



The Art of Cleaning Ancient Coins

Written, Produced & Directed
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Preface

Collecting ancient coins via uncleaned coins is a wonderful, inexpensive, yet addictive hobby; once bit, watch out! Remember, cleaning coins is an art not a science. No two coins will ever be quite the same in condition. Some will come clean with just a scrub of a tooth brush, soap and water...while others will be much more challenging. In this seminar, I will walk you through all the facets of cleaning, restoring and attributing ancient coins, revealing to you all lessons, tricks, mistakes and perhaps a few secrets that I have learned in fifteen years of cleaning ancient coins.

Chapter One – The Basics

✦ From the beginning, the *very most* important concept you must understand is that unless you purchase uncleaned coins that **can** be cleaned, you're wasting your time and money. Please note that 95% of the uncleaned sellers on eBay are a rip off. They make promises like "gold found" or "lots of silver coins". Hogwash! No one in their right mind would sell a gold or silver coin for \$2.00, eh? Don't trust pix as seen on the right, trust me.



Chapter One – The Basics



✠ This is what you're looking for; coins showing lots of detail. Shop around a bit, either on eBay (not suggested) or from a few selected sellers that I will suggest at the end of the seminar. It is best to pay just a bit more to receive "premium" uncleaned coins than wasting your money on crap.

Chapter One – The Basics

✠ Once you have established a relationship with a reputable dealer that you trust, stick with him or her, as the case may be. Sellers, the smart ones anyway, appreciate repeat customers and tend to send you even better coins to keep you coming back. Seen right are a few coins that I cleaned from a very reputable wholesaler. Read on and your coins will soon come out like these!



Chapter One – The Basics

- ✠ The two most asked questions concerning ancient coins, especially Roman issues, is where do they come from and how long will the supply last?
- ✠ As of this date, the bulk of Roman uncleaned coins come from the Balkans, and Bulgaria heads the list. Other sources are England, Syria, and Israel. In many cases, the coins that you receive have been smuggled from the country of origin. Not to worry, though, once in the US they are safe to own.
- ✠ As for the supply, just remember this: The Roman Empire existed for close to 1,000 years, and during that time they minted *millions* of coins *each year!* These coins didn't simply evaporate into the air; many millions were simply buried for safe-keeping, as there were no banks at that time. Through neglect, forget-fullness, death or Barbarian invasion, thousands of buried troves were lost for centuries. The supply for now seems assured.

Chapter One – The Basics

✠ Once you have purchased some uncleaned coins with great possibilities, you now need to consider how best to clean them.

✠ Mechanical

✠ Chemical

✠ Electrical

Chapter One – The Basics

✠ “Mechanical” refers to the long-standing established way of cleaning ancient coins: soap, water and a tooth brush, scalpels, dental picks, “rose thorns” and what have you. I have added a number of 21st Cent tools to this heading, despite the frowns of a number of my colleagues who consider this a “Dark Side of the Force”, such as Diamond-dusted Dremel tools. They are wrong and I am right. Mechanical is mechanical, eh?

Chapter One – The Basics

✠ “Chemical” refers to using solvents such as lye to clean coins. I’m not a true fan of chemical cleaning, but I do use it occasionally in stubborn cases. Lyed coins are sometimes referred to as having a “European Patina”. Most chemically cleaned coins come out bad, but many can be restored via restoration tools and products. I will discuss the “Good, Bad and the Ugly” of this process in the following chapters.

Chapter One – The Basics

✦ Electrical

✦ Cleaning ancient coins via electrolysis is truly the *”Dark Side of the Force”*. It is without doubt the very most invasive and damaging process for cleaning coins. Certainly, it does remove even the most massive encrustations, but leaves the coin stripped of all patina and in most cases, you’re left with a horribly ugly pitted coin. Nonetheless, I use this process in many cases as I know how to clean, smooth, and restore these coins to lasting glory.

Chapter One – The Basics

Now, I'll address the topic of lighting and magnification. If you are serious about about cleaning ancient coins, you absolutely need to have a steady "hands free" magnifying system. Forget about microscopes. Trust me, you don't need them. A simple "light and magnifier" as seen to right, is all you'll ever want; \$20.00 from Home Depot.



Chapter One – The Basics



✠ **Inexpensive
...and will
prove it's
price for
many years
to come.**

Chapter One – The Basics

- ✠ As mentioned above, cleaning ancient coins is an art, not a science, but before you begin, you must understand exactly what is that you are cleaning!
- ✠ Whether you are an experienced coin-cleaner, or a beginner in the hobby, you need to understand just what it is that you're cleaning! Fifteen years ago, when I got sucked into the hobby, I had no clue as to where to begin. At that time I could not tell one emperor's portrait from another...and as for legends? I was stumped! At that time, they all looked the same to me, and I made more cleaning mistakes than I care to admit. The most profound problem that I had then was learning to recognize the emperor's portraits, read the legends, and deciphering the reverse details.

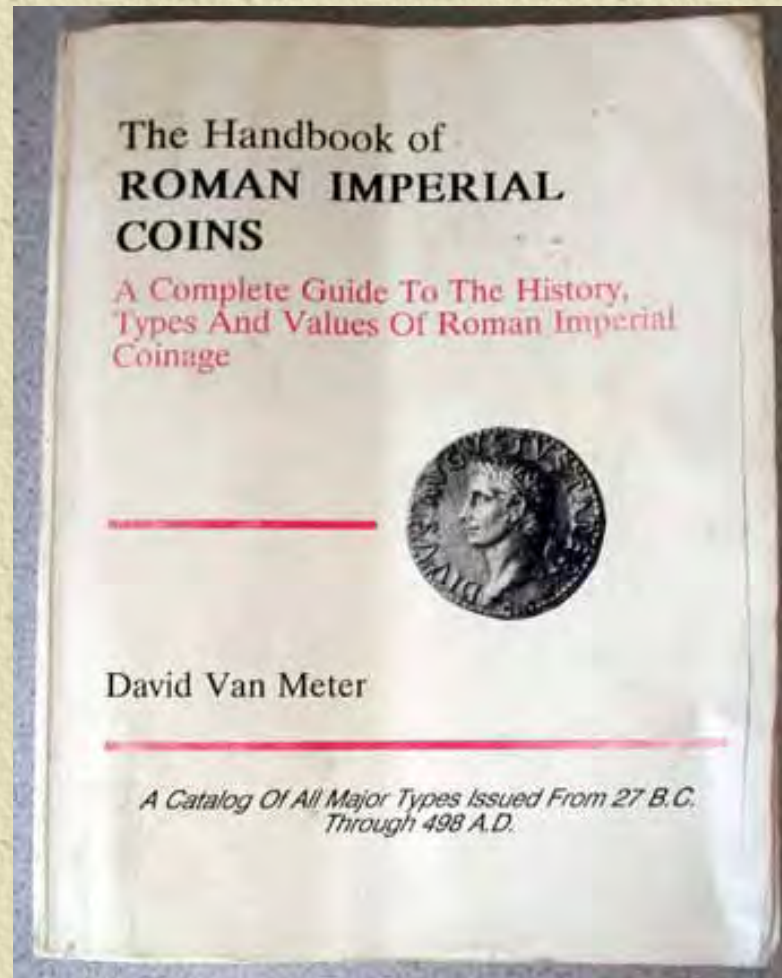
Chapter One – The Basics

- ✠ All ancient Roman Coin Legends are inscribed in Roman Latin Text.
- ✠ It will only take you a few hours time to decipher them; once understood, they are all rather easy; but you will need a few references to help you out.
- ✠ A “typical” late Roman Constantine I obverse legend reads “CONSTANTINVS MAX AVG”. Easy to interpret. “Constantine I, the “Ultimate Ruler of the Roman Armies”. Simple enough, eh?
- ✠ But what about this Reverse legend? “VICTORIAE LAETAE PRINCE PERP”?
- ✠ When you clean coins, you really need to know what your cleaning. eh?

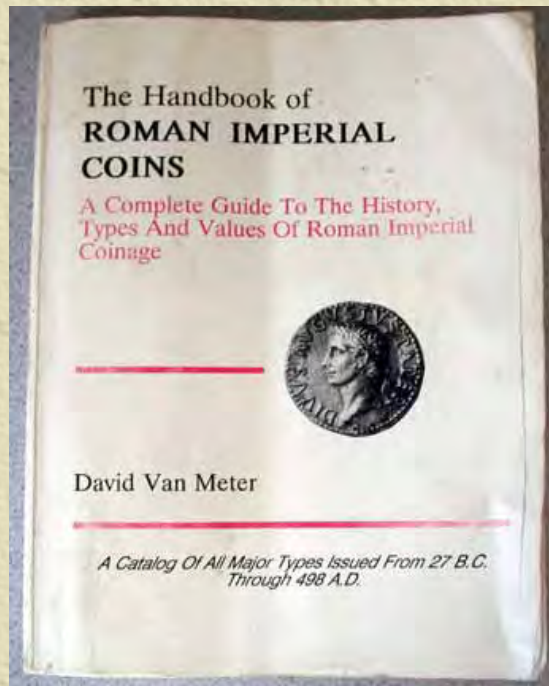
Chapter One – The Basics

✦ Books and References

- ✦ The necessity of resource materials is also very important! Purchase as many books as your budget allows; in fact, I advise that you purchase at least one reference before buying any coins!
- ✦ Seen right is my very worn, well-used, and dirt-stained copy of David Van Meter's "Handbook of Roman Imperial Coins".



Chapter One – The Basics



- ✠ Despite the fact that there are hundreds of Internet sources for ancient coin attributions, having to look up each and every coin becomes rather unwieldy and very time-consuming.
- ✠ My suggestion is to purchase this book; it is not the “be all – end all” of ancient Roman Coins, but it is the very best beginner Ancient Roman Coin reference that I subscribe to. A relatively inexpensive reference work that is filled with photos and near-complete Ancient Roman Coin attributions. I do not sell this book, but it’s available from a number internet sources at a low price, usually about \$30 or so.

Chapter Two

Mechanical Cleaning

- ✦ As mentioned above, mechanical cleaning is all about scraping and brushing to clean coins. This is the preferred method to clean any ancient coin. In any occasion that you can clean an ancient coin, this way is the best way; but there are other ways, as well.
- ✦ We'll discuss these other opportunities later in this seminar.

Chapter Two

Mechanical Cleaning

✦ The “tried and true” method of cleaning ancient coins begins with Olive Oil. Olive oil has a very low amount of acid that tends to impregnate and loosen dirt and encrustations. Simply place your coins in olive oil and let them rest for a week or two, allowing the acid to do it’s work.



Chapter Two

Mechanical Cleaning



✚ After a week soak in olive oil, remove the coin from it's olive oil bath and scrub it off with any liquid soap under warm running water with a common tooth brush.

Chapter Two

Mechanical Cleaning

✠ You must remove all dirt! 😊

In this case, dirt is your first enemy. It is of absolute importance that all dirt be removed before you can proceed. These coins are hard enough to clean as is, but until the minimal amounts of dirt are removed, you'll have no gauge to know when to stop cleaning.



Chapter Two

Mechanical Cleaning



- ✠ Before we proceed further to the tools, there is another way to loosen/remove the mud and hard clay from coins:
Gringott's Wizard Mix #2!
- ✠ In most cases, when I receive coins that I plan on cleaning, I use this product first before olive oil soaks. Simple to use either as “boil” or short term soaks.
- ✠ “But this sounds like Chemical Cleaning, Kevin!”

Chapter Two

Mechanical Cleaning

- ✠ Perhaps yes, perhaps no...
- ✠ After all, olive oil is mildly acidic as well.
- ✠ Gringott's #2, when used as directed, will not harm your coin's patina. I have found that after application of this product, 90% of coins will not need olive oil soaks!
- ✠ Let's proceed, shall we?



Chapter Two

Mechanical Cleaning



✠ Now that you've removed as much soft dirt as possible with brush and soap under running water, it time to examine your coins under your magnifying light.

Chapter Two

Mechanical Cleaning



- ✦ Examine each coin carefully, then separate them into three categories:
- ✦ 1) Those that have crisp portraits and details already showing.
- ✦ 2) Portraits and details that may need a bit more time in olive oil.
- ✦ 3) Coins that have very heavy encrustations.

Chapter Two

Mechanical Cleaning

✠ Category # 1

✠ Coins such as these are now ready for mechanical cleaning, with no further need of soaks.



Chapter Two

Mechanical Cleaning



✠ Category #2

✠ Coins that look like these are problematic; return them to olive oil, wait a few weeks, then soap and brush again. It can't hurt. I'll return to these coins later in the seminar.

Chapter Two

Mechanical Cleaning



✦ Category #3

✦ As seen, these coins are heavily encrusted. Commonly referred to as “crusties”, such coins, at least from my experience, can only be cleaned via electrolysis. You can put them in olive oil for the span of a lifetime with no result.

Chapter Two

Mechanical Cleaning

- ✠ Let's go back to Category #1 and talk about cleaning tools.
- ✠ You may have read that the only way to clean ancient coins is with a bamboo skewer or a dried rose thorn...?
- ✠ Please...



Chapter Two

Mechanical Cleaning



✠ Believe it or not, the accepted way to clean ancient coins for the last 100 years is to clean them with a bamboo skewer or a dried rose thorn, as seen left. I have tried both...but never again. Weak vegetable tools such as these will never clean your coins in your lifetime, trust me.

Chapter Two

Mechanical Cleaning

✠ This is the 21st Century, not the 19th...and our cleaning tools have come along way from the rose thorn.

✠ Consider a common dental pick...



Chapter Two

Mechanical Cleaning



✚ The common dental pick, with its hard steel and sharp point, is my 1st choice cleaning tool. Use this tool to probe your coin's surface. It's best to begin by using the tool sideways, rather than point first. Begin with the coin's fields, rather than the details, using little pressure, *remembering to use the tool in a circular manner rather than left-right or up and down.* This is important!

Chapter Two

Mechanical Cleaning

✧ X-acto Knife

✧ This common house-hold tool is sometimes referred to as a “scaple” by snotty coin cleaners, but it’s really a very simple craft-knife. Inexpensive? Yes! But I suggest that you only use the curved blade seen right, rather than the flat blades!

✧ As with all cleaning tools, this one is used for specific purposes only.



Chapter Two

Mechanical Cleaning



✦ **Craft Knife Cont.**

- ✦ If you use any flat-type blade, you're asking for trouble, trust me, I know. Flat blades tend to easily cut too deep into a coin's patina, and that's not what you want, eh?

Chapter Two

Mechanical Cleaning

- ✦ Craft Knife...and when to use it.
- ✦ Note the early Roman Imperial copper As seen right as a typical example. Dirty and corroded, little detail showing, this is a problem coin that can be restored.



Chapter Two

Mechanical Cleaning



- ✦ Craft Knife...and how to use it.
- ✦ Hold the coin in hand, then use edge of the curved blade to gently begin to scrape off the dirt and corrosions.

Chapter Two

Mechanical Cleaning

✦ Craft
Knife...
and how
to use it.
Go slow
and look
carefully
at the
coin's
surface.



Chapter Two

Mechanical Cleaning



✠ As seen left, always remember to keep the blade as flat as possible against the coin's surface...and when ever possible, use circular motions!

Chapter Two

Mechanical Cleaning

✠ Seen right are a few coins that were cleaned by Gringgott's #2 boil (no olive oil), a common dental pick and a craft tool.



Chapter Two

Mechanical Cleaning

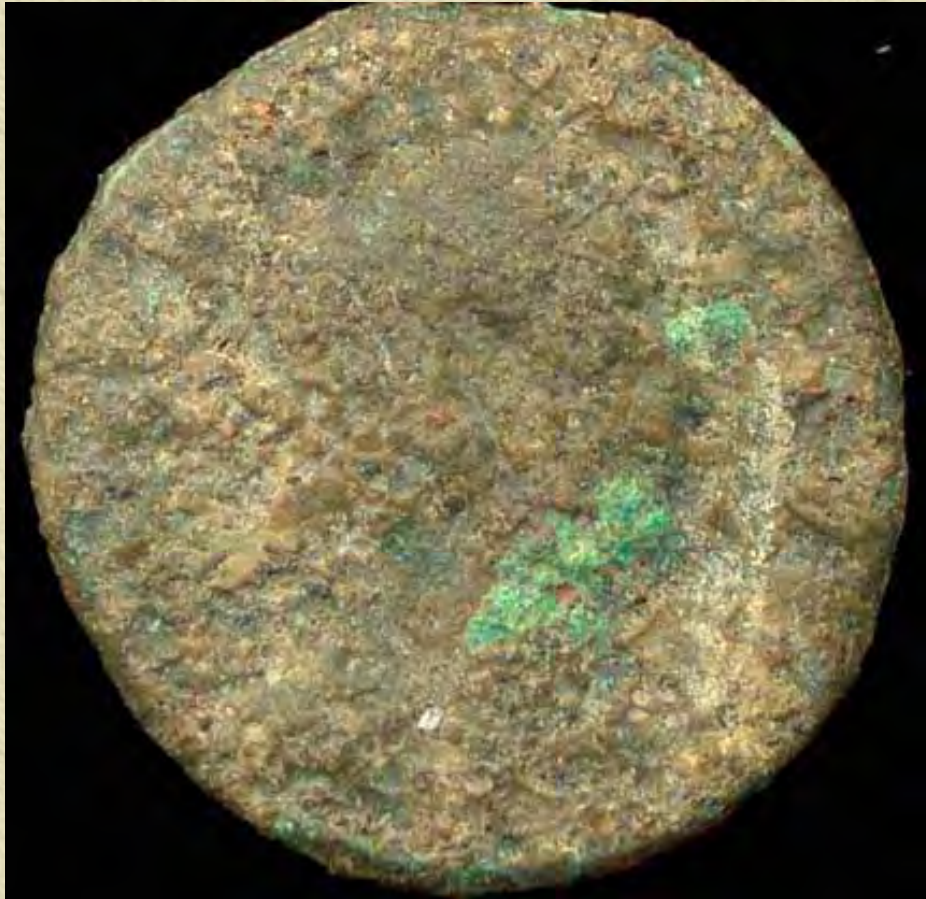


Following the above methods, from my experience, 40%-45% of your Ancient Coins should come out like this...and than ain't bad!



Chapter Two

Mechanical Cleaning



✠ Unfortunately, due to the vagaries of soil condition, many ancient coins do not fall into the previous categories. Too often, no matter how long the soak, many coins do not respond to either Gringott's #2 or olive oil...and the common dental pick, as seen in the example left. So, what to do...?

Chapter Two

Mechanical Cleaning with 21st Century Tools



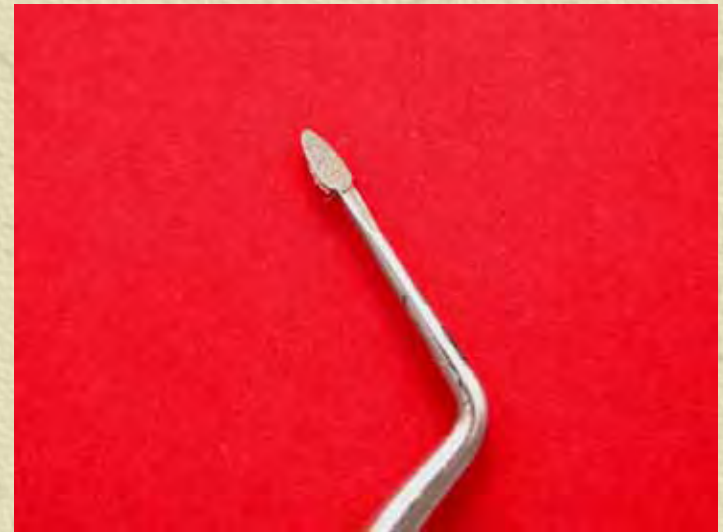
- ✦ **21st Century Tools**
- ✦ Our cleaning tools have come a long way since the days of rose thorns and bamboo skewers. Consider the **Diamond-dusted Dental Pick...** This tool was originally developed by a Doctor of Dentistry at the University of Southern California, to hone down miniscule imperfections on Crown replacements. It is spade-shaped on both sides, and has a 600 Grit covering of diamond dust...

Chapter Two

Mechanical Cleaning

The Diamond-dusted Dental Pick...

If you are new to this tool, I must remind you to go very slow. It's so much better than any tool that you have ever used that you may make a few blunders before you know it! When used correctly, you will be stunned, or even shocked, by how well it cleans your coins. This is not a "Rose Thorn!" Beginners should remember at all times that *easy pressure* wins the race. **THIS IS NOT A "SCRUBBER" TOOL!** It is best used for delicate cleaning...except in the case of "particular" coins.



21st Century Tools

✦ Dremel Soft-brass Bristle Cup Brush...

Unlike the common, and very harsh brass brush from the Dremel folks, this tool's bristles are twice as long.* We will use this tool at the completion of the following project to polish the coin. **DO NOT USE IT BEFORE!** ☹

* Thanks to Bruce Nessett for turning me on to this tool! ☺



Chapter Two

Mechanical Cleaning



- ✦ **21st Century Tools**
- ✦ **Dremel Tools!**
- ✦ **Everything worth doing well takes practice, whether it be sports, music, photography, or flying a stealth fighter. The use of Dremel tools for cleaning ancient coins requires not only practice, but patience, as well.**

Chapter Two

Mechanical Cleaning

✠ Do not expect to read the following lessons, purchase the tools & some uncleaned ancient coins and believe you have it all down pat. Accept from the beginning that you will make many mistakes. I still do.



The Dremel Mini-Mite

✠ The Dremel referred to in all my seminars is the battery-power Dremel Mini-mite 750-02. *Do not attempt to use any plug-in type of Dremel; they are much too powerful and un-wieldy for delicate hand work.* This tool is available at Home Depot, Loews Hardware, etc. but I suggest you click the following link to save some cash.

<http://www.nextag.com/dremel-cordless/search-html>



Dremel Mini-Mite Continued

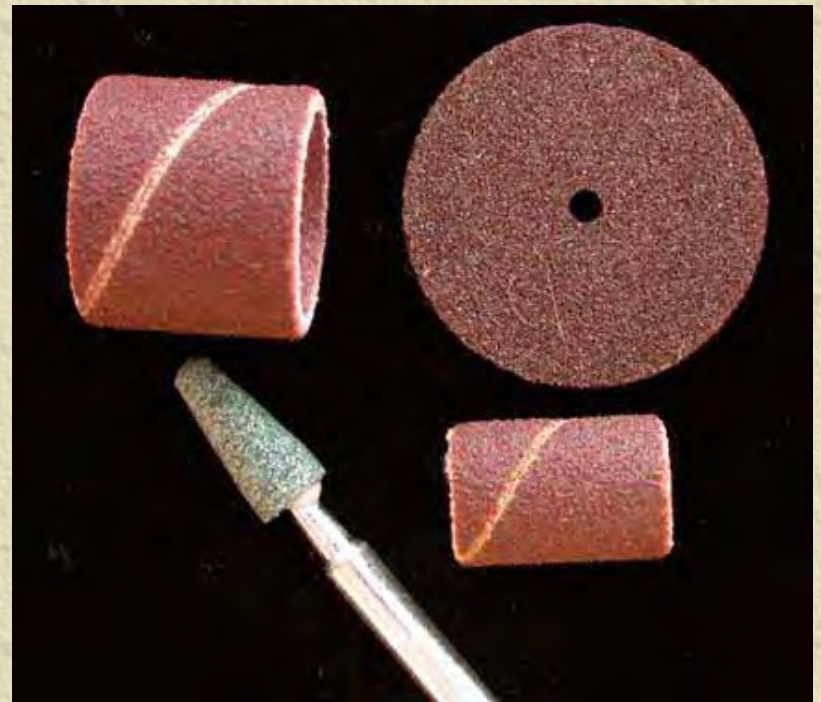


✦ This battery-powered Dremel is light in the hand and agile.

✦ Remember to **always** use it at the lowest speed: 5,000rpm. Faster is too fast! 5,000 rpm is just the ticket.

Common Dremel Tools...? Not!

✦ Never, **under any circumstances**, use any common Dremel tool! They will utterly destroy any ancient coin. Think using a pick-axe to clean the Mona Lisa, and you'll get the picture.



Chapter Two

Mechanically Cleaning “Silvered” Coins



- ✠ Now, after all of the above, let's get back to the topic of cleaning coins, shall we?
- ✠ In the following lesson, we'll kill two birds with the same stone; Using the diamond-dusted dental pick to remove hard encrustations.
- ✠ In this case, I'll walk you through *the most difficult ancient coins to clean...* “silvered” issues. The same process can be applied to any ancient coin, so pay attention!



Overview of Ancient Silvered Coinage

✧ Roman silvered issues –

- ✧ When the Romans realized that they didn't have enough silver to make all the coins needed to run the empire, they started covering AE (copper) coinage with a thin silver shell just to keep up appearances, just the same as our new modern coins.



The Art of Cleaning Ancient Coins

Silvered coins come in a myriad of conditions...

✦ THE GOOD...

Ancient coins similar to this example have a thick and intact silvered covering. These types, when you are lucky enough to find one, are relatively easy to clean.



Silvering conditions continued...



✠ ...THE BAD...

We have all discovered heart-breaking coins similar to this example. The silvering is intact, but VERY fragile. This type takes lots of time and even more patience.

Silvering conditions continued...



...THE IMPOSSIBLE...

Forget about it! The silvering is crumbling and is beyond restoration. With coins like this you have two choices; leave well enough alone, or strip it all off and see what remains. The latter rarely works...trust me, I know.



Silvering conditions continued...



✦ ...And the possible!

This coin is an excellent example of a silvered coin that has rock-hard encrustations commonly found on the Roman silvered coinage. I will use this example as a vehicle to demonstrate my methods for the cleaning and restoration of silvered coins.

Chapter Two

Mechanical Cleaning

✠ Pick and Brush...



For this lesson, you will need the following tools... A diamond-dusted Dental Pick, a soft-brass bristle Dremel cup-shaped brush, and a common toothbrush.

But why **these** tools...? Can't I clean my coins some other way?

- ✠ Sure, why not? But this is about how *I* clean my coins, after all. 😊
- ✠ As you all know, for the last 100 years, the accepted way of cleaning *all* ancient coins was the tried-and-true method of soaking them in olive oil for weeks, months, and even *years*, on end. Pundits also suggested that only sharpened bamboo skewers, and *even* dried Rose Thorns, be used to clean between the legends... Yikes, we'll all be dead before some of our coins come clean using this method.

Chapter Two

Mechanical Cleaning

- ✠ First of all, you need to understand that the “green encrustations” on coins such as this will never give up to any amount of olive oil soaks, trust me. They are hard as rocks.
- ✠ The above withstanding, I suggest that you place your silvered coin in olive oil for at least five days. The olive oil soak is more for removing any dirt that remains on the coin.



My coin is clean...now what?



OK! You're doing great!

Here's the obverse of my example, free of dirt. Compare it to the original example as pictured above. Your coin should look pretty much like mine. And this is why you needed to clean off all the dirt, first! Note that I have circled a few minor condition problems that were unseen until now. The two red bits seen at 11 o'clock and 2 o'clock are to be avoided at all cost. These tiny eruptions will only get worse with if you try to remove them, so forget about them. The larger blemish seen at 6 o'clock is where the silvering has pretty-much come off. Again, leave this alone. I'll inform you later how to deal with it!



My coin is clean...now what?



✦ Same as the above...

Again we see a number of similar tiny red eruptions. As we progress, you will discover that these minor problems need not concern you as long as you follow my methods.

“But Kevin, your reverse seems to show no details!”

Never fear, all will be fine with this coin!

Now that you understand *why* you removed the dirt...put it back in the Olive Oil

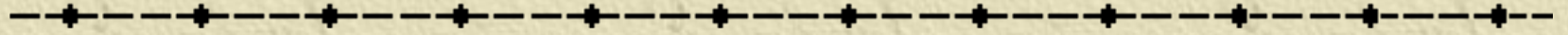
✧ What, again? That sounds lame...

Yes, back in the olive oil for at least a day or two...

I have two reasons for this: The first is that it can't hurt. The second is that I don't want you to get carried away with your cleaning. Go slow. Remember, slow but steady wins the race. And to quote JRR Tolkien, **“Shortcuts lead to long delays.”**

I cannot tell you how many great coins that I have ruined just because I was in a hurry!

Is your coin back in it's Olive Oil? I hope so...



- ✦ While you are waiting, I figure this is a best time to discuss the Pro's of the tools.
- ✦ Let us first discuss the Diamond-dusted dental pick.

Chapter Two

Mechanical Cleaning



Your coin is now clean of all dirt...

At this point we need to address the uses of the DDDP #1...the point and the blade.

In either case, this tool should NEVER be used in an Up-Down or Left-Right combination, i.e., scrubbing. You'll kill your coin! Use the tip to easily brush the encrustations.



Chapter Two

Mechanical Cleaning

✦ The Tip of the Pick...

**Remember to
always use a tiny
circular motion.
The tip of the
tool is great for
removing those
rock-hard green
encrustations....**



The correct way...



✦ Tiny circular motions!

You will be less apt to scar the silvered surface or common green patina using this method!

The wrong way!

✠ Up & Down
Strokes will
murder your coin!
This method will
only mar the
silvering. And
once done, there
is no way back,
trust me.
Remember,
circular motions
only!



Chapter Two

Mechanical Cleaning



✦ The Tip of the Pick...

Easy does it. Don't bare down. Use the tool's tip to clean between letters, etc.

The Blade of the Pick...

The DDDP #1 has any number of uses, and not only for cleaning silvered coins. It works great on AE coins as well. In this case, use the flat part of the blade to gently scrub off those rock hard green encrustations. Always use circular motions...never back-and-forth...



The Blade of the Pick...

✦ Here is a close up of
the blade in action...



The Blade of the Pick...

The right way. ☺

✦ Use the blade of the pick to gently remove the any encrustations ...As pictured, tiny circular motions always work best.



The Blade of the Pick...

The wrong way. ☹️



Again, as mentioned above, back-and-forth strokes will just not do!

Dang, Kevin, Having Followed Your Advice in Everyway, My Coin Is Now Pretty Much Clean of Those Pesky Encrustations, but It Looks Just a Bit Dull! What Do I Do Now? Note: The following only applies if you are using the tool in a battery-powered Dremel. If you do not have the Dremel, you should! ☺

- ✠ At last, we come to the fun part...the SBBB (Soft Bristle Brass Brush)! ☺
- ✠ The first thing you need to do is forget everything you think you know about brass brushes! Much like the DDDP #1, this tool is *not* a SCRUBBER! Rather, it is a ***polishing tool*** for very delicate work. Yes, I use it occasionally to knock off a bit of surface dirt on AE coinage...but that is not it's purpose in this presentation.
- ✠ There are any number of ways to apply the brush bristles to the coin, ***but only one correct way!*** Remember, use the ***tool only on low speed!***

Chapter Two

Mechanical Cleaning

✠ Proper application of the SBBB!

✠ **Rule #1** – Never bare down on the coin, I.E., ***do not apply any pressure!*** Only gently touch your coin's surface with the bristles. *“Go with the Force, Luke... Close your eyes and feel the gentle vibration of the brush on the coin as you hold in in your fingers...”* Doh! Sorry... ☺

✠ Rule #2 – *Always follow Rule # 1!*

✠ Rule #3 – Although not seen in the following pix, for brevities sake, you should always remember to *use the brush under cool/warm running water.* This is *very* important! Oil would be even better...but what a mess! I actually tried this once...but that's just me. Never again. ☹

The Soft-bristle Brass Brush... The Wrong Way!

✦ As noted above, this is the wrong way! ☹ Never place the bristles flat-wise against the your coin's surface! Go ahead and try it...but you'll be sorry you did! It's just a bit *too* abrasive and may cut through the thin silvering.



The Soft-bristle Brass Brush... the Correct Way!

✦ It is the very tips of the brass bristles that do the job correctly. I was serious about “**feeling the vibration**” in your fingertips. Remember, this final application is not about cleaning; it’s about ***polishing!*** When applied correctly, this method will easily “smooth” out your coin’s silvered/green patinated surface and restore it to as close to it’s original patina as possible.



Chapter Two

Mechanical Cleaning



✠ Before....The obverse covered with dirt and green encrustations.

If you have followed all my suggested procedures, your coin should now look something like this...

✠ And after...Here's the obverse...Wow! What an amazing difference, eh? A few minor bits of encrustation still remain, but that is just a small annoyance and can be fixed with just bit more cleaning.

✠ OVB/ GALLIENVS
AVG; laur. and dr. bust r.



Chapter Two

Mechanical Cleaning



- ✠ And the reverse...As noted above, all legends and details are now quite clear.
- ✠ REV/ CONSERVATOR AVG; Aesculapius standing left holding a rod around which a serpent is entwined.
- ✠ Antioch Mint; Gobl. 1649g

As mentioned above, here's the difference in the "problem" areas.



- ✦ **Before Obverse Problems...**
- ✦ **Dirt**
- ✦ **Nasty green encrustations**
- ✦ **And in the circled areas, where the silvering was thin, that I reminded you to leave alone.**

Chapter Two

Mechanical Cleaning

✦ Obverse Problems Solved...

✦ By *not* worrying these bits with the diamond pick, you can easily see that they have nearly disappeared. This effect comes from the SBBB. The fields have been smoothed and polished to a lovely sheen.



Chapter Two

Mechanical Cleaning



- ✠ **Before Reverse problems...**
- ✠ **Dirt**
- ✠ **Nasty green encrustations**
- ✠ **No Details...**
- ✠ **And the circled areas, where the silvering was thin, that I reminded you to leave alone.**

Chapter Two

Mechanical Cleaning

✠ Before reverse problems now solved...

✠ Again, by *not* worrying these bits with the diamond pick, you can easily see that they have nearly disappeared. This effect comes from the SBBB. The fields have been smoothed and polished to a lovely sheen.



Chapter Two

Mechanical Cleaning

**A few more
examples
of silvered
ancient
coinage
cleaned by
the above
process...
Byzantine
billon
trachy
syphate
coins.**



Chapter Two

Mechanical Cleaning



Another example of silvered ancient coinage cleaned by the above process...

Chapter Two

Mechanical Cleaning

✠ And,
finally, an
exquisite
silvered
Roman
Probus issue
cleaned via
the above
process!



Final Procedures

- ✦ As seen above, these tools work magnificently for cleaning ancient silvered coinage and Ae coinage as well.
- ✦ Remember that to succeed, you'll need both tools, as well as the battery-powered Dremel tool.

If you do not have these tools, go to www.nobleromancoins.com.

Chapter Two

Mechanical Cleaning

✠ As you progress in this delightful hobby, you will, at one time or another, come across uncleaned coins with what is known as a “desert patina”. These coins, unlike those found in wet European soil, come from dry lands such as Syria and Egypt. They can instantly be identified by their orange-colored patina.

Chapter Two

Mechanical Cleaning

✠ Cleaning “Desert Patina” coins is rather easy. But, unlike their Western Cousins, the thought is to under-clean them, as seen in the example right. Leave the sand-fill alone, and simply use a common dental pick to clean around the details and legends...



Chapter Two

Mechanical Cleaning




✠ This Alexandria issue was discovered in Syria. Note how I have left nearly all the sand-fill in place. Desert patina can sometimes be rock hard, and other times rather soft and very fragile, often to the point where even gentle tooth brushing will remove it! Be careful, and start out with a common dental pick until you understand the firmness of the patina.



Chapter Three

Mechanical Cleaning Ancient Coins with Dremel Tools



Chapter Three

Mechanically Cleaning via Dremel Tools

More 21st Century Tools

Cleaning Ancient Coins With Dremel Tools is an Art not a Science

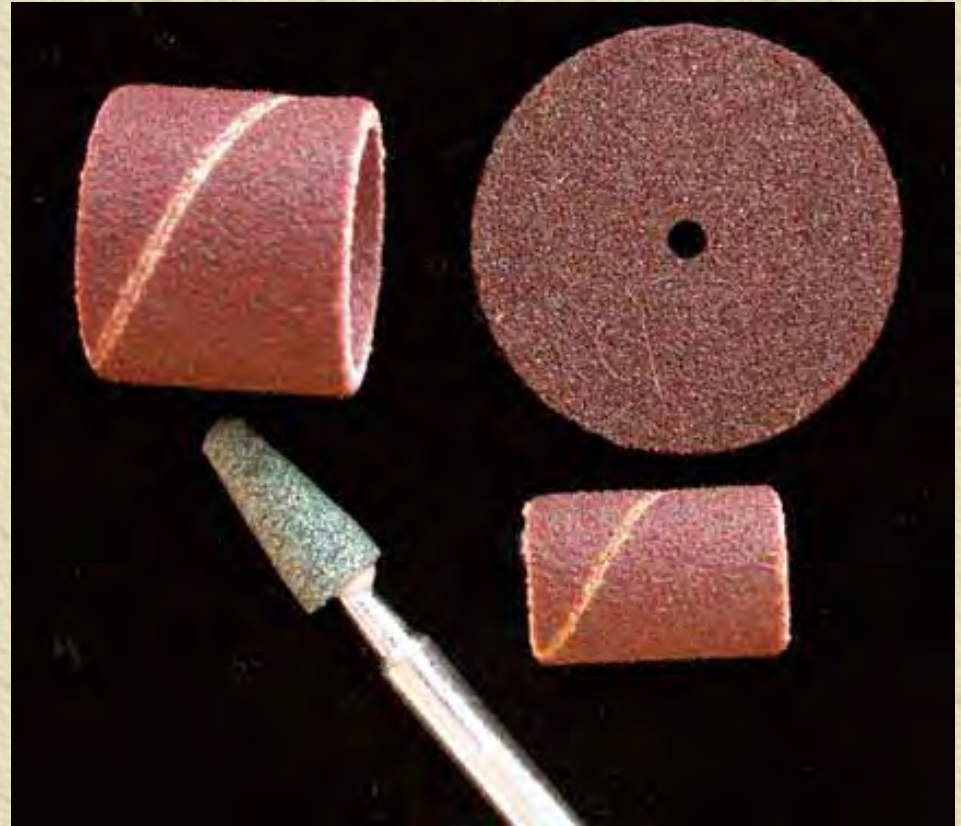
✧ Everything worth doing well takes practice, whether it be sports, music, photography, or flying a stealth fighter. The use of Dremel tools for cleaning ancient coins requires not only practice, but patience, as well.

✧ Do not expect to read the following lessons, purchase the tools, some uncleaned ancient coins and believe you have it all down pat. Accept from the beginning that you will make many mistakes. I still do.

Chapter Three

Mechanically Cleaning with Dremel Tools

✠ To repeat, never, **under any circumstances**, use any common Dremel tool! They will utterly destroy any ancient coin. Think using a **pick-axe** to clean the **Mona Lisa**, and you'll get the picture.



Chapter Three

Mechanically Cleaning with Dremel Tools



✠ These five unique, tiny diamond-dusted tools will easily and precisely clean the most stubborn coins of their encrustations. In many cases, with no or little harm to the patina.



DD Dremel Tool Names



- ✦ Left to right, tools are Flame Tip 55 (F55), Flame Tip 45 (F45), Point Tip 80 (P80), Bullet Tip 10 (B10), Bullet Tip 15 (B15).
- ✦ In future, the tools will be referred to as in parenthesis.

Diamond-dusted Rubber Dremel Tools

✦ These four Diamond-dusted Rubber Dremel tools are used for “smoothing” and their use will become tantamount as the lessons proceed.



Diamond-dusted Rubber Dremel Tool Names



- ✦ Left to right, tools are Black Arrow (BA), Black Bullet (BB), Sharp Gray (SG), Gray Bullet (GB).
- ✦ In future, the tools will be referred to as in parenthesis.

The Soft-bristle Brass Brush



- ✦ The SBBB is a remarkable tool that can be used for many purposes.
- ✦ I use it to knock off dirt, detail cleaning and for polishing as well.
- ✦ Again, **do not** confuse this brass brush with those sold by the Dremel company; their's are much too harsh.

Chapter Three – Lesson #1

Cleaning Encrusted Coins

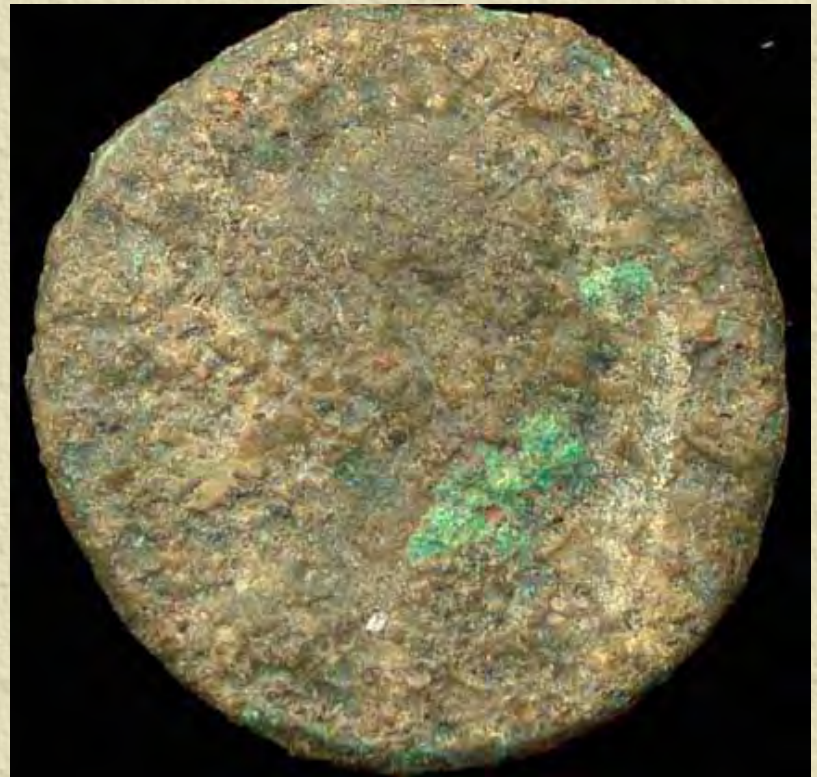
✦ The following lesson will certainly shock you. I would much rather clean any coin without many of the process's seen in this next lesson. But, as too many ancient coins will **never** respond to the techniques as seen in Chapters One and Two, this is the best way that I have found to solve the dilemma.

Chapter Three – Lesson #1

Cleaning Encrusted Coins

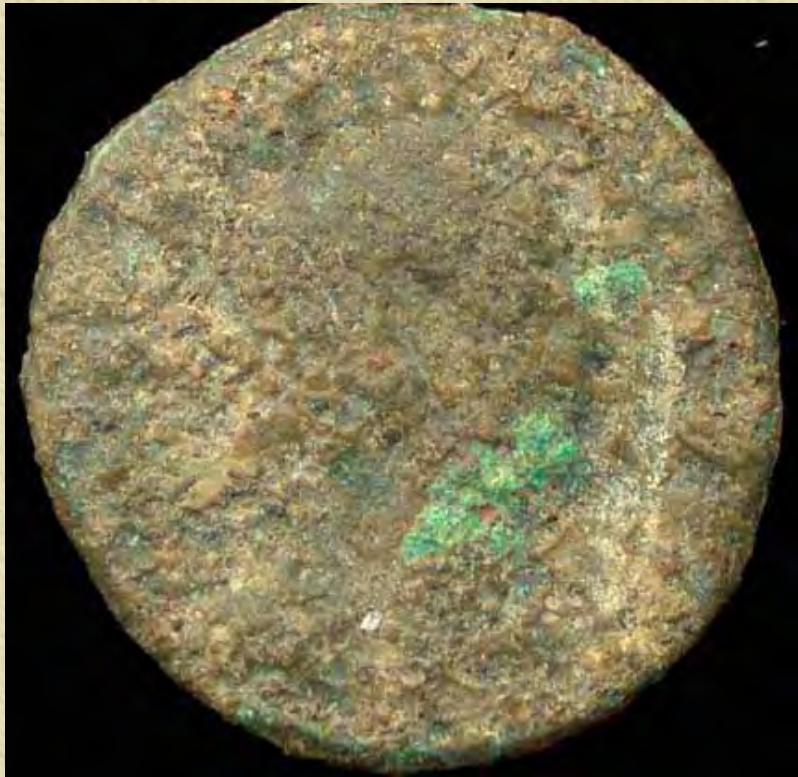
✧ The coin seen left is a perfect example for Lesson #1; it looks nasty, doesn't it? I'd guess that if you received this coin in an uncleaned lot, you'd either write it off as crap, or toss it in olive oil for a year or two, eh?

✧ No so, in this case; Note the "test" scratch in the right field. In this case, I can already determine that the metal is sound below the encrustations.



Chapter Three – Lesson #1

Cleaning Encrusted Coins



✠ Anytime I find a coin in this condition, the first thing I do is apply a Dremel Soft-bristled Brass Brush (SBBB) over the coin's surface *under running water*. The “running water” is very important, trust me. Only under running water and only very light pressure; just enough to see what we are dealing with.

✠ Before...

Chapter Three – Lesson #1

Cleaning Encrusted Coins

✦ Reverse...same coin.



Chapter Three – Lesson #1

Cleaning Encrusted Coins

✦ Note that in this case I use an worn-down SBBB to softly scour the dirt.



Chapter Three – Lesson #1

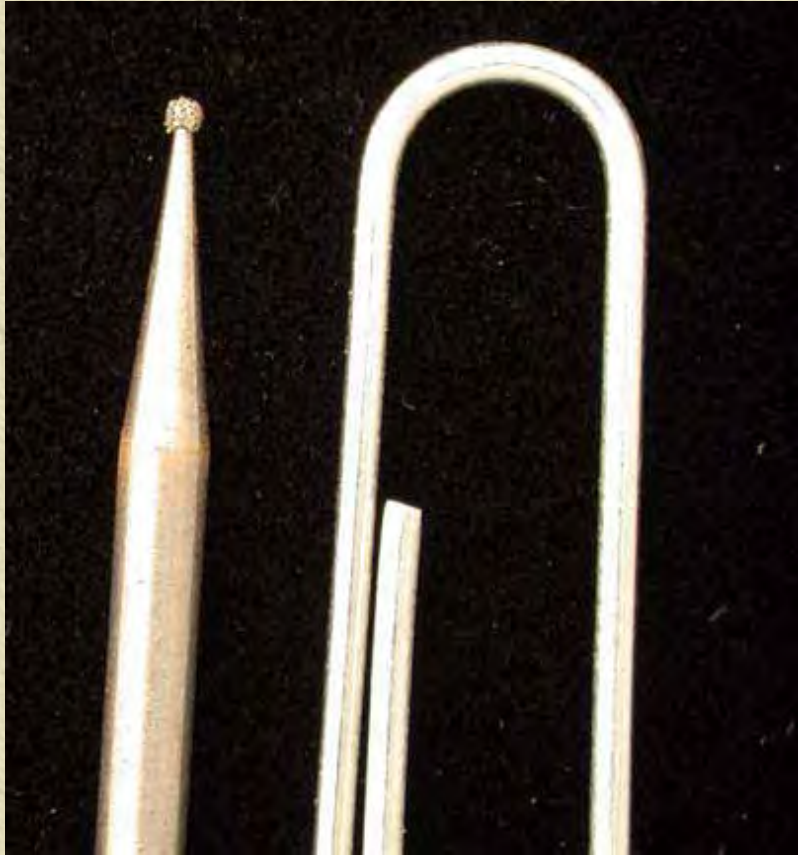
Cleaning Encrusted Coins



- ✠ And after...not much difference, but enough to see where we need to proceed.
- ✠ Ready to start using your Dremel DD tools?
- ✠ Let's go!

Chapter Three – Lesson #1

Cleaning Encrusted Coins



✦ The B10 Dremel tool is my best way to begin cleaning any ancient coin.

✦ Here is the wrong way...

Chapter Three – Lesson #1

Cleaning Encrusted Coins

- ✠ This is the “wrong way”...
- ✠ Never use any DD Dremel tool in a back and forth motion.



Chapter Three – Lesson #1

Cleaning Encrusted Coins



- ✠ The “right way”...
- ✠ Always remember to use any DD Dremel tool in circular motions.

Chapter Three – Lesson #1

Cleaning Encrusted Coins



✠ All I'm trying to do at this point is to remove just enough off the surface to better see the legends, fields and details. No pressure, please. Barely touch the ball tip to the surface and let the tool do the work. Never more than 5000 rpm, please. Do not over-clean.

Chapter Three – Lesson #1

Cleaning Encrusted Coins

- ✠ Let's look at the coin after the B10..
- ✠ The fields are more clear and the legends are becoming apparent.
- ✠ Note that I have left the green corrosion on the emperor's chin and in the right field alone for now. We'll deal with them later.



Chapter Three – Lesson #1

Cleaning Encrusted Coins



- ✠ And the Rx...
- ✠ Again, the legends and details have begun to appear. I believe the B10 has done it's job perfectly and can be set aside.
- ✠ Now, let's proceed to the Flame Tip 55 (F55).

Chapter Three – Lesson #1

Cleaning Encrusted Coins

✦ The Flame Tip 55

✦ The F55 is a broad-tipped 600 grit tool that you should use first to hone down dirt/encrustations, especially in fields and wide areas in the coin's detail.



Chapter Three – Lesson #1

Cleaning Encrusted Coins



✦ As seen left, I am holding the F55 nearly flush to the coin's surface. This is the correct way to employ the tool. I am using little to no pressure, feeling the gentle vibration in my fingertips, letting the tool it's job. Using the side of the tool will extend it's longevity as well as insuring less harm to the coin.

Chapter Three – Lesson #1

Cleaning Encrusted Coins

- ✠ Point down is the “**wrong way**”! Less coverage and all that you’ll accomplish is to wear down the tip.
- ✠ Using tool-tips is fine, but not under these circumstances.
- ✠ Remember, always use the tool in circular motions; not back-and-forth.



Chapter Three – Lesson #1

Cleaning Encrusted Coins



- ✠ Obv. after F55.
- ✠ Now we are seeing real progress. The fields, legends and portrait are coming clear and the patina remains intact.

Chapter Three – Lesson #1

Cleaning Encrusted Coins

- ✠ Reverse after F55.
- ✠ Same as the obverse;
make two notes here:
- ✠ **The fields, legends, etc. have been somewhat smoothed since the previous Rx.**
- ✠ **I went just a bit too fast and there are a few bits of copper showing.**



Chapter Three – Lesson #1

Cleaning Encrusted Coins

✦ I now want to take a closer look at the coin and, despite the copper showing on the reverse, I'm going to apply a new SB BB to both surfaces of the coin, under running water. This application serves two purposes: it gently removes any dirt/dust remaining from the Dremel tools, and will also smooth it up a bit for better consideration.

The Soft-bristle Brass Brush... the Wrong Way!



- ✦ As noted above, this is the wrong way! ☹
Never place the bristles flat-wise against the your coin's surface! Go ahead and try it...but you'll be sorry you did! It's just a bit *too* abrasive.
- ✦ Remember, the coin's under-surface/patina is now beginning to appear; slow but steady wins the race.

The Soft-bristle Brass Brush... the Correct Way!

✦ It is the very tips of the brass bristles that do the job correctly. I was serious about “feeling the vibration” in your finger-tips. These brushes, due to the soft bristles, will wear down with use. Always have a few new ones around for the detail work, but don’t throw your old ones away. They perform smartly for original cleaning and later polishing.



The Soft-bristle Brass Brush... the Correct Way!



✦ Similar to the other Dremel tools, remember to always use the SBBB in a circular motion, this time ***under running water***, turning/spinning the coin as you do so. **Do Not** press down; simply let the bristle-tips do the work.

Chapter Three – Lesson #1

Cleaning Encrusted Coins



✦ The sample coin's obverse after brass-brushing is now much clearer, but more naked copper is showing. Sadly, this is nearly inevitable with a coin so incrustated.

Chapter Three – Lesson #1

Cleaning Encrusted Coins

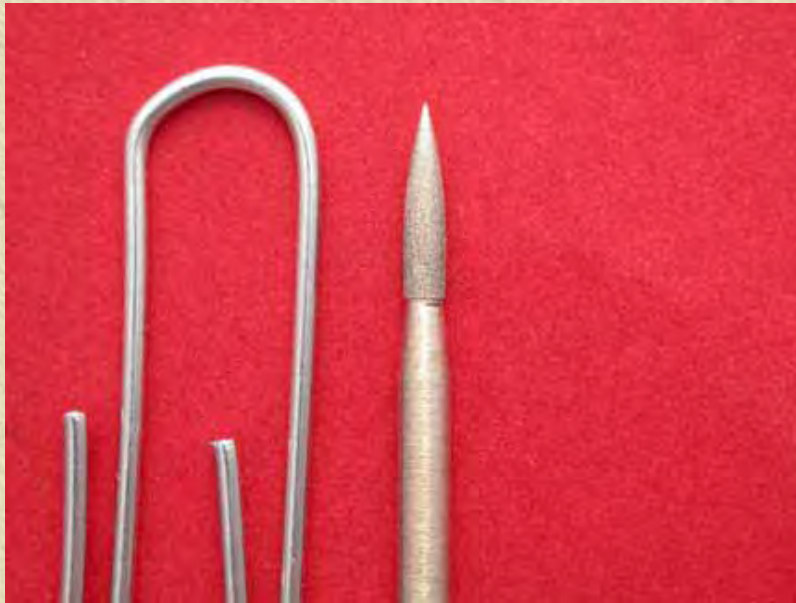
✠ The sample coin's reverse after brass-brushing is now much clearer, but more naked copper is showing. Hmmm...I am beginning to have some dark thoughts concerning this coin...but we'll press on anyway.



Chapter Three – Lesson #1

Cleaning Encrusted Coins

✠ The Flame Tip 45.



✠ Just a bit smaller than the F55, this 600 grit tool is an excellent two-way tool. Use the side for further cleaning and smoothing. This one's tip is now sharp enough for you to seriously begin to clean between the legends and the portrait details. Go slow and take your time. The final detail-work is still to come.

Chapter Three – Lesson #1

Cleaning Encrusted Coins

✦ This is the obverse after using the F45 and a short soak under running water with the SBBB. At this juncture I am not happy with the result, at all. The fault is not from the tools so much, but rather from the coin's condition. Read on and remember to refer back to this obverse as we continue.



Chapter Three – Lesson #1

Cleaning Encrusted Coins



- ✠ The details and legends on the reverse appear to be crisp and well struck, the under-lying metal intact.
- ✠ This coin's patina is shot; too much corrosion to save the original patina intact. Not my fault, nor the coins'. A shame, but it happens more often than not.

Chapter Three – Lesson #1

Cleaning Encrusted Coins

- ✠ In my wisdom, I have decided that this Lesson #1 Coin is a near-hopeless mess of bright copper, uncertain patina, and few bits of hard green encrustations which needs to be soaked in lemon juice. Don't be shocked.
- ✠ The next images of our coin *will* shock you, but not to worry. Remember, this seminar's lessons **will** include restoration, okay?

Chapter Three – Lesson #1

Cleaning Encrusted Coins

✠ Obverse
after a five-
minute soak
in lemon
juice and
the SBBB
under
running
water.

✠ Ugly, isn't
it?



Chapter Three – Lesson #1

Cleaning Encrusted Coins



- ✠ Reverse after a five-minute soak in lemon juice and the SBBB under running water.
- ✠ Yikes! It gets worse before it gets better, trust me.

Chapter Three – Lesson #1

Cleaning Encrusted Coins

- ✦ As seen above, this coin now appears to be a hopeless mess, doesn't it?
- ✦ Wrong! Patina-be-damned, it can and will be restored.
- ✦ Restoration of ancient coins is a rather simple process as you will see in the following.

Chapter Three – Lesson #1

Cleaning Encrusted Coins

- ✠ Using Diamond-dusted rubber tools for Cleaning and Smoothing.
- ✠ The following two photos show the use of the two tools on the left; the Black Arrow (BA) and the Black Bullet (BB).
- ✠ **All similar tools should be used under running water!**



Chapter Three – Lesson #1

Cleaning Encrusted Coins



✦ I first used the BB to clean/smooth the portrait and the fields and then the more narrow BA to define the legends.

Chapter Three – Lesson #1

Cleaning Encrusted Coins

✠ Same as above, I first used the BB to clean/smooth the portrait and the fields and then the more narrow BA to define the legends.



Chapter Three – Lesson #1

Cleaning Encrusted Coins



✠ I next turned to the Sharp Point P80, a superb tool for cleaning between legends and details. I used it to remove the bulk of the remaining patina on both sides of the coin.

Chapter Three – Lesson #1

Cleaning Encrusted Coins

✦ Note how much of the retaining encrusted patina has been removed...



Chapter Three – Lesson #1

Cleaning Encrusted Coins



✠ The P80 could have removed the last bit of green at the top of the coin, but I decided to leave it alone as it will improve the look of the coin when all is done.

Chapter Three – Lesson #1

Cleaning Encrusted Coins

- ✦ More smoothing...
- ✦ I next used the two rubber bits on the right; the Gray Bullet (GB) and the Gray Sharp Point (GSP). These two tools have a very fine diamond dust and work best after the BB and the BA.
- ✦ Don't forget the running water!



Chapter Three – Lesson #1

Cleaning Encrusted Coins



✦ Use the GB for all-over for smoothing the fields, portrait and above the legends.

Chapter Three – Lesson #1

Cleaning Encrusted Coins

- ✦ Next apply the GSP to clean/smooth between the legends and details.
- ✦ Note: The GSP is extremely narrow. Never use the tip itself as you'll wear it down in no time. Rather, use it length-wise.
- ✦ And don't forget the running water! ;-)



Chapter Three – Lesson #1

Cleaning Encrusted Coins



- ✦ Our 1st test coin now looks like this; stripped of all original patina, but with lots of sharp details showing. Bright and shiny, but what's next?
- ✦ It is now time for us to turn to “repatination” products.

Chapter Three – Lesson #1

Repatination Products

- ✠ Repatination Products...? What does that mean? How can I restore an ancient coin's patina, and doesn't it devalue the worth of my coin, you may ask?
- ✠ Certainly, especially if your considering a drop-dead gorgeous Nero Sestertius in EF+ condition that is valued at \$20,000! But this is not what we're discussing, is it?
- ✠ Much like me, you have spent your hard-earned money on inexpensive \$2 uncleaned coins in the hopes of cleaning and adding them to your collection. How many of these coins have been disappointing, eh? Too many...trust me, I feel your pain.

Chapter Three – Lesson #1

Repatination Products

- ✠ But, there is an answer, my friends!
- ✠ So sorry, but in your mind, what really matters most? An original patina on a crumbly, impossible to attribute coin, or one with crisp and clean details; a coin you'll be proud to add to your collection?
- ✠ In the next few pages I'll introduce you to a number of excellent “repatination” products before returning to our first coin example.

Chapter Three – Lesson #1

Repatination Products

- ✦ My favorite “repatinating” products are JAX solutions. They come in four types: Brown, Brown/Black, Black and Green Patina.
- ✦ Each are easy to use; just a few minutes soak in the solution. All of these solutions will give your coin a different patina; no one will be the same as every coin has a different metal content. Experiment with them.

Chapter Three – Lesson #1

Repatination Products



- ✠ Restoring the coin's patina and JAX Darkeners...
- ✠ These easy to use solutions are available in four types: Brown, Black/Brown, Black, and Green Patina.
- ✠ In this case, I chose JAX Brown Patina solution to give the coin a more natural appearance.

Chapter Three – Lesson #1

Repatination Products

✧ JAX Continued.

- ✧ As mentioned, these darkeners are very easy to use. Simply pour a very small amount into non-reactive container, just enough to cover the coin's surface. The “darkening” process happens quite quickly, just few seconds.



Chapter Three – Lesson #1

Repatination Products



- ✦ Now, let's proceed to the above patina-stripped coin, shall we?
- ✦ In this case I have chosen JAX Brown Darkener as the solution of choice.

Chapter Three – Lesson #1

Repatination Products



- ✦ Place your coin into the solution. After 5 seconds or so, turn the coin over and wait until no more bright copper is seen. Immediately remove the coin from the solution and *gently* brush the coin under running water with a soft-bristle tooth brush. It makes a mess in the sink and your fingers will get dirty, but it all washes off with a bit of soap.
- ✦ Return the solution to the container for further use.

Chapter Three – Lesson #1

Repatination Products

- ✠ Now, set the coin aside for an hour or so in a warm, dry area, allowing the darkener to complete it's work.
- ✠ See our coin on the right. Note: you can leave the coin “in solution” for a darker patina, if you like.



Chapter Three – Lesson #1

Repatination Products



✠ Same coin, reverse...

✠ JAX Darkeners are very forgiving; if you're not happy with the result, simply brush off the patina with your SBBB under running water and repeat with the same, or a different, solution until you are satisfied with your final product.

Chapter Three – Lesson #1

Repatination Products

- ✦ This first coin is nearly finished. I'm happy with the condition and false patina, but it looks just a bit dull, doesn't it?
- ✦ Time now to apply some Renaissance Wax!
- ✦ Ren Wax is a non-reactive wax that will not only bring out the luster of your coin...but will protect it as well. I have been using the same 1oz container for close to two years! A little goes a long way. ;-)



Chapter Three – Lesson #1

Repatination Products



✦ Apply a small amount of Ren Wax onto your thumb and fore-finger, then gently rub it onto the coin's surface, being sure to fill it into all the bits and details. Let dry in a warm place for an hour or so, then gently buff with a soft cotton cloth.

Cleaning Encrusted/Dirty Coins

✠ Now Ren Waxed and buffed, this is our final product...



Lesson # 1

Cleaning Encrusted/Dirty Coins



✠ Not the result that I was expecting, but certainly better than when we began this First Lesson...

Cleaning Encrusted/Dirty Coins

- ✦ Before and after pix...
- ✦ Not bad, all things considered, especially looking at the “before” pix. But, being the perfectionist that I am, I believe this coin could have come out even better.



Lesson # 1

Cleaning Encrusted/Dirty Coins

✠ What worked correctly:

✠ The DD dusted Dremel tools did their job as described.

✠ The “smoothing tools” as well.

✠ The JAX Darkener displayed a splendid result.

✠ Where I went wrong...

✠ Too much hurry, my friends. I was so caught up in finishing this coin for the seminar that I forgot my Number #1 Rule: Slow but Steady Wins the Race. See, even I screw up...sometimes. ;-)

Lesson # 1

Cleaning Encrusted/Dirty Coins

- ✠ I should have stopped here...
- ✠ At this point the coin was really clean enough to put into an olive oil soak; after a four or five months of tooth-brushing, most of the coin's original patina could have been saved.
- ✠ Oh well, live and learn...



Chapter Three

Question and Answer

✠ **Can DD Dremel tools be used to clean simple dirt-covered coins?**

✠ Of course! The coin seen right, from my personal collection, was solely cleaning with Dremel tools; the SBBB, F45, and the P80, only.

✠ In this case, I took my own advice; “Go Slow and Know When to Stop.”

✠ Lovely, isn't it?



Chapter Three

Question and Answer

- ✠ **Can DD Dremel tools be used to clean simple dirt-covered coins?**
Cont.
- ✠ I *do not* recommend that you *ever* attempt to clean any ancient coin in the condition as seen above with Dremel tools until you have mastered the art, and that will take you hours upon hours of practice. Remember, I have been using these same tools for over five years and I still make an occasional mistake.
- ✠ Please, begin your practice with Dremel tools on ancient coins that you do not mind sacrificing to the “Gods of Coin Cleaning.” Save your better condition coins until a later date.



Chapter # Four

Cleaning/Restoring Coins with Massive Encrustations

Chapter Four

Cleaning/Restoring Coins with Massive Encrustations

- ✠ Much too often, we all receive uncleaned coins with deep and ugly encrustations and, more often than not, we grumble a bit, pick somewhat at the coin, then either toss it in olive oil...or, more often, into our junk pile.
- ✠ I have discovered a method that may just save some, but not all, of these coins. Read on...

Chapter Four

Cleaning/Restoring Coins with Massive Encrustations

✠ My best guess is that you have too many similar coins in your junk pile. Stripped, “zapped”, over-cleaned, etc., coins purchased on eBay as “Excellent uncleaned coins – Gold Found!”

✠ Author’s note: **Never buy uncleaned coins on eBay; they suck, trust me.**



Chapter Four

Cleaning/Restoring Coins with Massive Encrustations



✠ As seen, this Lesson #2 coin appears to be a hopeless mess. But I have high-hopes for it! Let's see how it turns out, shall we?

✠ As always, I first used the SBBB brush under running water...and it looks better already.

Chapter Four

Cleaning/Restoring Coins with Massive Encrustations

✠ Soft strikes on the reverse...no encrustations. We'll leave this side alone for now.



Chapter Four

Cleaning/Restoring Coins with Massive Encrustations



✠ The Diamond-dusted EL44, a tool I haven't discussed until now, is one that I only use under these exact conditions. It can be harsh, so only use it sparingly on hard encrustations.

Chapter Four

Cleaning/Restoring Coins with Massive Encrustations

- ✦ Use the EL44 similar to the other Dremel tools, but being a bit more careful as this one sometimes can get away from you.
- ✦ Notice how the EL44 has grinded down the obverse encrustations to a more manageable condition.



Chapter Four

Cleaning/Restoring Coins with Massive Encrustations

✦ The next step in restoring this coin is electrolysis...the *Dark Side* of cleaning/restoring ancient coins. If you are weak of heart, turn back now...or simply skip to Lesson #3...

✦ Still here? Excellent! Let's move on...

Chapter Four

Cleaning/Restoring Coins with Massive Encrustations



- ✠ Obverse after 5 minutes of electrolysis.
- ✠ The fields and legends are now clear. Note the three red-circled areas...still encrusted. My eye and experience tells me that further “zapping” will certainly remove the encrustations, but will also create massive and ugly pitting.

Chapter Four

Cleaning/Restoring Coins with Massive Encrustations

✦ At this point there is not much more to do than use your four rubber smoothing tools and perhaps just a bit of the P80 tool to clean between the legends. See finished example right.



Chapter Four

Cleaning/Restoring Coins with Massive Encrustations



✦ Here is the completely finished example after a short soak in JAX Brown and a buff with Ren Wax.

Chapter Four

Cleaning/Restoring Coins with Massive Encrustations

✠ And the reverse.



Chapter Four

Cleaning/Restoring Coins with Massive Encrustations



✠ Certainly not the greatest example of coin restoration, but you now have a coin to add to your collection that's not quite so embarrassing as this one.



Chapter Five

Restoring Ancient Coins with the
“European Patina”.

Chapter 5

Restoring Ancient Coins with “European Patina”

- ✧ “European Patina” is just a polite way to describe a coin whose patina has been removed with lye.
- ✧ If you’ve been cleaning coins for a while, you’ve seen this type too many times; I know I have.



Chapter 5

Restoring Ancient Coins with “European Patina”



✠ In the past, when you received a coin in similar condition, there really wasn't much that you could do to improve the condition. But now that you have invested in this CD, you will learn how to greatly enhance it's appearance through a few very simple steps. Read on...!

Chapter 5

Restoring Ancient Coins with “European Patina”

✠ The reverse of the same coin. Yikes, it's really ugly, isn't it?

✠ The obverse only has a few minor problems, so I'll spend more time on this very nasty reverse.



Chapter 5

Restoring Ancient Coins with “European Patina”



✠ As seen circled in yellow, the lye has not only removed the patina but also revealed some horrible deep pitting. Naturally the pitting cannot be removed, but it can be smoothed just a bit and, with judicious use of JAX, be rendered somewhat less hideous.

Chapter 5

Restoring Ancient Coins with “European Patina”

✠ When in doubt, always start with the SB BB. At right, I have now removed as much of the lye-corrosion as possible.



Chapter 5

Restoring Ancient Coins with “European Patina”



- ✦ Next, I used the rubber BA to smooth the pitting as well as possible, then quit when I noticed that in a few spots the pits were actually growing larger.
- ✦ Note how the figure of Victory is much clearer than before.

Chapter 5

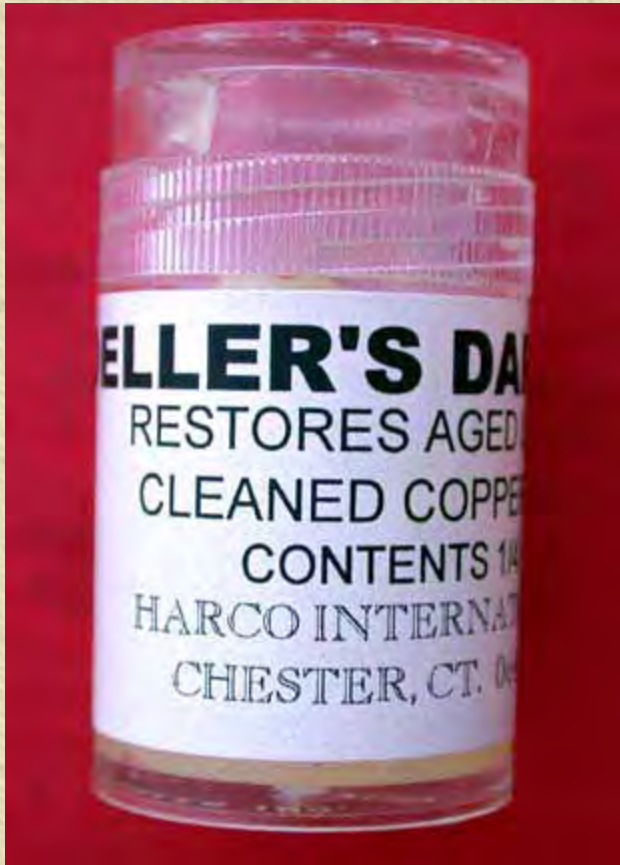
Restoring Ancient Coins with “European Patina”

- ✦ This time, I decided to place the coin in JAX Black to help hide the pitting.
- ✦ JAX Black will give your coin’s surface a very shiny, almost “silvered” appearance, which will not work well for this coin’s condition, but I’m not finished.
- ✦ After the soak and brush, I set it aside to dry for a few hours.



Chapter 5

Restoring Ancient Coins with “European Patina”

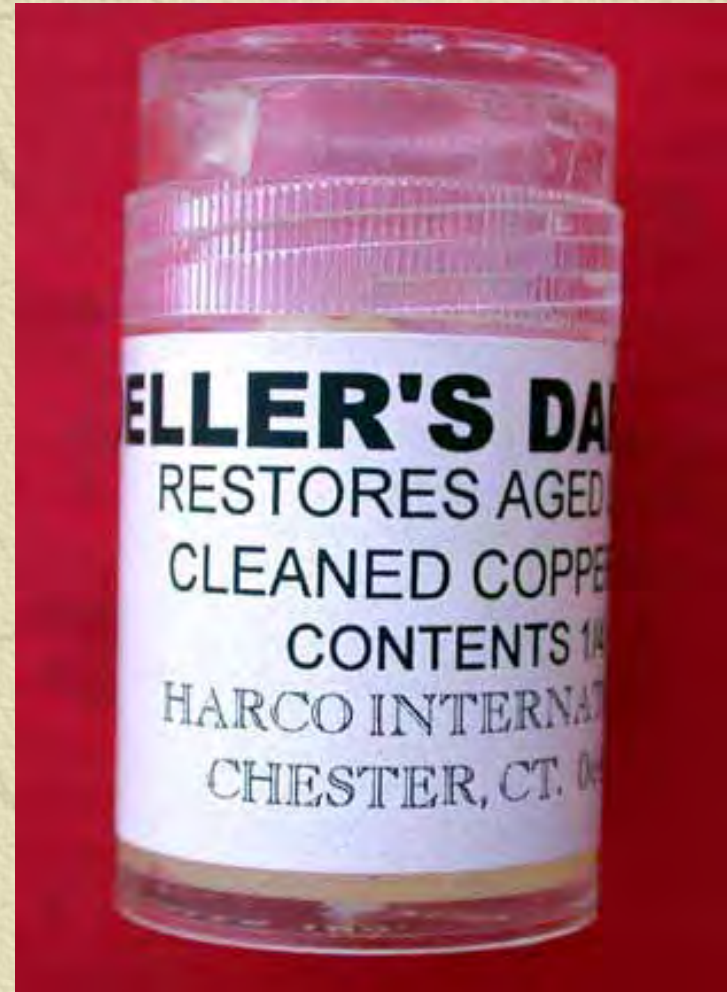


- ✦ While the coin dries, let's turn our attention to Deller's Darkener.
- ✦ Alone, Deller's is a terrific product for darkening either tiny mistakes or for major re-patination projects. Simply rub a small amount onto your finger-tips and rub it onto the coin, then allow the product to do its work.
- ✦ For completely stripped coins, Deller's works best if you gently brush both surfaces with the SBBB held in your hand rather than in your Dremel tool.

Chapter 5

Restoring Ancient Coins with “European Patina”

- ✦ Deller's works differently on each coin based on the copper content of the coin. Sometimes fast, sometimes slow, and sometimes with little result at all. Like all the JAX solutions, it cannot harm your coin, but unlike JAX, it tends to take much more time and patience.
- ✦ After application, set the coin aside and, if possible, in direct sunlight for a few days. Repeat the process until you are satisfied with your coin's new patina.



Chapter 5

Restoring Ancient Coins with “European Patina”



- ✠ Using Deller's Darkener on coins with their original patina to restore a few cleaning mistakes where the base metal is showing is just a bit different.
- ✠ Again, rub in a very small amount onto the coin's surface, then set it aside to dry. After an hour or two, more or less, the Deller's will be absorbed into the patina and the “shiny bits” should begin to darken. If the Deller's fails to be absorbed after at least 24 hours, the coin is done. If not, repeat until the patina fails to absorb the darkener.
- ✠ Now, let the coin rest for several days, in bright sunlight, if possible.

Chapter 5

Restoring Ancient Coins with “European Patina”

✠ Either way, once you are satisfied with the new patina, let it rest for a few more days; it can't hurt but will certainly help. When done, simply gently buff with a soft cotton cloth.



Chapter 5

Restoring Ancient Coins with “European Patina”



✠ Using Deller's Darkener in conjunction with JAX Solutions is another remarkable way to add an endless variety to your final patina restorations.

✠ The trick is to let any coin soaked in JAX to let dry for several days, then very, very gently rub a bit of Deller's *only* onto your coin's *high-lights*. Set it aside in a warm place for at least 24 hours and see what happens. I'm always surprised; remember, this is an art, not a science! ;-).



Chapter 5

Restoring Ancient Coins with “European Patina”

- ✧ Now that you have better understanding of Deller’s/JAX, we’ll return to our European Patina example.
- ✧ Seen right is the Obv/Rev of the coin after SBBB, rubber smoothing tools, a short soak in JAX Black and a long dry.
- ✧ The following slides will show the difference after an application of Deller’s darkener.



Chapter 5

Restoring Ancient Coins with “European Patina”



✠ Obverse
before...an
unhappy ancient
coin, harshly
cleaned with lye,
with no patina
and little to no
details. A toss-
away coin
destined for the
junk pile.

✠ And after...

Chapter 5

Restoring Ancient Coins with “European Patina”

- ✦ Obverse after...
- ✦ Buried 1,600 years underground, lyed, then brass-brushed, Dremel-smoothed, JAXed, and Dellered, this poor coin now has a new lease on life.
- ✦ Note how the application of Deller's has toned-down the fields and high-lighted the portrait and legends.



Chapter 5

Restoring Ancient Coins with “European Patina”



- ✠ Reverse before...
- ✠ Again, an unhappy ancient coin, harshly cleaned with lye, with no patina and little to no details. A toss-away coin destined for the junk pile.

Chapter 5

Restoring Ancient Coins with “European Patina”

-
- ✦ Reverse after...
 - ✦ Note how the application of Deller's has toned-down the fields, kept the color of the pitting to a minimum, and highlighted the details and legends.
 - ✦ This is only my presentation of this coin, patina-wise. Using different combinations of JAX solutions, with or without Deller's, your results could be much better in the final outcome.



Chapter 5

Restoring Ancient Coins with “European Patina”

✦ Same coins, before and after.



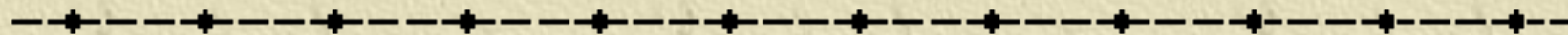


Chapter 5

Restoring Ancient Coins with “European Patina”

Lessons to remember...

Cleaning Ancient Coins is an Art...not a Science.



- ✧ Use your eyes to detect which coin to clean and how.
- ✧ Look for sound under-lying metal.
- ✧ Go slow..."Slow but steady wins the race."
- ✧ Learn when to stop cleaning.
- ✧ The SBBB is your very best friend.
- ✧ JAX Darkener can be removed.

Chapter Five

Question and Answer

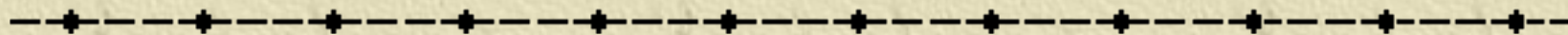
✠ **My methods seem very harsh; are there other ways to clean ancient coins?**

✠ Certainly. For the last 100+ years, the accepted way of cleaning *all* ancient coins was the tried-and-true method of soaking them in olive oil for weeks, months, and even *years!* Certain pundits suggest that only sharpened bamboo skewers, and *even* dried Rose Thorns, be used to clean between the legends... Yikes, we'll all be dead before some of our coins come clean using this method.


✠ If you have the time and patience, this is the best way to proceed. But in the case of too many coins, olive oil will just not answer.

Chapter Five

Question and Answer

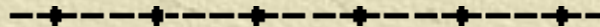
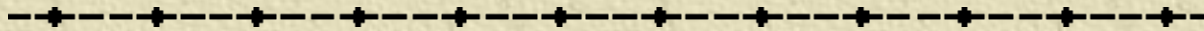


- ✦ Are there any other cleaning tools that you can suggest?
- ✦ Certainly; common dental picks work great on dirt-covered coins, while **Diamond-dusted dental picks** are even better, but like all the Dremel tools listed above, they take practice.
- ✦ Gringgott's Wizard Mixes can work wonders to aid in loosening hard dirt and other substances from coins. Simple to use, as well. No practice!
- ✦ Dremel buffing tools also are a superior way to really bring out the shine on Ren Waxed coins.



Chapter Six

Restoring Ancient Coins via Electrolysis



Project Goals

- ✦ The ultimate goal of this chapter is to inform Uncleaned Coin enthusiasts as to the most up-to-date methods of cleaning ancient coins by way of Electrolysis.
- ✦ Here we will consider all the latest Electrolysis cleaning tools and methods pertaining to all types of ancient un-cleaned coins, including Dremel tools, Brass Brushes, Dental Picks, Diamond-dusted Dental Picks, Buffing Tools, and Re-patination techniques, etc.
- ✦ Many of my methods are controversial...and will certainly lead you to the “Dark Side” of coin cleaning. If you are a traditional coin-cleaning type, you may want to turn back now.
- ✦ Like it or not, the following is how I clean many of my ancient coins.

Cleaning Ancient Coins via Electrolysis is not something to take lightly...

- ✦ Still here? Great! Now that you've decided to consider the *Dark Side* of coin-cleaning, you need to know from the get-go, that each and every ancient coin should be considered as a "one-of-a-kind." No two ancient coins are alike in condition. Each coin must be carefully examined before the electrolysis cleaning process begins.
- ✦ We will use the following photos as a guide for discussing coin status, tools, and final examples.

Overview of the Electrolysis Process...

✦ Electrolysis...what is it, anyway?

The electrolytic process requires that an electrolyte, an ionized solution or molten metallic salt, complete an electric circuit between two electrodes. When the electrodes are connected to a source of direct current one, called the cathode, becomes negatively (-) charged while the other, called the anode, becomes positively (+) charged. The positive ions in the electrolyte will move toward the cathode and the negatively charged ions toward the anode. This migration of ions through the electrolyte constitutes the electric current in that part of the circuit. The migration of electrons into the anode, through the wiring and an electric generator, and then back to the cathode constitutes the current in the external circuit. *

*Courtesy of Answers.com

The Electrolysis Process...

- ✦ Oh yeah, that clears it up a bit, doesn't it? LOL!
- ✦ In a nut shell, (and this case) electrolysis simply removes the encrustations from your ancient coins. ☺

Electrolysis...why is this considered the “Dark Side”...?

✠ **PATINA IS ALL...** Ancient coins similar to this example have rested in the ground for centuries, and during those hundreds, sometimes thousands of years, the coin's metal oxidizes and creates what is known as a patina. If your coin looks anything like this...you do not want to consider electrolysis!



**Many collectors believe that ANY coin stripped of
it's original patina is just a hideous piece of
junk...**



✠ Despite some opinions, many “zapped” coins can turn out like this one. If you’re like me...read on. The best is yet to come.

But I beg to differ.. You'd be amazed how many “zapped” coins appear on eBay.

- ✧ What? Zapped coins for sale on eBay?
- ✧ Oh yes, my brothers and sisters...at least 50% of the coins on eBay have been “zapped” and re-patinated...at least to one degree or another.



But why should I resort to electrolysis...?

✦ Because, if you get really lucky, you're coin will turn out looking like this!



But why should I resort to electrolysis...?



✦ Or even better, this Carus example: “Zapped” coins do not ever get any better than this, trust me.

**OK, I'm convinced, Kevin! I want to learn how you clean
ancient coins...and still manage to keep their integrity.**



✦ No problem...just
follow my methods
and all will be well.

Creating your own electrolysis machine is simple...

- ✦ As seen in the photo right, assembling your own electrolysis machine is rather simple.
- ✦ The first thing you'll need is a sturdy transformer. I use a 12 volt, 1500amp transformer from Radio Shack. Neither too strong nor too weak, this is one a real workhorse. The transformer seen in the photo has been under steady use for over three years and cost about \$12.00.



Creating your own electrolysis machine is simple...



- ✠ Next you'll need some sort of low-sided plastic container, such as the beat up-looking example seen to the left. Choose one that your spouse is willing to sacrifice! ;-)
- ✠ The container needn't be too large; but it should hold at least two cups of liquid...or a bit more.

Okay, now let's wire it up!

✦ Get your transformer and clip off the plug in at the far end of the wiring. Split the two wires apart about four inches, strip off $\frac{1}{2}$ inch of the plastic and twist the wires. Fill your plastic container with water, then place the two wire ends in the water, being careful to not let them touch. Now plug in the transformer. Look close at the two wires; one should be “fizzing”. Mark the fizzing wire with a piece of tape and unplug!



About half done...!



- ✖ Now, take a short (6 inch) length of solid copper wire, circle it 4 or 5 times around your finger, then attach one end to the transformer wire that you taped (the fizzer), and the other to a small brass alligator clip, as seen in the photo.
- ✖ Next, attach a heavy gage solid copper wire to one end of the other transformer wire. Again, twist it around a pen or pencil, then strip off $\frac{3}{4}$ of the plastic and bend the exposed end onto a stainless steel washer and secure it firmly with pliers.

Hey, what's the point of all this wire-twisting, anyway?

The benefit of twisting the wires in circles is that you can now easily affix the two wire ends to the sides of the container without having to worry that they will touch.



My machine is now complete...but what solution should I use? Salt?



- ✠ Never, *ever*, use Salt or Soda! Electrolysis is harsh enough without adding certain misery to the process.
- ✠ The **ONLY** solution additive that I recommend is Gringott's Wizard Mix #1. Developed by my good friend and colleague, chemist Bruce Nessett, it has proved to be the very best.

Excellent! You are now ready to start “zapping”. But...there is more you need to know.

- ✦ In most instances, “zapped” coins come out looking pretty rough.
- ✦ To solve this problem, and restore your precious coins, you will need to invest in a battery-powered Dremel Mini-Mite. \$35.00 at Home Depot, etc.
- ✦ If you can’t afford to purchase this tool, you need not go any further.



Now, let's consider the Dremel tools you'll “Need to Succeed...”



✦ **The Number One tool in your ancient coin cleaning arsenal is the Soft Bristle Brass Brush (SBBB). This inexpensive little tool will make all the difference when it comes to removing all the brown/black residue from zapped coins.**

Dremel tools you need to have...

✦ These five Diamond-dusted Dremel tools are integral when it comes to cleaning/smoothing zapped coins. The two ball-tipped tools seen on the right of the photo are especially important.

✦ Yes, I understand your dismay...but read on, it gets worse. I will show you how these tools are used later.



Smoothing tools...



✠ These four Dremel tools are used for buffing and polishing. The black arrow-point and black bullet-point seen on the right are used for rough cleaning, and the gray arrow and gray bullet are used for final “smoothing”.

Common Dental Pick

✠ Although I normally prefer Diamond-dusted dental picks for coin cleaning, in the case of electrolysis, the DDDP not necessary. A common dental pick is all that you'll need.



Repatinating Solutions...

✠ These four JAX darkening solutions are essential for the final phase of the the project.




And finally, a buffing wax.



✠ I use Renaissance Wax as a final sealer and buffing agent. There are other products/ways to seal and buff coins, but this is the product that I prefer.

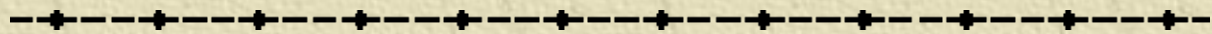
But why **these** tools/products...? Can't I clean my coins "zapped" coins some other way?

- ✦ Sure, why not? But this is about how *I* clean my coins, after all. ☺
- ✦ As you all know, for the last 100+ years, the accepted way of cleaning *all* ancient coins was the tried-and-true method of soaking them in olive oil for weeks, months, and even *years*, on end. Certain pundits also suggested that only sharpened bamboo skewers, and *even* dried Rose Thorns, be used to clean between the legends... Yikes, we'll all be dead before some of our coins come clean using this method. And that's where we come to electrolysis.
- ✦ Yes, electrolysis does work, but not always. In nearly every case it should be considered a method of last resort rather than a common technique. In most cases, the final product is an ugly mess that even my methods cannot restore. The real trick is training your eye as to which coin *appears* to have the visible traits of an issue that stand up to the very invasive and damaging process of electrolysis

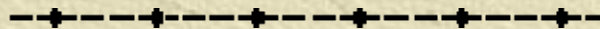


Chapter Six

Restoring Ancient Coins via Electrolysis



TRAINING YOUR EYES TO SEE



“To Zap or not to Zap...that is the question.”



As mentioned above, each uncleaned ancient coin must be considered as a one-of-a-kind example. Please, do not begin to heedlessly zap your uncleaned coins without looking at them very carefully. Note the encrusted appearance of the red-circled coin at right. This single coin of them all may be a candidate for electrolysis.



Use your eyes to discern the likely candidates.



- ✠ The example seen on the left is certainly ***not*** a candidate for electrolysis.
- ✠ The coin has a lovely natural green patina.
- ✠ The details are crisp. Covered with soft dirt that can easily be removed with a toothbrush and bit of soap, an example such as this needs only a bit of mechanical cleaning.
- ✠ Note that there are no encrustations; this is important!

Simple “**dirt**” verses “**encrustations**”... and how to see the difference.



The three coins seen on the right are excellent examples of ancient coins covered with soft dirt. The way to discern the difference between dirt and encrustations is to simply probe the coins surface with a dental pick. This works better if the coin's surface is dry. Using the point of the pick, gently push downward and twist. Dry dirt will simply pop off to reveal a green patina.



Dirt and encrustations -- What's the difference....?



✠ As seen on the left, this *Antoninianus* issue has both dirt *and* encrustations.

✠ I refer to “encrustations” as those metallic boils that erupt on an ancient coin’s surface. Sometimes, they can be removed via mechanical cleaning, or simply ignored. Either way, this coin could be zapped or not; but to my eye, I’d leave it alone—no electrolysis.

Semi-Encrusted Coins...Dirt and Detail

✠ This Late Roman example shows both detail, dirt and encrustations. So what to do? With long olive oil soaks (months to years), it will not come clean, no matter what.


✠ This is another “tweener” example as that seen above...but in this case, I would have no remorse for putting it in an electrolysis bath.



Coins with complete encrustations...



- ✠ If your coin looks like this...**ZAP it!**
- ✠ The coin is already close to a worthless slug...so you have nothing to lose. It will never come clean no matter how many years in olive oil.
- ✠ Now that you have a firm idea of which coins to zap or not...let's proceed onward!



Chapter Six

Restoring Ancient Coins via Electrolysis

Wherein we discover how to clean
ancient coins using the electrolysis
process.

Example Number One



A typical coin

Note that this example has all the ear-marks for electrolysis consideration...

- 1) Not dirt-covered.**
- 2) No details showing.**
- 3) Heavy encrustations**



Example Number One Continued



Beginning the process...

Fill your plastic container with two cups of very **HOT WATER**, then stir in two table spoons of Gringott's #1 . Make sure that your coin is firmly connected to the alligator clip. Note that I have located the machine next to a sink with running water & that the drain hole is covered! ***This is IMPORTANT!***

Example Number One Cont.



TIME TO START!

Fix the wire connected to the stainless-steel washer to one side of the container and the wire with the coin on the other, being sure that they **DO NOT** touch. Now, plug in your transformer. Within a few seconds, the washer should begin to fizz, followed a few more seconds later by the coin in the clip. As electrolysis is more an art, rather than a science, the times mentioned above are just a rule-of-thumb. Quit staring at the machine and walk away for five minutes.



Example Number One Cont.



After five minutes or so, the water in the container will become dirty as sludge-like foam rises to the surface. This tells you that the electrolysis process has begun...

Example Number One Cont.

- ✱ Five minutes up!
Time to remove the coin...Do you have all your tools in place?
- ✱ Un-plug the transformer!
This is important, unless you have the dough to buy a new one. ;-)
- ✱ Remove the coin from the clip...then scrub it lightly with a soft-bristle toothbrush under running water.
- ✱ You will discover that quite a bit of black residue will be removed. It will make a bit of a mess in the sink, but will not stain.
- ✱ Now, look carefully at the coin.



Example Number One Cont.

✠ Before we go any further...

Lets talk about lighting and magnification again, shall we....?

If you are serious about about cleaning ancient coins, you absolutely need to have a steady magnifying system. Forget about microscopes...trust me, you don't need them. A simple "light and magnifier" as seen to right, is all you'll ever want; \$20.00 from Home Depot.



Lighting and Magnification

✦ Inexpensive...and will prove it's price for many years to come.



Example Number One Cont.

First look...Your coin may now look something like this.

Note how the previous green encrustations have become dark and that just a bit of the coin's original surface has begun to show.



Example Number One Cont.

✠ The electrolysis process has begun to loosen the encrustations and it is now time to use the battery-powered Dremel and the soft-bristle brass brush, the SB BB!



Proper application of the SBBB!

✠ **Rule #1** – Never bare down on the coin, I.E., do not apply any pressure. Only gently touch your coin's surface with the bristles. *“Go with the Force, Luke...close your eyes and feel the gentle vibration of the brush on the coin as you hold it in your fingers...”* Doh! Sorry... 😊

✠ **Rule #2** – *Always follow Rule # 1!*

✠ **Rule #3** – Although not seen in the following pix, for brevities sake, you should always remember to *use the brush under cool/warm running water.* This is *very* important

The Soft-bristle Brass Brush... the Wrong Way!

✠ As noted above, this is the wrong way! ☹ Never place the bristles flat-wise against the your coin's surface! Go ahead and try it...but you'll be sorry you did! It's just a bit *too* abrasive.

✠ Remember, the coin's under-surface is now becoming rather fragile; slow but steady wins the race.



The Soft-bristle Brass Brush... the Correct Way!



✠ It is the very tips of the brass bristles that do the job correctly. I was serious about “feeling the vibration” in your finger-tips. This application is about removing the upper, loosened encrustations.

Example Number One Cont.

- ✠ After the first application of the SBBB, your coin should look something like this...
- ✠ The surface details are beginning to appear beneath the encrustations. Excellent!
- ✠ Now it is time to return the coin into the electrolysis bath.



Example Number One Cont.



- ✠ After five more minutes, or so, remove your coin and repeat the two steps as noted above; tooth-brushing and the SBBB.
- ✠ With luck, and the coin's inner condition, it will begin to look like this.
- ✠ Back to the bath for five more minutes, remove, and repeat the two-step cleaning process as noted above.

Example Number One Cont.



- ✠ Having followed my own advise....the note the photo.
- ✠ The obverse/reverse details are now clear. This is good!
- ✠ Now, look carefully at the crusty bit on the empress's hair. The electrolysis has now begun to eat into the metal below the coin's surface. This is bad, but it happens more often than not.
- ✠ Rather than subject the coin to another full five minutes of zapping, try this: under magnification, use your dental pick to gently probe at the remaining crusty bits. In most cases, the already loosened crusty bits will simply pop off. If this happens, feel free to use a bit more pressure on the pick. Remove as much of the remaining electrolysis crusts as possible with the pick. If you encounter any spots on the coin's surface where the "zapping" has begun to eat beneath the coin's surface, leave it alone.

Example Number One Cont.

- ✦ Continue to probe with your pick.
- ✦ Once you are satisfied that no more can be achieved with the pick, fire up your Dremel and clean off the remaining encrustations with the SBBB as normal.
- ✦ You may want to try this trick: rather than simply brushing the coin's surface, gently tap the spinning bristles against the encrustations, revolving the coin in your hand as you do so, attacking the crusty bits from different angles. You will be amazed how well this works, trust me. 😊
- ✦ If all the remaining encrustations are removed, the electrolysis segment of the cleaning process is finished. If not, place the coin back in the bath, but for only a minute or two, then follow the “pick, brush and tap” procedure until you are satisfied with the result.



Example Number One Cont.



- ✠ **Wow! My coin looks like this! Now what should I do? 😊**
- ✠ *If your coin's surface is this intact, burn some incense to the God's!*
- ✠ One of the most important issues for cleaning coins via electrolysis is knowing when to stop; this coin is finished, at least for “zapping-wise”.
- ✠ All encrustations have been removed and the coin's original surface is quite bright.
- ✠ It is now time to “smooth” out the surfaces and details.
- ✠ But first...

Example Number One Cont.

✦ *All coins that have undergone the electrolysis process need to be soaked in de-mineralized water for at least 24 hours. THIS IS VERY IMPORTANT! Do it Now!*

✦ Do it! I'm serious! The coin needs to rest!

Example Number One Cont.

- ✦ What's "smoothing" and which Dremel tools should I use?
- ✦ "Smoothing", to be brief, is a term used by ancient coin collectors to describe the process of honing down the surface of a coin to where the all details appear similar. This is a common, and accepted, practice.
- ✦ In this first example, I was quite lucky (at least to my eyes), as this example only needed a minimal amount of smoothing.



Example Number One Cont.



✦ Smoothing tools...

In this case, I only used the Diamond-dusted Black Rubber Bullet Dremel tool to smooth out the coin's surface. When using ANY diamond-dusted Dremel tool, always remember to use the side of the tool for smoothing, rather than the point. The point is fine for cleaning between legends and details, but it can be over-used, and will soon become blunted.

Example Number One Cont....

Time to add a new Patina.

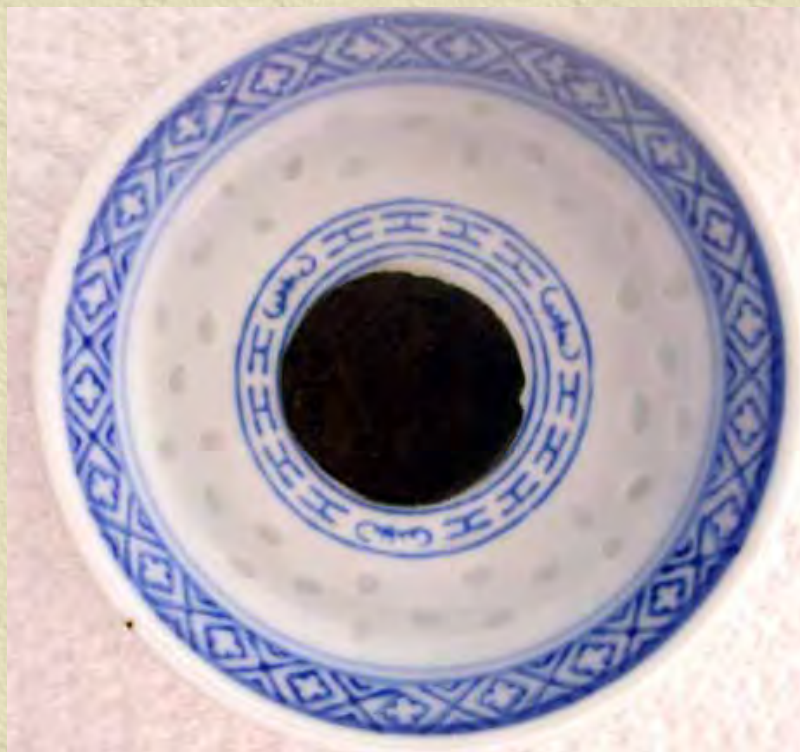
✠ This coin also appears to be struck from orichalcum, so I have chosen to use JAX Brown Darkener as the solution medium to give it the most natural appearance.

✠ All you need is a small one ounce ceramic or glass container as seen on the right.



Example Number One Cont....

Time to add a new Patina.



There are several tricks to using JAX Darkeners...

- 1) **Time is your enemy! JAX works fast: only five to ten seconds in the solution!**
- 2) **Remove the coin from the solution (you can use your fingers, they won't rot!) and immediately lightly brush the coin's surface with a toothbrush under running water until the darkener is removed. **Pat** the coin dry with an old cotton towel and set it aside for 15 or so minutes. After that, look it over and, if you're happy with the result, your coin is now ready for the final restoration process. If you're not happy, simply remove the patina with the SBBB under running water...then repeat the above until you are.**
- 3) **Return the darkener solution to the bottle.**

Example Number One Cont.... Conservation.

- ✠ Your coin is now ready for the final applications.
- ✠ I use Ren Wax for a number of reasons:
 - 1) It beautifies the coin, adding luster and high-lights.
 - 2) It protects the coin.
 - 3) And...it's really easy to use.



Example Number One Cont....

Application of Renaissance Wax.

✦ Like the label says...

A small amount goes a very long way. Simply rub the Ren Wax onto the coin's surface, no need to press too hard. Let the wax dry for ten minutes or so in warm place; I just put it under the lamp of my magnifying glass. When the wax has dried, buff each side of the coin face down on a soft terry-cloth towel that is resting on a solid flat surface. You can use a bit of pressure. **NO NOT** buff the coin back-and-forth! Rather, use swirling circular motions.



Example Number One Cont....

The Final Result.



- ✠ Well, actually, *my* final result. Your's could look quit different, dependent upon your choice of darkener and the length of time in the solution.
- ✠ As seen, the coin's Obv. surface suffered some inevitable pitting in the empress's hair, on her cheek and in the inscriptions. The Rev. has some crumbling in Nike's wing and a few other minor problems. Certainly not a perfect example of electrolysis, but much better than the impossibly encrusted coin with which we started. Not the prettiest example of electrolysis, but better than most.
- ✠ Now, NOTE the following example!

Example Number Two

A typical “zapped” crusty coin

✠ At this point, if you're still serious about electrolysis, you must realize that 9 out of 10 zapped crusty coins will end up looking just like this one – a hopeless mass of encrusted metal. **In the first example I got lucky, trust me. No one was more surprised than me to discover a Stobi issue.**



Example Number Three

Let's explore the possibilities of this 3rd example...



- ✦ Under magnification it is easy to see that this is a Roman Imperial Antoninianus of Gallienus.
- ✦ Time to use your eyes again... The first thing you need to discern is whether or not your coin has been silvered. My experience with encrusted coins in similar condition tells me that if it was originally silvered, the silvering is long gone. *If you ever see any silvering on an ancient coin be advised that, in nearly every case, electrolysis will remove the silvering.*
- ✦ Next, as you can see some detail showing on the legends on left obverse, you need to delve just a bit deeper before considering electrolysis.
- ✦ Use the SBBB and Dremel to clean just a bit on the obverse...under running water, of course.

Example # 3



After lightly brushing the coin's surface with the SBBB, we now discover three things:

- 1) The coin's surface IS NOT silvered.
- 2) By and large, the obverse metal appears to be sound.
- 3) The encrustations are rock hard, especially on the portrait.

Are you ready to go for it? Let's see how this one turns out!



Example # 3 Continued



- ✠ Yikes! After five minutes in a hot water electrolysis bath...here's the obverse.
- ✠ The metal appears quite sound with little or no pitting. That is very good news! So, back in the bath? No, not this time.
- ✠ Due to the intact surface and lack of pitting, it's now the time to turn to the Dremel tools.
- ✠ But why not simply return the coin to the bath? All looks swell so far...
- ✠ Read on for the answer!

Example # 3 Continued

✠ At this point, you need to understand that further electrolysis may damage the coin's surface and details. As stated earlier, you need to know when to stop. More than likely, we'll return the coin to the bath...but not at this time. Instead, we'll begin to mechanically remove as many encrustations as possible.



Example # 3 Continued: Dremel Tools and Encrustations



- ✠ Dremel Tools and Encrustations
- ✠ Experience tells me that these small blobs of green encrustation may hide some pitting. It's always better to attempt to remove them mechanically, before resorting to further zapping

Example # 3 Continued: Dremel Tools and Encrustations



As seen on the reverse, the encrustations are even more problematic.

Example # 3 Continued: Using Dremel Tools...



**The 1st
Dremel tool to
start with is
the diamond-
dusted Ball-tip
B 15. As seen
in the photo,
compared to a
common
paperclip, it's
quite small. Be
not deceived;
this tool is a
true
workhorse!**



Example # 3 Continued:

Using Dremel Tools...the Wrong Way!

✠ As seen on the right, using the tip on any diamond-dusted Dremel tool is a bad idea. In the case of the Ball Tip B15, the real problem is control. Face down, the tool is difficult to control and it may slide about, causing more harm than actual cleaning.

✠ Try this, instead...



Example # 3 Continued:

Using Dremel Tools...the Correct Way!



- ✦ As seen, using the side of the B15 will give you much more control. I am serious about “feeling the vibration” in your finger-tips. **Remember, and this is very important, always use circular motions when removing any encrustations, never back-and-forth!**
- ✦ So far, this coin coming out pretty good.
- ✦ Now it’s time to move onto another Dremel tool, the B10, a smaller version of the tool seen left.

Example # 3 Continued: Using Dremel Tools...Cleaning the details!

- ✠ Now that the ugly green encrustations have been successfully removed with the B15, we need to turn to a more exacting tool, the B10.
- ✠ Note the remaining bits of residue that still remain. These can easily be removed and smoothed by the following tool.



Example # 3 Continued: Using Dremel Tools...the B10!

✠ The B10 is my tool of choice when it comes cleaning and smoothing between legends and bringing out details.



Example # 3 Continued: Using Dremel Tools...the B10.



✦ Use this tool to smooth out the details, as well as the coin's fields.

Example # 3 Continued: Using Dremel Tools...Detail work.



✦ The very best tool for detail work is the Dremel Sharp Point P80. This super sharp-pointed tool is perfect for cleaning between legends and cleaning up all the tiny details.

Example # 3 Continued: Using Dremel Tools...Detail work...the P80.

- ✦ Use this super-sharp tool to clean and smooth in and out of the legends and details.
- ✦ Always remember to use the side of the tool rather than the point. The tool's point should only be used in the case of cleaning very small problem areas...trust me.



Example # 3 Continued: Using Dremel Tools...further smoothing.



- ✠ Now we turn to another diamond-dusted Dremel tool, the Flame Tip 45.
- ✠ This is another “**must have tool**” when it comes to smoothing out any zapped coins surface.
- ✠ As seen in the photo left, use the side of the tool to smooth out the coin’s surface. Go slow, using the side of the tool to smooth and clean between the legends, portrait and other details.

Example # 3 Continued: Using Dremel Tools...further smoothing.

✠ Now, completely stripped of all encrustations by the use of electrolysis and Dremel tools, and further smoothed by rubber diamond-dusted tools, and by a final brush with the SBBB, here is my final result. This coin could look just a bit better with more detailed cleaning...



Example # 3 Continued: After Darkening...



- ✠ The final, final result. A very crisp and clean Gallienus Antoninianus issue.
- ✠ No buffing and no Ren Wax applied.
- ✠ Nice, huh?
- ✠ Remember...that we started out with the following coin....

Example # 3 Continued: Before the process...

- ✦ A crumbly, encrusted mass of unrecognizable metal...that turned into this...



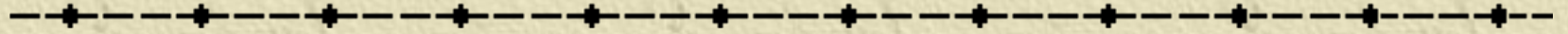
Example # 3 Continued: After Darkening...and the Final Product



✠ Not bad for a crappy
encrusted coin, eh?

Chapter Six

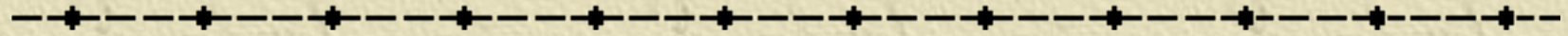
Restoring Ancient Coins via Electrolysis



- ✦ As seen above, these tools work magnificently for cleaning ancient “zapped” coinage.
- ✦ Remember that to succeed, you’ll need all these tools as well as the battery-powered Dremel tool.

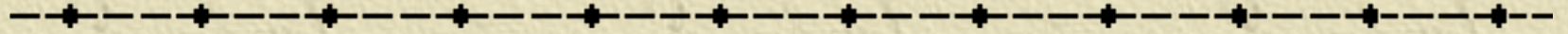
If you do not have these two tools, go to www.nobleromancoins.com.


Electrolysis is an Art...not a Science.



- ✦ Use your eyes to detect which coin to zap.
- ✦ Look for sound under-lying metal.
- ✦ Go slow..."Slow but steady wins the race."
- ✦ Give up on coins that appear too crusty.
- ✦ Always use VERY HOT water in your Electrolysis bath.
- ✦ The SB BB is your very best friend.

Dremel Diamond-dusted tools



 Always use the electrolysis methods and Dremel tools as described above.

 The Jax Darkener can be removed!

Chapter Seven

Bronze Disease

✠ Bronze disease is the bane of ancient coin collectors. An insidious and highly infectious disease, it occurs when..."**The matrix of copper and tin that forms bronze is attacked by hydrochloric acid {HCl} to form tin-chloride and copper. The hydrochloric acid in turn attacks the un-corroded metal to form more cuprous chloride: The reactions continue until no metal remains. This chemical corrosion process is commonly referred to as 'bronze disease.' Any conservation of chloride-contaminated cupreous objects requires that the chemical action of the chlorides be inhibited either by removing the cuprous chlorides or converting them to harmless cuprous oxide. If the chemical action of the chlorides is not inhibited, cupreous objects will self-destruct over time.**" *

✠ * My thanks to Bruce (of the too many numbers) Nesset, for this clear and concise description! Thank you, my friend!

Chapter Seven

Bronze Disease

✦ Bronze
Disease
looks
like
this...

Nasty,
huh?

* More thanks
to Bruce N
for these
excellent
photos!



Chapter Seven

Bronze Disease

✠ Not to digress too far from the subject, but just a few years ago I received an uncleaned Nero Sestertius that had a very bad case of BD. I cleaned and cured it, and finally sold it on eBay for \$150. Had it not been for the BD cancer, it would have easily sold for \$2,000+. Sad, but true...

Chapter Seven

Bronze Disease



✠ Consider this 1st Century A.D. copper Judaea Prutah as a very sad example of BD.

Chapter Seven

Bronze Disease

✠ As seen, the obverse is sharp and clear; in this state, the coin would be a gem in any collector's book, yes or no?

✠ But...



Chapter Seven

Bronze Disease

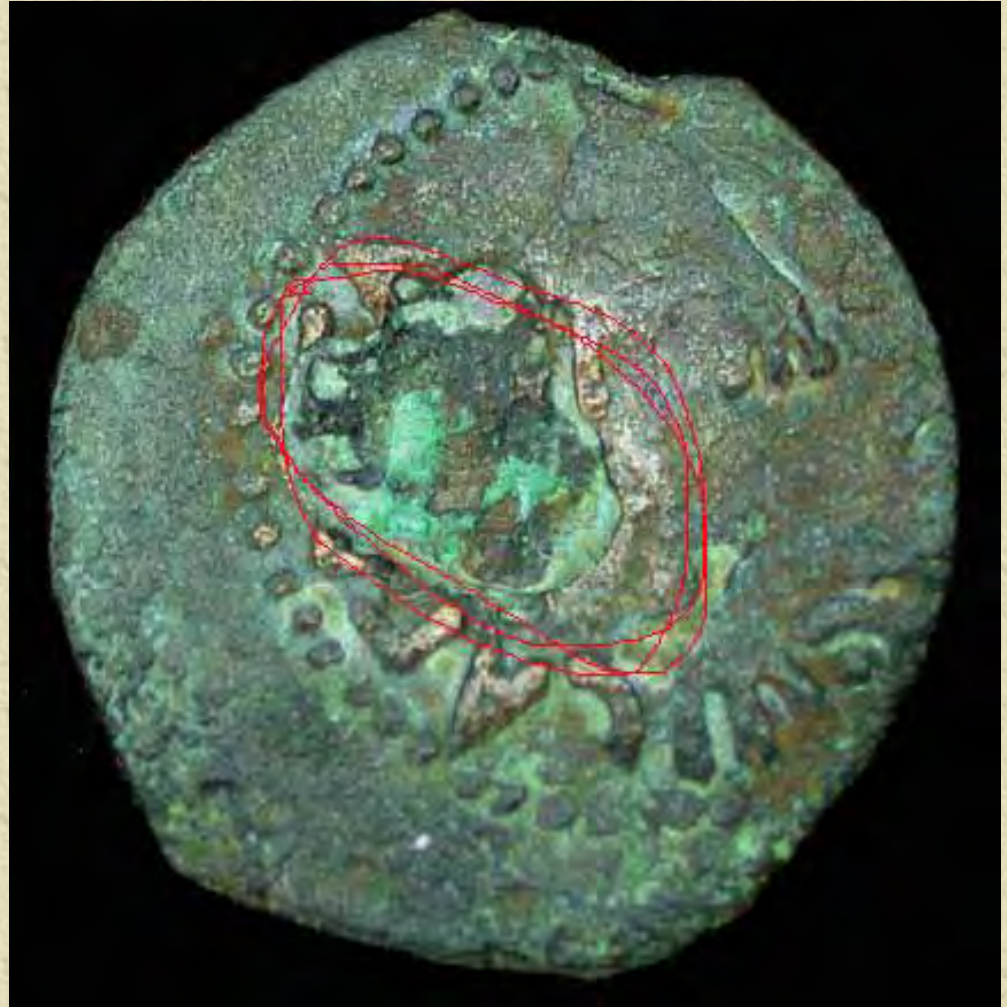


✦ But...as you can see, something really bad is happening to the reverse – and that is *bronze disease*!

Chapter Seven

Bronze Disease

✠ As seen circled in **red**, this coin has a very bad case of **BD**. Note how the cancer has eaten away into the coin's copper surface. If not treated soon, the entire reverse will soon disappear for ever.



Chapter Seven

Bronze Disease

- ✠ Bronze disease can be easily discerned. If you see massive problems similar to the above, it's easy. But, if you see just a spot or two on your coin's surface that has green fuzzy appearance, it may be BD. The best way to find out is to probe the green fuzzy bits with a dental probe. If they are hard, you're OK, but if the fuzzy bits scrape off easily, it's BD!
- ✠ Not to worry... they can be cured! Below is Bruce Nessel's way to cure such coins!
- ✠ Trust me! It works!

Chapter Seven

Bronze Disease...

- ✦ “1. With running water and a stiff nylon brush, scrub the entire surface free of "green fuzz".
- ✦ 2. Use a magnifying light and a dental pick to remove and open any obvious green spots still visible. With care these will not be obvious later.
- ✦ 3. Prepare a bath of Gringott's Bronze Disease Killer, 1 teaspoon per 8 ounces of water.
- ✦ 4. Use de-mineralized or distilled water for better results.
- ✦ 5. Place water; coins into a stainless steel pan **[Do Not Use Aluminum]** and heat the mix to boiling, reduce heat for a minimum of 3 minutes. Set aside to soak for an extended period of time. Re-heat every 12 to 24 hours, for three days. For thick coins like Sestertius allow at least 5 days. After the initial soak, rinse with clean water and give the coin/s a light scrubbing, and return to solution.

Chapter Seven

Bronze Disease

- ✦ 6. Repeat step 5, three times, replacing the solution.
- ✦ 7. After the last soak and scrub, dry the coins, and soak in **100% isopropyl alcohol**, for about 20 minutes. This will help draw out more water from the coin fabric. Allow the coin to sit in the air , watch for signs of returning Bronze Disease. Use magnification, if any signs are seen, immediately re-start the process. If no signs are seen after 5 to 10 days, continue to Step 8.
- ✦ 8. Dry thoroughly, and seal with a paste wax (Ren Wax), well rubbed into the coin.
- ✦ It is recommended that all bronze coins be checked periodically, as I have found "clean" coins suddenly break out 2 years after purchase.”*
- ✦ ***Bruce Nessel©2006 all rights reserved**

Dremel tools...

- ✦ All of the specialty diamond-dusted Dremel tools are available from Noble Roman Coins at www.nobleromancoins.com
- ✦ You may search about on the internet to find similar products, but you will pay more for them...trust me.

Premium Uncleaned Coins

✦ For “premium” uncleaned coins similar to those found in the lessons above, I suggest you purchase them from either:

<http://www.nobleromancoins.com/>

Or Jerome Holderman at

<http://www.rustyromans.com/>

Post Mortem

- ✧ The author has attempted to make all the lessons above as easy to follow as possible.
- ✧ If you have any queries as to the use of any of the products listed above, please feel free to email me at mayadigger@sbcglobal.net.
- ✧ Thank you for your time and I hope that this seminar has helped you in all your ancient coin-cleaning endeavors.
- ✧ I give you joy of cleaning! Kevin Sandes