



# Putsutvecklingen sedd i mikroskop

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# Metoder



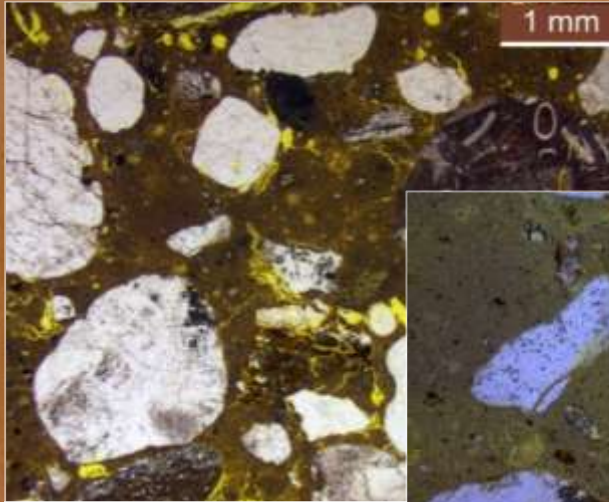
Ljuskop

Kemisk analys av syralösliga komponenter, kisel, aluminium, järn, magnesium, kalcium

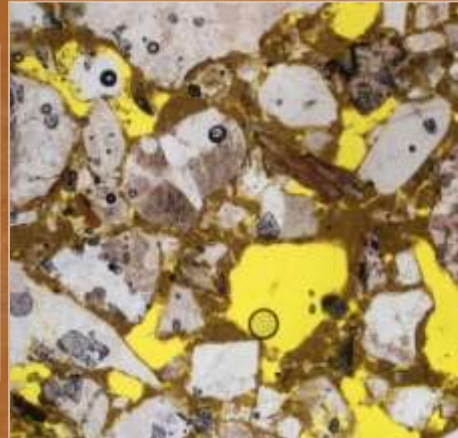
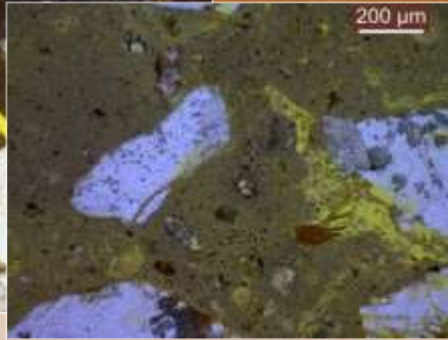


Svepelektronmikroskop

# Kalkbruk



Benestad Omputsning 1858



Gamla riksarkivet 1891 (5X) K100/450  
(Tyrens, Malin Myrin)



Uppståndelsekapellet  
1925 (5X) K100/500  
(Puts & Plattsättning,  
Per Hallgren)

# Hydrauliskt kalkbruk

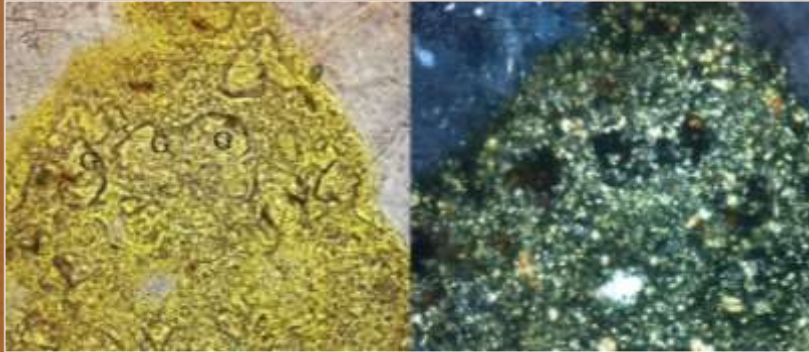
## Syralösliga komponenter

$\text{Al}_2\text{O}_3$	CaO	$\text{SiO}_2$	$\text{Fe}_2\text{O}_3$	MgO	C.I.
0,8 %	14 %	1,4 %	0,2 %	0,2 %	0,35



Stockholms Stadshus 1920  
(Sölve Johansson)

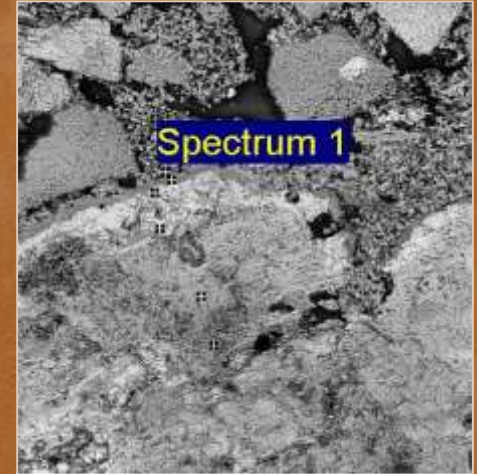
# Slaggbruk



Stenbro vid Nora 1868 (40x)  
(Grenberger Byggnadsrestaureringskontor)

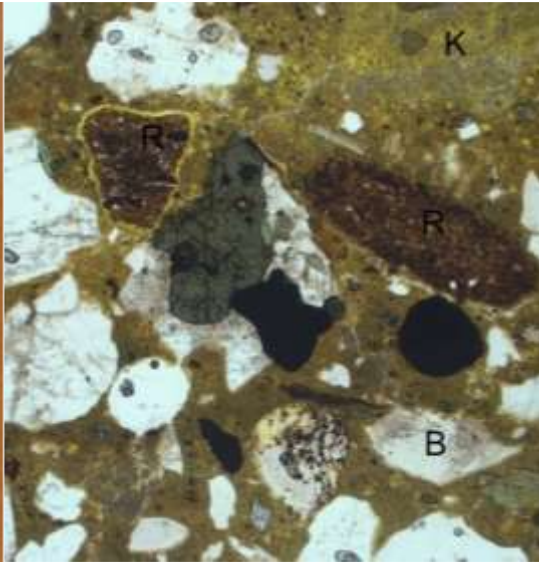


Stockholms Stadshus (10x)  
(Sölve Johansson)

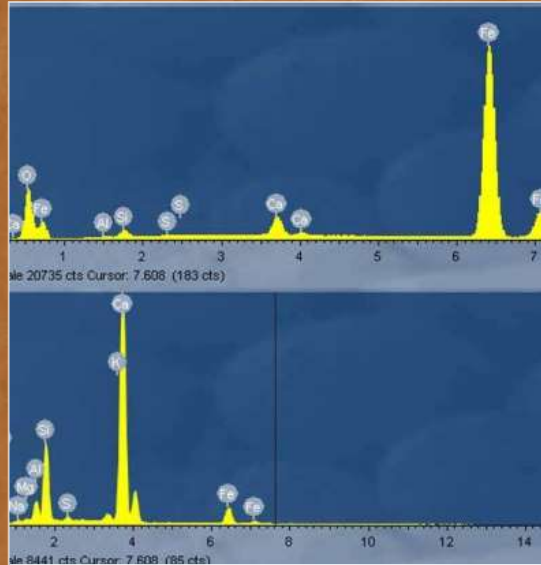


Slagg Stockholms  
Stadshus SEM/BSE

# Rödfyr, skifferaska



Borås regemente 1905  
(Ritningen Arkitektbyrå AB,  
Ywonne Lilja)

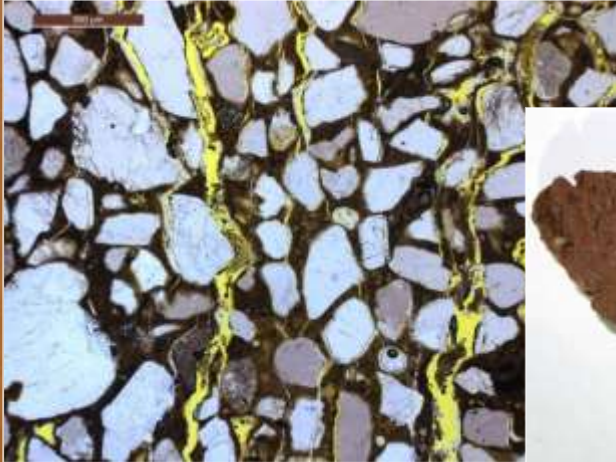


SEM/EDS mikrokemi

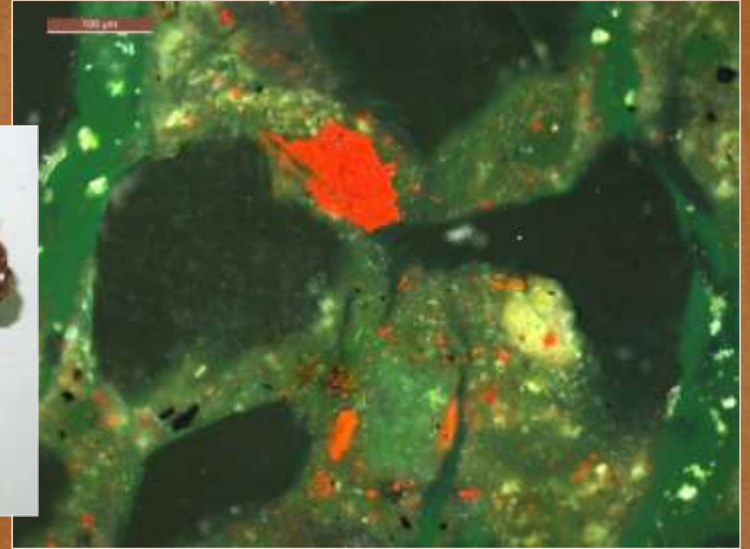


Rödfyrsbruk typisk färg

# Rödpigmenterat bruk som inte är baserat på rödfyr

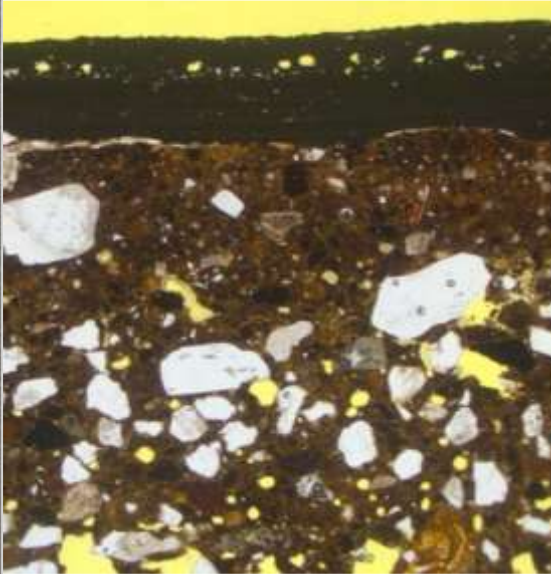


Terrasstrappor Helsingborg 1903  
(Tyrens, Jesper Carlsson)



Kopparbaserat pigment i påfallande ljus

# Protocement



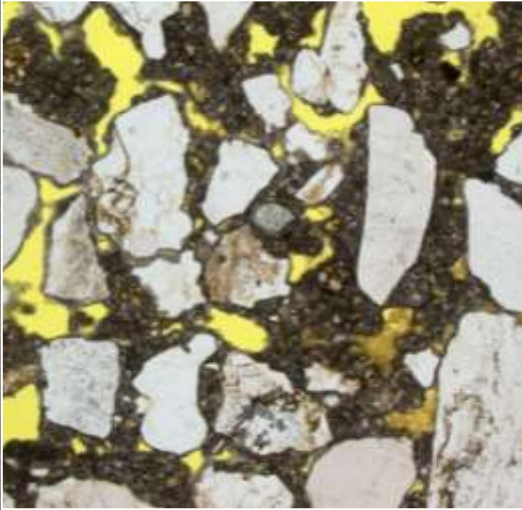
Parkercement  
(Sölve Johansson)



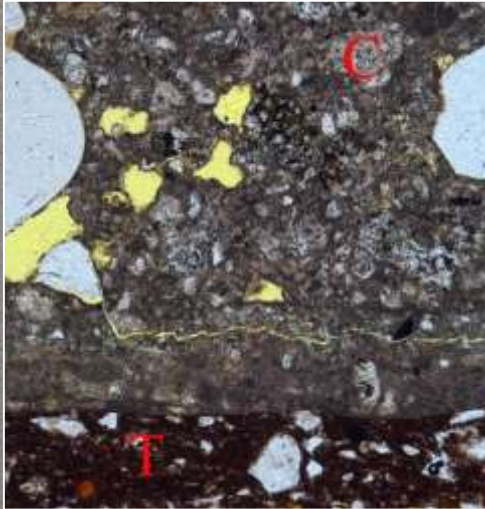
Börshuset Göteborg 1848



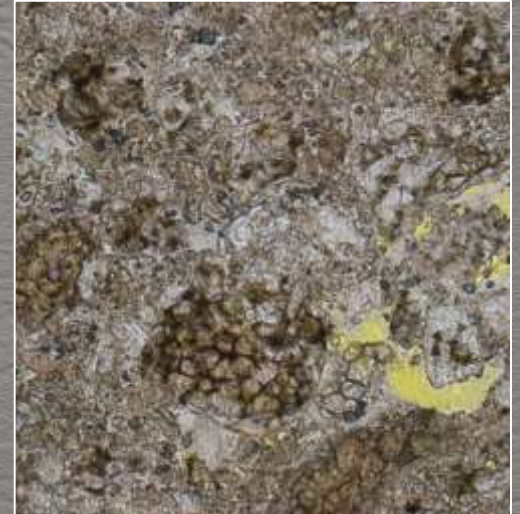
# Cementbruk



Höglunda Gård 1890 (5x)  
C100/250 (Grenberger  
Byggnadsrestaureringskontor)

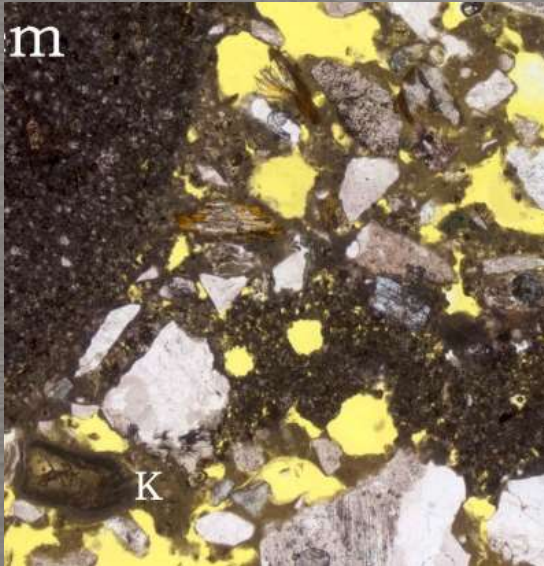


Allahelgonakyrkan Lund  
1891 (10x) C100/100

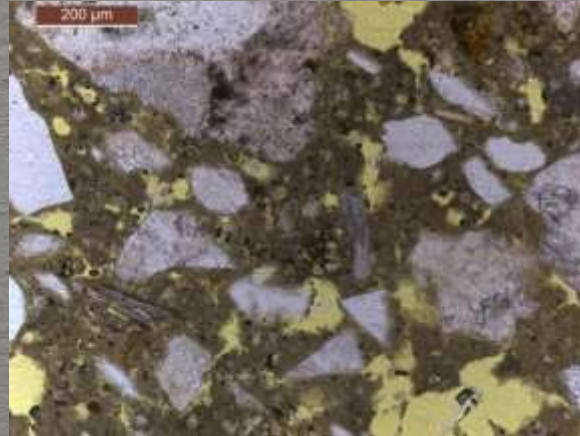


Engelbrektskyrkan Sthlm  
1914 (20x) C100/250  
(Tyrens, Lisa Lantz)

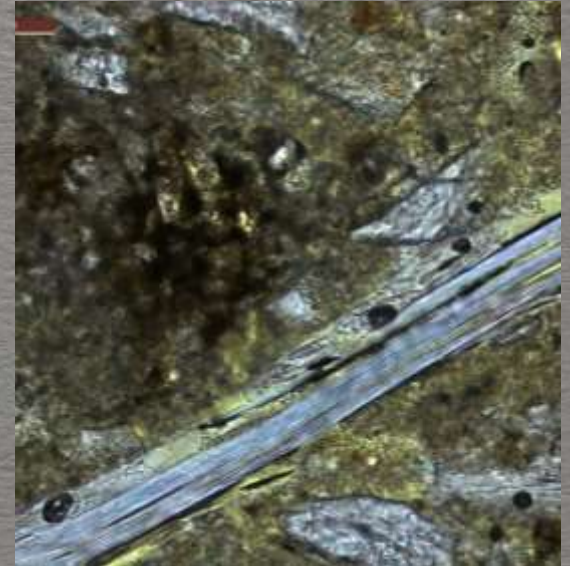
# Kalkcementbruk



Uppsala stationshus 1889  
(Bjerking, Pia Haglund)

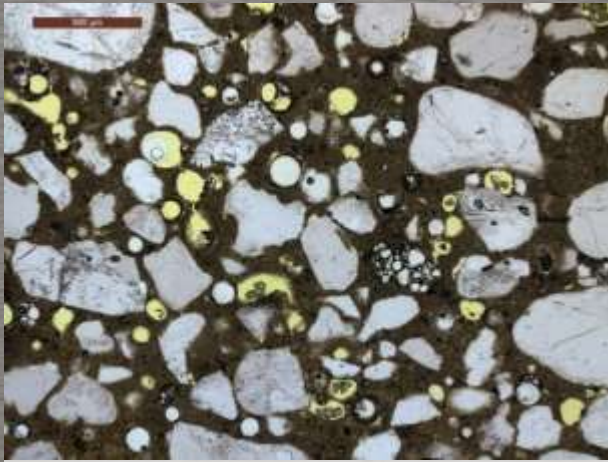


Modernt KC-bruk  
ca 50/50/50

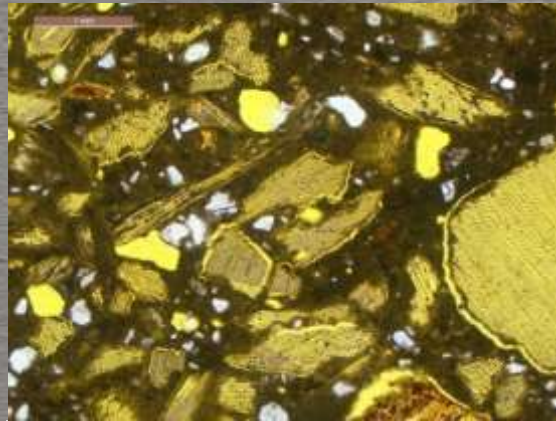


Ädelputs, hotell i  
Vänersborg (Sölve Johansson)

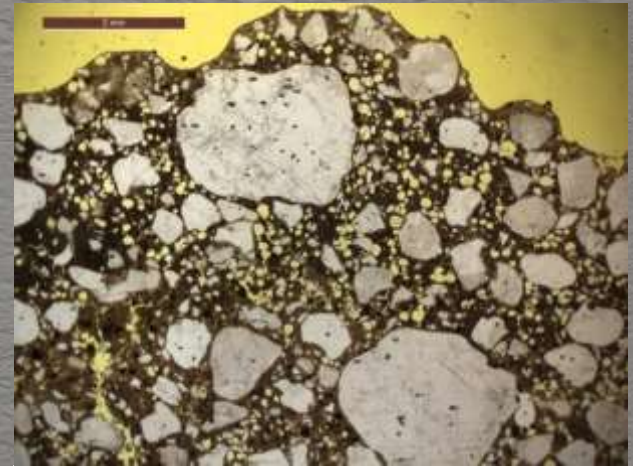
# Moderna bruk



Flygaskeputs hyresfastighet  
1960

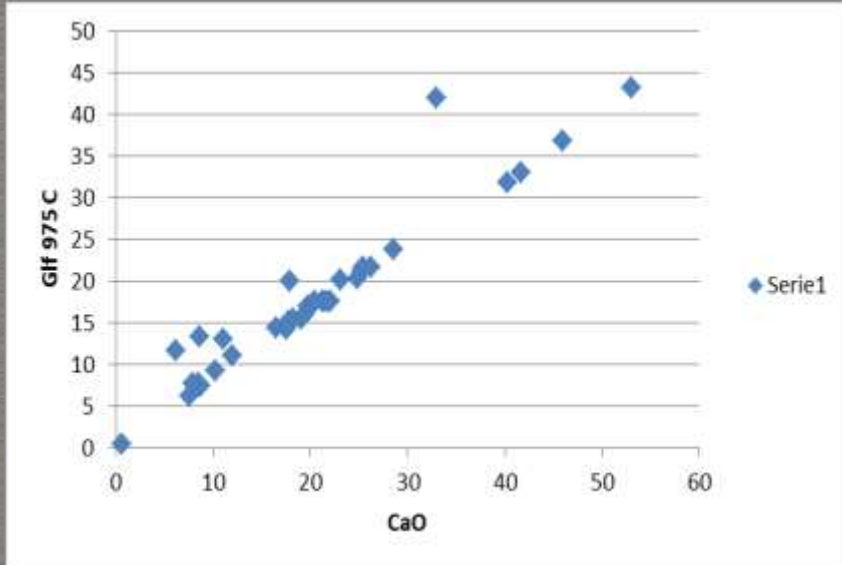


Puts med träfiber  
mitten av 1900-talet

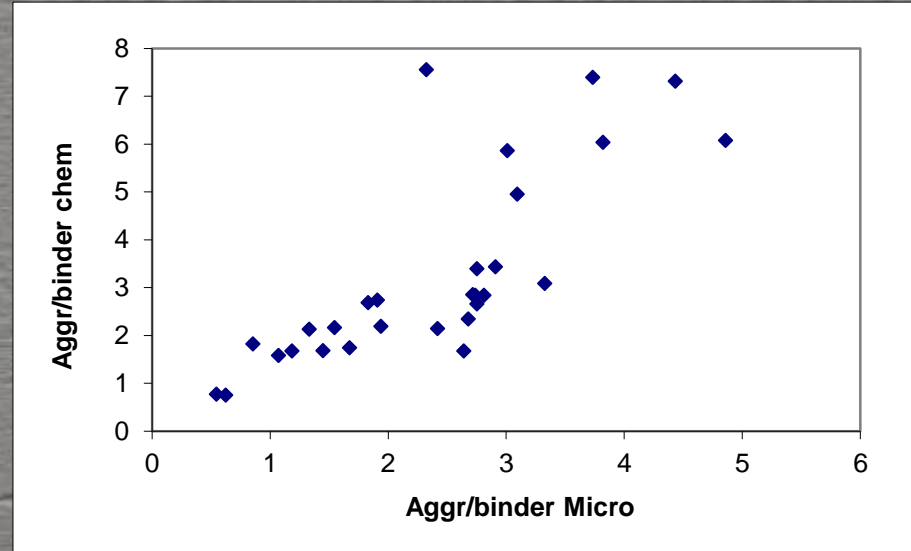


Spritputs hyresfastighet  
1960

# Är metoderna tillförlitliga?



Syralösligt kalcium mot glödförlust



Mikroskopi mot syralösligt kalcium och kisel

