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## A NEW YEAR MESSAGE FROM THE ACA NZ PRESIDENT

2024 has been an interesting year with some ups and downs for the NZ Branch.

The big up is for two of our members; Raed El Sarraf being elected to the ACA Council Presidency and Trish Shaw being re-elected to the ACA Board. Also, now that our Branch is recognised by the IRD as a charity, donations/sponsorship to the ACANZ can be claimed on your tax return as a donation.

The ACA annual conference now has a specific category for asset owners where they can get a cheaper registration rate with reduced access to the program, but they have a specific owners-only discussion meeting. They will also have access to the trade exhibition. Hopefully, this initiative will encourage more asset owners to attend the conference.

The conference in Carins was well attended with 387 registrations. The ACA is hopefully going to have the annual conference in NZ in November 2026, after being in Melbourne's Marvel Stadium this year.

The small "downs" were the postponement of the Coating and Applicators Road Show and the cancellation of the Lyttelton drydock site visit.

Within the ACA, there has been discussion about the future status of the NZ Branch with the proposed change from an Incorporated Society to a Company Limited by Guarantee. Also, discussions were had about returning a percentage of the subscriptions paid by NZ members to the NZ Branch to help pay for our events. By the end of 2025, a formal MOU document should be in place covering this.

The ACA is still suffering from "talking to the converted." One of the objectives of the ACA is to create more

awareness of corrosion and its prevention and treatment options.

To do this, we have to go outside the ACA and disseminate the vast knowledge that ACA members hold to other organisations. "Talking to the converted" was evident at this and previous conferences, where only people from within the ACA organisation registered and listened to the technical talks. To address this, we are starting to make contact with other organisations where corrosion is recognised as a cost to its members.

The Lyttelton drydock site visit was another example of the isolation of the ACA from others who are affected by corrosion. We have access to the ACA membership list but no access to other organisations and, hence, no easy way to make others aware of the event.

The number and attendance of technical events has also dropped post-Covid. Also, the percentage of people who attend in-person events has dramatically dropped. This is not limited to the ACA, as it has also affected many meetings and events of many other organisations. The ACA is now gearing up to have all technical events available live online, and having a library of events members can search for.

In summary, the ACA is changing to match the times:

- ACA is reaching out to other organisations that we can share expertise with.
- Meetings are now going to be more by Skype/Teams and recorded for later viewing.

2025 should be an exciting year!

*from Grant Chamberlain, ACA NZ President*

*ACANZ would like to gratefully acknowledge this month's sponsor...*

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Q  
&  
A

Older ACA NZ members have probably seen a number of situations that may never have made it to a textbook.

## CORNER

If you have a question you'd like clarification on, email it to the Editor at [lesboultonrust@gmail.com](mailto:lesboultonrust@gmail.com). We'll pose it to our panel of experts who will answer it in another Bulletin, so everyone can improve their knowledge.

## Q:

***What is the secret of ancient Roman concrete's durability?***

## &amp; A:

For decades, scientists have sought to unravel the secret behind Roman concrete's longevity. According to Science Alert, modern analysis techniques have revealed that the Romans' mixing techniques were more sophisticated than previously thought. MIT researchers have studied concrete samples from the archaeological site of Privernum in Italy, dating back nearly 2000 years, using techniques like scanning electron microscopy and X-ray spectroscopy.

One of the key findings was the presence of small, white chunks of lime, known as clasts, within the concrete. These lime clasts were initially considered signs of poor workmanship. However, the researchers challenged this notion: "the idea that the presence of these lime clasts was simply attributed to low quality control always bothered us," they said. By examining the clasts with special microscopes, the team concluded that the clasts originated from quicklime added directly during the mixing process – a method known as hot mixing.

Hot mixing involves adding quicklime (calcium oxide) to the mixture instead of slaked lime (calcium hydroxide), generating temperatures of nearly 400 C. This process not only produced high-temperature compounds that wouldn't form otherwise but also reduced curing times, allowing for faster construction. The lime clasts resulting from hot mixing imparted self-healing properties to the concrete. When cracks formed, they preferentially travelled to the lime clasts. Upon contact with water, the reactive lime released calcium-rich solutions that hardened into calcium carbonate, naturally sealing the cracks. This phenomenon helped maintain the structural integrity of Roman concrete over centuries.



The MIT team tested this theory by creating concrete samples using ancient recipes with quicklime and controls without it. They reported that when they deliberately cracked the samples and exposed them to water, the quicklime concrete healed completely within two weeks, while the control samples remained cracked. Understanding the self-healing mechanism of Roman concrete opens avenues for developing more sustainable and durable modern materials. Modern concrete, based on Portland cement developed in the 19th Century, is less durable than its ancient counterpart.

However, not all experts agree on the centrality of hot mixing in the Romans' self-healing concrete. Geologists at the University of Utah, believes the key lies in the materials mixed with lime, such as pozzolan, a type of volcanic ash. They have tested their hypotheses by creating modern analogues of Roman concrete. "The way Romans chose the materials actually blocked the propagation of fractures. They were the masters," the Utah researchers stated.

*Acknowledgment: M.Bonder, American Media Institute*



## ACANZ Wellington's end-of-year meeting

On 6 December 2024, a small group of ACA and SCANZ members met for an end-of-year lunch at Cars Inc (a café and car museum) in Trentham, Upper Hutt. After an enjoyable lunch, attendees visited the adjacent museum to admire an amazing collection of over 60 vehicles.



Submitted by Willie Mandeno

## A cocktail for corrosionists? The rusty nail...

The International Bartenders Association (IBA) specification requires 45ml of Scotch whisky and 25ml of Drambuie poured into an old-fashioned glass filled with ice and stirred gently, with orange zest or an optional orange peel garnish. It was made popular in the early 1960's as the go-to cocktail of the 'Rat Pack'.

(ref. Wikipedia)



## 2024 ACA Foundation Scholarship winner announced at CP24

For three years, Phoenix Solutions has sponsored a New Zealand resident to an ACA training course or attendance at the ACA's annual conference.

The 2024 scholarship was awarded to Lakein Cottam, a CP technician with First Gas in New Plymouth. The \$NZ 2,000 scholarship was awarded to her at CP24 in Cairns.

While this was reported in our December Bulletin, we now have a photo of her accepting the award with ACA NZ and Foundation representative Willie Mandeno.

## White rocks – an infinite energy supply?



The search for cheap clean forms of energy has been an ongoing research effort, and one of the most interesting breakthroughs that have arisen has come out of MIT where a research group is developing a process to extract hydrogen from rocks. Natural hydrogen, particularly “white hydrogen”, is generated from the reaction of water with iron bearing rocks; the iron corrodes to release hydrogen gas. The reaction takes place within the earth’s crust allowing the formation of pure hydrogen gas bubbles, which has not been investigated previously as a limitless source of clean energy.

Other resources, such as water (H<sub>2</sub>O), have been estimated to contain perhaps billions of tonnes of geologic hydrogen, “white” hydrogen, trapped within the earth’s crust. Meanwhile, the electrochemical reduction of carbon dioxide (CO<sub>2</sub>), is still very much in the development stage.

The US Department of Energy is now funding some big research projects with the following objectives:

- **Catalyst Development:** To speed up the hydrogen-generating reaction from iron-bearing rocks.
- **High-throughput system:** An intelligent system that will allow comparison of different catalysts and modelling their impact on various rocks.
- **Parameter optimisation:** Hydrogen yield of various microorganisms with the goal of defining the best conditions for hydrogen production – temperature, pressure and pH.

The various methods of hydrogen production fall under a particular colour category based on the level of environmental impact and how the hydrogen is produced. Geologic hydrogen is “white”; “gray” hydrogen is derived from natural gas; “green” hydrogen is derived from water electrolysis. “White hydrogen” shows lots of promise and everything points to it becoming, along with geothermal energy, the sub-surface mining of the future, a far cry from non-renewable resources that are still being explored in many countries around the globe.

*Acknowledgement: D.Garcia, Econews*





The ACA Applicator and Coatings Technical Groups are excited to hit the road! Their annual Roadshow is heading to Sydney, Perth, Auckland, and Christchurch for an epic tour across Australasia, with roadshows three and four in New Zealand.

**Roadshow Three: Monday 21st July 2025, Auckland**

**Roadshow Four: Thursday 24th July, Christchurch**

These events will include a variety of engaging presentations by expert speakers, an exhibition featuring our Corporate Partners in the coatings industry, and live outdoor demonstrations of the latest equipment designed for coatings professionals.

We currently have a limited number of opportunities available for presenters and sponsors. Abstract submissions from potential speakers are open until Friday, 28th February 2025.



## California's deadliest fire started by corroded hook

California's deadliest wildfire in history was the Camp Fire. It started on November 8th 2018, when an uninspected, 100 year old metal hook holding up a high voltage line snapped under the weight of the power line which sparked against the steel tower holding it up – creating an electric arc that reached temperatures of 5,000 to 10,000oF.

The responsibility for inspecting the power line belonged to Pacific Gas and Electric, which hadn't climbed the tower to inspect it for over a decade. 86 dead, 153,336 acres burned.

## Paris Olympics medals are tarnishing

In an article published by the New York Times in January, it was reported that the medals won by athletes during the 2024 Olympics in Paris are deteriorating. The medals were designed by luxury jewellery maker Chaumet, which is owned by the French luxury conglomerate LVMH (Louis Vuitton, Moët and Hennessy), the Olympics' biggest corporate sponsor. LVMH has declined to comment.



The International Olympic Committee has apologised and says it will find replacements. Monnaie de Paris, the French mint which produced the medals, has so far taken responsibility, blaming the problem on a technical issue related to varnish.

The mint discovered that the varnish used to prevent oxidation was defective. Its varnish recipe is a trade secret, but the coating was weakened after the mint changed it to conform to recent European Union regulations banning the use of chromium trioxide, a toxic chemical used to prevent metal from rusting, according to La Lettre, a French industry newspaper.

A spokeswoman declined to confirm the report, but said in a statement that the mint "has modified the varnish and optimised its manufacturing process."

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