

International Snowmobile Ride Day

Winter sports offer amazing opportunities for people to enjoy the outdoors in a unique way. And snowmobilers can get access to beautiful natural landscapes that would be almost impossible to get to in other ways, like cars, trucks or even skis. Whether used for transportation or recreation, snowmobiles offer incredible opportunities to get out in the winter and enjoy nature. Take on an amazing adventure over the river and through the woods, in the midst of a beautiful white terrain, with this invitation to participate in International Snowmobile Ride Day!



#RECYCLING

Reusable Take-out Containers

City-scale systems with common containers across multiple restaurants may prove advantageous.



The number of times a reusable take-out container gets used is a key factor affecting how sustainable it is, a new study indicates.

In an effort to reduce plastic waste in the restaurant industry, single-use takeout containers, specifically, the researchers compared the life-time environmental impacts of single-use and reusable take-out food containers.

Depending on the single-use container being replaced, the researchers found that the reusable alternatives, which initially use more energy and generate more climate-altering greenhouse gases, can break even with single-use containers after four to 13 uses.

"Reducing the quantity of single-use plastics in the restaurant industry by implementing reusable take-out container systems has the potential to reduce greenhouse gas emissions and save on energy, water, and cost," says study author, Greg Keoleian, director of University of Michigan's Centre for Sustainable Systems (CSS) at the School for Environment and Sustainability. "Our study found that reusable containers can outperform single-use in all impact categories."

The study, published in the journal *Resources, Conservation and Recycling*, reports that on a global scale, plastic production has accelerated dramatically over the past decades, leading to a sharp increase in plastic waste.

In the United States alone, more than 90 times the 1960 amount of plastic municipal solid waste was generated in 2018. Single-use packaging contributes millions of tons of plastic waste to that total each year.

In addition to the number of times that a reusable container is reused and the material type (e.g., polypropylene, the bioplastic PLA, aluminum), the study also found that customer behaviour will be a significant factor in sustainability performance.

"If 5% of customers make trips by vehicle solely to return used containers, the reusable system has higher life-cycle greenhouse gas emissions than the single use," says co-author, Christian

Hitt, a dual-degree graduate student and Center for Sustainable Systems' research assistant.

"We also looked at the water usage of at-home cleaning of the containers," Hitt says. "Excessive washing can tip the balance against the primary energy impacts of reusable containers."

According to the study, education will be key in counteracting these potential downsides by encouraging customer best practices. Informational labels on containers, signage in restaurants, employee dialogue with customers, and online information are a few educational tools that the study recommends.

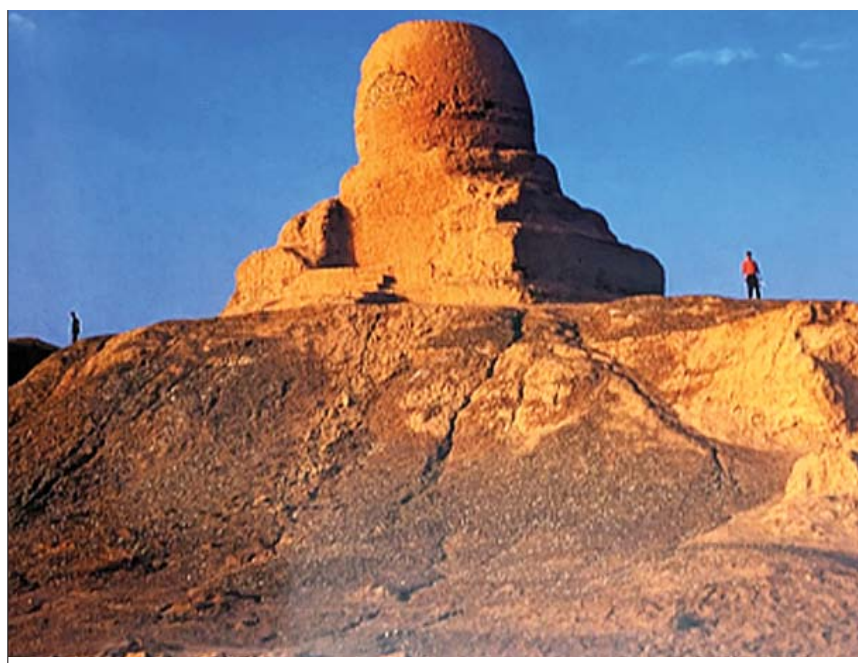
Convenience can also play a part. City-scale systems with common containers across multiple restaurants may prove advantageous, as customers can return containers to different locations, decreasing the likelihood of customer travel for the sole purpose of container return.

Study authors recommend further research on actual customer behaviour, including the effectiveness of incentives that encourage best practices, such as discounts to customers wearing bike helmets, or meal discounts if returning a container.

It is also possible that container deposits could encourage returns, the study reports, citing the example of plastic bottle recycling rates in states with deposit programs compared to those without them (62% vs. 13%).

As a base for their model, the researchers studied the pilot program for returnable take-out containers, launched by the non-profit organization *Live Zero Waste* in Ann Arbor. The program, *Ann Arbor Reduce, Reuse, Return* (A2R3), is now in its second pilot phase and was implemented in partnership with the city of Ann Arbor's AZZERO carbon neutrality plan.

The research, which was supported by a Morgan Stanley Reduction Research and Fellowship award, concludes that a reusable container system, as part of a circular economy strategy, offers the chance for significant benefits over time, if customers can be effectively educated to adopt sustainable behaviours.



This is earliest Buddhist site in Xinjing Uyghur, China, Qashkar, approving that Buddhism was developed in the Central Asia and Mongolia in third century AD.



Nyamdavaa Oidov

According to Indian scholars, Buddhism spread in the Indo-Gangetic valley during the lifetime of Buddha. King Ashoka deputed a group of monks to Gandhara to propagate the *dharma*. The first missionary, who brought Buddhism to Central Asia, was Valrochana, who was Kashmiri Buddhist scholar, and built the first monastery at Khotan.

Chronicles of Chinese pilgrims, Fa-Hien (5th century AD), Hsuen Tsang (during 620-645 AD, he travelled to India) and I-tsing (spent 10 years in India, from 675-685 AD) are most important sources. Both Hsuen-Tsang and I-tsing saw among the students at Nalanda foreign scholars hailing from far off countries like Korea, Mongolia, Tokhara, China, Tibet. I-tsing counts 66 foreign scholars residing in Nalanda in his days. It shows that Mongols studied in Nalanda University during 7th to 8th centuries. There are big ruins of a Buddhist monastery, which is situated 20 kms from Kashkar.

In Karakorum, capital of Great Mongolian State, Ogedei



The deity, Tara, was found in the northwest corner of the excavation site.

The Iranian authority made a formal request to Munkh Khan in Karakorum, capital of the Great Mongolian State, to destroy the destabilising forces (smalls) in the Alamut castle, Alborz, Qarvin, presently it is Mazandarun province, Iran for establishing peaceful life (Pax Mongolia) for the local people as well as international trader. So, considering their request, Munkh Khan sent his brother Hulegu to Alamut Castle to establish Pax-Mongolia, 1256. After fulfillment of the request, Hulegu further moved to Baghdad. These countries were Islamic. In 1258, after

Hulegu's victory over Baghdad, Munkh Khan had awarded Hulegu as 'Il Khan'. So, Ilkhanid dynasty appeared on world map. Buddhist 'Ilkhanid dynasty', as political and cultural phenomenon, had suddenly become visible on Eurasian world. There are several scholars who wrote on Ilkhanid Buddhism. These are Roxan Praziak, Allsen Thomas, Reuven Amitai Preiss, A. Pausani, Donald N. Welber, Devin Dewesse, David Jacoby, Tomoko Maskya, Samuel M. Crupper, Sheila S. Blair, Jonathan M. Bloom, Landa Komaroff, Paul D. Buell, Sh. Bira and Nicholas

They Began With Tolerance And Continued With Hardline

PART:2

#MONGOL

Iranian Buddhist temple construction: Khorasan to Azerbaijan

During Ilkhanate, Mongol rulers built a corridor of Buddhist temples between the Black sea and the area South of Caspian sea, along routes that linked Anatolia to the Indus river valley and Uyghurstan. After the construction of Labnasagut, Hulegu sponsored a second Buddhist complex of comparable quality in Southern Azerbaijan at Khoi.

The Rasat Khanh Hill caves near Maragaha, west of Tabriz, were possibly another elaborate example of Buddhist cave structure, as were the Varjuvi caves, just 6 kms to the south. There is need to make joint study in two countries to explain it to the world.

Sultaniyya, founded by Arghun and completed by his son Oljaitu, had a castle built of cut-stone and known for its beauty. It is called locally Dash Kasan, built in 1290 with Dragon picture, carved on it. There is second explanation that Dash Kasan was constructed by Oljaitu and his sister used to go there and do daily prayers as a Buddhist with her followers.

Arghun and other Ilkhans regularly used the site QONQOR OLONG, near Sultaniyya for religious ceremonies, supervised by Kashmiri 'bakhshi', and there the archeological evidence is richer. According to some scholar, the area of Qonqor Olong used to be falcon hunting area and the *Falcon* is the State bird of Mongolia.

The village that sits on the plain of extensive palatial ruins is today named *vijay*, a possible cognate of *Vijaya*, Sanskrit for Buddhist monastery. Rashid al-Din indicates in one place that Arghun Khan built a temple (in Tebriz) and pictured his images on the walls.

The Uyghur artisans were particularly respectable and influential as masters of miniature and architectural decoration.



The Uyghur artists, Kutlug Buga, Altun Buga, Toktimur, Ayas and others took part in the formation of the Tebriz miniature school in the 13th-14th centuries. No doubt, Uyghur architects, we do not know yet anything about, played a leading part in the building of a number of constructions in the territory of Azerbaijan, such as Buddhist temples, Kumsir, Mongolian obas and other architectural forms, characteristic of Central Asian architecture. According to Nizari, a 13th-century Iranian poet and traveller, 30 dragons were depicted on the Hulagu-Khan castle on Shakhut-tell Island. Images of a lion or dragon, symbolising power and protection, were widely used in the architectural decoration of buildings of Karakorum.

The Kasban tiles of Takht-e-Sulaiman are decorated with Buddhist motifs, such as an array of lotus flower designs. The complex built at Takht-e-Sulaiman by Ilkhan abaga (1265-1281) was summer palace of the Ilkhans with residence, a treasury and halls for Imperial audiences. Because rulers held religious ceremonies at their seasonal locations, Takht-e-Sulaiman would have had such buildings and they would have been Buddhist, in keeping with Abaga's preferences, and possibly also Nestorian to accommodate his wife's beliefs. A specific large

four-columned structure at Takht-e-Sulaiman has been identified as a likely location of Buddhist temple. Archeologists have also identified the remains of a Buddhist temple near Merv, that incorporated local architectural features into a Buddhist design. There is also a need for joint research study by the scholars of the two countries.

The next Buddhist influence in Ilkhanid dynasty mentioned by Rashid al-Din is as follows. "Arghun Khan was highly devoted to the Bakhshi and followed their path. Arghun Khan constantly patronized and favoured them. One Bakhshi came from India and claimed to have lived a long time. In order to show his favour, Arghun Khan built lofty idol temple at Khabushan in Kharasan, and he performed his duties in such way that all the bakhshis and monks were astonished by his degree of asceticism and rigor. The full extent of Buddhist temple building in Iran under the Mongols is lost to us. Historical records, however, documents a contemporary perception of a culturally pros-

domains. One eminent Buddhist monk, master Xingxiu (Hsinghsiu, 1166-1246), responded to the political uncertainties of early Mongol rule by retiring to write.

For all schools of Buddhism, the sudden reality of Mongol dominance offered competitive opportunities. As waves of Tibetan, Kashmiri priests found audience with the Khan at Karakorum, Chan Buddhist groups experienced a gradual eclipse of their authority. Court issued invitations to Dharmasvamin and other Tibetan monks, familiar with Nepalese Buddhist teachings, pop-



Chingsid claims to world leadership and continued to serve as valued military and political advisors to the Khans throughout their rule within the Han Chinese

The Buddha in the land of 13th century, Central Eurasia, was a Mongol phenomenon of the Ilkhanid court. For almost 40 years, Ilkhanid Buddhism had noteworthy levels of support through political and scholarly connections and functioned as the primary ideology of an Empire of exchange with transcontinental reach. I should note that Buddhist ideology was essential to Ilkhanid's political and cultural reach.



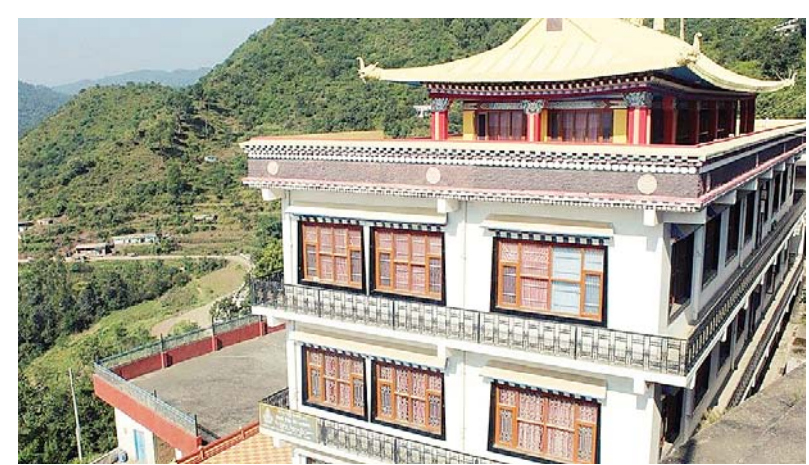
Ashoka spread Buddha's message.

Cultural mapping: Buddhism in the Jami al-Tavarikh of Rashid al-Din

The *Jami al-Tavarikh*, compiled by Rashid al-Din, was a unique product from the period of Ilkhanid Buddhism. Its first part, known as the *History of the Mongols*, was commissioned by Ilkhan Ghazan after his conversion to Islam in 1295. Ghazan Khan himself was raised in Mongol Buddhist traditions, shaped by teachers who hailed from Western Tibetan Region. It was Ghazan's successor Ilkhan Oljaitu (1304-1316), who commissioned the next volumes of Jami al-Tavarikh, which were produced in the Tabriz workshop, first in 1304 and extended the work to the world history.

Ilkhanid ruling was not easy and it faced with many problems. So, some people put questions to public and one of them is "How could the facts of the Mongol rule, with its cultivation of Buddhist teaching, a diverse Iranian Muslim elite, diplomatic opportunities in Christian Western Europe, and military challenges from Mamluk Egypt be woven into a coherent world view under Ilkhanid rule?"

Initially, Oljaitu, sponsor of the project, became Buddhist, then a Sunni Muslim, who eventually moved toward Shi'ism. When he contacted the Ilkhan Ghazan's Islam was superior to that of the Mamluks, he pointed to the



Bon-monastery.

Mongol's assumed Buddhist genealogy as evidence of pedigree higher than that of the slave ruler of Egypt. Learned Buddhist monks of Chinese and Kashmiri origin served as his consultants on scholarly, agricultural, and medical projects. Buddhist monks employed as historians at the Imperial library in Dadu maintained the 'Archives of the Court' known as the *Dejafartin-i Dizan*, to Rashid al-Din through the assistance of Bolad, emissary from the court of Kublai Khan to Ilkhanate Dynasty. The western scholars call him as the *cultural messenger and informant* to Rashid al-Din. Marco Polo himself passed through Tabriz around 1290, travelling sea and land routes from India

during a time when Ilkhanid Buddhism was at its height under Ilkhan Arghun (1284-1291). The inventory of Polo's and his uncle's possessions, at the time of their deaths, list four 'large golden tablet of authority, Gerege,' received at Ilkhanid court. During that time, Polo used the Mongol term *Burkhan*, meaning 'divine,' when referring to the Buddha as Sakyamuni Burkhan.

Ilkhanid Buddhist concept of *Kingship and Karma* (merit) offends a potent framework for organizing disparate histories. This would not be the first time that Buddhist-inspired concepts were put into secular political service without direct acknowledgement.

Leo Jungeneo Oh has noted numerous detailed examples of Buddhist iconography in Ilkhanid pictorial language found in 'The Great Mongol Shahnama, the Diez Albums, and the Jami al-Tavarikh.' It is interesting that after Ghazan's conversion, when he gave orders to build or refurbish mosques in every village in his domain, he also ordered the endowment of fund at each location for maintenance of bird shelter, a practice, that at that time, was associated primarily on will, Hindu and Buddhist attitude towards animals. The Buddha, in the land of 13th century Central Eurasia, was a Mongol phenomenon.

"Looking at the small insects, butterflies and hovering birds, they have well-defined trajectories for the wing movement. So, flying by wing flapping should be a simple skill to learn. Let's forget about the agility and sophistication in controlling the flight motion, but consider the simplest step in natural flying species, flapping the wing to take off, can we reproduce them in inanimate material? To achieve this will be a big progress in the research of micro robots and smart materials, and it will be the next step of our research," said Zeng.

The polymer assembly robot inspired by dandelion seeds is

equipped with a soft actuator, made of light-responsive liquid crystalline elastomer. Because of this, the researchers could induce the bristles of the actuator to open or close by exciting it with visible light. According to Zeng, the proof-of-concept built by the team shows that it is an important step towards realistic application of robots that can act as pollinators.

Last year, engineers from the Northwestern University published a research article in the journal *Science Robotics* about a similar invention. They built various tiny robots that could be controlled using lasers. At the time, the researchers told that they envisioned controlling a swarm of such robots to carry out various tasks. So, the natural question was, can a swarm of FAIRY robots be controlled to pollinate plants in an area?

However, researchers at Tampere University have a radically different approach. "Control, coordination, precision in actuation, and manipulation over long distance are words from the field of robotics. In our research, we try to think in a different way. In a biomimicry sense, we try to build the material-based robot, smart enough to decide by itself what to do," said Zeng.

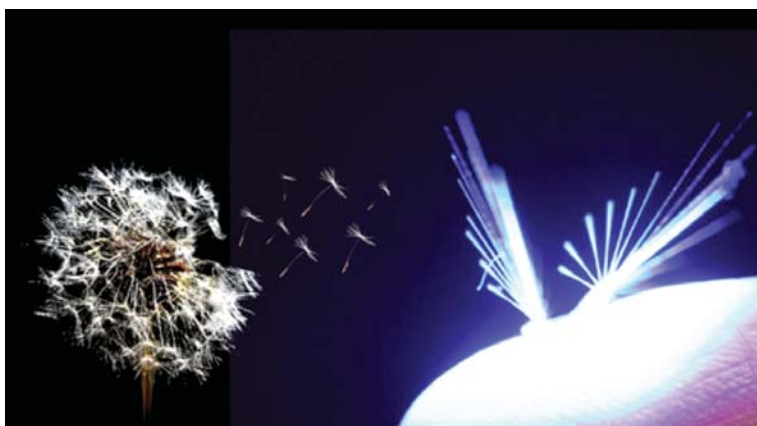
"We can see many examples in nature, when the light illuminating condition, temperature and humidity conditions meet, the flowers bloom, and the seeds start to disperse. This is the capability we try to improve in our materials," Zeng explained that the researchers are working on the robot to let it self-adapt to environmental changes and work automatically. Essentially, they could be configured in such a way that their design makes them activate automatically and pollinate plants depending on ideal environmental conditions.

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#TECHNOLOGY

'Fairy' Robot

Can a swarm of FAIRY robots be controlled to pollinate plants in an area?

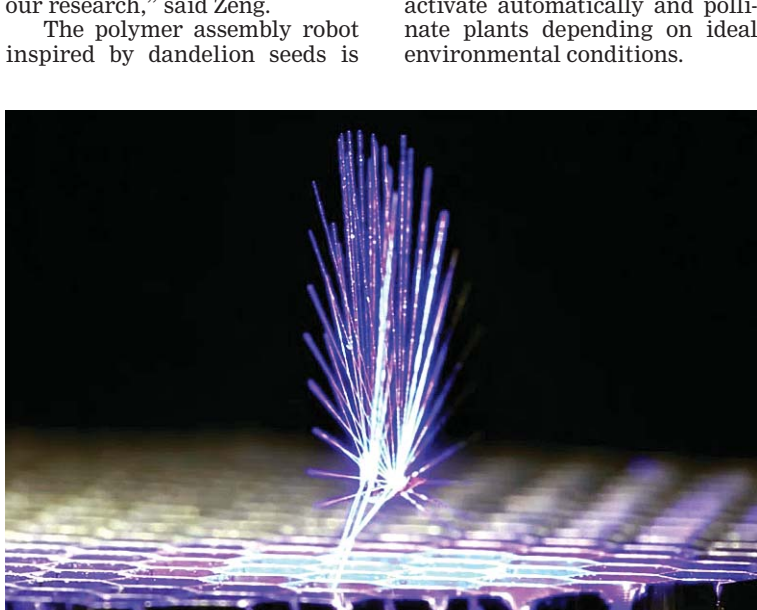


Populations of major pollinators, bees, butterflies, wasps, beetles and others, are diminishing drastically worldwide. And this rapid decline of pollinators is alarming and poses a great threat to biodiversity and food security. These concerns may be allayed through realistic application of robots that can act as pollinators.

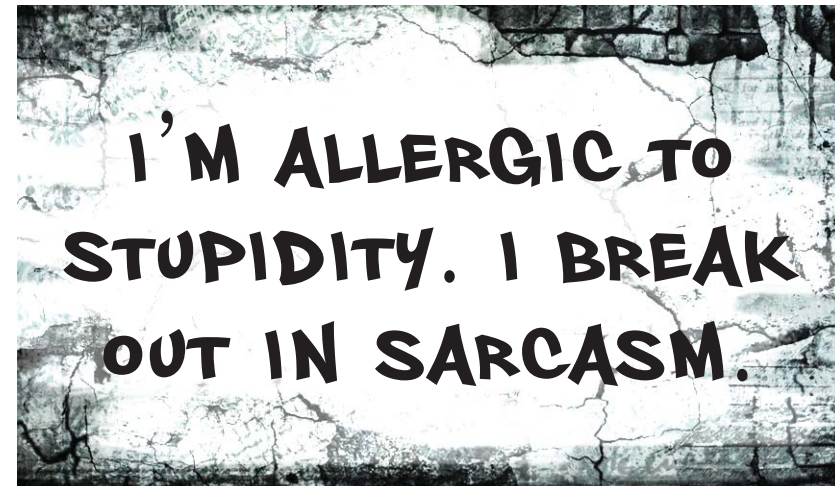
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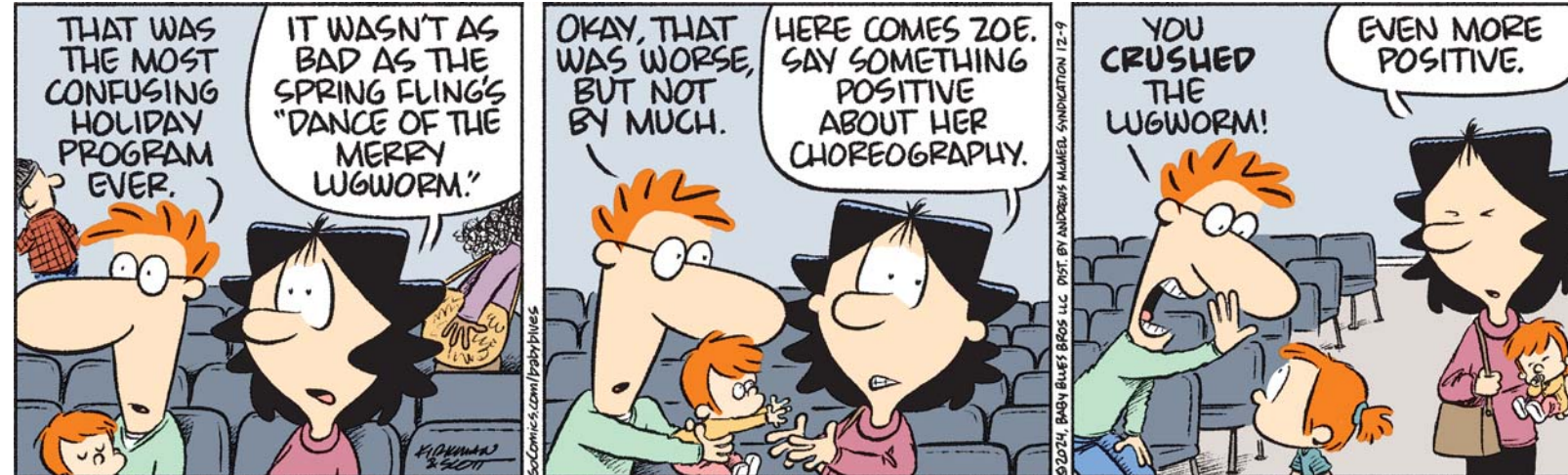
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THE WALL

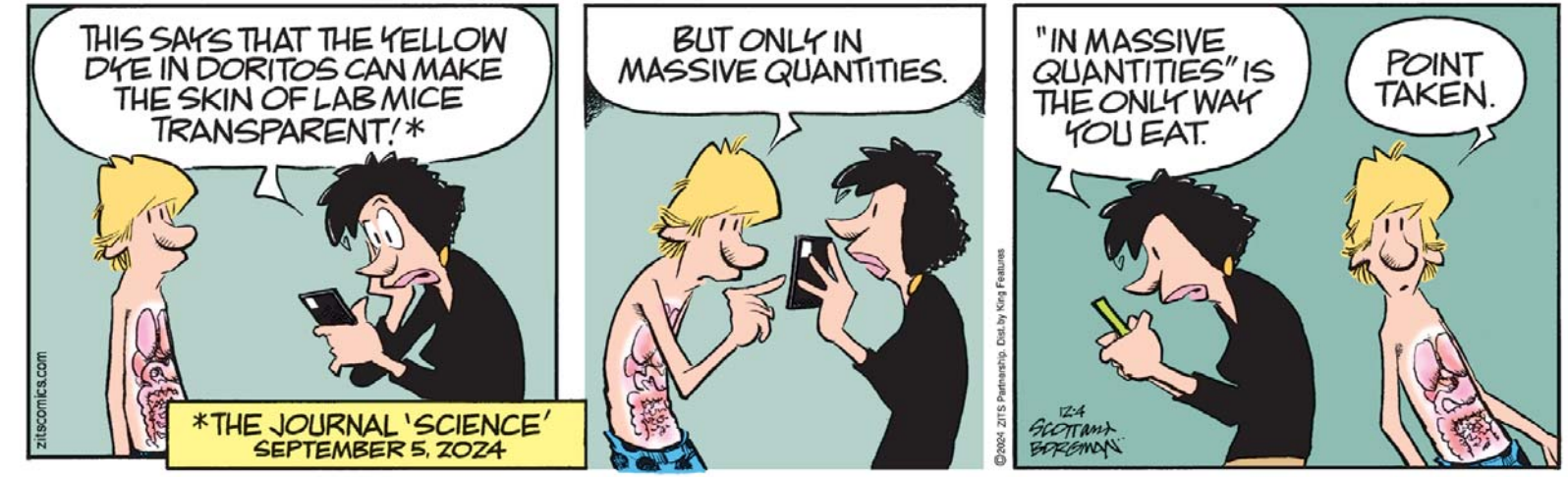


BABY BLUES



By Rick Kirkman & Jerry Scott

ZITS



By Jerry Scott & Jim Borgman

