ISSN: 0308 -2237

CV NEWS LETTER 30

comite technique du corpus vitrearum

ICCROM 13 VIA DI SAN MICHELE ROMA NOVEMBRE 1979

THIS ISSUE CONTAINS ARTICLES ON:
DIESE NUMMER ENTHÄLT FOLGENDE BEITRÄGE:
CE NUMERO CONTIENT DES ARTICLES SUR:

1. generalities

1.1a Future of CV Newsletter

In its last meeting the editorial board decided that with a view to dividing up the work the editing of CV Newsletter will be done in turns by its members. Here is some information.

Editors

1980 Dr. Ernst Bacher, Institut für Osterreichische Kunstforschung des Bundesdenkmalamt, Hofburg,Schweizerhof, Vienna, Austria.

1981 Dr. Rudiger Becksmann, Arbeitstelle CVMA, Urbanstrasse 84, Stuttgart 1, Federal Republic of Germany.

1982 Mr. J.M. Bettembourg, Research Laboratory of Historic Monuments, Château de Champs-sur-Marne, 77240 Champs-sur-Marne, France.

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Subscriptions: in Swiss Francs to Kontokorrent Nr. 589.029.01 Q Schweizerische Bankgesellschaft 9 Badenerstrasse, CH-5200 Brugg, Switzerland.

The present editor strongly doubts that Newsletter No. 31 will see the end of 1979. At present 147 people and institutions request to receive CV Newsletter. Those concerned with and working to preserve stained glass windows consider it as being a valuable and useful source of information or as a liaison bulletin. But CV Newsletter only acts as such if it is provided more frequently with information worth spreading. Without this, CV Newsletter will not be regular. Thus the editor very much hopes for responses in the near future. General notes about foreseeable meetings and conferences are welcome, even if their scope is only local, as well as reports from recently finished ones. Are there new restoration projects planned, or going on, or recently terminated? We are looking for information on Corpus volumes, book reviews and abstracts. Your contribution is welcome.

1.2a Instructions for authors

The CV Newsletter is produced by photoreduction onto offset printing plates using the original typescript. The authors must therefore be particularly careful to follow these instructions completely.

- The contributions (in English, French or German) should be typed in single spacing, on one side only of good quality paper. The width of the text should be a column of 105 mm (4 1/8 inches) but wide tables can be accommodated across two columns, that is to say, a width of 220 mm (8 1/2 inches).

- Line drawings or photographs should be pasted in the text at the appropriate places with the captions below each illustration (if this is not possible, mark the place of the illustration in pencil).

- Pages should be numbered in pencil and the typescript should not be folded or creased in any way.

- Typewriters with small typefaces should not be used.

- Very black carbon ribbon should be used to provide good contrast when reproduced.

- The typescript should begin with a summary in English of not more than 200 words. Authors are encouraged to provide summaries in French and German also but if there is any difficulty in preparing an English summary, the author should contact the editor.

1.1 b Futur du CV Newsletter

A sa dernière réunion du bureau de rédaction, il a été décidé que dans le futur la rédaction du "CV Newsletter" sera faite à tour de rôle. Voici quelques renseignements.

Rédacteurs

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1981 Dr. Rudiger Becksmann, Arbeitstelle CVMA, Urbanstrasse 84, Stuttgart 1, République fédérale d'Allemagne.

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Le rédacteur de ce numéro doute fortement que le n° 31 sorte avant la fin de l'année. A ce jour, 147 individuels ou institutions sont abonnés. Ceux qui s'occupent de la conservation des vitraux considère le CV Newsletter comme une source d'information ou un bulletin de liaison. Mais il ne le sera que si la rédacteur reçoit plus fréquemment des informations dignes d'être diffuées. Autrement le CV Newsletter paraîtra irrégulièrement. Le rédacteur espère que cet appel sera entendu. Avez-vous des réunions ou des conférences à annoncer ? Y a-t-il des rapports de travaux commencés, en cours ou terminés ? Qu'est-ce qui se passe aux laboratoires? Y a-t-il des Volumes Corpus à annoncer? Avez-vous des recensements ou des abstracts? Je vous remercie d'avance de chaque contribution!

1.2 b Instructions pour les auteurs

Le CV Newsletter est réalisé directement à partir du manuscript original de l'auteur par photoréduction sur plaque offset. Les auteurs sont donc priés de suivre attentivement les instructions qui suivent.

- Les textes - en anglais, français ou allemand - doivent être tapés à la machine avec un simple interligne, sur une seule face d'un papier de bonne qualité. Les textes se présenteront en colonne de 105 mm (4 1/8 inches) mais des tableaux pourront être présentés sur une largeur de 220 mm.
- Les dessins ou les photos seront collées à leur place dans le texte, avec la légende en dessous (si ce n'est pas possible, indiquer au crayon dans la marge la place de l'illustration).
- Les pages seront numérotées au crayon et le manuscript ne devra en aucun cas être plié.
- Ne pas utilisez de machine à écrire à tout petits caractères.
- Prenez un ruban très noir pour obtenir un meilleur contraste à la réproduction.
- Le manuscript devra commencer par un résumé en anglais de moins de 200 mots. Il est aussi suggéré aux auteurs de mettre un resumé en allemand et en français. En cas de difficulté pour préparer ces résumés, contacter le redacteur.

1.3 Letter to the Editor

In their letter to the Editor dated 10th July 1979 the Dean and Chapter of Canterbury kindly requested to draw the attention of readers of News Letter to a few inaccuracies that have happened to appear in an article on "problems of conservation and restoration at Canterbury" published in News Letter No. 29.

If as an unsuspected reader of this article the editor understands the situation aright, what needs clarification is the Dean and Chapter's policy of presentation of their beautiful glass in its architectural setting and what the objectives of their conservation work are.
(Bruno Mühlethaler, editor in chief)

The Editor,
Comite Technique du
Corpus Vitrearum,
ICROM
13 Via di San Michele,
ROMA, Italy

10th July 1979

Dear Sir,

Re: News Letter No. 29

Item No. 4. Problems of Conservation and Restoration at Canterbury Cathedral

1. The article "Problems of Conservation and Restoration at Canterbury" by Madeline H. Caviness in

News Letter 29 has been drawn to my attention and has been studied with some concern for I note that the content has been drawn from popular journalism and I feel bound to bring to your notice inaccuracies of fact. I am sure that you would wish the following corrections to be included in News Letter 30 in order that the work at Canterbury, both past and present, is more accurately recorded.

At the commencement of our work in 1973 there was a wide divergence of opinion on restoration methods among experts and little evidence of the acceptability of the various techniques at that time being practised.

Our early efforts were based upon techniques in use at that time in Dr. Frenzel's studio, The York Glaziers' Trust and the Victoria and Albert Museum.

2. Replacement of lost Painted line

The use of epoxy cold colour was used only on the head of Neri (S.XIII) and Elizabeth Woodville (Royal window). This technique was then discontinued and has not since been used.

Comparative illustrations (Elizabeth Woodville).

Only the face and neck were repaired and cleaned, not the crown and shoulders; this illustrates photographic exposure inaccuracy, not loss of paint.

3. Backing plates

Unlike previous restorations, it is present practice not to replace damag ed or heavily correded ancient glass. Pieces of fragmented glass are carefully reassembled and jointed. By edge sealing to a moulded backing plate, it is then possible to reglaze the fragile ancient glass back into the window.

4. Backing Plates (with replaced detail)

Replacement on moulded backing plates of lost paint line applies only when it is considered that the line is essential to the iconography. No shading washes are ever used.

5. Cleaning processes

(a) At no time has casual labour used the airbrasive unit on medieval glass.
(b) At no time has casual labour been employed in cleaning medieval figure panels.
(c) The inner painted surfaces of the 12th Century glass are thickly layered with accretions of dirt, lime dust, candle smoke and animal products which, with condensation, has formed a cement like layer which attacks the painted line. The outer surfaces are deeply pitted and covered with decomposed glass, dirt and atmospheric pollutants.
(d) The purpose of our cleaning methods is to remove this opaque material and to disclose the painted pattern and coloured glass previously concealed. Although there is evidence in the glass striations that back painting had once existed, this has long disappeared with approximately one third of the original glass thickness.

6. Acid polishing

This was an experiment and evaluated by Prof. Newton (York) and Dr. Bridge (Kent and Canterbury University). After its use on a small area of border in window S. XIII, the process was discontinued in 1973 and has not been used since.
See C.V. News Letter No. 21, Section 2.

7. Tinted backing glasses

These have been used to achieve a colour harmony where a piece of glass has decayed to a degree where it appears as a hole in an otherwise uniform area of tone and colour.

8. Professor Rees-Jones

Professor Rees-Jones did take a small piece of 19th Century glass to demonstrate replacement of lost painted line, however, he did not do any painting on that glass and no further experiment has been suggested.

9. It is the judgement and policy of Dean and Chapter of Canterbury that the stained glass should be restored and reglazed so that it continues to function in a religious building for the purpose for which the windows were designed.

Yours sincerely,
Fredk. W. Cole

1.4 Meetings

Meeting "Projektgruppe Glass" , held in Berlin on June 7 - 9, 1979.

Papers delivered and abstracts respectively will be included in News Letter No.31. Prof. Knoll informed the editor that the outcomings of this meeting will be completed and be available towards the end of 1979. A hist of the papers presented has already been set out in NL No. 29, page 4.

1.5 Corpus Volumes

This is a notice to all members of the Corpus Vitrearum.

The third german Corpus volume is now available from October 15 on.
Die mittelalterlichen Glasmalereien in Baden und der Pfalz (ohne Freiburg i.Br.), Berlin 1979 LXIV Seiten Kunstdruck mit 42 Textabb., 326 Seiten Werkdruck mit 173 Fig., 26 eingeschobenen Tafeln mit 97 Abb. und 14 Farbtafeln, 122 Tafeln mit 400 Abb.
German Democratic Republic Vol I/2: in the last quarter of 1979, the second volume of the Corpus Vitrearum Medii Aevi will be published by the publishing house of the Academy of Sciences of the GDR at Berlin: Erhard Drachenberg CVMA DDR, Vol I/2. Text: Medieval stained glass windows of the Erfurt Cathedral. In addition to the comments on glass staining the volume offers a survey on the history of art. In this context, the windows published in CVMA DDR Vol. I/1 are also taken into consideration. Besides numerous line drawings on the state of preservation of the panels, the publication is vested with 20 colour plates and 24 black-and-white plates for the stained-glass cycle in the Erfurt Cathedral with 1070 black-and-white pictures and also 20 colour plates (CVMA DDR Vol. I/2 plates) will follow within a year.
Im 4. Quartal 1979 wird im Berliner Verlag der Akademie der Wissenachften der 2. Band des Corpus Vitrearum Medii Aevi in der DDR Erscheinen: Erhard Drachenberg. CVMA DDR Bd 1,2. Text: Die mittelalterliche Glasmalerei im Erfruter Dom. Der Band enthält neben den Ausführungen zur Glasmalerei eine kunstgeschichtliche Uebersicht. In diesem Zusammenhang werden auch die im CVMA DDR Bd 1,1 veröffentlichten Scheiben berücksichtigt. Die Publikation ist ausser mit zahlreichen Strichzeichnungen zum Erhaltungszustand der Felder noch mit 20 Farbtafeln und 24 Schwarzweissabbildungen ausgestattet. Der Bildband für den Glasmalerei-Zyklus im Erfurter Dom mit 1070 Schwarzweissaufnahmen und ebenfalls 20 Farbtafeln (CVMA DDR Bd 1,2. Abbildungen) wird in Jahresfrist nachfolgen.

In August 1979 Corpus Volume austria III/1 became available: Ernst Bacher, The medieval stained glass windows of Steiermark, Part 1, Graz und Strassengel. Published by the Institut für Oesterreichische Kunstforschung des Bundesdenkmalamtes with the sponsorship by the Austrian Academy of Science. Vienna 1979.
208 pages, 8 colour plates, 513 black-and-white figures in the Catalogue, 11 plates in the text part, 41 figures in the arthistorical introduction, 22 textfigures.
Price: Austrian shillings 1650.-, DM 240.-, Brit. pounds 60.- approx., US Dollars 120.- approx.

2. sicherung und restaurierung der mittelalterlichen glasmalereien im freiburger münster

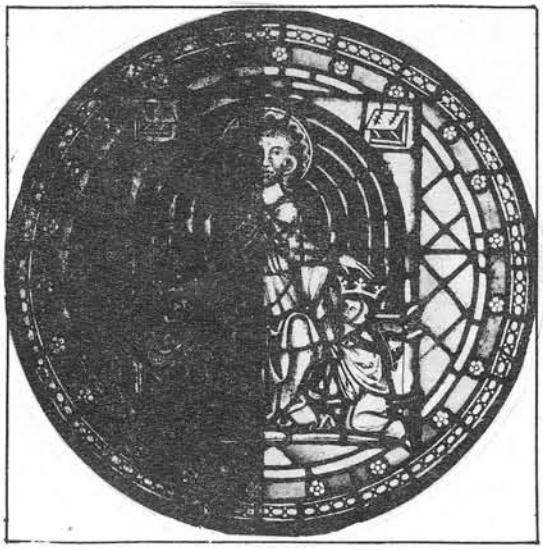
(Vortrag gehalten durch Rüdiger Becksmann an der Jahresversammlung des Münsterbauvereins Freiburg am 20.Mai 1979

Das Freiburger Münster besitzt 80 Fensteröffnungen unterschiedlichster Formen und Ausmasse, die seinen Innenraum erhellen. Nur 20 enthalten eine ausschliesslich farblose Verglasung aus Butzen oder Rechteckscheiben; mehr als die Hälfte hiervon befindet sich im Obergaden des Langhauses. Von den 60 ganz oder teilweise mit Glasmalereien geschmückten Fenstern sind andererseits nur fünf modern; 20 zeigen Kopien von Glasbildern, deren Originale sich im Augustinermuseum befinden oder die im späten 19.Jh. von der Glasmalerei-Werkstatt Helmle/Merzweiler neu bemalt worden waren, also nicht mehr als Originale angesprochen werden können; sie gehören sämtlich zur partiellen Farbverglasung der Chorkapellen aus der Zeit von 1515-1528. Es verbleiben 35 Fenster, die ihre mittelalterliche Farbverglasung mehr oder weniger vollständig bewahrt haben. Hiervon befinden sich 13 im Langhaus, zwei - von dort aus nicht sichtbar - in der Michaelskapelle des Westturmes, zehn im Querhaus bzw. in den von dort aus zugänglichen Kapellen, neun im Hochchor und eines in der Sakristei. Insgesamt zählt man in diesen 35 Fenstern noch über 500 alte Scheiben - ein nicht nur in seiner Fülle, sondern vor allem in seiner künstlerischen Vielfalt überraschend reicher Bestand. Zeitlich reicht er vom frühen 13. bis in das frühe 16. Jh., umfasst also drei Jahrhunderte.

Obgleich die Glasmalereien des Freiburger Münsters aus vielerlei Gründen - nicht zuletzt auch dank des relativ konstanten und trockenen Innenraumklimas - weniger gefährdet waren und sind als etwa die Farbfenster des Kölner oder Regensburger Domes, hat hier die in den späten 60er Jahren einsetzende wissenschaftliche Bestandsaufnahme der mittelalterlichen Glasmalereien im Rahmen des CVMA frühzeitig Pläne zur Sicherung und Restaurierung der Münsterfenster reifen lassen, die seit 1971 unter der Leitung des von einer Kommission beratenen Münsterbaumeisters mit Mitteln der Denkmalpflege, der Kirche und der Stadt von den Glasmalerei-Werkstätten Dr. Oidtmann in Linnich

in Zusammenarbeit mit der Freiburger Kunstglaserei Isele durchgeführt werden. Am Beginn der Arbeit standen zunächst zwei Grundsatzentscheidungen, die seinerzeit keineswegs selbstverständlich waren, auch wenn sie dies - nicht zuletzt dank des Freiburger Beispiels - inzwischen vielerorts geworden sind: 1. dass der Sicherung der Glasmalereien durch eine Aussenschutzverglasung, die die Funktion des Fensterverschlusses übernimmt, der absolute Vorrang gebührt, und 2. dass alle Massnahmen der Reinigung und Sicherung dem Prinzip des geringstmöglichen Eingriffs in die originale Substanz zu unterwerfen sind, was freilich erst durch die Aussenschutzverglasung möglich wird. Wenn in Freiburg von Anfang an auf eine Flächensicherung mit Epoxidharzen verzichtet worden ist und Zweikomponentenkleber lediglich zur Sicherung akut gefährdeten Schwarzlots verwendet werden, so bestätigt die Tatsache, dass die moderne Restaurierungstechnologie noch immer keine materialgerechten Sicherungsmassnahmen anbieten kann, die in Freiburg geübte kritische Zurückhaltung und damit die hier gewählten Mittel und Wege.

Wer in den letzten Jahren aufmerksam die durch die Restaurierung verursachten Veränderungen an den Farbfenstern im Münster, vornehmlich an denen des Langhauses, verfolgt hat, dem wird die allgemeine Aufhellung des Raumlichtes, die gesteigerte Transparenz oder besser Transluzidität der mittelalterlichen Scheiben schwerlich entgangen sein, er wird sie vielleicht sogar als einen Verlust an Stimmungshaftigkeit im Sinne eines romantischen Mittelalterverständnisses empfunden haben. Diese Rückgewinnung von diaphaner Struktur und autophanem Farblicht, wie sie gerade den Langhausfenstern des späten 13. und frühen 14. Jh. eigen waren, beruht jedoch nur in geringem Masse auf der Entfernung transparenzmindernder Verwitterungssubstanzen auf der Aussenseite der Farbgläser, sondern wesentlich auf der Entfernung der von Geiges auf der Innenseite aufgetragenen künstlichen Patinierung. Geiges hatte diese Massnahme seinerzeit damit begründet, dass er die bei der Reinigung eingetretene Aufhellung nicht der natürlichen Patinierung überlassen könne, und sich hierfür sogar auf Viollet-le-Duc berufen, der behauptet hatte, dass die Glasmaler bereits im 13.Jh. ihre Seiben kalt übermalt hätten, um deren Brillanz zu dämpfen. Da es sich auch bei Geiges um eine kalte, vielfach erst nach Einsetzung der Scheiben vom Gerüst aus vorgenommene Uebermalung handelt, konnte sie in der Regel mit einer Acetonlösung problemlos wieder entfernt werden. Wie nachteilig diese Uebermalung das Erscheinungsbild der Langhausfenster beeinflusst hat, zeigt das zur Hälfte "freigelegte" Medaillon mit dem Pilger krönenden Hl. Jakobus aus dem Masswerk des Schmiede-Fensters besonders eindrucksvoll (Abb.1).



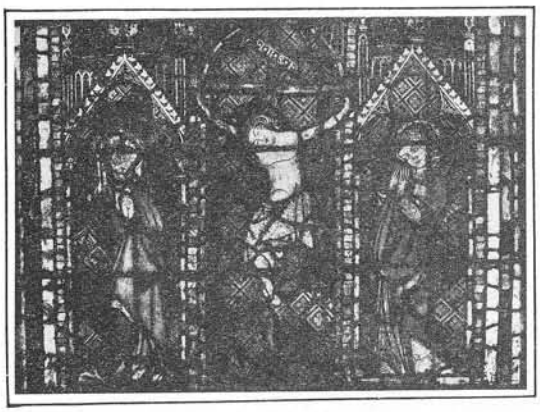
1. Schmiede-Fenster. Hl. Jacobus Pilger segnend, um 1320 (halbseitig gereinigt).

1. Blacksmiths' window, St. James blessing pilgrim, about 1320 (half-cleaned).

Andererseits befanden sich die von Geiges zwischen 1917 und 1927 restaurierten Scheiben allgemein in einem guten Zustand, d.h. der Grad ihrer Verschmutzung auf der Innenseite wie ihrer erneuten Verwitterung auf der Aussenseite hielt sich - von Ausnahmen abgesehen - in engen Grenzen.

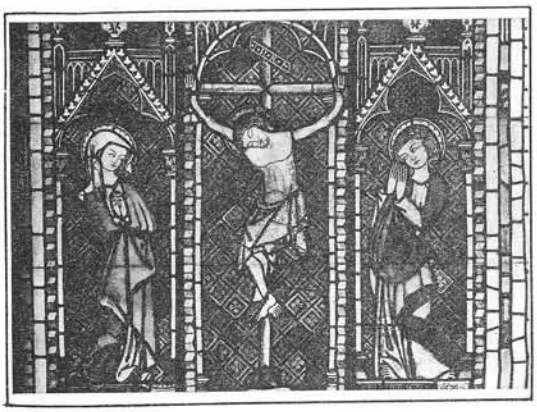
Wie sehr die Geigessche Restaurierung jedoch trotz ihrer Uebermalungen die jüngste Restaurierung erleichtert hat, wurde bei der Arbeit am Konstanzer Fenster offenkundig, das von Geiges nicht restauriert worden war und dessen Scheiben seit 1820 - damals waren die kurz zuvor von Konstanz nach Freiburg verbrachten Scheiben in das leere Fenster über dem Heiligen Grab eingesetzt worden - mehr oder weniger unberührt geblieben waren. Eine Gegenüberstellung der Kreuzigung - einem Hauptwerk der Konstanzer Malerei um 1320 - vor und nach der 1974 abgeschlossenen Restaurierung zeigt in welch grauenvollem Zustand sich die

Scheiben dieses Fensters befunden hatten (Abb.2,3): Das Bleinetz war so brüchig geworden, dass die einzelnen Farbgläser sich nicht mehr in einer Ebene befanden, was eine starke Verschmutzung der Gläser zur Folge hatte.



2. Konstanzer Fenster. Kreuzigung Christi, um 1320 (Zustand vor Restaurierung).

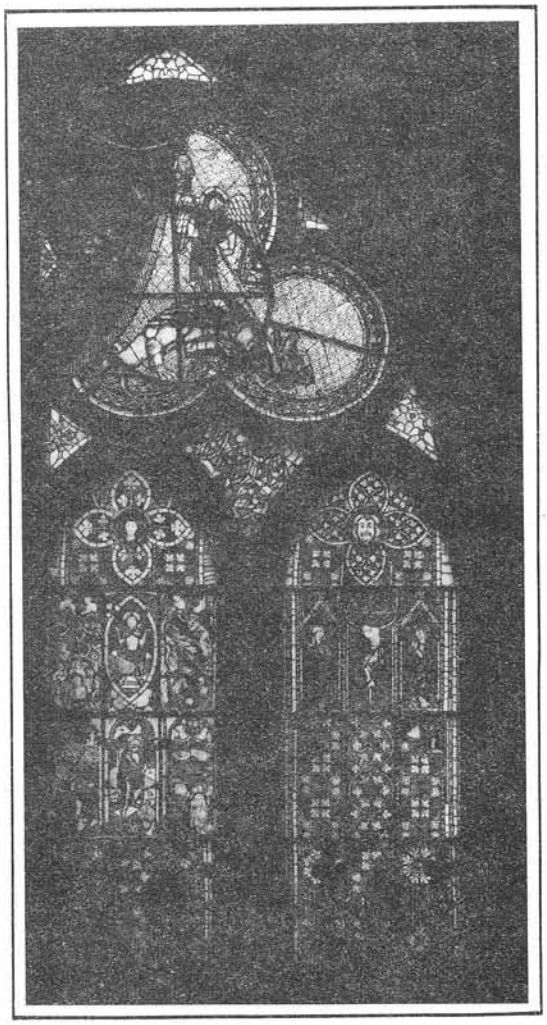
2. Constance window. Crucifixion of Christ, about 1320 (before restoration)



3. Konstanzer Fenster. Kreuzigung Christi, um 1320 (Zustand nach Restaurierung).

3. Constance window. Crucifixion of Christ, about 1320 (after restoration).

Ausserdem hatte die unterschiedlich starke Verwitterung der Farbgläser die ursprüngliche Farbwirkung weitgehend zerstört. Dank der überragenden technischen Qualität der Farbgläser und ihrer Bemalung, die der künstlerischen Qualität entspricht, konnte das mittelalterliche Erscheinungsbild dieser Scheiben in überraschendem Umfang wieder zurückgewonnen werden (Abb.4).

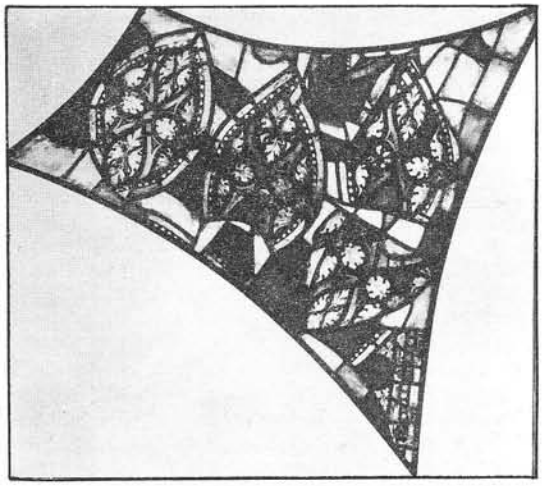


4. Konstanzer Fenster, um 1320 bzw. 1430. Gesamtaufnahme (Zustand nach Restaurierung).

4. Constance window, about 1320 or 1430, respectively. Vista shot (after restoration).

Der zusammengesetzte Charakter des Konstanzer Fensters blieb als bemerkenswerte restauratorische und denkmalpflegerische Leistung des frühen 19.Jh. grundsätzlich unangetastet, da verbessernde Eingriffe letztlich die Auflösung dieses Depotfensters zur Folge gehabt hätten. Zu schliessen waren jedoch die riesigen asymmetrischen Zwickel um den wohl merkürdigsten Dreipass, den die Geschichte der gotischen Architektur kennt, da die von Geiges geschaffenen ornamentalen Zwickel 1944 zugrunde gegangen waren.

Um den konglomerathaft zusammengesetzten Charakter dieses Fensters zu wahren, entschloss man sich schliesslich, den grossen Zwickel (Abb.5) mit



5. Konstanzer Fenster. Grosser Zwickel (1976 nach Entwurf von O. Krauss neu geschaffen)

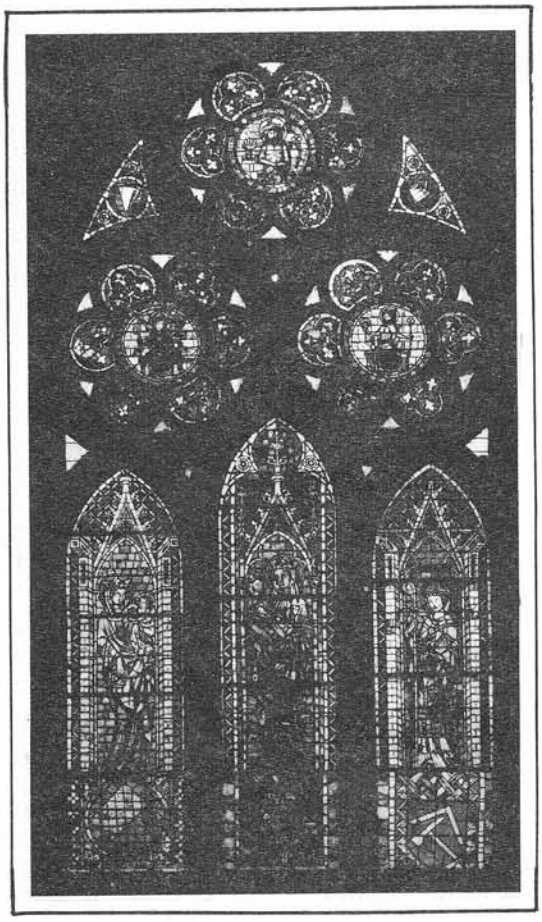
5. Constance window, large gusset (made new in 1976, after a design by O. Krauss)

zugehörigen Ornamentfragmenten zu füllen, die sich im Augustinermuseum befanden, und die kleinen Zwickel unter Verwendung einzelner alter Gläser in freier Komposition farbig so zu gestalten, dass die ungewöhnliche Form des Dreipasses nicht unterdrückt, sondern betont wird. Die Tatsache, dass die für alle Beteiligten so schwierige Lösung heute im Fenster so selbstverständlich erscheint, dürfte für ihre künstlerische Qualität spechen.

Abgesehen vom Konstanzer Fenster und dem Küfer-Fenster, auf das noch einzugehen sein wird, verdanken die übrigen Langhausfenster ihre formale Geschlossenheit der von Geiges angestrebten Wiederherstellung des ursprünglichen Erscheinungsbildes im Sinne des Historismus des ausgehenden 19.Jh. Obwohl ihm auf Grund seiner historischen Kennerschaft und seinem künstlerischen Einfühlungsvermögen auf diesem Gebiet Bewundernswertes gelungen ist, waren aus heutiger Sicht fragwürdige oder gar falsche Lösungen nicht zu vermeiden. Wie sich die Farbfenster-Kommission in solchen Fällen entschieden hat, lässt sich an einer Gegenüberstellung des Schmiede-Fensters und des Maler-Fensters aufzeigen. Obwohl im Maler-Fenster die Seitenbahnen mit den in Tabernakeln stehenden Wilden Männern jeder ikonographischen Grundlage entbehren, da der Thron Salomonis der Mittelbahn auch die Seitenbahnen umfasste und dort, in gestaffelter Anordnung, Propheten, vielleicht auch Tugenden zeigte, blieb die von Geiges geschaffene Fensterkomposition insofern unverändert, als für die hier angedeutete Rekonsturktion genaue historische oder archäologische Anhaltspunkte fehlen. Völlig anders war in dieser Hinsicht die Ausgangssituation beim Schmiede-Fenster. Geiges hatte zur Vervollständigung der Seitenbahnen Rössli-Wappen entworfen, ohne zu beachten, dass die beiden Szenen darüber - Verkündigung und Visitatio - wie die obersten Szenen von Arkadenwimpergen bekrönt gewesen sein müssen. Bei der Untersuchung des Scheibenbestandes in der Werkstatt zeigte sich denn auch, dass die beiden erhaltenen Wimpergscheiben nicht übereinstimmen und die steiler proportionierte Scheibe über der Flucht nach Aegypten ausserdem im frühen 19.Jh. spitzbogig zugeschnitten worden war. Rechteckig vervollständigt war die untere Bekrönung zurückgewonnen und für die Rekonstruktion des Fensters mussten lediglich die beiden alten Scheiben je einmal kopiert werden, um die ursprüngliche Anordnung wiederherstellen zu können. Dass die figürlichen Scheiben ausserdem im frühen 19.Jh. beschnitten worden waren, lassen die fehlenden Flügelspitzen des Verkündigungsengels, das unvollständige Spruchband sowie die fehlende Taube des Heiligen Geistes erkennen. Ergänzt wurde in diesem Falle jedoch nur der Farbgrund.

Die grössten Schwierigkeiten bei der Sicherung und Restaurierung bereitete bisher das Schauinsland-Fenster, das einzige intakt erhaltene Obergadenfenster des Langhauses aus der zweiten hochgotischen Verglasungsphase. Dies war zwar auf Grund seines mit dem exponierten Standort zusammenhängenden schlechten Zustandes von Anfang an vermutet worden, die Geigessche Uebermalung bereitete hier jedoch angesichts des vielfach lockeren Schwarzlots zusätzliche Probleme, deren Lösung in der Folge dazu führte, die von Geiges ergänzten Farbgründe zu ersetzen, nicht immer mit befriedigendem Ergebnis.

Das derzeit zur Restaurierung in Linnich befindliche Küfer-Fenster (Abb.6)



6. Küfer-Fenster, um 1340. Gesamtaufnahme (Zustand vor Restaurierung).

6. Coopers' window, about 1340. Vista shot (before restoration)

Sämtliche Aufnahmen: CVMA Deutschland (R. Becksmann)

All photographs: CVMA Germany (R. Beckmann)

ist wie das Konstanzer Fenster ein Depotfenster, d.h. es enthält Scheiben, die aus verschiedenen Zeiten stammen und nicht für denselben Standort geschaffen worden waren. Seine Restaurierung wirft insofern besondere Probleme auf, als es seinerzeit nicht in die Geigessche Neuordnung der Bestände einbezogen worden war, aber auch nicht mehr den im Laufe des 19.Jh. geschaffenen Zustand bewahrt hat. Ausser der Masswerkverglasung gehören im jetzigen Zustand nur die beiden seitlichen Standfigurentabernakel zur ursprünglichen Fensterkomposition, während die Hl. Anna in der Mittelbahn der einzige Rest eines dem Schauinslandfenster entsprechenden zweiten Obergadenfensters ist. Ebenfalls aus dem Hochschiff stammen die drei Sockelfelder, das linke aus der zweiten, die beiden anderen aus der ersten Verglasungsphase. Es handelt sich hierbei um Reste einer farbigen Ornamentverglasung aus reich verschlungenen Flechtbändern, wie sie für Pfarr- und Bettelordenskirchen des späten 13. und frühen 14. Jh. charakteristisch war.

Die Tatsache, dass elf von zwölf Hochschiffenstern ihre Farbverglasung verloren haben, dass gerade hier ungebrochenes Tageslicht in solcher Fülle in den Innenraum eindringen kann, hat 1977 zu Ueberlegungen geführt, diese Fenster, deren Notverglasung aus der ersten Nachkriegszeit ohnedies schadhaft geworden ist, wieder farbig zu verglasen. Mit dieser Farbverglasung soll dem Hochschiff ein den Seitenschiffen entsprechendes Farblicht zurückgegeben werden, das die derzeit auseinanderklaffenden Raumteile zu einem homogenen Gesamtraum zusammenschliessen und damit auch die Wirkung der restaurierten Seitenschiffenster steigern würde.

Dies setzt angesichts der formalen und inhaltlichen Vielfalt in den Seitenschiffenstern allerdings voraus, dass die Hochschiffenster weder formal noch farblich hiermit in Konkurrenz treten, sondern sich unterordnen. Am ehesten lassen sich diese Forderungen mit einer farbigen Ornamentverglasung erfüllen, wie sie inzwischen erprobt wird. Ausgangspunkt hierfür waren jene farbigen Ornamentscheiben im Küfer-Fenster, die einst in den östlichen Hochschiffenstern sassen. Da das Flechtband in der Glasmalerei eine lange Tradition hat und bis in deren Anfänge zurückreicht, ist es ein im Grunde zeitloses Ornament, das vielfältigste Variationen erlaubt und das mit Hilfe eines rhythmisierten Form- und Farbwechsels von Fenster zu Fenster, aber auch innerhalb eines Fensters ein spannungsreiches, dennoch ausgewogenes Gesamtbild ermöglicht. Vor allem aber kann dieses Form- und Farbvokabular den gegensätzlichen Fensterformen im Hochschiff jeweils so angepasst werden, dass den vorgegebenen Masswerkformen kein Zwang angetan wird. Um einer zu starken Einheitlichkeit im Hochschiff entgegenzuwirken, ist an eine Einbeziehung von Restscheiben der ursprünglichen Hochschiffverglasung, etwa jenen im Küfer-Fenster, gedacht.

Findet sich das Projekt einer Farbverglasung der Hochschiffenster noch im Stadium der Erprobung, so gehen die Restaurierungsarbeiten ihrem Ende entgegen. Im Herbst werden das Küfer-Fenster und das Fenster der Peter-

und Pauls-Kapelle nach Freiburg zurückkommen. Möglicherweise ist zu diesem Zeitpunkt auch die nördliche Langhausrose von der Geigesschen Uebermalung befreit und die Restaurierung im Langhaus damit abgeschlossen. Im Querhaus stehen hingegen noch die Standfigurenscheiben der nördlichen Dreifenstergruppe und des Endingen-Chörleins sowie die Medaillons einer Wurzel Jesse in der südlichen Dreifenstergruppe aus. Da sich die in der Ropstein-Werkstatt ausgeführten Hochchorfenster wie das Fenster der Annen-Kapelle in gutem Zustand befinden und durch die Aussenschutzverglasung hinreichend gesichert sind, kann Das Restaurierungsprogramm nach Fertigstellung der Querhausfenster und der beiden Fenster im Michaelschor des Turmes mit Scheiben aus der Dominikanerkirche, wie geplant, 1980 abgeschlossen werden.

Noch zu bewältigen bleibt die Aussenschutzverglasung des Chorkapellenkranzes. Wegen der Nahsichtigkeit wird nicht nur ihre Gestaltung noch Probleme aufwerfen. Es stellt sich vor allem die Frage einer Rückführung jener 44 Originalscheiben, die dem Augustinermuseum 1927 als Leihgaben der Münsterfabrik überlassen worden waren, an ihren ursprünglichen Platz im Chorkapellenkranz, wo sie heute durch Kopien von Geiges ersetzt sind. Die Situation ist insofern paradox, als die Originale heute im Münster - dank der Aussenschutzverglasung und des ausgewogenen Raumklimas - jene nahezu idealen konservatorischen Bedingungen finden würden, die ihnen vor allem im Keller des Augustinermuseums fehlen und dort ihren Fortbestand ernsthaft gefährden. So sehr man eine Rückführung dieses Originalbestandes in das Münster wünschen möchte, lässt sich doch auch der Widerstand des Augistinermuseums, das zu den an Glasmalereien reichsten Sammlungen Deutschlands gehört, verstehen. Die von Teilnehmern des letzten CVMA-Colloquiums im Mai 1977 in Freiburg geäusserten Bedenken haben inzwischen jedoch dazu geführt, dass die konservatorischen Bedingungen für die Glasmalereien im Augustinermuseum entscheidend verbessert werden sollen.

Nachbemerkung

Das Konstanzer Fenster ist bereits in dem soeben erschienenen ersten Teilband des CVMA Deutschland III (Baden/Pfalz) behandelt, die übrigen Fenster werden erst in dem 1981 erscheinenden zweiten Teilband enthalten sein. Es muss daher vorerst auf F. GEIGES, Der Mittelalterliche Fensterschmuck des Freiburger Münsters, Freiburg i.Br. 1931, verwiesen werden.

2.conservation and restoration of the medieval stained glass windows in freiburg cathedral

(Paper delivered by Rüdiger Becksmann at the annual meeting of the Münsterbauverein Freiburg May 20, 1979 - abbreviated by B. Mühlethaler and translated by Mrs. Hangartner, Zurich)

The Freiburg Cathedral has 80 windows of the most diverse shapes and dimensions. Only 20 of them contain exclusively colourless glazing; of the 60 windows either fully or partially decorated with stained glass, five are modern. 20 of those are copies of glasspaintings whose originals are at the Augustinian Museum or which had been stained anew by the stained-glass workshop of Helmle/Merzweiler in the late 19th century. All of them belong to the partially stained glazing of the choir chapels dating from the years 1515-1528. 35 of these windows have preserved their medieval stained glazing more or less intact. 13 of them are in the nave, 2 of them in St. Michael's chapel of the west tower, ten in the transept and its adjoining chapels, nine in the high choir and one in the vestry. In all, there are more than 500 glass-panes in these 35 windows. They were created between the early 13th and the early 16th centuries, covering a period of three centuries.

There are many reasons why the stained glass windows of the Freiburg Cathedral were less endangered than, for instance, those of the Cologne or Regensburg Cathedrals - not the least of them is the fact that the interior climate is relatively stable and dry. Nevertheless, the scientific inventory-taking of the medieval stained glass windows started in the late sixties within the CVMA framework has led to early plans for the conservation and restoration of the cathedral windows. Since 1971, the conservation work is being carried out by the stained glass workshops of Dr. Oidtmann at Linnich in cooperation with the Freiburg artistic glazier's shop Isele, under the supervision of the cathedral consturction engineer who is assisted by a committee. Two basic decisions had to be taken before work was started:
1. The stained glass windows had to be preserved by an external glazing which would assume the sealing function. 2. All measures of cleaning and fixation would have to observe the principle of minimum intervention with the original substance which, however, will only be possible by installing the external protective glazing. From the very beginning, the Freiburg team desisted from applying

any epoxy resin surface protection, and thermosetting adhesives were merely used on paint work in imminent jeopardy. The fact that modern restoration technology has not yet come up with any method of conservation appropriate for the materials involved endorses the critical restraint and the ways and means chosen in Freiburg.

Those of you who have closely observed the changes brought about by restoration on the stained glass windows of the cathedral will certainly not have missed the general increase of lightness, the improved translucidity of the medieval panes in particular. The recovery of transparency and light-colour - the very characteristic of nave windows of the late 13th and early 14th centuries - is due only to a limited extent to the removal of transparency-reducing weathering crusts on the exterior of the stained glass windows, but essentially to the removal of the artificial patination applied to the interior by Geiges. In his time, Geiges had justified this step by alleging that he could not leave the lightening caused by cleaning to natural patination. He even quoted Viollet-le-Duc who had claimed that the glass-stainers of the 13th century had already overpainted their glass-panes to subdue their brillancy. The overpaint applied by Geiges could easily be removed with an acetone solution. The detrimental effect of this overpaint on the appearance of the nave windows is impressively apparent from the half-cleaned medallion showing St. James on the blacksmiths' window (Fig.1). On the windows restored by Geiges between 1917 and 1927, the extent of soiling on their interior surfaces and their new weathering crusts on the outside were - with few exceptions - negligible.

The Geiges restoration has made the latest restoration easier, though. This is evident in the work performed on the "Window of Constance" which had not been restored by Geiges and which had remained more or less untouched since 1820. A comparison of the Crucifixion - one of the main oeuvres of Constance paintings around 1320 - before and after the restoration concluded in 1974 shows the desastrous state of repair of these windows (Fig. 2,3). The lead network had become so brittle that individual stained panes were no longer arranged on a plane. Consequently, the windows accumulated a lot of dirt. Besides, the varying degree of weathering had largely destroyed the original colour-emphasis of the stained glass. Due to the supreme technical quality of the stained glass and of the paint, the medieval appearance of these stained glass windows could be recovered to a surprising extent (Fig.4). The composite nature of the Constance window was basically left untouched as a sign of respect to a worthy effort in restoration and preservation of the 19th century. Actions of the War caused the loss in 1944 of the ornamental spandrels introduced by Geiges. In order to maintain the conglomerate nature of this window, a decision was finally reached to fill the large gusset (Fig.5) with the ornamental fragments of the original then kept at the Augustinian Museum. The small gussets were assembled from old glass into a free colour composition which emphasizes the unusual shape of the trefoil. The fact that this - from all points of view - difficult solution looks now so natural in the window is probably a token of its artistic quality.

Besides the Constance window and the coopers' window, the other nave windows owe their formal unity to Geiges' endeavour to restore the original appearance in line with the historicism of the outgoing 19th century. Although his historical expertise and his artistic sensitivity helped him achieve admirable results in this field, it was unavoidable that some of his solutions should seem questionable from today's point of view. The restoration committee's attitude in such cases is best shown on a comparison of the blacksmiths' window with the painters' window. The side panels in the painters' window with their savages standing in the tabernacles lack any iconographic foundation, since Solomon's throne in the center panel previously spread to the side panels as well and possibly showed prophets, and maybe virtues, in a step-like setup there. In spite of that, the window composition created by Geiges remained unchanged insofar as precise historical or archeological data for a reconstruction as indicated are missing. In this respect, the initial situation with the blacksmiths' window was entirely different. To complete the side panels, Geiges had designed horse coat of arms without taking into consideration that the two scenes below - Annunciation and Visitatio - must have been crowned by arcaded canopies like the topmost scenes. When we looked through the window panes in the workshop we found that the two existing canopy-panes do not match and that the pane of steeper proportions above the Flight to Egypt had been cut ogivally in the early 19th century. Completed as a rectangle, the crowning was recovered and, to reconstruct the window, all that was left to do was to copy each of the old window panes once, in order to restore the original grouping. It is further apparent that the figural panes must have been cut in the early 19th century because of the missing wing-tips of the angel in the Annunciation, the

incomplete banderol and the missing dove of the Holy Ghost. In this case, only the ground was stained.

So far, the greatest difficulties were encountered with the "Schauinsland"-window. It is the only fully preserved clerestory window of the nave now remaining from the second high-gothic glazing period. Its poor state of repair is due to its weatherward location which led to extensive loosening of the paint work and this jeopardized the preservation of the overpaint applied by Geiges. The consequence was that the colour grounds pieced out by Geiges were replaced, not always to our full satisfaction.

The coopers' window (Fig.6) now at Linnich for restoration, contains panes from different periods - like the Constance window - which were not created for the same location. Its restoration poses some special problems. It had not been included in the Geiges reorganization of holdings, nor had it been preserved in the conditions achieved in the course of the 19th century. Besides the tracery glazing, only the two lateral tabernacles belong to the original window composition at the present stage, whereas St. Anna in the center panel is the only remainder of a second window corresponding to the "Schauinsland"-window. The three base fields also come from the high nave. They are the remainders of a stained ornamental glazing of richly interlaced banderoles, as they were characteristic for churches of parishes or mendicant orders of the late 13the and early 14th centuries.

Since eleven of the twelve high nave windows have lost their stained glazing, the daylight streams into the interior in unhampered fullness. In 1977, this gave rise to thoughts that these window ought to be glazed with stained glass once more, thereby uniting the high nave and the aisles which heretofore seemed to be torn apart, into a homogenous whole and thereby to enhance the effect of the restored aisles even more. It would seem that all the requirements to achieve this objective would be met by a coloured ornamental glazing, as has been tried out in the meantime. The point of departure in this respect were the stained ornamental window panes in the coopers' window which used to be in the eastern windows on the high nave. Since banderoles have a long-standing tradition in glass staining, actually going back to its very beginning, it is an ageless ornament, permitting the most diverse variations and by means of rhythmical changes in shape and colour from one window to the next, or even within a window, it allows for an exciting, yet balanced overall impression. But above all, an adaptation to the contrasting window shapes in the high nave is possible without restraint on the given tracing.

The project of introducing stained glazing into the clerestory windows is still in its experimental stage. The restoration work is about to be finished. The coopers' window and the window of St. Peter and Paul's chapel are on their way back to Freiburg; the restoration work in the nave is expected to be completed at about the same time. The standing figure windows of the northern group of three windows from the transept and of the small Endingen choir, as well as the medallions of a Jesse tree in the southern group of three windows are still being worked on. The high choir windows carried out at the Ropstein workshop as well as the window of St. Anna's chapel are in good condition and are sufficiently preserved by the external protective glazing. Once the transept windows and the two windows from St.Michael's choir in the steeple are completed with panes from the Dominican church, the restoration program will be concluded in 1980, as planned.

The problem of the external protective glazing of the string of choir chapels has not yet been solved. The matter of returning the 44 original panes which were lent to the Augustinian Museum in 1927, to their original sites in the string of choir chapels, is still pending, too. At present, they're still replaced by the Geiges copies. The situation is paradoxical: Today, the originals would find almost ideal conditions of conservation in the cathedral - thanks to the external protective glazing and a balanced indoor climate - which are totally lacking in the basement of the Augustinian Museum and which seriously endanger their continued existence. On the other hand, although the return of these original panes to the cathedral is certainly desirable, it is also understandable that the Augustinian Museum is opposed to this since it owns one of the most extensive collections of stained glass windows of Germany. Meanwhile, the objections raises by the last CVMA colloquium in Freiburg in May 1977 have led to plans for decisive improvements in the conservation conditions for the stained glass in the Augustinian Museum.

Post scriptum

The Constance window is covered in the first partial volume of the CVMA Germany III (Baden/Pfalz) just published, the other windows will only be included in the second partial volume to be published in 1981. Therefore, please refer to F. GEIGES, The Medieval Window Decorations of the Freiburg Cathedral, Freiburg i.Br. 1931. for the time being.

3. book reviews

3.1 Journal of Glass Studies, Volume 20 (1978).

The first two articles are by Robert Charleston, and the first one ("Glass furnaces throughout the ages", pp. 9-33) must be the most comprehensive account of early glassmaking furnaces (from the earliest times up to the eighteenth century) ever to have been written. I thought I knew the literature well, but Robert has included references which were new to me. The article is well illustrated, with 30 figures drawn from the whole gamut of sources: 10 copies of original woodcuts or drawings; three engravings on glassware; two models of furnaces; two reconstructions of furnaces; four contemporary architects' plans; two site plans as revealed by excavations and one Renaissance easel painting. The scholarship is superb and no-one interested in early furnaces can ignore this thoughtful and well-documented survey.

The second article ("A gold and enamel box in the form of a glass furnace", pp. 34-44) describes a unique box, shaped like a glass furnace, which holds two crystal-glass scent bottles. The decorations around the sides show small enamelled figures carrying out all the operations needed for the operation of a furnace: pounding the raw materials in a mortar; making pots; teasing the furnace with billets of wood; blowing an article; using a pontil on a glassmaker's chair; annealing the ware.

The box is in the collection of Mr A.A. Houghton, Jr., and it seems to represent a German glasshouse of the late seventeenth or early eighteenth century, although there is no clue as to the reason for using it to hold scent bottles, nor who was the original owner.

The fourth article ("The use of equilibrated silica gel for the protection of glass with incipient crizzling", pp. 100-118) is the long-awaited article by Robert Brill on the way that controlled humidity cabinets have been constructed and used at the Corning Glass Museum for the storage of unstable glass. There have been problems in adequate sealing of the showcases against ingress of moisture during the summer, or egress during the winter, but the main procedure was to use large quantities of "equilibrated" silica gel (about 6 kg per cubic metre of show case).

We are so accustomed to the use of silica gel as a drying agent that it comes as a slight shock to realise that, if it is sprayed with distilled water (about 25% of its dry weight), it can be used to control the relative humidity of the cabinet at about 45%. There is much discussion of a technical nature, supported by several graphs, and anyone who needs to look after unstable glassware should consult this article.

3.2 Ancient glass in its context, By Anita Engle (Readings in Glass History No. 10), published by Phoenix Publications, Jerusalem, 1978.

This book is remarkable for its illustrations. It is described as 'an illustrated companion to Readings in Glass History Nos. 1-8' (No. 9 is the index volume) and it thus summarises the contents of the eight earlier volumes in addition to its main function of illustrating them. Briefly, it covers the origins and spread of glassmaking; the names and relationships of the families of medieval glassmakers; glassmaking areas and sites; glass and the silk route; the Islamic and Crusader periods; and the Elizabethan period.

There are more than 100 illustrations in the form of photographs, maps and sketches; perhaps the most fascinating photographs are those of the elusive River Belus (the modern Na'aman), stated by Pliny to have been for centuries the best source of sand for making glass and (erroneously) the alleged place were glass was discovered. Figures 1 and 2 show this murky little river and, if anything, heighten the mystery surrounding it.

Another interesting photograph is that (Figure 58) of the 8-ton rectangular slab of glass made in the middle of the first millennium A.D.; no one has yet given a convincing reason why it was made, although it now seems clear that one of the earliest tank furnaces was used for melting it, some 1500 years ago.

Other fascinating photographs show how entirely different types of ancient glassware could be blown from the same mould (Figure 53), and now (Figure 69) Judaeo-Christian symbols were used to decorate mould-blown bottles, both types evidently coming from the same glassworks.

This book will appeal to everyone having an interest in ancient glass, although some of the author's speculations may well cause an eyebrow or two to be raised.

3.3 The Stained and painted glass of York Minster, by Peter Gibson, published by Jarrold Colour Publications of Norwich, for the Dean and Chapter of York, 1979, £1.25.

This modest little booklet of 48 pages is quite unlike any other book on stained glass that I have seen because all the 48 coloured illustrations show only parts of windows, and never whole windows. So often these books attempt to show whole windows with the result that the reader sees neither the full glory of the window, nor the beauty of the detail.

The photographs were selected to form a pocket-sized guide book to be taken on a tour of the Minster, giving close-ups of the points which are of particular interest at various stages of the tour. Thus there are details of styles of painting (from the 12th century to Bossanyi), and of different techniques, such as silver staining and enamelling, but these illustrations also provide a quite different catalogue of interesting features. Thus Plates 1, 33 and 34 show examples of medieval humour; Plates 2 and 4 illustrate details of corrosion; Plate 3 is a good example of how newly-painted heads, in excellent imitation of twelfth-century work, can enhance the 'readability' of a restored window; Plates 20 and 21 show how a panel can be rearranged during its restoration; Plate 5 illustrates how the Five Sisters grisaille window, usually regarded as being 'colourless', actually contains fascinating patterns of colour, etc.

This is therefore a booklet to be recommended, both as a guide to the glass in York Minster and a handbook for increasing general interest in the fascinating world of stained glass.

3.4 Corrosion of Glass, by David E. Clark, Carlo G. Pantano, Jr., and Larry L. Hench, published by "Books for Industry and the Glass Industry", New York, 1979.

This book of 75 pages is a summary of the present state of knowledge of the corrosion of glass. The five chapters are devoted to: (1) a general review of corrosion and weathering of glass; (2) the many modern methods now available for studying corrosion phenomena; (3) the corrosion of glass by aqueous solutions; (4) the weathering of glass; and (5) the effects of methods of manufacture on the durability of glass articles.

There are 83 illustrations (photographs, diagrams or graphs) and the book is essential reading for anyone who wants to learn the present position in understanding, or predicting, the durability of glass.

4. abstracts

358. Scapova, Julia. "A propos de l'origine de la verrerie". Paper delivered at the 8th congress of the association of the history of glass (1979)

Le problème de l'origine de la verrerie s'est enrichi de nouvelles données qui nous sont fournies par la chimie et la technologie du verre ancien.

Composition principale, additions modifiées, technologie de la fabrication du verre, de la faience, de la cèramique et des métaux (cuivre et bronze) sont réexaminées et comparées.

Le coéfficient de liaison R_2O/RO qui est égale 0,6, caractérise les réalions de la faience, du verre et du métaux.

La faience et le verre sont qualitativement pareils: ils se composent de silice (une base), d'alcalis et de calcium-magnèsium (les fractions l'égères fondues). Ces dernières atteignent 20% en verre et sont moins 10% - en faience. Cette diffèrance quantitative détermine, à elle seule, les propriétée physiques et chimiques differents des deux substances. L'antiquité de la faiences glaçures est bien établie. Le verre, en tant que matèriel, peut être sporadiquement fait sur la base de faiences glaçures en même temps, exister dans leur cadre.

C'est pourquoi on peut envisager que L'histoire du verre en tant que matèriel commence des l'èpoque aussi éloignée que celle des faiences.

La technologie de fabrication des objets en verre tels comme fondage, soudage, pressage etc. est pareille du cuivre et du bronze ainsi que creusets et moules. La technologie du verre est une adaptation partielle de la technologie des métaux au matériel qui lui pareil, mais qui, en même temps, lui est différant. Cette adoptation est devenu possile à partir de l'èpoque du haut bronze. C'est pourquoi les dé ut de la verrerie comme branche de mètier doivent être portès à cette époque-la.
(Author's abstract)

359. Dekówna, Maria. "Remarques sur la chronologie de l'introduction dans la verrerie européenne médiévale de la technologie potassique et celle de plomb non alcaline" Paper delivered at the 8th congress of the association of the history of glass (1979)

Les nouvelles trouvailles des verres qui ont été découverts dans les ensembles archéologiques à la chronologie précise de l'Europe centrale et de sud-est démontrent, que l'introduction de la technologie potassique / basée sur l'application des cendres des plantes continentales / a eu lieu, au moins, dans la 2ème moitié du VIIIe siècle, et l'introduction de la technologie de plomb non alcaline - aux VIIIe - IXe siècles. Les études détaillées sur la composition chimique de ces verres ont permis de constater, que la transformation en technologie appliquée dans la verrerie européenne s'est produite par les menus changements technologiques, dont à peine la totalité ont abouti à élaborer de nouvelles recettes.
(Authors abstract)

360. Foy, Danièle, "Un atelier de verrier du XIVe siècle a Cadrix" (Saint-Maximin-la-Sainte-Baume; Var) Paper delivered at the 8th congress of the association of the history of glass (1979)

Cinq campagnes de fouilles ont été réalisées au lieu dit Cadrix sur la commune de Saint-Maximin-la-Sainte-Baume dans le Var. On a mis au jour, sur la plateforme sommitale d'une colline. un castrum du XIe siècle avec son habitat et ses structures agricoles (huilerie). Dans la seconde moitié du XIVe siècle, le site a été partiellement réoccupé par un atelier de verrier. Les structures antérieures ont été alors en partie réutilisées et transformées; deux maisons en pierre ont été aménagées: l'une servant probablement d'habitation, l'autre d'atelier. Dans cette dernière, un four en pierres liées à l'argile a été bâti sur le rocher. Ce four, conservé jusqu'au départ de la voûte est unique. Aucun autre four de recuit n'a été découvert. Les fragments de verres et de creusets retrouvés, permettent de connaitre les productions de cet artisanat (gobelets moulés de fifférentes proportions, bouteilles décorée en verre verdâtre relativement épais, fioles incolores au goulot double, gobelets et coupelles decorés de filets de verre bleu rapportés) dont des pièces comparables ont été signalées dans diverses fouilles medievales de Provence. Les analyses physico-chimiques (fluorescence X) donnent la composition de ce verre à fondant sodique.

Dans le bassin de Saint-Maximin, on ne connaissait l'artisanat du verre qu'à partir du XVe siècle par des textes attestant l'arrivee de verriers italiens, en particulier d'Altare. L'archéologie - par les fouilles de Cadrix et du Castrum proche de Rougiers où un travail du verre s'est aussi effectué - perment de reconnaitre un artisanat assez important pour alimenter en verre tout la région et notamment la ville de Marseille comme le mentionnent les données scripturaires.
(Author's abstract)

361. Spitzer-Aronson, Martha. "Project of an archaeometric reference Corpus. Physical and Chemical microstructures of the York Minster medieval old stained glasses. Paper delivered at the 8th congress of the association of the history of glass (1979)

We propose a complementary Corpus of medieval old stained glasses, Corpus adjoining to historical studies the new scientific Data and allowing a interdisciplinary point of vue.

Effectively, the chemical analysis, the investigation on corrosion and conservation technics, but also the results of new Physics methods - methods undestructible and arranged for a precise research of old stained glasses physical and chemical microstructures - the whole representing a documentation bound to each cathedral.

We present the results of Physic research (our M I) with archaeometric Data bounded to the history of the conditions - ethnical, technical, mining and firests - of medieval Europe.
(Authors abstract)

362. Newton, Roy, G., Holloway, D.G. and Hench, L.L. "Spontaneous cracking of ancient glass" Paper delivered at the 8th congress of the association of the history of glass (1979).

A study of several examples of alleged "spontaneous cracking" has strongly suggested that they all arose from some kind of surface damage (such as scratching or impacting) before burial or before excavation. Thus it is now believed that visible "spontaneous" cracking does not occur, but the title of this contribution has been retained in order to draw attention to the contents.

Under the influence of prolonged weathering during burial, produced by permanent moisture or persistent high humidity, points of relatively insignificant surface damage can, on susceptible glasses, become visible or develop into cracks; in extreme cases holes or slots are formed which penetrate through the glass.

Several apparently strange defects found on ancient glass objects have been duplicated on modern glass, by causing different kinds of deliberate damage followed by accelerated "weathering" in dilute hydrofluoric acid. It has even been possible to produce sharp-cornered slots which penetrate through the glass.
(Author's abstract)

363. Hetman, F.W. (1977) "Stained glass window / Frame restoration: architectural considerations / Repair / Replacements Procedures", Technology and Conservation, 1977, Vol.2, No.3, pg. 12-16

Topics dealt with: Restoration project for the christian Reformed Church, Pease, Minesota - Problems posed by weathering, deterioration of structural members - two possible restoration approaches, "temporary repair" versus De Vac's method:

The former usually consists of replacing missing or shattered sections of glass with new glass that may or may not be properly matched in color or tone; attaching aluminum T-shaped members horizontally across the window opening to accept and hold in place storm glazing; and caulking around the perimeter of the storm glazing. Sometimes the temporary repair method also will consist of attaching horizontal reinforcing bars across the stained glass in an attempt to straighten bulged glass. When either of the reinforcing bars of the aluminum T-shaped members are attached, they often are located without regard to the design of the stained glass, resulting in unsightly lines across the window that were not intended in the original stained glass design.

De Vac's alternative plan in volues removing the windows from the window opening, cleaning and repairing the stained glass and the lead cames between the pieces of glass, constructing new window frames that include a storm window, and reinstalling the stained glass in the new frames in the building.

To make sure that the building committee was aware of the scope of the problems that they had with the windows in their church, the company pointed out all of the evidence of deterioration. This included bulging of the stained glass, a high rate of air infiltration through both the stained glass and the wood framing, rotted frames, and sagging transom bars on the hinged sash.

The problems were compounded by some previous temporary repair work that had resulted in stained glass windows containing glass that was not well matched to the original glass. Continued temporary repair probably would result in loss of beauty and value of the stained glass windows. In addition, temporary repair efforts by their nature cannot restore the window frames, or even prevent their further deterioration. Plus, if the congregation of the church decided again to try to remedy its window problems by the temporary repair method, it would probably be 10 years after the temporary repair work had been completed before the congregation and building committee would take another look at the windows. And, in 10 years, the memberships of the building committee and consistory may be entirely changed, so that instead of having a total restoration job done properly at this time, the same mistakes could easily be repeated.

Further topics: Selectionprocedure - Fishing aged and damaged stained glass - Insulating abilities and aeration facilities.
(Bruno Mühlethaler)

364. Millard, Richard. (1979)"Stained glass Preservation: Guidelines for Repair and for restoration", Technology and Conservation, 1979, Vol.4, No.1, pg. 36-41.

Since most of the stained glass in the United States and Canada is much younger than most European glass, there has not been much "restoration" work done in North America to date (nor much need for it). Most of the restoration here that has been performed has been on European glass, with some done on American work created by the Bolton Brothers, Tiffany, and Wrigt Goodhue. However, there is much need, and it is increasing, for repair of stained glass. The article then exposes the various changes that can happen to stainedglass - briefly discussing the technical and aesthetic problems presented in the restoration work conducted at Chartres Cathedral and Canterbury Cathedral the need of a balanced approach is exemplified - Description of technical methods of repair - As examples of excellent work that can be carried out serve the recent stained glass projects described here: The Chicago Public Library, Fordham University Chapel, National arts Club and Cooper-Hewitt Museum.
(Bruno Mühlethaler)

365. Spitzer-Aronson, M. "Nouvelles méthodes non destructives destinées à la recherche fondamentale sur les vitraux médiévaux". Silicates Industriels, Octobre 1978, Tome XLIII-No. 10, pages 213-219

For the study of medieval old-stained glasses, conforming to the Corpus Vitrearum Medii Aevi technical programme, a new physical non destructive method is presented. It is based on a precise coordination of all informations obtained thanks to the investigation possibilities of Physic instruments like: The Electroprobe X-Rays Microanalyzer (EPMA), the Scanning Electron Microscope (SEM), the Ionic Micro-Analyzer (SIMS) and the Optic Microscope (OM).

Three successive optic microscope studies are done and connected to EPMA-Scan lines studies. Special "Correlation-Diagrams" give the accurate reciprocal distribution of the elements contens, colour variations and chemical and physical properties variance.
(Author's abstract)

366. Spitzer-Aronson, M. "Précisions sur les techniques médiévales des vitraux, par des recherches en Physiques". Verres et Réfractaires Vol. 33, No.1 Janv. 1979, Institut du Verre, Paris.

The microstructure of different series of early medieval european coloured old-stained cathedral glasses - conforming to Corpus Vitrearum Medii Aevi technical programme - were studied. Theories on the making of these glasses and especially the colouring techniques were discussed. An analysis of the diffusion of copper, zinc and tin, introduced together at fabrication time, and of coloured layers, was performed and final remarks were made on three types of archaeometric glass processes date. (Author's abstract)

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