

CV NEWS LETTER 19

Comité Technique du Corpus Vitrearum

Physics, University of York

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1 GENERAL

1.1 EUROPEAN SCIENCE FOUNDATION

The group of experts which met in Munich on 25th February consisted of:-

Dr E. Bacher, Comité Technique, representative of Austria
 Dr J.C. Ferrazzini, Comité Technique, representative of Switzerland
 Professor W. Gentner, Chairman, and member of the E.S.F. Steering Committee for Archaeology Group
 Professor L. Grodecki, President of the Corpus Vitrearum
 Professor R.G. Newton, President of Comité Technique and a Vice-President of the Corpus Vitrearum
 Dr F. Schneider, Secretary General of the E.S.F.
 Professor H. Scholze, Director of the Institut für Silicatforschung in Würzburg
 Dr M.O. Ottosson, Secretary, Scientific Assistant at the E.S.F.

There was a long discussion of many aspects of the urgent work to be done on the conservation of medieval stained glass windows and eventually it was agreed to recommend that the E.S.F. Council should seek support for three topics:-

- (a) the preparation of ten more specially-melted simulated medieval glasses, having different weathering characteristics, so that experimental conservation procedures can be standardised (and also carried out more precisely) in all the laboratories,
- (b) the study of any long-term adverse effects of well-documented conservation procedures used previously, e.g. in the 19th century or even earlier, and
- (c) a fundamental study of the effect of Viacryl VC363 on the actual surfaces of poorly

durable glasses of medieval types when exposed to accelerated weathering.

Problem (c) is certainly the most urgent but it is also by far the most expensive project of the three, so much so that it is possibly too expensive to undertake! The draft proposals will be submitted to the Comité Technique for comment during April, before being sent to the E.S.F. Council in May.

1.2 ERRATA

1.2.1 News Letter No.18

Unfortunately there are several typographical errors in N.L. No.18 because the Editor tried to economise by sending material in his own handwriting.

Page 1, col. 1, line 5 from the bottom, the name of the Italian representative is Marchini.

Page 1, col. 2, line 1, the name of the Czech representative is Losos.

Page 3, item 1.3.1, I referred to the 19th century glass being fixed "behind" the existing white glass in the clerestory instead of "in front of".

Page 9, col. 1, section 4.1, line 4 from the end, "10% soda" should read "1.0% soda".

Page 11, col. 2, line 7 from the end, the address should be "29 Clarendon Road".

Dr Martha Spitzer-Aronson has asked me to make an amendment to item 1.1.5 on page 2. Not only has she had great experience in analysing copper rubies but she has also done fundamental work on the subject.

1.2.2 News Letter No.17

Frau Dr Eva Frodl-Kraft has kindly written to point out that I have slightly misunderstood her meaning in Abstract No.202, page 9, col. 2, when I wrote that she was "probably right" when she thought that "solution" processes of cleaning may loosen paint which is undermined by corrosion products. She has sent me photographs to prove her point and these are given in item 1.3.

1.3 LOSS OF PAINT WHEN CLEANING WITH PLAIN WATER

Frau Dr Eva Frodl-Kraft's comment in connection with erratum 1.2.2 is "I do not assume that wet cleaning might loosen part of the paint because we have definite evidence that soaking in plain water can bring about substantial loss of paint. This is shown in Fig.1, from the South Rose window of the Wallfahrtskirche at Strassengel. The view on the left is before soaking and that on the right shows that 20% of the painted linework was lost. Moreover, it was very difficult to discern, before the treatment, whether the paint was loose or not."

1.4 DOES FUNGUS GROW ON MEDIEVAL GLASS? - PART 2

In item 1.2 of N.L. No.16 I reported that there had been a suggestion that fungus might have been growing inside the broken plating of a window in Barsham Church, in Suffolk, England, but subsequent investigation showed that the patterned "growth" was not that of a fungus. Some inorganic material (either gypsum or silica) had formed a pattern like a fungal growth.

Recently a report was received that a "fungus" was growing inside the plating at Beerbach Church near Nuremberg in Germany. Frau Eva Ullrich, of Dr Frenzel's restoration workshop, kindly visited Beerbach Church and discovered that this "fungus" was actually a collection of dead beetles, as is shown by her photograph, reproduced as Fig.2.

No one else has written to me in connection with this enquiry about fungal growth on glass. Does anyone know of a case? If so, please write to me with details and a photograph. If possible, a piece of the glass, with the fungus on it, should be sent as well so that laboratory tests can be carried out.

2 "CONTRARY OPINIONS"

In this new feature of the News Letters, where differences of opinion can be stated, the Editor takes no responsibility for the views expressed other than that of giving some space to the outbursts which seem to him to be more tolerant than those to which he gives no attention!

Mr Frederick Cole, RF, FMGP, of the Canterbury Glass Restoration Studio, has written about Dr W.P. Bauer's paper on the cleaning of glass, translated in item 2 of N.L. No. 18. He says: "I have read Dr Bauer's paper with interest but I wonder whether he really appreciates how I used the hydrofluoric acid when polishing (not 'cleaning') the glass at Canterbury after it had been cleaned by airbrading. I am not surprised that he has considered the procedure to be 'disastrous' because I would have had the same opinion if I had used the method which he employed!"

"First, I did not 'immerse' (eintauchen) the glass in the acid but I used a corrugated plastic tray and added acid until it exactly reached the tops of the corrugations. The 'inner' surface of the glass had been protected with a coating of beeswax and the outer surface, which had previously been cleaned with the airbrasive equipment, was then carefully placed on the corrugations in the tray, using rubber gloves. Thus the outer surface of the glass was just wetted by the acid and neither the acid nor its fumes reached the painted side.

"Secondly, there was no evidence at Canterbury of the painted linework lifting after the acid-polishing had been completed.

"Thirdly, any formation of a white slurry indicates either that the acid has been too concentrated or the time of the treatment has been too long.

"Examination with a microscope, before and after treatment with the acid, demonstrated that most of the Canterbury glass did not show roughening of the surface in the acid; instead, a high polish was produced. Occasionally, if a 'crusted' type of glass was treated instead of the usual 'pitted' type, the polishing effect was not so satisfactory and it is possible that Dr Bauer's glass from St Michael-in-Wachau was of the type which is not suitable for polishing with acid, at least with the concentration which had been used at Canterbury. In other cases, where the pitting was very deep, the acid did not always reach the bottom of the pits and then the polishing was incomplete.

"Dr Bauer listed three requirements for a cleaning technique but there is a fourth point which should be considered, that of improving the durability of the surface during cleaning. It seems that, with glass of the Canterbury type, the surface can be made more durable by treatment with hydrofluoric acid owing to its leaching effect on the alkalis (see News Letters No.12, item 2; No.13, item 2.1 and No.14, item 4).

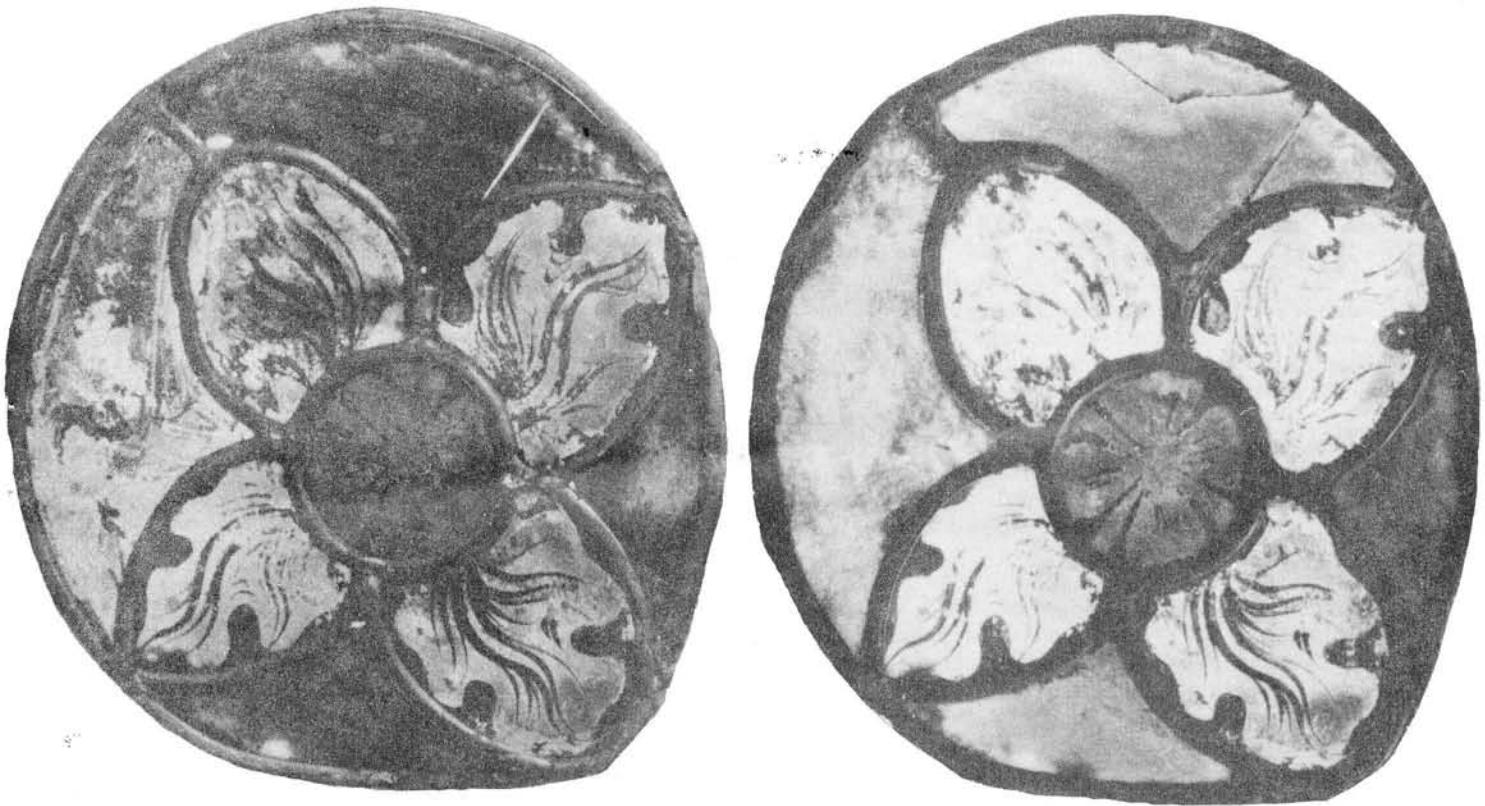


Fig. 1 Part of the South Rose Window of the Pilgrims' Church at Strassengel. Left, before cleaning. Right, after cleaning for a short time in a bath of pure water; there has been a substantial loss of the painted linework. See item 1.3.



Fig. 2 This photograph, taken by Frau Eva Ulrich, shows the mass of beetles which had collected between the plating glass and the stained glass window at Beerbach Church, near Nuremburg. A 'fungal growth' had been reported. See item 1.4.

"As regards cleaning with the airbrasive equipment, reference should always be made to the type of 'grit' used. Using the grades supplied by GEC-Elliott Automation Ltd., both No.3 (alumina) and No.8 (silicon carbide) 'bite' into the glass and roughen it but No.9

(glass ballotini) should be used for most of the operations because it has a peening effect. Microscopic examination shows that Powder No.9 produces a smooth, even polishing effect on surfaces which have been roughened by weathering or by coarse abrasion."

3 THE FUTURE OF THE CORPUS ?

Dr Eva Frodl-Kraft has kindly sent me the note which she produced about the 9th Colloquium of the Corpus Vitrearum, held in Paris in September 1975. It was published in OZKD 1975 29 154-158 but it contains much more than a mere account of the Colloquium, being in fact some philosophical thoughts about the Corpus Vitrearum and its future. I am therefore delighted to include an edited translation of it here.

"Since the last Colloquium, held in York and Canterbury in 1972, Prof. Hans Hahnloser and Mr Derek Allen have died, and then, just before the Paris Colloquium, Prof. Hans Wentzel was suddenly taken ill and died, only in his early seventies.

"Wentzel had been responsible during the war for hiding and keeping photographic records of German and Austrian historic glass and he took the opportunity of studying the greater part of the material himself. Before the 'Corpus' as such began its work, i.e. during the war, he had prepared a volume on Swabia as a pattern for a series which would cover all German stained glass, but the book was destroyed by fire in 1945 as it was going to press. When an organisation was set up for the documentation of medieval stained glass it was thus natural that Wentzel should take on the academic direction of CVMA in the Federal Republic. In 1958 he brought out his work on Swabia, expanded and revised on the lines laid down by the Corpus, as the first German volume of the Corpus. He lived just long enough to see the publication of the second volume, devoted to the glass of Cologne Cathedral. Although he was by no means always a comfortable 'father' to the German authors under his leadership, because of the high standard he demanded of academic work, and not least his own, Wentzel established the high level of the work right from the start and now, after twenty years of Corpus work, we can truthfully say that he was one of the main guarantors of the international esteem in which this work is held.

"But Hans Wentzel was a warm and sensitive man, and a friend of incomparable loyalty; it is this gap which his colleagues, meeting in Paris, found even more difficult to fill than the academic one.

"Shortly after the Colloquium, the Corpus lost another of its fathers - Jean Lafond, the old master of French research into medieval glass. Although his great age prevented him from being present in person at York, a lucky star had ensured that he could be present in the printed word in the form of the volume on the Church of St-Ouen de Rouen. During years

of close personal collaboration on the second French Corpus volume he passed on much of his knowledge to his young assistants, especially to Françoise Perrot. Lafond also passed on his love of the subject, something which does not always happen in the normal teaching situation.

"We have thus lost three of the men who were present at the birth of the Corpus and who carried it on since then; with Hahnloser's death we also lost the leadership, which had never been questioned in all these years. A 'generation gap' has set in, and the Paris conference found itself faced with completely new conditions: the relationship with the UAI and the CIHA, both of which are patrons of the CVMA, needed clarification because previously the contacts had been made exclusively by Hahnloser. The International Committee, made up of representatives of all the countries participating in the Corpus, or of the corresponding national committees, needed tighter organisation; among other things, the International Publication Committee, whose individual members had indeed undertaken the checking of Corpus manuscripts, did not really function as a committee and needed to be given some real power; and finally the relationship of the International Technical Committee to the Corpus as a whole had to be formalised. This Committee of the Corpus, which is concerned with material research into glass and problems of conservation and preservation (which Hahnloser had formed and directed) has recently begun to take over the major proportion of our international activity. Admittedly, this is not surprising when we remember the urgency of preservation work, the inadequacy of our knowledge and the questionable value of some of the methods used.

"A prerequisite for the satisfactory solution of all these problems, and of new ones which might arise, was to ensure continuity; this requirement had in fact been anticipated by Hahnloser himself when - almost on his death-bed - he was able to persuade the most well-known academic personality of the CVMA, who had been connected with the enterprise from its inception, not least as an author, to act temporarily as his successor. The Colloquium, i.e. that part which consisted of the delegates of the national committees, then elected Professor Louis Grodecki of Paris as the definitive President of the International Committee, which represents the Corpus on the international institutions with which it has links. The international office, with Françoise Perrot elected as secretary, will now be located in Paris.

(The article then describes the election of the officers, see item 1.1 of N.L. No.17)

"It will be the job of the International Corpus Committee, which is made up of representatives from the National Committees, to maintain contacts between the National Committees (these are the real executives). The extent to which decisions which concern the enterprise as a whole fall into the lap of the Presidency, or the point at which this freedom of decision is taken over by the two patron institutions, CIHA and the UAI, is just as difficult a problem as is the division of power between these two institutions themselves. Some insight into these complicated relationships is provided by the evolution of the new Statutes of the CVMA. A draft compiled by Professor Grodecki (intended to replace an unpublished statute devised by Hahnloser in 1952) was laid before CIHA in June 1975 and approved by them. In the same month, the draft was also laid before the UAI who commented on it, discussed it and finally worked out an amended text. The new version then went back to CIHA for formal approval and was ratified by them on 3rd September 1975. It was this version of the Statutes which was put before the Paris Colloquium as the definitive one. In these statutes, under Point II, the two institutions CIHA and UAI are mentioned as patrons of equal rank with the same obligations. For it is obvious that an enterprise which has published seventeen volumes so far, and thus demonstrated its efficiency, is an asset to its patrons and also places obligations on them, not least of a financial nature. As far as the basic decisions are concerned, these will form a useful working basis for the next phase of the Corpus Vitrearum. The scene was reminiscent of the death of a monarch; the bereaved populace, attempting uncertainly to take its affairs in hand, sees itself drawn into a net of established powers, of whose existence it was barely aware, which make themselves felt after the death of the monarch.

"From the practical point of view, the new Statutes have far-reaching consequences for the future of the enterprise: Belgium, Great Britain, the Netherlands and Spain all have glass which is younger than 'about 1500' which has been used to define the term 'medieval'. However, in cases where the majority of the glass is late-medieval (or even where no earlier glass exists at all, as in Holland) and where there is an express desire to publish within the established guidelines of the enterprise as a whole, then the label 'Corpus Vitrearum Medii Aevi' is really contradictory. CIHA therefore considers that the enterprise should in future be known merely as the 'Corpus Vitrearum' (although the acronym CVMA could be retained). Those countries which continue to limit their publications to medieval glass may continue to use the old style.

"The decisions cited here are indeed far-reaching, but they took up only a little of the Colloquium's time. From the start, attention

was concentrated, both as regards the participants and as regards the papers and the visits, on the work of the Technical Committee. This was even more true of the Paris conference, since the choice of location had been influenced by the fact that one of the west windows of Chartres Cathedral is at present being restored (the restoration of the Jesse Tree window has already been completed). The participants thus had the opportunity of studying one of the most important series of 12th century glass at close quarters and of obtaining detailed information about the methods of restoration and conservation at the Gaudin workshops in Paris. Never before in the history of stained glass restoration has a project had such a thorough scientific and technological preparation. The L.R.M.H. in Champs-sur-Marne, established and directed by Inspector-General Jean Taralon, had for several years commissioned systematic investigations into cleaning, adhesion and surface protection of the glass. All the methods used are based on their results, which have been reported orally and in print by M J.M. Bettembourg (see News Letters 11(169,170); 13(181); 15(169)). Since external protective glazing cannot be used on the west face of Chartres for aesthetic reasons, the three large windows there must be protected against further weathering, to some extent at least, by an external coating of plastics. It gives the Austrian conservationists some satisfaction to know that the synthetic resin Viacryl VC363 (mentioned at the York-Canterbury Colloquium and also published in ŽZKD 1973 27 63, and Fig.67) which was first used on a test panel in the east window of St Maria am Gestade in Vienna in 1971, proved to be the best of all the materials tested in every respect in accelerated weathering tests. However, this satisfaction is mingled with the worry that too much confidence might have been placed on this protective film, which we have not yet dared to use on an original Austrian medieval glazing. This worry is increased by the report that the restored windows at Canterbury Cathedral are also to be treated with Viacryl. (RGN - in late 1975 a decision was taken not to use it any more at Canterbury, at least unless external protective glazing is also used.) Periodic close examination will be essential at both Chartres and Canterbury, and this is already planned.

"The cleaning of the outside of the glass with wet processes produced an unexpected result, at least as far as wider publication is concerned. When the Jesse Tree window was replaced in Chartres Cathedral it was seen in contrast to the uncleansed Passion window and caused an outcry in the Press against this restoration, the reporter apparently having the backing of authorities of the standing of Emile Mâles. Prior to the restoration, the glowing blue glass, which had suffered little weathering, had dominated out of all proportion the other, largely severely darkened colours. The famous 'sky-blue' glow of Chartres was thus not due to any artistic intention but to unequal ageing (a parallel is the chrysoprase green in German and Austrian painted glass of the 13th and 14th centuries; chemical analysis of the blue

glasses of Chartres was therefore of major interest). There can be no doubt that cleaning, although it has destroyed a cherished myth and the associated 'inherited picture', has created a balance of light and colour which comes much closer to the original. The increase in transparency might also be due to the use of the plastics coating on the outside, since the plastics material has a different refractive index.

"However, contact by the delegates with the originals was not restricted to Chartres; they also had the opportunity of viewing another prominent example of gothic painted glass, the Martyrdom of St Vincent from Saint-Denis; the very unusual kind of weathering here has concerned experts since the Paris exhibition of 1953 (see the catalogue 'Vitraux de France du XIe au XVIe siècle' published in Paris, 1953, No.3, p.39, plate 2).

"However, delegates were particularly glad to be invited by one of the old masters of French painted glass restoration (and one of the most prominent experts on painted glass), J.J. Gruber, to visit his workshop where, among other things, work is in progress on the restoration of the Ascension or Pentecost panels from Le Champ (Isère) dating from 1160. Anyone concerned with medieval glass would be glad of an opportunity to get to know this late-Romanesque work from southwest France. Whereas in French painted glass execution is generally determined by the scale of the cathedral, so that it is large and also has a certain degree of uniformity, the painted glass from Le Champ, which is in excellent condition, shows the heights which can be reached - with the technical aspects inextricably merged with the artistic - when a window is created as an individual work of art.

"I shall not discuss the conference papers in detail - in part they concern very specialised technological problems - as they will doubtless be summarised in the very valuable News Letters published by Professor Roy Newton.

"The International Committee or its President will have the difficult task of integrating the extremely important scientific-technological research of the Corpus Vitrearum with the aesthetic work. The task is difficult because in the first place there is a danger that, if subjected to international discussion, questions of aesthetics and methods will be the losers, and because in the second place aesthetic-technological work should not be restricted but should be expanded. If we attempt to find a solution to the problem in separation, say by separating art historians and restorers, then we sacrifice the basic idea which inspired Hahnloser and his friends when they set up the Technical Committee. Research on materials is needed to answer the problems raised by aesthetics in the interests of safeguarding and backing up its own results; it is also needed to achieve concrete practical results. It is the task of the committee continually to adjust the course followed by scientists thus ensuring that they

follow the basic precepts of conservation (whose first task is to save the original) and also to prevent technological research from becoming an end in itself. (RGN - as I am the Chairman of this Committee I must take proper note of these remarks!)

"In future, therefore, there must not be a separation or even a simple running in parallel; on the contrary, there must be closer cooperation between art-historians and conservationists on the work of the Technical Committee. However, it will only be possible to handle the large amount of scientific work in a single forum, say at the next Colloquium, if it has already been co-ordinated and overseen by the Technical Committee. Perhaps the Centre International d'Etudes pour la Conservation et la Restauration des Biens Culturels in Rome, whom we must already thank for the translation of the Corpus News Letters into German, could be asked to assist in this important sector. (RGN - no doubt Professor Phillipot will read this when he gets this News Letter, and we shall get in touch with each other!)

"At the present time, however, the situation is that neither the art historian nor the conservationist can really cover the - fortunately - extensive range of scientific and technological research work or its results; there is thus always a danger that the restorer will receive information which is quite one-sided. (RGN - Can the Chairman of the Comité Technique help here, also?)

"Although I cannot give a report of the Colloquium papers here, I should in conclusion like to refer to one paper because it throws new light on the tragic-grotesque business of Austrian conservation and restoration. Jane Hayward reported on the exhibition of the painted glass from St Leonhard i.L., now owned by the Metropolitan Museum in New York. It is well known that the panels were dismantled in 1935 to make way for a monstrous new tower building - see E. Frodl-Kraft 'Die Geschichte eines Glasgemälde-Verkaufs' (The history of the sale of some stained glass) OZKD 1965 19 186-190, Figs.183-186). The Metropolitan Museum purchased them in stages between 1965 and 1970, restored them and did not spare any expense in altering the middle window in the 'gothic chapel' of the cloisters (built in 1938) to correspond with the windows of the north chapel in St Leonhard's, where the panels had come from, i.e. the tracery and bars were copied. Thus the painted glass, in the middle window including the tracery and bars, but without these in the side windows, is now a quasi-original setting (see the illustration on p.157 of the original article). Any visitor to St Leonhard's who is disappointed because the chapel has been deprived of its glass thus only needs to travel to New York to see the original relationship of stonework and windows. As a protection against the unfavourable effects of the New York climate, the windows of the 'Gothic chapel' have been fitted with external protective glazing (see the paper by Jane Hayward in the proceedings of the Colloquium - published in *Verres et Réfractaires*).

"There would be a significant gap in any report on the Colloquium if it did not stress the extremely good organisation (together with excellent hospitality) of the French organisers. In particular, mention should be made of Inspector-General Jean Taralon and his colleagues in Champs-sur-Marne and of Mme Françoise Perrot.

"Above all, we should say how much it means to the work of the Corpus that Professor Louis Grodecki has agreed to take over the leadership at such a critical time: this is indeed a guarantee for the survival and further development of an international enterprise directed by common scientific precepts."

4 RESEARCH FACILITIES IN EUROPE – PART 1

The European Science Foundation wishes to encourage co-operation among all European countries in the study of stained glass and they have asked me to list the organisations which possess suitable experimental facilities, and other expertise, and to describe these facilities.

There are at least 15 organisations in Europe which can help with stained glass (and one in America) and a start has been made in this News Letter (Part I) by describing four of them. Other organisations will be described in subsequent News Letters.

4.1 ERLANGEN Institut für Werkstoffwissenschaften III Universität Erlangen – Nürnberg, 852 Erlangen, Martenstrasse, 5, Germany. Tel. (09131) 85-75-41.

This organisation is one of the best in Europe for helping with stained glass, in view of the nature of the apparatus and the expertise of the staff. It does, in fact, have a senior member of the staff (Frau Dr H. Marschner) who is responsible for Archäometrie.

The Director of the Institute, Professor Dr H.J. Oel, has had a long experience of glass, having come from the Max Planck Institute for Silicate Research in Würzburg (Professor A. Dietzel) and has published a number of papers concerned with the durability of glass. The Oberingenieur, Dr H.A. Schaeffer, is concerned with experiments on corrosion of glasses, leaching of ions from glasses, evaporation of soda from glass surfaces, and diffusion of materials in glass. Another senior member of staff, Dr J.R. Varner, is concerned (among other things) with the protective effect on glass of surface compressive stresses.

Thus the team is well able to understand the problems which are currently causing the greatest concern to restorers and conservators. Their sophisticated equipment includes the scanning electron microscope, analysis by X-ray fluorescence (including the removal of inter-element effects), X-ray diffraction, and many kinds of spectroscopy.

4.2 OXFORD Research Laboratory for Archaeology and the History of Art, 6 Keble Road, Oxford OX1 3QJ. Tel. (0865) 55211.

This laboratory has, in the analytical field, specialised in the development of non-destructive techniques for analysis of metals, ceramics and glass – it does not specialise in any one type of object. In particular the development of the "Isoprobe" X-ray fluorescence spectrometer using a non-dispersive method and measurement by high resolution silicon detector has been applicable to unleaded stained glass panels where the test-piece may be of considerable size.

Optical emission and atomic absorption spectrometry, neutron activation, X-ray diffraction and electron probe microanalysis are also available within the laboratory, although these methods may not often be applicable to stained glass work owing to the need to destroy a small part of the sample.

The Director of the laboratory is Professor E.T. Hall. Dr R.E.M. Hedges is in charge of the analytical work.

4.3 SHEFFIELD Department of Ceramics, Glasses and Polymers of the University of Sheffield, "Elmfield", Northumberland Road, Sheffield S10 2TZ, England. Tel. (0742) 78555, Ext. 128.

This institute has the longest history of any in the field of glass research, having been first set up (in a different building) in 1916. It is well equipped to carry out measurements of physical, optical and chemical properties, including micro-analysis with the electron-probe.

There are facilities for preparing small-scale melts of experimental glasses (up to 500g) and for the surface-treatment of glass specimens. The library is one of the best in the world on glass topics. Any work for outside organisations must be charged on a commercial basis but can be undertaken only when the staff and equipment are not employed on normal teaching and research activities. For further information please contact Professor H. Rawson.

4.4 YORK Department of Physics, University of York, Heslington, York, YO1 5DD, England. Tel. (0904) 59861.

One of the major research activities in the Physics Department at York is the study of surfaces. Extensive research programmes in this area include the use of electron microscopy, low energy electron diffraction and Auger emission spectroscopy, the latter being a powerful method of surface chemical analysis enabling the composition of the first few atomic layers of a surface to be determined. In addition, the department possesses

an X-ray analyser capable of making non-destructive analyses which was installed as part of a programme on the study of the weathering of glass, with particular reference to medieval glass. The necessary techniques, both in experimental and computational areas, needed for the accurate analysis of glass composition, have been established and an extensive programme of the analysis of medieval glass is now in progress. The dependence of weathering characteristics on composition is at present being examined, in a programme involving Professor O.S. Heavens, Professor R.G. Newton, Dr G.A. Cox, Mr S. Moehr and Mr M. Pollard.

5 FRANZ MAYER WORKSHOPS

COMMENTS ON CONSERVATION METHODS USING SYNTHETIC RESINS, AND SOME RESEARCH ACTIVITIES

I have received some interesting comment from the Franz Mayer'sche Hofkunstanstalt, Munich. This stained glass studio was established in 1848 and often played an important part in developing new techniques for the conservation of medieval windows, having been connected among others with the introduction of the "Zettler-Process" at the beginning of the century and having carried out the first application of the "Jacobi-Process" at Naumberg Cathedral under the supervision of both Professor Josef Oberberger and Dr Jacobi of the Deutsche Tafelglas AG.

5.1 RESERVATIONS ABOUT THE USE OF SYNTHETIC RESINS

For a number of reasons this Munich studio has considerable reservations about the use of synthetic resins, and especially epoxy resins, in the conservation of medieval glass and in particular for the refixing of painted linework (Schwarzlotssicherung). They stress the point that synthetic resins have a coefficient of linear thermal expansion which is up to 10 times that of glass. (See also section 3.6 of N.L. No.18). The synthetic resin makes the loose painted linework extremely hard while the adhesion to the glass occurs only at isolated points. They claim that changes in temperature, from about -20°C to about +70°C as may happen in Central Europe will lead to cracking and loss of adhesion of treated paint work.

In addition they claim that epoxy resins turn yellow and become brittle with time, and they mention several unfortunate experiences with these resins, either as cold paint or as adhesive for appliquée work, as well as for edge-joining of thick glasses.

They therefore maintain that the use of epoxy resins will lead to "rather certain destruction of the painted linework, a process which is quite irreversible". (Unter diesen Umständen vertreten wir die Ansicht, dass die Schwarzlotssicherung mit Epoxidharzen immer noch eine äusserst bedenkliche und gefährliche Methode darstellt. Nach unserer Meinung bedeutet eine derartige Schwarzlotssicherung auf längere Sicht geschen eine nahezu sichere

Zerstörung der Konturenmalerei, die nicht mehr rückgängig gemacht werden kann).

The Doerner-Institut, Munich, Professor Dr W. Schaupp, Munich, and also Dr Riederer, Berlin, agree with the considerable reservations of the Franz Mayer'sche Hofkunstanstalt (RGN - as is illustrated in the considerable correspondence which they have had with these gentlemen and which they showed to me).

5.2 WORK IN INORGANIC COATINGS

In view of all these doubts the Franz Mayer Studios stimulated, and are supporting, a research project at the Doerner-Institut, Munich, to investigate in particular inorganic adhesives and hardeners for the conservation of medieval painted glass and especially the painted lines. (RGN - the results of this work will be eagerly awaited, especially if the Doerner-Institut is able to overcome the lack of adhesion which tends to occur when the coatings are applied to poorly durable glasses, such as British glass No.2, and exposed to hot water - see N.L. No.6, item 4.)

In addition, the Munich studio is experimenting on further developments of a glazing system for sealing medieval windows between two sheets of glass.

5.3 MAKING COPIES OF IMPORTANT WINDOWS

The Franz Mayer Studios, though certainly keen on helping to discover the best possible conservation methods, also point out the urgent necessity of making exact copies of the most important and most valuable medieval stained glass panels, due to the fact that so far no absolutely perfect conservation method has been found, nor may one be found within the foreseeable future. These copies of selected panels should be installed in the church in place of the original while the original panels should be exhibited in church museums in perfect museum conditions.

The Franz Mayer Studios claim that such museum conditions seem so far to be the only practicable method of conservation which has no risk.