ACA BRANCH NEW ZEALAND BRANCH

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PRESIDENT'S MESSAGE 2024

Greetings fellow ACA Members,

Finally, after years of sitting back and enjoying the Branch Presidency of previous incumbents, it is time for me to step up.

I have been lucky to meet and work with many experts in the corrosion field. I first met Willie Mandeno back in the 1980s when I did my CBIP coating inspector training. In the 1990s I met Les Boulton when attending an ACA Corrosion Technology Certificate Course (CTC). I also worked with Patrick Connor at the Defence Scientific Establishment (DSE) when I was the Coatings Technician at the Devonport Naval Base in Auckland.

Training with the ACA has been a very important part of my corrosion prevention career. I enjoyed the CTC course and I believe that the course should be part of the degree course for mechanical and civil engineers. It would be a good insight for them and it might help prevent some of the corrosion issues that I have seen in my work. Over the years I have been involved with many big projects in NZ and I have learned that if anything is going to go wrong, it will probably be the coatings and/or corrosion mitigation.

When working in Auckland I attended as many ACA Technical Meetings as possible back to the days when the meetings were held at the Industrial Research Ltd (IRL) premises in Parnell. The ACA field trips were great

with one particular visit to SAFE Industries in Drury I recall as a highlight. It is sad, but a sign of the times, that these technical meetings are now changing mainly to web-based talks and webinars.

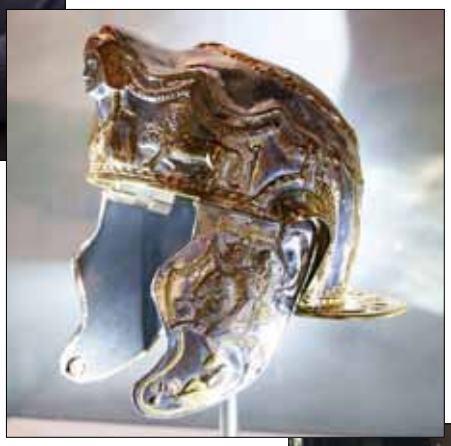
During my two-year term as President, I hope to focus on trying to keep the technical meetings alive, both virtual meetings, in-person meetings, seminars, and the great conversations held with colleagues at ACA social occasions.

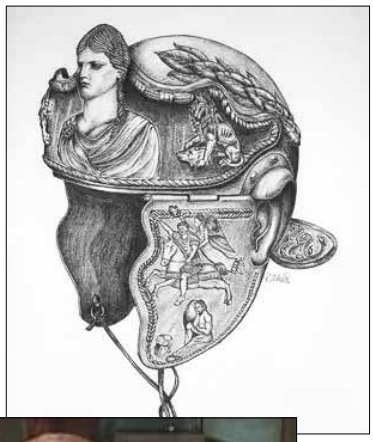
Grant Chamberlain
ACA NZ Branch President

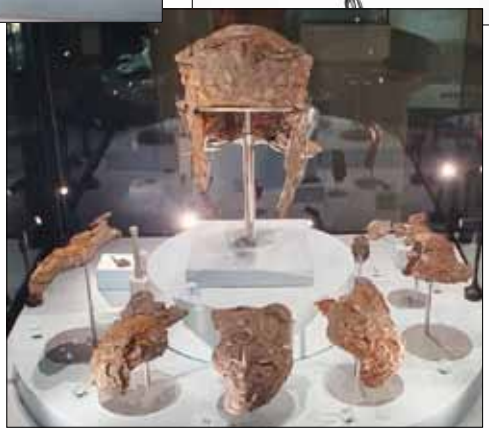
ACANZ would like to gratefully acknowledge this month's sponsor...

Restored Roman helmet used to be a "rusty bucket"

In 2001 amateur archaeologists and the University of Leicester Archaeological Services in the UK dug up a large and extremely rusted metal object somewhere in Leicestershire. It certainly didn't look like much, but this discovery would prove to be one of the most important archaeological finds made this century in Britain.







The artefact, still encased in the soil block in which it was found, was examined by experts at the British Museum who found it was an ancient Roman helmet for a cavalry officer that was about 2,000 years old.

This was no ordinary foot-soldier headgear. As conservators painstakingly peeled off the many layers of rust and soil, they realised this was a Roman helmet of extraordinary craftsmanship, etched with intricate decorations made of gold and silver. The helmet was carefully restored "to approximately 80 percent completion," and according to the county council was made of silver-gilded iron.

The helmet was discovered alongside thousands of Iron Age and Roman coins and pig bones within what is believed to have been a shrine from around 43 AD. Its intricate design, adorned with decorations made of precious metals, suggests it belonged to a high-ranking Roman cavalry officer.

After two decades of meticulous restoration, the artefact, now known as the Hallaton Helmet, has been restored. Initially described jokingly as a "rusty bucket," the Roman helmet has now regained a semblance of its former glory. It is displayed at the Harborough Museum, offering the public a rare glimpse into early British-Roman military history and craftsmanship.

The ancient armour is also accompanied by some sparkling new additions: two replicas showing what the helmet may have looked like when it was made.

- The first replica is the work of Rajesh Gogna, a Leicestershire-based silversmith. Gogna used a scan of the helmet to create a 3D-printed model in resin, which he decorated with silver and gold.

Pics from top left:

British Museum conservator, Marilyn Hockey with the original "rusty bucket" helmet

Rajesh Gogna's helmet

A detailed drawing of how the Hallatan Helmet might have originally looked

The helmet on display at the Harborough Museum, encased with five loose cheekpieces found in the same field in the early 2000's

- The second was handcrafted by Italian archaeologist Francesco Galluccio, who tried to recreate the traditional methods the Romans may have used. "The work started over a year ago and was carried out with intense and continuous collaboration with the museum's management, succeeding in creating an incredible result," Galluccio told BBC News. "The reconstruction … is based only on the actual existing pieces."

"CORROSION HUNTERS"

The ACA organised a social media campaign for World Corrosion Awareness Day (24th April). This was New Zealand's contribution from President Grant Chamberlain.

"Rust never sleeps" are famous words from singer-songwriter Neil Young.
So, Corrosion Hunters have to work twice as hard during the day to make up for their sleeping.

If you have anything made of steel it will want to rust 24/7, even when you're sleeping, on weekends, or on annual leave. It doesn't even stop for Christmas.

Rust doesn't announce its presence; it hides in corners, behind panels, under shiny cladding, and in the soil. To combat rust, you need the expertise of a proactive Corrosion Hunter. Like most hunters, they start thinking like their prey (rust).

Rust thrives in moist, dirty, and salty environments; Corrosion Hunters are adept at finding these environments and not being fooled by camouflaged rust hiding in a moist environment under shiny cladding. Rust also loves to camouflage itself underground, where it finds a moist, dirty, and sometimes a salty environment 100% of the time. This is where a specifically trained Corrosion Hunter excels, ensuring no rust goes undetected.

The Hunter can reduce and weaken its prey by.:

- Providing a barrier between the steel and its environment; for example, paint it.
- Remove any contact with more noble metals.
- Changing its electrical properties by applying Cathodic Protection.
- Changing the environment. For example, dehumidifiers or vapour phase inhibitors can be installed.

Cars are a good analogy to use.

Cars are painted to provide an environmental barrier. You wash your car to change the environment by removing salt and dirt. As the car gets older, it must have more frequent WOFs. WOF inspectors are Corrosion Hunters. They have books to tell them where each model of car will rust. They know it will be under shiny chrome strips, in poorly draining areas, and underneath. You maintain your car's rust prevention system by repainting the car when the paint fails,

I think NZ asset owners can learn from this analogy by.

- employing Corrosion Hunters,
- increasing the frequency of inspections as assets get older,
- hunting out rust-prone areas, and either, Eliminate, Isolate or Control the areas.
- Maintain the asset's anti-corrosion systems.
- Install new anti-corrosion systems as new risks are identified.

The Australasian Corrosion Association assists Corrosion Hunters by providing standards covering corrosion prevention techniques.

They also train and qualify corrosion prevention specialists to assist asset owners in sleeping at night, knowing rust is tucked up in bed.

TRAINING OPPORTUNITIES IN NEW ZEALAND

Coating Inspector Programme

CIP1 | NZ | 8-13 Jul 2024 Level 1

This is the first step on the Coatings Inspector ladder. This foundation course delivers all the basics to start your paint inspector journey. For more details and to register, go to: https://events.blackthorn.io/en/5j1hxgo7/g/3VggT5Fffm/ampp-cathodic-protection-level-1-tester-or-nz-or-14-18-oct-2024-4a2ZI7235y/overview

CIP2 | NZ | 15-20 Jul 2024 Level 2

This course is the next step in earning the Certified Coatings Inspector Certification. For more details and to reegister, go to: https://events.blackthorn.io/en/5j1hxgo7/g/3VggT5Fffm/ampp-coating-inspector-program-level-2-or-nz-or-15-20-jul-2024-4a2ZI71VVw/overview

ACA ACRA Corrosion & Protection of Concrete Structures & Buildings

ACRA | NZST | 25-26 Jul 2024

This course covers the mechanisms of corrosion, protection and repair of reinforced concrete structurers and buildings. For more details and to register, go to: https://events.blackthorn.io/en/5j1hxgo7/g/3VggT5Fffm/aca-acra-concrete-structures-and-buildings-or-nzst-or-25-26-jul-2024-4a2ZI71kEw/overview

AMPP Cathodic Protection

CP1 | NZ | 14-18 Oct 2024 Level 1 Tester

This course is the first of AMPP's Cathodic Protection series, covering both theoretical and practical CP techniques. For more details and to reghister, go to: https://events.blackthorn.io/en/5j1hxgo7/g/3VggT5Fffm/ampp-cathodic-protection-level-1-tester-or-nz-or-14-18-oct-2024-4a2ZI7235y/overview

CP2 | NZ | 21-25 Oct 2024 Level 2 Technician

This certification indicates intermediate-level knowledge of corrosion theory and CP concepts, types of CP systems, and advanced field measurement techniques. For more details and to reghister, go to: https://events.blackthorn.io/en/5j1hxgo7/g/3VggT5Fffm/ampp-cathodic-protection-level-2-technician-or-nz-or-21-25-oct-2024-4a2ZI7236D/overview

ACA Coating Selection & Specification

CSS | NZST | 21-23 Oct 2024

This course addresses the guidelines for writing paint coating specifications that are fit for purpose. For more details and to register, go to: https://events.blackthorn.io/en/5j1hxgo7/g/3VggT5Fffm/aca-coating-selection-and-specification-or-nzst-or-21-23-oct-2024-4a2ZI7236S/overviewACA

ACA Corrosion Technology Course

CTC | NZ | 25-29 Nov 2024

This is a great foundation course for all corrosion professionals. For more details and to register, go to: https://events.blackthorn.io/en/5j1hxgo7/g/3VggT5Fffm/aca-corrosion-technology-course-or-nz-or-25-29-nov-2024-4a2ZI71kFV/overview

Q & A CORNER

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

If you have a question you'd like clarification on, email it to the Editor at 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:

Why do some aluminium and aluminium alloys corrode?

& A:

Aluminium is the second most abundant metallic element on earth, and has become the most widely used non-ferrous metal. Aluminium metal possesses some unique characteristics that make it very suitable for a wide variety of engineering applications. However, designers and specifiers need to understand the chemical nature of aluminium and how it may lead to corrosion.

Aluminium alloy composite panel cladding on a modern building façade

Aluminium metal is an amphoteric element that can react with both acidic and alkaline chemical substances. It is highly reactive that reacts spontaneously with water and air to form a thin aluminium oxide protective film; Al2O3. The good corrosion performance of aluminium and aluminium alloys is due to the passivity produced by the protective oxide film. However, aluminium is passive only in the pH range of approximately 4 to 9. If the passive film on aluminium is damaged it will re-form immediately in most environments, but when the film is damaged under conditions such that self-repair cannot occur then corrosion of the aluminium can happen. The common forms of corrosion that occur are localised types such as pitting corrosion, crevice corrosion and galvanic corrosion.

Aluminium alloys have been successfully employed in structural engineering applications for many years, and the alloy properties are well known and well understood. Some aluminium alloys are even tailored for specific applications. For example, several aluminium alloy grades are particularly successful in marine environments including seawater immersion. Other aluminium alloys are chosen for their excellent mechanical properties because they are lightweight and strong, while demonstrating good corrosion resistance.

Most applications for aluminium utilise alloys with one or more elemental additions, which give improvements to the mechanical, physical and chemical properties of the resulting material. The major alloying additions used with aluminium are copper, manganese, silicon, magnesium and zinc. The total amount of the alloying elements can constitute up to 10 percent of the alloy composition by weight. Aluminium and its alloys are non-magnetic, they have high electrical conductivity, high thermal conductivity, high reflectivity and non-catalytic action. Thus the specification of an aluminium alloy for a particular application often incorporates one or more of these desirable properties.

Aluminium alloy parts that have been anodised to enhance their corrosion resistance and mechanical properties

Advertorial

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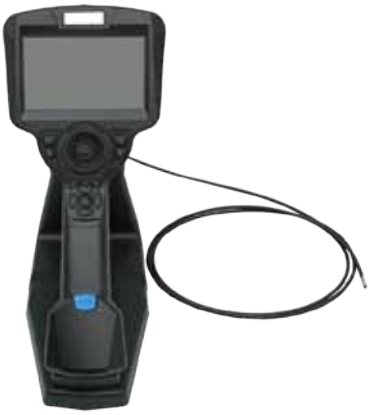
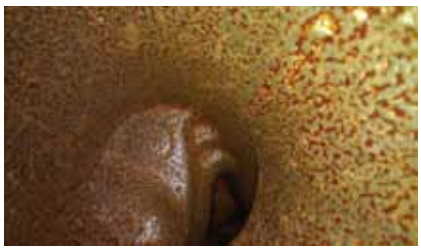
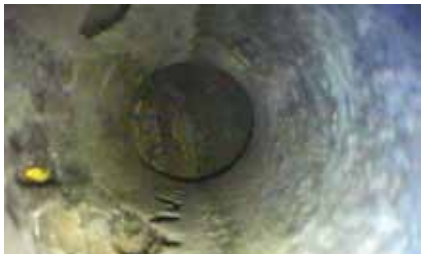
Hire a scope

We also can hire some of our scopes for periods of time or loan a unit to allow you to evaluate and check your requirements, prior to purchase.







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