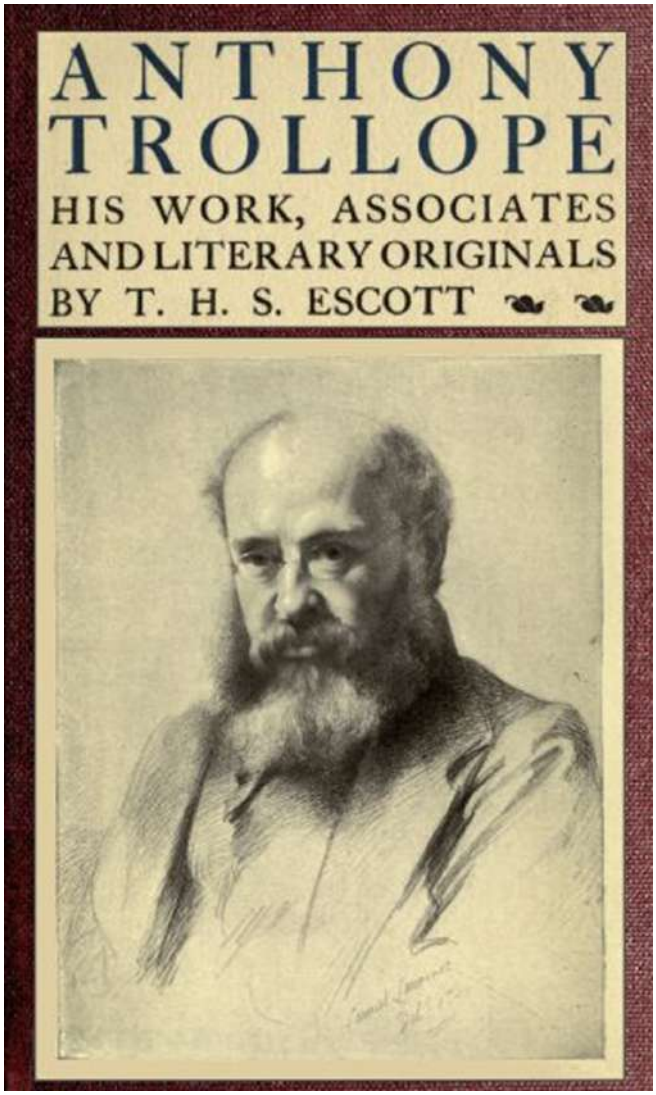
Reflections & Introductions of the Author and Book



Contributed by our editor
"*SYED ZOHAIB*"

The book "Reflections & Introductions of the Author and Book: Anthony Trollope; His Work, Associates and Literary Originals" by T. H. S. Escott provides a biographical account of Anthony Trollope's life, including his upbringing, education, and early experiences. It delves into Trollope's literary journey, highlighting his significant contributions to Victorian literature (which lasted from 1837 to 1901) and his unique writing style that greatly influenced classical English writing. In fact, Trollope's works can be compared to old wine that sweetens with time and age. His enduring writing has garnered appreciation long after his time. Known for their realistic portrayals of Victorian society, Trollope's works offer rich character development, intricate plots, and insightful social commentary. The book by Escott on Trollope was published on June 1, 1967, approximately 84 years after Trollope's death in 1882.

The Victorian age is the rise of prominent authors (Charles Dickens, Charlotte Brontë, Emily Brontë, Anne Brontë, George Eliot, Thomas Hardy, Anthony Trollope, and Oscar Wilde). These authors and many others explored various themes and produced works in different genres, including novels, poetry, drama, and essays. But in my opinion Trollope surpasses all because of the sweetness and relevancy of prose. Let me explain. Trollope's novels capture realistic portrayals, rich characters, intricate plots, and insightful social commentary. The richness and timeless quality of Trollope's writing is enjoyable and indeed timeless.

A notable mention goes to one of Trollope's novels, "The Way We Live Now" (published in 1875), which revolves around the corrupt and materialistic society

of Victorian England. It tackles themes such as financial speculation, greed, and moral decay. These themes, including corruption and moral decay, financial speculation and economic crises, social critique and class dynamics, media and public opinion, and human nature and morality, remain relevant today, closely reflecting their relevance to contemporary life.

One themes that Trollope discusses consistently is his works is class dynamics. As a former colonial colony, we are still struggling with the class dynamics in the subcontinent, which is a pity and has plunged our souls deep into an identity crisis and extreme moral poverty. We have a parallel to Trollope's type of lamentation in the verses written by Amrita Pritam, reflecting on the tragedy and violence witnessed during the partition of India in 1947:

اج سبھے کیدو بن گئے، حُسن عشق دے چوراج
کتھوں لیا ئیے لبھ کے وارث شاہ اک ہور
اج آکھاں وراث شاہ نوں کِتوں قَبراں وچوں بول
تے اج کتابِ عشق دا کوئی اگلا ورقا پھول

Above all, Escott's biographical account of Trollope shows Trollope's ability to capture the intricacies of human relationships and the complexities of Victorian society, which has contributed to the lasting appeal of his works.

In general Escott, delves into Trollope's literary contemporaries and associates, shedding light on the friendships, rivalries, and collaborations that shaped his career. The book explores Trollope's relationship with other notable authors of his time, such as Charles Dickens, George Eliot, and Wilkie Collins, offering valuable insights into their creative exchanges and the literary landscape of the era.

Lastly, I would also recommend to my readers "An Autobiography," by Trollope which was published in1883 after his death. In this, Trollope expresses his thoughts and views on reading, emphasizing its impact on his life and writing career. Trollope admitted that reading not only entertained him but also educated him. He considered reading as a form of self-improvement that allowed him to enhance his writing skills by exposing himself to various writing styles, storytelling techniques, and narrative structures.

As a former colonial colony, we are still struggling with the class dynamics in the subcontinent, which is a pity and has plunged our souls deep into an identity crisis and extreme moral poverty.

Moreover, Trollope firmly believed that reading was crucial for aspiring writers, as it served as a wellspring of ideas and inspiration. He acknowledged the influence of the books he had read on his own writing, recognizing that his works were a product of the literary influences he had absorbed over the years.

Green Roofs for Bus Stops in Vienna would be a Great Idea

AYOUB HAMEEDI
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Founder/Operations Manager of Project
Green Earth

Bus stops in Vienna can act as a thriving engine of ecological sustainability for Austria. The idea is very simple. The local government government in Vienna can pass a law that would allow them to plant green roof on each of the available bus stop in the city. An implementation of the given idea will improve the aesthetic appearance of the city plus it will certainly boost bee population in Austrian capital as well. An important point to remember here is to plant numerous species of plants and flowers especially the ones that have a high ability to produce pollen and nectar. These plants are normally referred to as melliferous plants and they facilitate the bees in solving the nutrition problem. A diverse species of plants and flowers will ensure a large diversity in the pollen that will then help the bees to have sufficient nutrition. On the contrary, a limited number of plants and flower species will cause nutrition deficiency in the bees. So diversity is crucial for a healthy population

of bees.

From a financial point of view, it would not be much expensive for the Vienna city administration to plant green roof on each of the bus stop in the city. All of the needed resources including soil, seeds and manpower are available locally. Most importantly, if the city administration would manage the available space more efficiently and add another advertisement to each bus stop, it would most probably generate enough financial resource to manage green roof on the same bus stop. The city administration can also install solar PV panels on the sides of each bus stop that would then generate clean electricity which could be fed in the nearest grid and earn extra revenue to manage green roofs. A transformation of bus stops roof into green roofs will really help the beekeepers in Vienna as the bees would have the opportunity to take nectar from diverse species of flowers. It would then help bees to produce an extremely good quality honey.

Most importantly, if the city administration would manage the available space more efficiently and add another advertisement to each bus stop, it would most probably generate enough financial resource to manage green roof on the same bus stop.

In my personal opinion, bus stops with green roof tops and colorful flowers will be an extremely attractive thing from tourist's point of view too. From an environment perspective, bees are crucial when it comes to pollination and thus planting diverse plants with colorful flowers will really help Vienna city in increasing the number of bees and thus strengthening the ecological products and services in the city. From a social aspect, there is a high probability that the residents of Vienna city will for sure like the green roofs concept. It will look much better in appearance than the ones we already have in place in Vienna city.

All in all, green roof tops will generate employment, give a boost to beekeeping business and will be an extremely attractive thing for tourists in Vienna city. The green roofs on bus stops will make Vienna city more ecologically sustainable, financially viable and socially equitable as the citizen's would get an even greater of a chance to experience nature first hand. Green roofs on bus stops will be more like adding "modern art" to city of Vienna. It will be a win-win situation for both nature and the residents of Vienna city. It would also be an excellent addition to our urban environment that is normally made of concrete and asphalt. There is a high probability that green roofs on bus stops might as well cause happiness among the citizens of Vienna and would also reduce their stress level too. I really think that City of Vienna should transform its plain bus stops into ones with green-roofs and colorful flowers. It will increase an ecological resilience of the city of Vienna. It might be a small step for the administration when it comes to implementing sustainability in urban environment but for bees it will be a giant leap forward.

Achieving Sustainability in Nanotechnology: Nanomaterials for Circular Economy

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Nanotechnology deals with the synthesis and modification of the physical and chemical properties of the material on an extremely small scale. How small is nano? Nanomaterials should have one of their dimensions between 1-100 nanometers. Think about human hair; it can hold 100,000 of 1 nm nanoparticles. What makes nanomaterial special other than its size is that it can show different properties compared to their bulk material (from where they were synthesized). For example, silicon which is an insulator can become a conductor at the nanoscale, and inert material like platinum can turn into super-catalysts at nano.

Nowadays, those tiny nanomaterials are in high demand due to their exceptional properties. They are used in every field of daily life, such as nano-titania in sunscreen to block harmful UV radiations, self-cleaning windows, and modified paints, nanosilica to prepare waterproof and stain-proof fabrics and silicon chips, nano-silica in toothpaste for antibacterial properties, nanocatalysts for removing environmental pollutants, and for energy production, nanomaterials for gas, pressure, voltage, and microbial sensing, superconductors in smart electronics, engineering, aerospace technologies, and environmental sciences

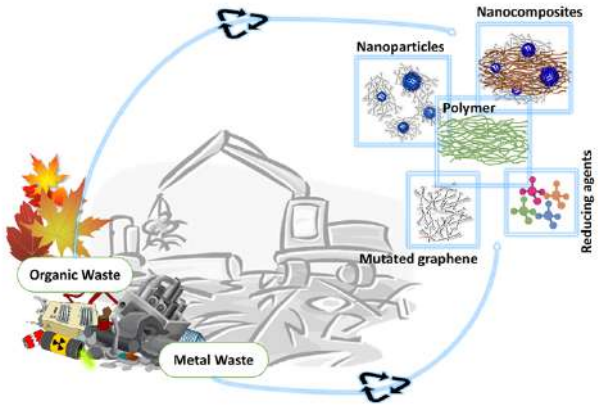
Synthesis of Nanomaterials and Sustainability Issues

Nanomaterials are usually produced by the “top-down method” or “bottom-up method”. In the top-down method, bulk materials are converted into nanomaterials, by using ball-milling or electron beam lithography techniques. In bottom-up approach, atoms are assembled to form nanomaterials of various kinds for example, nanoclusters, nanoparticles, nanosheets, or nanotubes. Sol-gel synthesis, chemical co-precipitation method, electrodeposition and green synthesis are examples of the bottom-up approach.

However, apart from the tremendous development in the synthesis methodologies of nanomaterials, their high production cost and use of natural resources remain unsolved.

Recycling of environmental waste into nanomaterials

Considering the depletion of natural resources, robust population growth, high consumer demands, and escalating environmental pollution (also because of nanomaterials’ synthesis procedures), it is worthwhile to adopt new approach that can create highly efficient products purely from waste.



Concerning this important issue, we designed a new method that can use both inorganic (metals) and organic waste to produce different types of nanomaterials (nanoparticles, carbon nanomaterials, polymers, and nanocomposites). While demonstrating the importance of this new approach, we used titanium scrap and dead plant leaves as an example to produce mutated graphene with TiO2 nanomaterials, nanocellulose (polymer) and TiO2-nanocellulose nanocomposite [Figure 1].

Achieving Sustainability in Nanotechnology

Like any production method, nanomaterial production also requires precursors (reagents) as starting materials. For example, if we would like to make bread, flour and water will be precursors. Similarly, to produce metal/metal oxide, carbon, or polymer nanomaterials, we need metal-salt, carbon source, polymer and metal ions chelating (reducing) agents that can help in synthesis. However, consuming natural resources as precursors to produce nanomaterials results in the depletion of natural resources and environmental pollution. That is why achieving sustainability in nanomaterials synthesis is challenging. Interestingly, our designed method collects all precursors from waste. Metal comes from industrial metal waste; carbon, polymers and reducing agents come from dead plants. In this way, both inorganic and organic waste materials were used in their full potential and subsequently transformed (recycled) into highly efficient nanomaterials of different types.

How efficient are the nanomaterials produced from waste?

The production of nanomaterials from waste is the first success. However, it is equally important to demonstrate the efficiency of those nanomaterials produced from waste. Our prepared nanomaterials were successfully tested to treat wastewater by removing organic pollutants in quick time. We observed that the prepared nanomaterials were very effective, even when used in very small concentrations. This aspect is essential, when we talk about eco-friendly products. The goal was to obtain products that can have high efficiency at minimum price-value.

Future Perspective

The sustainable approach in the synthesis and application of nanomaterials is gaining importance day by day. Our current findings will provide new opportunities to scientists and industry in the field of nanotechnology to recycle waste materials into cost-efficient nanomaterials. Different metal wastes such as Al, Cu, Zn, Ti, Fe etc. and organic wastes (e.g. decaying plant matter) can be processed through this approach and converted into nanomaterials for various applications. This will not only lower the production cost but also preserve the natural resources and surely reduce environmental pollution.

We are trying to further enhance the efficiency of nanomaterials produced from waste, such as modification into 2D nanomaterials, scale-up production in collaboration with industrial partners, and targeted applications in environmental sciences. In the near future, we hope to see more development in sustainable nanotechnology.

Dr. Jawad Akbar Khan's Journey to Excellence: A Pakistani Scholar's Academic Adventure in Austria

Being a student in Pakistan, and a prospective HEC scholar, I was offered to choose one country out of four viz. France, Germany, Austria and China. Since I wanted to get my PhD from Europe so it was a difficult choice for me to pick one from three because apparently, they all looked the same to me at that time. I was aware of the news about Islamophobic incidents in France so I decided to leave the France out of equation. Between Germany and Austria – I preferred Austria because a lot of students were going to Germany in the recent past at that time so I decided to chose the least preferred country (based on my own calculations – which might seem stupidest thing to some readers). The second reason was one of my senior and city fellow who I must mention here, Dr. Arshad Mahmood, he went to Innsbruck a couple of years ago so I was already feeling a little affiliation for Austria because of him. Although I got admission in Vienna and could not go to Innsbruck for other reasons.

The arrival in Vienna was an amazing experience. When I landed at Vienna airport, and I was heading towards S-bahn, I saw a couple kissing right in front of me and I closed my eyes and said to myself: Welcome to Europe, Jawad!

I was received by my lab fellow who was also happened to be a Pakistani – Dr. Azmat Sohail, such a nice guy and I feel lucky to be his friend. He was so simple and naïve about the food that he took me to some restaurant and ordered a vegetarian pizza for me when the pizza arrived, I was shocked to see a pizza with eggplant toppings – since I never saw an eggplant pizza before and I don't like eggplant at all,

but I had to eat it and then I couldn't sleep because my stomach was upset.

Next day I told him that I didn't like the pizza last time. He said OK, no problem! Let's go to another place. This time he took me to another food point and he ordered a pizza. I was surprised to see a pizza with spinach topping. Again, I was unable to ask him if there was some pizza with halal meat or anything other than a pizza. Next time I started to google things and found a suitable place to eat.
I was enrolled in "Institute of Pharmacology, Medical university of Vienna" and the lab experience was also amazing. I worked on a protein that transports different substances from outside of the cell towards inside of the cell. I don't want to go into the details of my project but for the sake of reader's understanding – consider it a machine that is embedded in the cell membrane and it works to move things across the cell. We call these machine as "the transporters". And these transporters are involved in different neurological diseases such as depression, anxiety and mood changes.

One day there was a lab gathering and my colleague gave me the sprinkled water in a glass. I saw the bubbles and I refuse to take it because I thought it was alcohol and I told him that sorry I don't drink. He laughed and so does everybody and then they told me that it's a carbonated water and its not alcohol. Cool stuff to learn for the first time.

Ibelieve the quality of life is really great here. People here are filled with their basic needs like "roti, kapra, makan" and also the purity of everything. Even milk is pure, wow! Second thing is that the facilities are not just limited, they are in excess. I have never seen food shortage at any store or grocery shop unlike in my country.

The transport system is such a blessing in this country. Although I got the chance to visit other European countries as well but according to my experience Vienna stands out tall. You can have access to multiple different kind of transport

Unraveling cellular mysteries at the Medical University of Vienna. Investigating cell membrane transporters—a key element in substance movement within cells. Exciting research with potential implications

services like S-bahn, U-bahn, tram, bus, and night lines. Everything with a single ticket for Vienna city. Although I like here the culture of offering seats to seniors or people with prams – I still remember the nasty look some people give to foreigners like us as were some aliens. The funny thing is that during the first few days when I use to travel in underground train (U-bahn), I was not sure which door will open – whether the one on the right side or the left side?

But I always liked to rhyme with the announcement of U-bahn. The voice of the lady who recorded these announcements is very charming.

There is a lot to talk about Vienna and its history as it is one of the historic capitals of a once historic empire “the Austro-Hungarian empire”. So, people who are interested in history, may well get a chance to see the historic places such as Schönbrunn Palace, St. Stephens’ Cathedral, Kahlenberg Mountain and many more like these. On there independence day 26th October, every year they bring their military equipment on the roads for the public and they also open their parliament for public. I also got the chance to visit the Austrian parliament and met a few members who were there and people were getting selfies with them.

In Austria, two most important things that I learned are the 1. The importance of time and 2. The importance of Key. You should always be punctual and never loose your key since both are costly and some time you get embarrassed if you don’t take care of any of these two.

The famous foods here that I tried and also loved are chicken schnitzel, Turkish platter, Apfelstrudel, cheese cake and Döner pizza. Although I was never a fan of coffee, but living in Vienna made me a coffee lover. The tradition of breaking the Fast at Pakistani mosques of Vienna is very much appreciated. Not sure if it still happens? The note-able mosques includes Madina Masjid, Al-noor Mosque and Ibrahim mosque. Famous Pakistani store where you can buy desi food and grocery Rana store and there is also a Pakistani restaurant “der wiener deewan”. The good thing about this restaurant is that you can pay as much as you want! Their buffet is amazing.

Overall the Pakistani community is affable, although they are very busy like every other person but still you can meet them at different occasions and get-togethers.

Alhamdulillah! I completed my PhD in time and now after almost 3 years I came back again in December, 2023 for a post doctoral fellowship and I am very happy to see some old faces like Syed Zohaib, Dr. Mudassar, Dr. rana Ishtiaq and Dr. Raja Imran who welcomed me as a guest and I am very thankful to these folks.

Cherishing memories of unforgettable culinary adventures with my lifelong mentor, Dr. Azmat Sohail, and the incredible research group

How Plants Protect themselves from "Sunburn"

MUHAMMAD AHMAD
Austrian Research Centre for Forests BFW - Department of Forest Growth, Silviculture & Forest Genetics

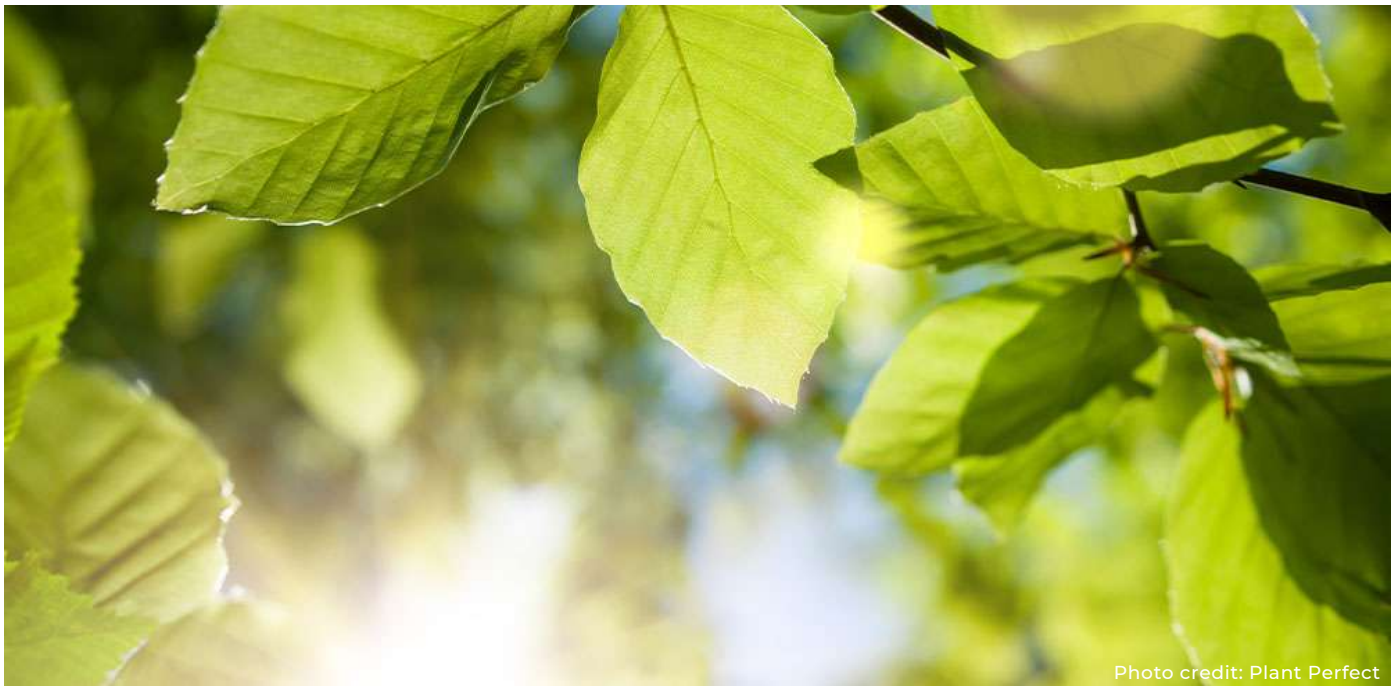


Photo credit: Plant Perfect

Photosynthesis, the conversion of carbon dioxide (CO_2) and water (H_2O) with the aid of sunlight into sugars and oxygen (O_2), is central to life on the planet Earth. However, not all the sunlight reaching the plant surface is utilized for photosynthesis. Scientists have estimated that plants can use only 10-30% of absorbed light to derive photosynthesis. On full sunny days, leaves or tree canopies fully exposed to the sun commonly experience light intensities of ~ 2000 µmol quanta 1/m2 s. Excessive light energy is harmful as it reacts with chlorophylls (the molecules that give green color to the plants) to produce toxic products (reactive oxygen species), thereby limiting plant growth. In extreme cases, this led to sunburn apparent as dry brown/bleached leaves commonly observed during hot summer days.

Unlike animals, plants are sessile and cannot take refuge in shadows on full sunny days. Nevertheless,

thanks to the evolution, plants have evolved intricate and elegant ways to deal with excess sunlight. One of the best-studied mechanisms by which plants protect themselves from the harmful effects of excess sunlight is non-photochemical quenching (NPQ). This is based on the evidence that once the plants absorb the excess light, chlorophylls transfer it to the nearby molecules called carotenoids, the same molecules that are essential parts of the human eye. Carotenoids are highly specialized in removing excess light energy through rapid vibration. Importantly, they are also potent antioxidants. Once the excess light energy is passed to these specialized molecules, they safely dissipate it as heat, avoiding subsequent damage to the plant. Dissipation of extra energy as heat appeared to be evolutionarily conserved as it has been extensively reported in other photosynthetic organisms such as cyanobacteria and algae.

Other mechanisms by which plants avoid excess light include changes in the leaf angle and the production of substances on the leaf surface that enhance the light reflectance. For example, Oxalis oregana changes leaf angle from horizontal to vertical within 6 minutes of exposure to full sunlight, thus avoiding sunburn. Several plants that grow in high-light environments produce wax layers or hairs on the leaf surface. These modifications increase the light reflectance by up to 60% and help plants to thrive in high-light environments.

Understanding how plants manage excess sunlight has significant implications for real-life scenarios. In agriculture, this knowledge is vital for optimizing crop yields as farmers need to consider the light conditions in which crops are grown. It also has relevance in landscaping and gardening, aiding in the selection and care of plants based on their light requirements to maintain healthy and aesthetically pleasing gardens. Additionally, the adaptability of plants to varying light intensities is crucial for natural ecosystems, contributing to biodiversity conservation. As climate change alters environmental conditions, including light intensity, insights into plant responses become essential for predicting and mitigating its impact on ecosystems and food production.

The study of plant responses to light holds immense potential for addressing critical challenges in agriculture, biotechnology, and environmental sustainability. By uncovering the intricate mechanisms through which plants cope with excess sunlight, researchers pave the way for biotechnological applications. This research presents opportunities to develop crops that are more resilient to environmental stressors, particularly excess sunlight, thus contributing significantly to sustainable agriculture and global food security. Beyond agriculture, this knowledge reaches into the realms of human health and nutrition, given that plants serve as a primary source of nutrition for humans.

Moreover, the understanding of photosynthetic processes in plants contributes substantially to renewable energy research. This knowledge holds promise for developing sustainable energy technologies, presenting a valuable avenue for addressing pressing global challenges. In summary, the comprehensive insights gained from studying how plants manage excess sunlight extend across agriculture, environmental science, biotechnology, conservation, and energy research. This research impacts various facets of daily life and the broader ecosystem, underscoring its significance for a sustainable and resilient future. The critical need for this research stems from its profound implications on agriculture, ecosystems, and human well-being, offering solutions for optimizing crop yields, landscaping, and mitigating the impacts of climate change.

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Mitigating Mycotoxin Risks in Dairy Sector of Pakistan

Dr. Mubarik Mahmood, an Animal Nutrition expert, holds a doctorate obtained through an HEC scholarship in Austria. Currently an Assistant Professor at the University of Veterinary and Animal Sciences in Lahore, he collaborates closely with the University of Veterinary Medicine in Vienna. Dr. Mahmood has led impactful projects, including determining mycotoxin levels in dairy farms and converting fruit and vegetable waste into sustainable livestock feed, securing funding from reputable organizations like Biomin GmbH, ARASS, the Austrian Federal Ministry, OeAD, AGRANA, and UVAS Lahore.

Pakistan holds 3rd position in worldwide milk production after India and USA [1]. Cattle and buffalo diet can be contaminated with a broad range of fungal toxic metabolites called mycotoxins during post- and pre-harvest plant stages. The environmental conditions of tropical and sub-tropical regions and poor implementation of standard operating procedures for dairy industry put animals feed in Pakistan under higher contamination risk. Despite of animals possess inherent ability to detoxify toxic substances, long term exposure not only jeopardizes their health and production performance but also sheds these toxins to milk compromising human health including those of infants. This is because some of these mycotoxins have proven carcinogenic, mutagenic, and immunosuppressive properties [2-3].

Keeping in view mycotoxins as potent one health risk, the current Austrian-Pakistan joint research project explored in total of 96 mycotoxins in cattle compound feed from dairy farms of Pakistan. The research was funded by private sector including Biomin and Agri Food Research and Sustainable Soultions (ARASS) and was collaboratively performed in University of Veterinary Medicine (Vetmeduni), Vienna-Austria and University of Veterinary and Animal Sciences (UVAS), Lahore-Pakistan. Samples of complete cattle feed were procured from 30 dairy cattle farms (herd size minimum 200) from all administrative divisions of Punjab province of Pakistan. After initial analysis and drying performed in Animal Nutrition Laboratory, UVAS, sub campus, Jhang, the samples were shipped to Institute of Animal Nutrition and Functional Plant Compounds, Vetmeduni for

processing and preparation for final mycotoxins analysis in Department of Agrobiotechnology, IFA-Tulln, Institute of Bioanalytics and Agro-Metabolomics, University of Natural Resources and Life Sciences (BOKU), Vienna. By employing a validated multi-metabolite liquid chromatography/electrospray ionization-tandem mass spectrometric (LC/ESI-MS/MS) technique, highest prevalence was observed for mycotoxins produced by the fungal species Fusarium and Aspergillus which include fumonisins B1 (93%), fumonisins B2 (100%) and fumonisins B3 (77%). 40% of the total samples were found positive for afltoxin B1 and 7% exceeded the European Union recommended levels. The dietary components corn, soybean meal and canola meal were highly related to the fungal metablites concentration. As this study indicates a high contamination with certain fungal metabolites in large dairy farms which are generally quality conscious for feedstuff, the contamination level is expected to be even more for the small farmers which are higher in number and raise cattle and buffalo in conventional way. Thus it is recommended to execute future inter-disciplinary research to explore the prevalence of mycotoxins in animal source human food and develop agricultural policies to minimize the risk.

In response to the mycotoxin contamination challenges in Pakistan's dairy industry, implementing robust agricultural and feed management practices is essential. Farmers, especially those in small-scale operations, need comprehensive education on good agricultural practices and effective feed management. Training programs should cover proper storage, handling, and processing of feed ingredients, empowering farmers to identify and mitigate the risks associated with mycotoxin contamination in cattle feed. Simultaneously collaboration between government agencies, research institutions, and private sector organizations is crucial to efficiently execute these monitoring efforts, ensuring a comprehensive approach to tackling mycotoxin regulatory issues in the dairy industry. Therefore, to reinforce these efforts, stringent regulatory standards need to be implemented and enforced. The adoption of strict regulations will incentivize the integration of best practices in feed production, creating a safer environment for livestock and mitigating potential health risks associated with mycotoxin-contaminated feed.

Research in Harmony: Dr. Felipe Penagos-Tabares, a research collaborator and friend of Dr. Mubarik at the University of Veterinary Medicine, Vienna, immersed in dedicated research at the forefront of feed safety and nutritional physiology studies

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Unraveling Mysteries: Dr. Muhammad Nauman is on a Mission to Detect a new Phase of Matter

Dr.Nauman currently holds the position of ESPRIT Fellow at the Institute of Science and Technology (IST) Austria and a visiting scientist at the Los Alamos National Laboratory USA. In this role, he engages in various responsibilities, including teaching, conducting experiments, characterizing materials, analyzing data, writing scientific papers, making presentations, and contributing to grant writing initiatives. His multifaceted role reflects his dedication to advancing research and education within the institute. Dr. Nauman, currently serving as a postdoctoral researcher, brings expertise and enthusiasm to the dynamic academic environment at IST Austria.

Take some sand on a piece of paper and bring a magnet near it. The magnet will align all the iron particles in the sand by attracting them. All these iron particles are called “dipoles” due to the presence of two poles namely “north pole” and “south pole” like a bar magnet. In a lay man language, these are called dipoles because they are either attracted or repelled by a bar magnet.

There are other class of “high order multipoles” having more than two poles (i.e. four, six, eight, etc.) and therefore have more complex angular distribution/shape as well as unusual behavior. All these “high order multipole” are also called “hidden order” as they are not detectable with traditional experimental/detection tools such as a bar magnet. Hence we need a special material and special technique to detect them.

With Prof. Hiroshi Amano (Physics Nobel Laureate for the year 2014) at KPS Fall Meeting, 2018. See his scientific contributions.

Our project is all about a special material class called Pr-based cage compounds which has the element Praseodymium (Pr) of the period table mixed with some other elements and having cage-type structure hence termed as Pr-based cage compounds. These materials have the advantage

that they don't host these dipoles stuff which is nasty in a sense that their presence in material take over and suppress the high order multiples make it harder to detect them.

Next stage is having a proper tool to detect them. To address this challenge, we will take a silicon cantilever of the size of a human hair, and will mount our Pr-based sample (thousand times smaller than a dust particle) on it. We will vibrate the cantilever electrically with its resonance frequency and detect changes in it. This approach will help us detecting these high order multipoles.

During this process, we will use very high magnetic field as high as 60 Tesla (short hand notation 60 T), 80 Tesla, and 100 Tesla. Just to give a feel of the scale of measuring unit Tesla, 1 Tesla is the magnetic field strength that can lift 1000 Kilogram car in a car junk yard. You can easily imagine how much will be 60 T, 80 T, and 100 T.

We're using a brand-new way to study this special state of matter for the first time! This cool technique has already worked well when scientists were looking into something called "quantum spin liquids" which is a hotly pursued state due to its potential application in super-fast topological quantum computers. Now, we want to use it to understand even more about this special state called "multipole physics."

The detection of these multipoles could help us solve big mysteries in science, like why some materials act super weird when they get super cold.

An eye-catching view from a hiking track during summer 2021 around IST Austria in Maria Gugging, Klosterneuburg

Clay Tablet Reveals Ancient Babylonians Used Calculus to Track Jupiter 1,500 Years before Europeans

A new analysis of a set of ancient clay tablets has revealed that ancient astronomers of Babylonia used advanced geometrical methods to calculate the position of Jupiter – a conceptual leap that was previously thought to have occurred in 14 th century Europe.

In a report published today in the journal **Science**, it was revealed that the ancient tablets containing the secret knowledge of the Babylonians, which date from 350 BC to 50 BC, had laid unnoticed in the cuneiform collection at London's British Museum for decades. It was not until Astroarchaeologist Mathieu Ossendrijver of Humboldt University in Berlin conducted a reanalysis of the tablets from photographs, that the significance of the text was realized.

Babylonian Astronomy

The history of astronomy in Babylonia (present-day Iraq) originated with the Sumerians who recorded their observations as early as 3500–3200 BC. Astronomical phenomena were important to the Sumerians, who equated planets with gods that held an important role in their mythology and religion. Jupiter, for example, was associated with their main god, Marduk, patron deity of the city of Babylon.

Sumerian astronomy had an important influence on the astronomy of the Babylonians, who produced their first star catalogues by around 1200 BC.

By the 8th century BC, Babylonian astronomers had developed a new empirical approach to the prediction of planetary movements, an approach that was later adopted and further developed by the ancient Greeks.

Astronomical Calculations in Babylonia

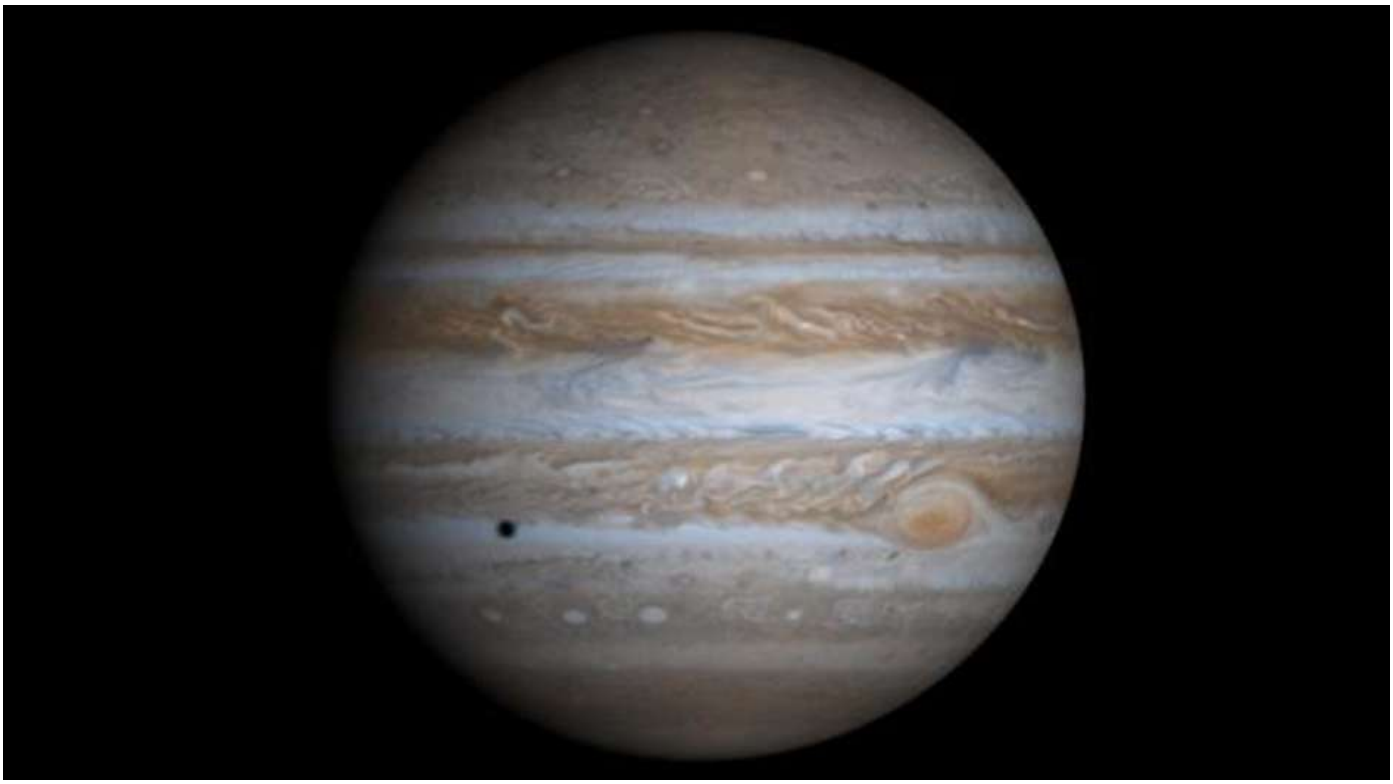
Studies of their textual records found on clay tablets in cuneiform text, suggested that the Babylonian astronomers were using purely arithmetic methods to make their calculations and predictions. However,

Astronomical phenomena were important to the Babylonians. Kudurru (stele) of King Melishipak I (1186–1172 BC): the king presents his daughter to the goddess Nannaya. The crescent moon represents the god Sin, the sun the Shamash and the star the goddess Ishtar. ***(public domain)***

one of the tablets in the newly analyzed collection, made reference to a trapezoid shape while discussing Jupiter. Ossendrijver discovered that the trapezoid drawing was being used to predict Jupiter's place in the zodiac. The computations covered a period of 60 days, beginning on a day when Jupiter first appeared in the night sky just before dawn.

"By calculating the area inside the trapezoid, Babylonian astronomers could find where the planet would be in the sky – exploiting the same link between velocity and displacement taught in introductory calculus classes," reports New Scientist .

This constitutes the only known geometrical method used in Babylonian astronomy, a method thought to have been invented only in 14th-century Oxford, Cambridge. Historian Alexander Jones of New York University told **ScienceMag** that compared with the complex geometry embraced by the ancient Greeks a few centuries later, the Babylonian inscriptions reflect "a more abstract and profound conception of a geometrical object in which one dimension represents time. Such concepts have not been found earlier than in 14th century European texts on moving bodies. Their presence .... testifies to the revolutionary brilliance of the unknown Mesopotamian scholars who



The Babylonians used geometric methods to predict Jupiter's place in the zodiac (public domain)

constructed Babylonian mathematical astronomy." Back in 1974, historian A. Aaboe, said in his article ' Scientific Astronomy in Antiquity' that Babylonian astronomy was:

"the first and highly successful attempt at giving a refined mathematical description of astronomical phenomena" and that "all subsequent varieties of scientific astronomy, in the Hellenistic world, in India, in Islam, and in the West—if not indeed all subsequent endeavour in the exact sciences—depend upon Babylonian astronomy in decisive and fundamental ways."

The latest study certainly supports Aaboe's conclusion over three decades ago, revealing that Babylonian astronomy has made an extremely important contribution to the history of science.

By
"April Holloway"

Note: Author April Holloway originally published the article titled "Clay Tablet Reveals Ancient Babylonians Used Calculus to Track Jupiter 1,500 Years before Europeans" on January 28, 2016. PCFA Magazine extends its sincere gratitude to April Holloway and the publisher of the original article for granting permission to republish it in our magazine.

Diplomatic Journey and Insights: An Interview with Ambassador Aftab Ahmad Khoker

Contributed by our editors "*SYED ZOHAIB*" & "*DR. MUDASSAR VIRK*"

MR. AFTAB AHMAD KHOKER
Ambassador of Pakistan in Austria (as per today, January 2024)

Mr. Aftab Ahmad Khokher, born on 18 May 1964,is an accomplished diplomat currently serving as the Ambassador of Pakistan to Austria with concurrent accreditation to Slovakia; he is also representing Pakistan to the UN and other International Organizations. He holds degrees of MBA, MA (Economics), and M.Sc. (Politics of World Economy). Mr. Khokher joined the Foreign Service of Pakistan in 1991 and since then had a distinguished career. After completing his common training at the Civil Services Academy, Lahore for 9-months and specialized training at the Foreign Service Academy, Islamabad for 8-months, he served as Desk Officer at the Ministry of Foreign Affairs from 1993 to 1994 and again from 1999 to 2004. He also did a 10-month diploma course in Turkish language in TOMER, Ankara in 1994-95. In addition, he held the position of Joint Secretary (Inter-Parliamentary Relations) at the Senate Secretariat from 2011 to 2012. Throughout his career, Mr. Khokher has taken on various diplomatic assignments, including postings in Pakistan Missions abroad, such as Tashkent (1995-1999), Geneva (2004- 2010), Consul General in Jeddah from 2013 to 2015 and as Ambassador to Lebanon from 2015 to 2018. Furthermore, Mr. Khokher held the position of Additional Secretary (Americas) at the Ministry of Foreign Affairs from 2018 to 2020 and served as the Director General of the Foreign Service Academy from January 2019 to February 2020. Mr. Khokher is married and has two sons.

We, Syed Zohaib and Mudassar Virk, had the privilege of conducting an interview with Ambassador Aftab Ahmed Khokher on the 20th of June 2022. As we made our way to the Pakistan Embassy in Vienna, we couldn't help but appreciate the pleasant summer weather. The romantic ambiance of Vienna enveloped us, with the sun shining brightly and casting a warm glow on the picturesque streets. It was a perfect day for an interview, and we were delighted. The beautiful architecture and charming atmosphere of Vienna added an extra touch of elegance to our meeting

From left to right: The office space exudes elegance with its exquisite wooden decor, creating a distinctive and timeless atmosphere. The wall-to-wall windows, reminiscent of Roman architecture, contribute to the charming ambiance, evoking the spirit of a colonial-era building of Pakistan during the summer.

with Ambassador Khokher.

The Ambassador's office, located on the upper floor of the Pakistan Embassy in Vienna, exudes a timeless charm. Stepping inside, one is immediately captivated by its architectural elegance. With high ceilings and large windows, the space radiates sophistication, enhanced by the natural light that floods through. Every corner showcases meticulous attention to detail, making the office truly stand out in a class of its own. It provided a fitting backdrop for our interview with Mr. Khokher. We were fortunate to be graciously allowed to photograph the office, a testament to the generosity and hospitality that characterizes the working environment of the embassy. Through our photographs, we captured the intricate details, preserving the memory of this extraordinary setting for future reflections. Mr. Khokher embodies the attributes of a seasoned diplomat.

During our discussion on cultural integration, we sought Ambassador Khokher's insights on socialization, integration, and showcasing culture. Drawing from his experience, he emphasized the potential of information technology (IT) in facilitating these processes. He highlighted the parallels between the Port of Hamburg and business opportunities in Karachi, underlining the crucial role of trade, especially within the IT sector. The Ambassador stressed the importance of leveraging technology, exploring trade prospects, and embracing cultural exchange to foster socialization, integration, and a profound understanding. Additionally, he emphasized engaging local communities through cultural events to create a favorable impression of the Pakistani diaspora.

The Ambassador expressed his profound satisfaction with his career in civil service, emphasizing that the fulfillment derived from serving in such a role cannot be measured solely in financial terms. He confidently stated that he did not regret seeing his friends earn significantly more by pursuing ventures outside the civil service and establishing their own businesses. The Ambassador's contentment with his chosen path exemplifies the deep sense of purpose and fulfillment that comes from dedicating oneself to public service.

Sharing his vast experiences serving in challenging

diplomatic assignments, with a particular emphasis on his time in Jeddah, Saudi Arabia, he vividly described the dynamic and vibrant community in Jeddah, with a population of 2.5million, influenced by the influx of pilgrims. The Ambassador highlighted the daunting task faced by the Embassy, serving approximately 2,000 visitors daily.

Beyond the logistical complexities, he expressed his profound spiritual affiliation for Jeddah in the proximity of the holy cities of Makkah and Madinah.

The picture of Jinnah, gracefully adorning the wall of the corridor leading to the Ambassador's office, exudes a timeless blend of classic aura and dignified demeanor.

As a seasoned diplomat, Ambassador Khokher exhibited utmost professionalism by refraining from singling out any specific country as more challenging than others. Instead, he acknowledged that each assignment, whether in Turkey, Lebanon, Uzbekistan, Switzerland, Saudi Arabia, Lebanon or elsewhere, presented its own unique set of challenges. This demonstrated his training in navigating diverse and complex diplomatic landscapes. Furthermore, the Ambassador stressed that comparing the engagements of the Pakistan Embassy in Saudi Arabia to those of the Austrian Embassy in Vienna would be an apples-to-oranges comparison. He recognized the distinct nature of each diplomatic mission, with varying dynamics and priorities, highlighting the need for tailored approaches and strategies.

He expressed his preference for utilizing ambassadorial conferences as a platform to address challenges. During these conferences, he said, he always emphasized the importance of Pakistan's trade relationship with Austria and highlighted the potential for collaboration in the private sectors. When Mudassar asked about the trade between Austria and Pakistan, he highlighted the continued importance but also emphasized the need to explore and tap non-traditional sectors such as IT and software development which held great promise on traditional products such as textiles, sports goods, leather, and rice.

When offering advice to young people, Mr. Khokher highlighted the importance of education, training, having an open mind, and a passion for the country, especially during difficult times. He emphasized the value of respecting others and striving in tough conditions while maintaining a positive attitude.

The Ambassador considered working with United Nations institutions based in Vienna a privilege. In conflicting situations, ambassadors follow the policies set by the government and have the opportunity to provide feedback and express their opinions within their ambassadors' group discussions.

Regarding e-governance, Mr. Khokher highlighted the progress made in implementing online systems, such as the visa system, and mentioned that the Pakistan Embassy was moving in a positive direction.

To foster integration with the local community, the Ambassador shared that they distributed gift hampers of local Pakistani products to approximately 500 people in 2021. He encouraged the Vienna Scholars Community to unite on a single platform to improve the image of Pakistan and supported the idea of inviting scientists, PhDs, and authors to collaborate with the Pakistan Embassy. He emphasized the need to work collectively towards improving the image of the Pakistani community by highlighting their positive contributions and achievements.

When discussing the Pakistani community in Austria, Mr. Khokher expressed a positive opinion of their hardworking nature and relationship with the country. He acknowledged the gap in integration and German language proficiency and stressed the importance of political, economic and security related enhanced engagement with local, social and political life to avoid being left behind. He had a positive outlook on the next generations of Pakistanis in Austria and believed that crises should be seen as opportunities to improve the country's image.

A Captivating Encounter: Syed, Mudassar, and Ambassador Aftab Ahmad Khoker Embrace the Spirit of Diplomacy and Cultural Exchange in the Enchanting Ambiance of the Ambassador's Office."

Ambassador Khokher informed us that the Embassy receives regular policy briefs from Pakistan and maintains regular contact with the Foreign Office. He highlighted the professional reporting system of the Embassy, which included monthly summaries and an annual report on the developments in Austria.

He said that Pakistan-Austria bilateral relationship had improved significantly over the years, with no differences in major policy issues. The connection between the governments was getting strengthened, as evidenced by the meeting between the Foreign Ministers in DAVOS.

In an unexpected shift in the interview, we asked the Ambassador why he didn't pursue other professions such as becoming a pilot. He shared that he was motivated to join the civil service to fulfill his late father's wish and chose the Foreign Service as his path. Despite initially earning less than in the private sector, he reiterated that representation of a country as a diplomat far outweighed financial incentives in the private sector.

Celebrating Unity: Eid Milan Mega Event 2023 in Vienna, Austria May 20, 2023

In a vibrant and inclusive celebration, the Eid Milan Mega Event 2023 took place at Kurpark Oberlaa in Vienna, Austria. Organized on the 20th of May, the event brought together a diverse community to commemorate Eid and foster a sense of unity and understanding. PCFA Team led the festivities, including a special reception for the Ambassador Aftab Ahmad Khokhar, flag ceremonies, and engaging activities for kids.

The event drew the participation of 110 Pakistani from Burgenland and countless people from various cities of Austria, contributing to the lively and multicultural atmosphere. It showcased the beauty of cultural diversity and the spirit of togetherness, exemplifying the harmonious coexistence of different communities in Austria.

Peter Florianschütz, a key figure in Vienna's

municipal governance, shared his comments on the celebration. As the Chairman of the Municipal Council Committee for European and International Affairs and a member of other significant committees, Florianschütz praised the event for its positive impact on community integration. He acknowledged the role of such gatherings in promoting social harmony and understanding among residents.

In attendance was Zeliha Çiçek, a Teacher at City School Board and former Islamic Studies teacher affiliated with the Islamic Faith Community in Austria (IGGÖ). Çiçek, known for her vocal stance against discrimination, expressed her appreciation for the inclusive nature of the Eid Milan event. Her presence highlighted the importance of creating spaces where diverse voices can be heard, fostering a culture of acceptance and respect.

The Eid Milan Mega Event 2023 stands as a testament to the power of community-driven initiatives in promoting understanding, respect, and unity. As Vienna continues to embrace its multicultural identity, events like these play a crucial role in fostering a sense of belonging and appreciation for the rich tapestry of cultures that call Austria home.

Contributed by our editor
"*SYED ZOHAIB*"