# CIMCIM Newsletter

NEWSLETTER OF THE
INTERNATIONAL COMMITTEE
OF MUSICAL INSTRUMENT
COLLECTIONS

BULLETIN DU COMITÉ
INTERNATIONAL DES MUSÉES
ET COLLECTIONS D'INSTRUMENTS
DE MUSIQUE

Special Issue:

## MUSICAL INSTRUMENT EXHIBITIONS IN SCANDINAVIA

A Study of the Basic Concepts, Educational Objectives, and Conservational Techniques of Three Recently Installed Exhibitions by the International Committee of Musical Instrument Collections (CIMCIM) of the International Council of Museums (ICOM)

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Series Editor: Hélène La Rue

ICOM

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# INTRODUCTION

The problem of exhibiting musical instruments is something that is a constant occupation for most members of CIMCIM. How can we carry through our ideas having to include often opposite aspects such as pedagogical and esthetic approaches while maintaining good security? What can be done to make the presentation educational as well as more attractive for visitors of all ages and at the same time ensure that the conservation of the items remains optimal?

In 1980 these questions were discussed during a CIMCIM colloquy in Burgdorf, Switzerland, and at the Committee meetings in connection with the ICOM General Conference in Mexico City. It was thereafter natural to follow up the discussion with a meeting in Scandinavia where there were recently installed exhibitions at Ringve Museum, Trondheim; Musikmuseet, Stockholm; and Musikhistorisk Museum og Carl Claudius' Samling, Copenhagen.

This meeting took place June 10 to 19, 1982; the idea was to study and evaluate the three museums under the following headings: basic concepts (coordinator Friedemann Hellwig); pedagogical approach (coordinator Felix van Lamsweerde); conservation and security (coordinator Robert Barclay).

The participants were divided into three working groups after the coordinators had given introductory lectures. Close to two days were spent at each museum allowing the working groups to give their evaluations and comments.

The Scandinavian meeting was made possible by the openmindedness of the three museums who put their advantages and faults at the participants' disposal, and we would like to thank the administrations of these museums, the Norwegian National ICOM Committee and the Carlsberg Mindelegat for Brygger J. C. Jacobsen, Copenhagen for their support. In addition, the National ICOM Committee of Norway has supplied financial help for the publication of this report.

Peter Andreas Kjeldsberg

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# THE THREE MUSEUMS AS DESCRIBED BY THEIR OWN STAFF

## INTRODUCTORY REMARKS

ICOM's definition of the museum sphere of activities has its roots in a practice which is older than ICOM itself. The three museum workers who are responsible for the following description of Scandinavian music museums were raised in the solid tradition of seeing the entire museum field as a coherent entity. Describing our permanent exhibitions in isolation from our other activities has required a good deal of restraint, since this is and remains an abstraction from our living reality. However, abstractions are sometimes necessary, and we have kept a watchful eye on each other in this regard. We have not said a single word about temporary exhibitions, concerts, or publications - nor anything about collecting, research, or conservation.

We have been able to do so in friendly cooperation largely due to the collaboration between our institutions which has existed since long before our own appearance on the scene. Since we are very good personal friends with deep respect for each others' abilities, it was quite natural for us to begin discussing our exhibition plans with each other virtually at their outset. We did so not solely in terms of courteous interest, but rather frank criticism was given and accepted in an open and straightforward manner. This dialogue was very productive but did not, as easily may have happened, result in a uniform approach to the task at hand. On the contrary, it may be said (as the participants in the June 1982 conference surely can confirm) that the newly opened permanent exhibitions in Trondheim, Stockholm and Copenhagen may be characterized by their individuality. It would nonetheless be interesting to determine whether or not our efforts, despite of their different results, have some sort of common "Nordic" quality (of course, we cannot ourselves pass judgement on this question).

The subject discussed at the conference was the use of exhibitions as a medium for transmitting musical culture in a manner which provides personal experience or information - or both. In the description of the three museums' solutions we have kept to a common heading close to the main points which were treated during the conference. It is our hope that this report, together with the evaluations from the three working groups may help illuminate basic and important problems.

It is with great pleasure, and not without a certain degree of relief, that we look back on the entire course of events. We came up with the idea ourselves in Mexico in 1980, and were pleased to note the favourable response of our colleagues. Having returned to the cooler climate of our home countries we got down to the preliminary work. At times we were a bit unsettled by the thought of exposing ourselves to the earnest criticism of colleagues who would be judging the degree to which our exhibitions had succeeded in fulfilling our original intentions. The conference demonstrated, however, that this can be done without maiming the museums under scrutiny. We received both roses and

brickbats, and found the experience most educational. We believe that the other participants in these brainstorming sessions also found them edifying.

We would like to express our gratitude to our CIMCIM colleagues who took us at our word and thus help us to realise our plans. It was their enthusiastic participation in the conference which ensured its success.

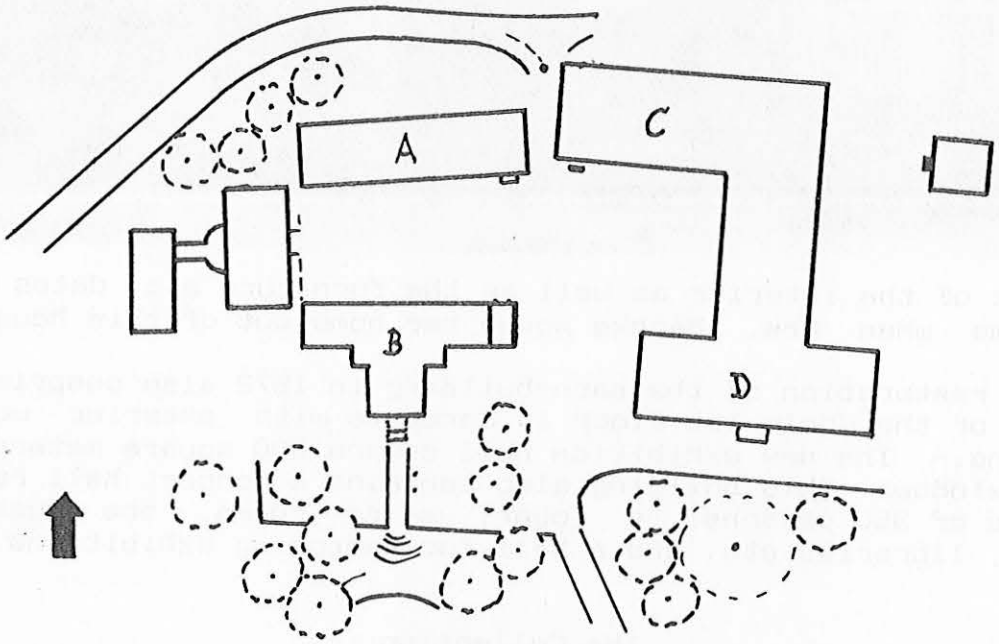
P.A.K., B.K., M.M.

## Its History

Ringve Museum is the most recently founded of the three main Scandinavian museums of musical instruments, thanks to the initiative of the last private owner of Ringve Manor, Christian Anker Bachke. He died in 1946 and left it to his wife Victoria Bachke (born in Moscow 1897 - died in Trondheim 1963) to realize his plans for establishing a collection of musical instruments which finally opened in 1952. Mrs. Bachke brought together a considerable amount of instruments, and her strong and vivid personality came to characterize the museum in many ways. She was the typical enthusiastic private collector equipped with a non-Norwegian temperament which at the beginning met difficulties in working among the sceptical inhabitants of Trondheim. In her way she is already a legend twenty years after her death and very well known in Norway. Many visitors have come only to know more about her and "her" museum.

The museum is a self-governing institution partly financed with support from the state and the county of Sør-Trøndelag. It has today a staff of four: director, curator, secretary and manager. In addition, there are temporarily employed guides.

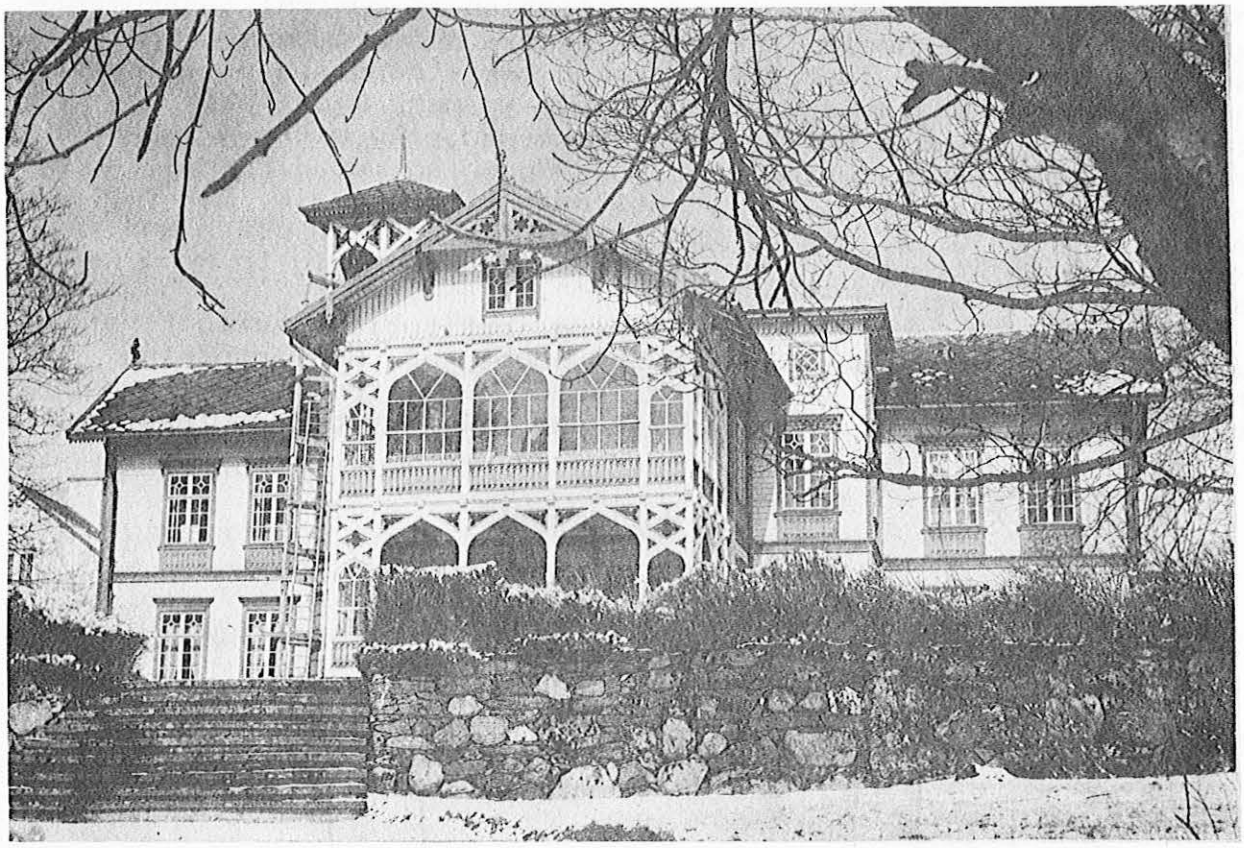
## Its Buildings




A. Oldest remaining building, 2nd half of 17th century, containing a small inn for visitors. B. Main farm building, 1860-80, the "old museum". C. Barn-building, 2nd half of 19th century, restored in 1972, with new exhibition hall (1st floor) and concert hall (ground floor). D. Museum offices, library, store rooms, temporary exhibition hall.

The museum is housed in an old manor with several large wooden buildings in a style typical of the region around Trondheim, the earliest dating from second half of 17th century.

The old museum (where parts of the collection are still exhibited) was the main farm building, built during a lengthy period between 1860 and 1880. It is in a style which we call the "Swiss style" and which found its motives in mid-European architecture, mixed with elements inspired by the Norwegian stave churches as a result of the dawning national feeling.



Most of the interior as well as the furniture etc. dates from the time when Mrs. Bachke moved her home out of this house in 1950.

The restoration of the barn-building in 1972 also comprised a renewal of the whole 1st floor in concrete with exterior wooden panelling.- The new exhibition hall covers 300 square meters and has no windows. This building also contains a concert hall for an audience of 350 persons, a foyer, store rooms, the museum's offices, libraries etc. and a hall for temporary exhibitions.

## The Collection

The Museum's collection comprises c. 1200 instruments from all over the world. Approximately one half of these are instruments from the western classical tradition; the other half being European folk musical instruments from all continents.

In addition, the collection also holds pictures and items connected to musical surroundings, autographs and printed music.

## Basic Concepts

The exhibitions want to present glimpses of a chronological and at the same time historical development in the history of musical instruments, including a more detailed presentation of special subjects according to the contents of the collection.

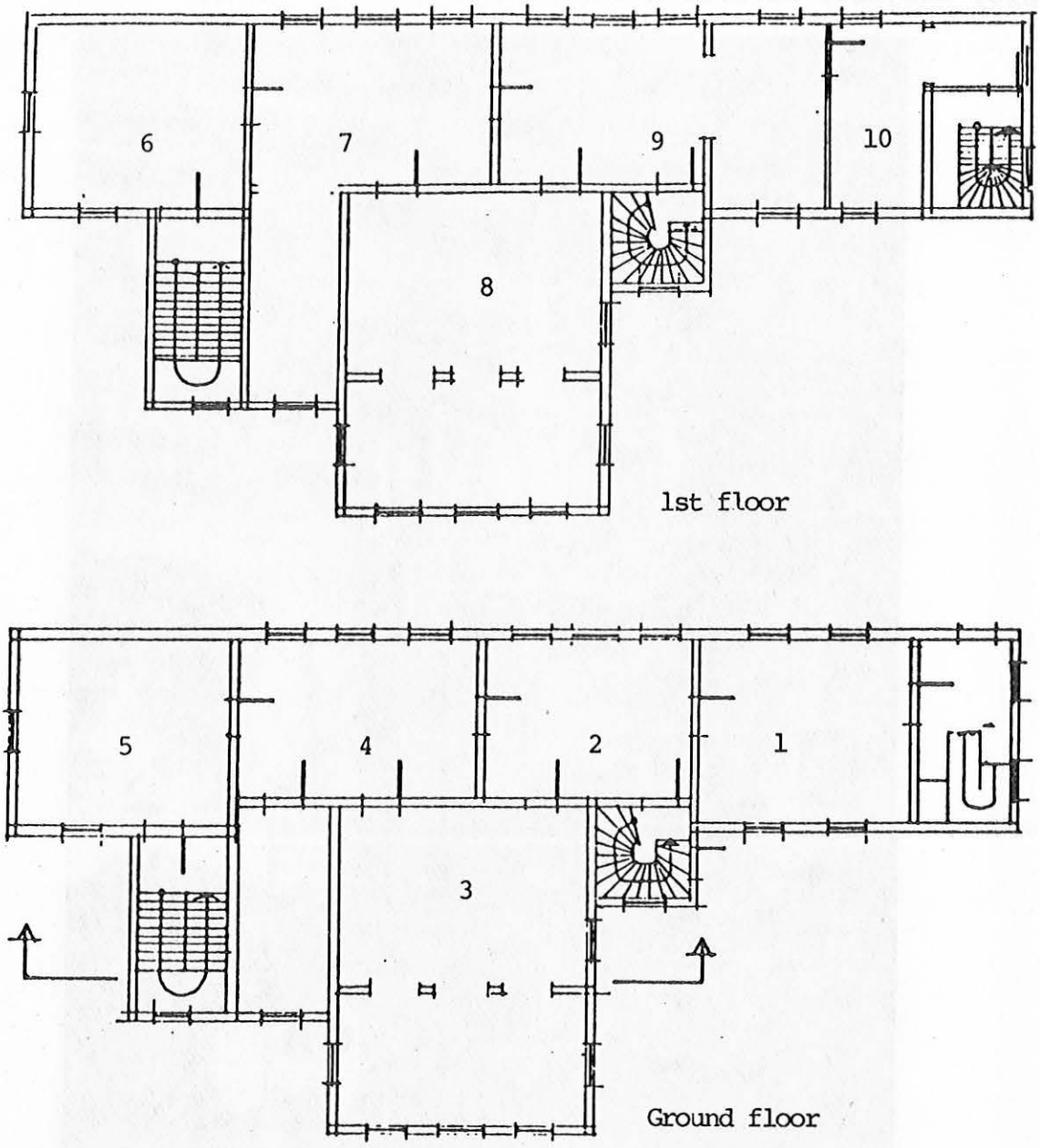
The ethnographic exhibition is mainly aiming at giving an impression of musical instruments as a sound-producing tool.

The "old museum" is kept up more or less unaltered, preserving Mrs. Bachke's own arrangement and realizing a museum in a private home. It is no secret that this part is the most attractive to many of our visitors.

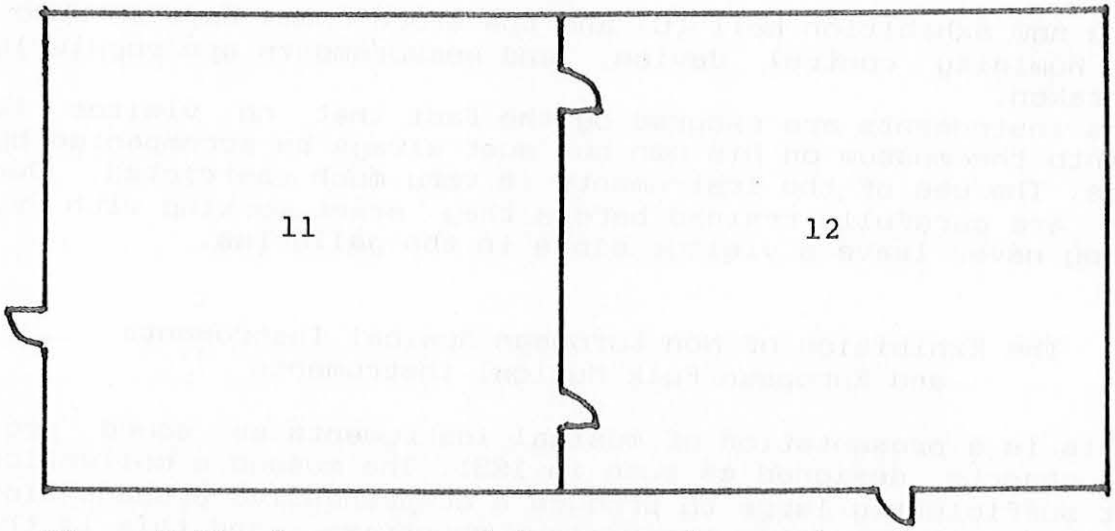
The fundamental idea is that of the guided tour; all visitors are shown the museum in groups. Professionally interested people are recommended to make advanced contact for special arrangements. Guided tours offer the possibility of presenting the exhi-

bition in various ways, according to the different kind of visitor and his varying expectations.

Plan of the Exhibition Halls




Plan of the "old museum" (scale 1:200), indicating the original and present functions of the various rooms:
1. Office; introductory room. 2. Entrance hall; memory to Mrs. Bachke. 3. Garden room; 18th century instruments ("Mozart-room"). 4. Red sitting-room; early 19th century instruments ("Beethoven-room"). 5. Green sitting-room; mid 19th century instruments ("Chopin-room"). 6. and 7. Bedrooms; late 19th century intruments ("Grieg-room"). 8. Large hall. 9. Organs, harmoniums. 10. Various instruments: miniature instruments, accordions, mechanical instruments.




Plan of the "new museum" (same scale as above):
11. Western classical musical instruments (chronologically displayed) and Norwegian folk musical instruments. 12. Ethnographical, typological exhibition of folk- and non-European musical instruments.

## Pedagocical and Aesthetical Approach

The basis of the presentation is the guided tour. The guides are music students looking upon this work as part of their education. They must be able to speak at least one foreign language. Besides the information she or he offers to the group of visitors, demonstrations are also given on some of the keyboard instruments. This is, of course, a controversial point and difficult dilemma. We feel an obligation towards our public to try as much as possible to make a live presentation of the music history within defensible limits. The demonstrations are short and done with music contempory to the instruments.

In the exhibition of ethnographical material there are tapes presenting the sound of some of the instruments along with verbal information.

A guided tour lasts about 75 minutes.

The display in the "old museum" is influenced by, and is very much part of the interior of the house (please consult the detailed description for further information about this subject and the ethnographical exhibition).

The temporary exhibitions are designed for self-studying with written texts and tape equipment for the visitor's use.

Through its presentation our museum is characterized as a museum of music as well as of musical instruments.

## Security

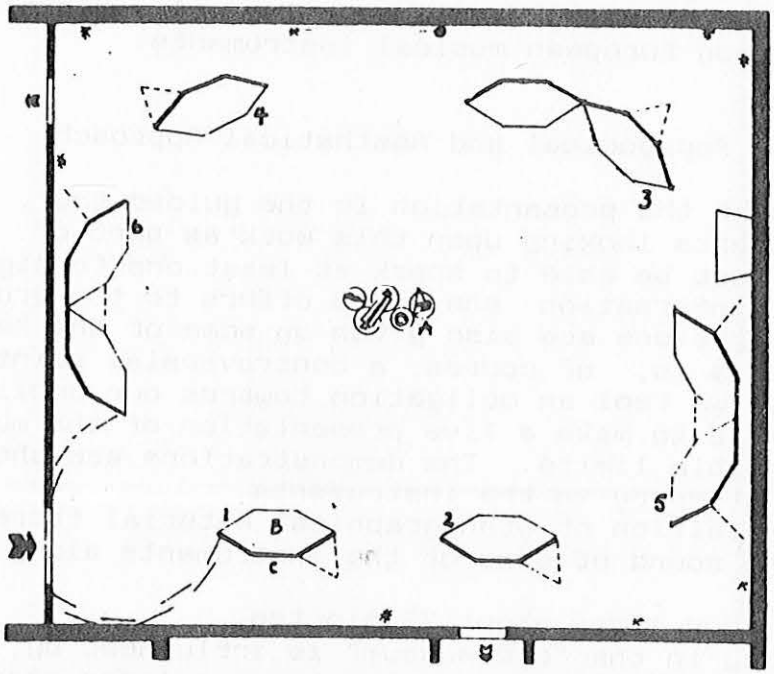
The buildings are secured against fire and burglary by means of an alarm system. However, there is always the danger of fire in the "old museum" (B) even with fire detectors directly connected to the fire station. Furthermore, this house has no humidity or temperature control which forces us to keep that part of the exhibition closed between the 1st of November and the 20th of May.

The new exhibition hall (C) and the store rooms have an automatic humidity control device, and measurements are regularly being taken.

The instruments are secured by the fact that no visitor is let into the museum on his own but must always be accompanied by a guide. The use of the instruments is very much restricted. Our guides are carefully trained before they start working with us, and they never leave a visitor alone in the galleries.

## The Exhibition of Non-European Musical Instruments and European Folk Musical instruments

This is a presentation of musical instruments as sound producing objects, designed as such in 1981. The museum's collection is not sufficiently large to produce a comprehensive presentation of musical culture within the various countries, and this is the reason why the exhibition is mainly typological.

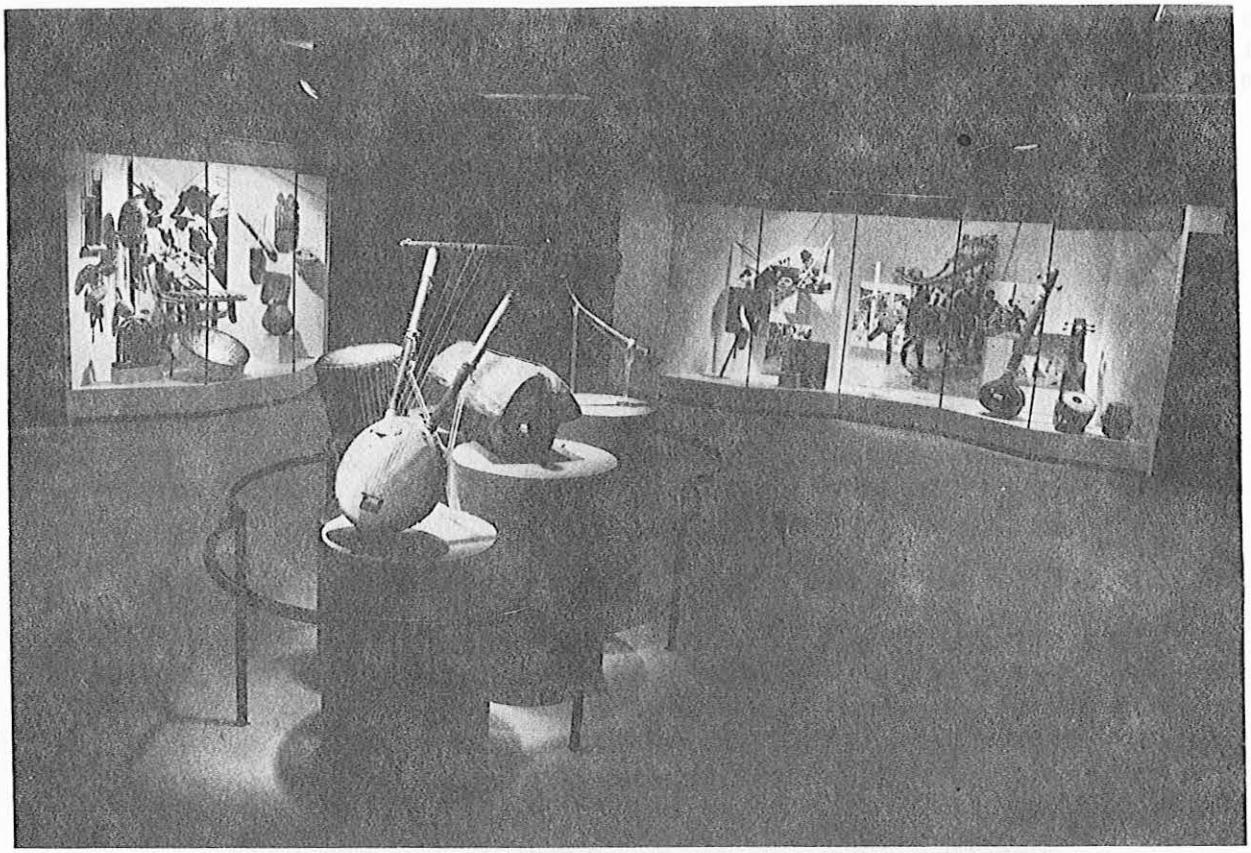



The six pavilions are placed in an elliptic arrangement within the room (B; the old music pavilions are the basic idea for their shape; they are of wooden walls and platforms covered with tammy).

In the center, there is a collage of cardboard cylinders rising from the floor and hanging from the ceiling (A).

A few fluorescent tubes together with the light sources in the ceilings of collage cylinders form the only permanent illumination of this room which otherwise has no windows. Each pavilion has its individual lighting which is turned on by the guide during the tour and switched off when the group is leaving the exhibition.

Besides the positive effect of "surprise", the duration of lighting is thus reduced. There is a switchboard on each pavilion for the control of the light, for the casset recorder volume, and for the headphones.



The group of visitors is at first guided to the collage with its display of the four basic groups of instruments (idiophones, etc.). After an introductory talk the group is shown to the pavilions where the visitors are then introduced to the various groups of instruments: the idiophones (1); membranophones (2); chordophones (3) and aerophones (4). The exhibition represents several aspects of the instruments within each group: similaritiy in shape and use within the same cultural and geographical region; different solutions of technical problems relating to sound; musical instruments as decorative items; etc.

In addition, there are two other pavillions, the first showing musical instruments used in connection with ritual music (5); and the other, presenting instruments used in connection with social dance, two basic uses of music.

Each pavilion shows illustrations of instruments in use. As far as possible, the instruments are displayed in playing positions, often secured in specifically made acrylic mounts.

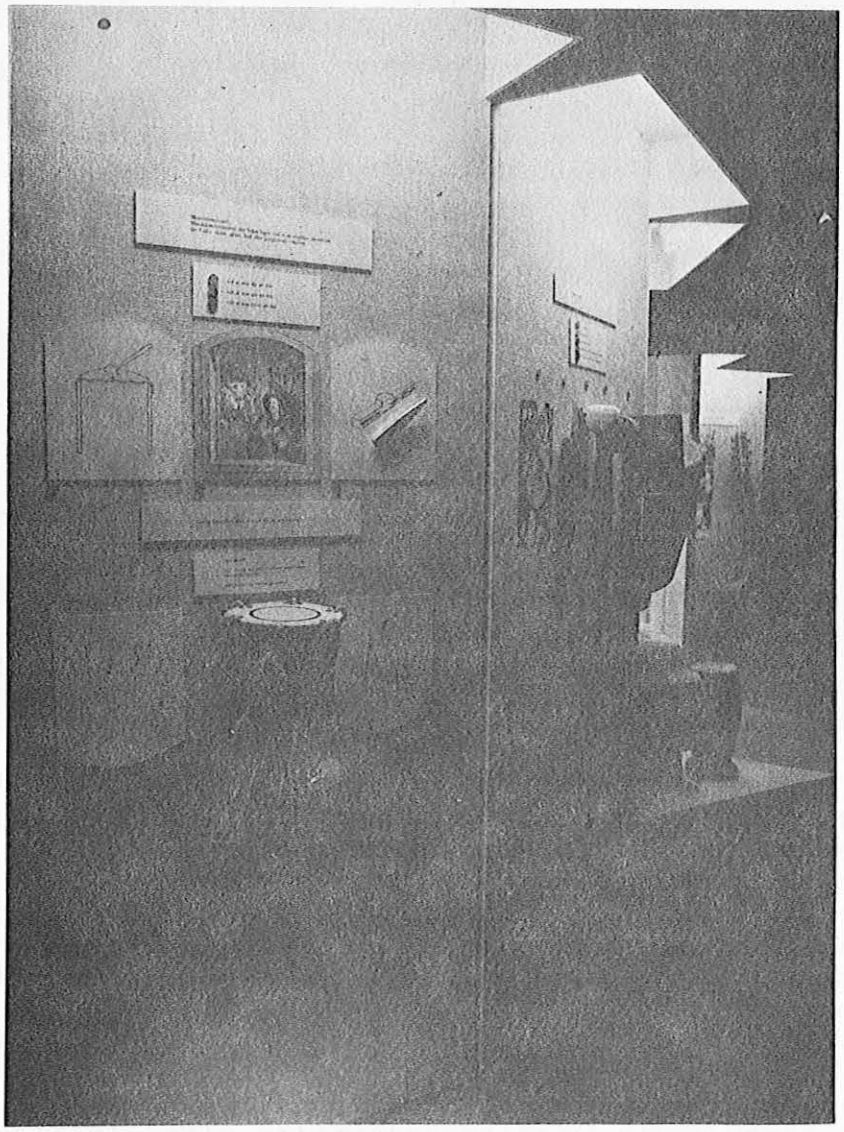
The casset recorders are operated by the guide and give examples of instruments similar to some of those in the exhibition; e.g., in the case of the chordophones a struck instrument, the cymbalon (Hungary); for bowed instruments: the masingo (Ethiopia) and the nyckelharpa (Sweden); for plucked instruments: an u'd (Near East). These are endless cassets which stop automatically before the program of 3 to 4 minutes duration starts again.

The guides gives his information parallel to the sound examples; these recordings were made at the museum.

This is the presentation for the daily, average visitor.

Furthermore, there is a "study exhibition" on the rear side of each pavilion (C). This serves as an elaboration of the material shown on the front and is mainly meant for schools, students

and especially interested groups. This additional exhibition of illustrations together with a few short texts provides further material for individual study.



The whole presentation aims at answering the questions of why and how sound is produced; of how the instruments served certain functions and how natural objects can be used as musical instruments (with simple modifications).

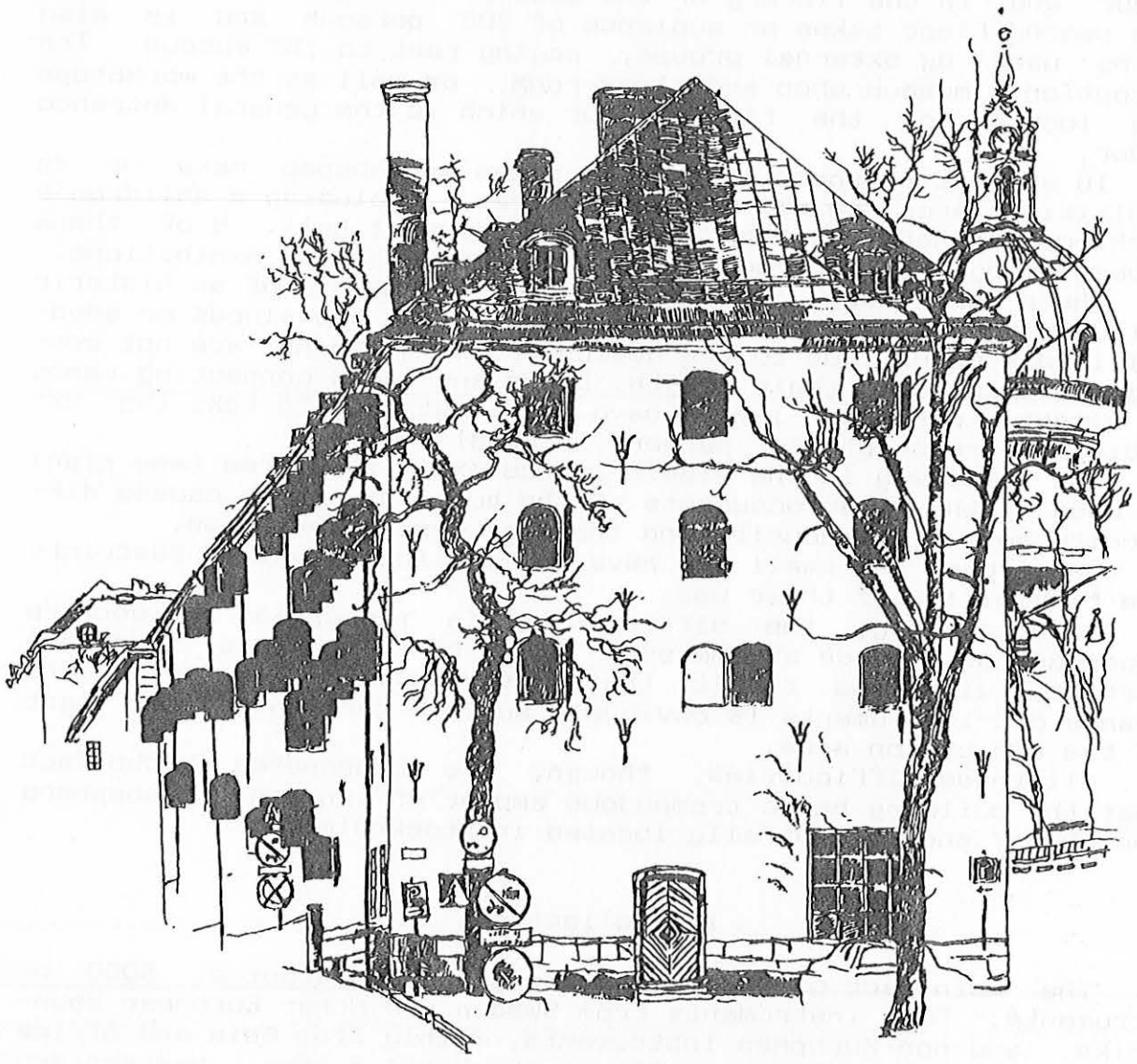
Peter Andreas Kjeldsberg

## Its History

The Museum of Musical History was founded in 1899 on the initiative of the Danish businessman and instrument collector Carl Claudius and of the secretary and treasurer of The Royal Theatre in Stockholm, Johannes Svanberg who became the museum's first director. Through personal donations and solicited gifts they assembled a basic collection of, amongst other things, 200 instruments and theatrical archival material; the new museum was opened to the public in 1901.

After several active albeit economically meager decades the museum received state support and was affiliated as a foundation to The Royal Academy of Music in 1932.

The housing problems which had long troubled the museum were solved in 1979 after relocation to the newly-rebuilt Crown Bakery, a building dating from the 17th to 18th centuries.



An ever increasing Government responsibility for the growing museum culminated in 1981 with the museum being incorporated into the newly founded Swedish National Collections of Music. On this occasion the old name "The Museum of Musical History", long since inadequate to describe the wide scope of the museum's activities, was formally dropped in favour of the name "The Music Museum".

## Its Building

Since 1979 the museum is housed in a building whose oldest part was erected around 1640. From that time until 1958 it was used primarily as the Crown Bakery, supplying the Swedish armed forces with bread. Being Stockholm's oldest surviving industrial building it is protected by the legislation for historic buildings.

The building, measuring c. 100 to 13.5 metres, is divided into three parts by two stairways. The museum shares it with an other institution and keeps the main part of it, c. 2.600 sq. metres.

Office rooms are located in the central part, on the fourth floor and in the library on the second. The concert hall above the second floor takes an audience of 300 persons and is also being used by external groups, paying rent to the museum. The reception, museum shop and cloak-room, as well as the workshops are located on the first floor which is the general entrance floor.

10 exhibition rooms of varying sizes and shapes make up an exhibition area in all 880 sq. metres, including a children's workshop and café and the foyer of the concert hall. 4 of these rooms, among them the foyer, are used for temporary exhibitions.

There are many problems attached to the use of an historic building for museum purposes. The exhibitions are placed on several levels which, due to the design of the building, are not contiguous throughout their length. Lifts and ramps connecting rooms on slightly different levels have been installed to make the exhibitions accessable for persons in wheel chairs.

The stairway in the middle of the exhibition area (see plan) is used by the other occupants of the building, which causes difficulty both with security and the visitors' orientation.

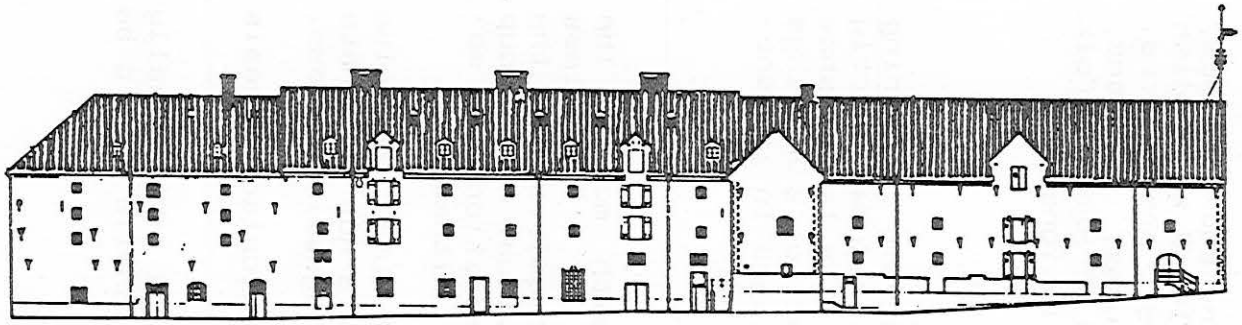
Many rooms are small and have low ceilings, which restricts the flexibility of their use.

Unfortunately, the difficulties in navigation between the rooms do not provide at the same time the slightest accoustic barrier, with the result that every visitor trying one of the "hands on"-instruments is obviously audible through a great part of the exhibition area.

All these difficulties, though, are compensated by the fact that the building has a tremendous amount of inherent atmosphere and charm, and is centrally located in Stockholm.

## Its Collections

The main part of the collection comprises about c. 5000 instruments. Folk instruments from Sweden and other European countries, and non-European instruments, mainly from Asia and Africa make up a little less than 50% of the total number. Western art



A "The Sound Workshop"

B Temporary exhibitions

C Temporary exhibitions

D "Kloink" -Childrens workshop/Café

E-H "Four Cross Sections of Swedish Musical Life"

E "The Imperial Period"

F "In Bellman's Stockholm"

G "The Battle Cry"

H "From Vaudeville to Punk Rock

I Study room

J Temporary exhibitions

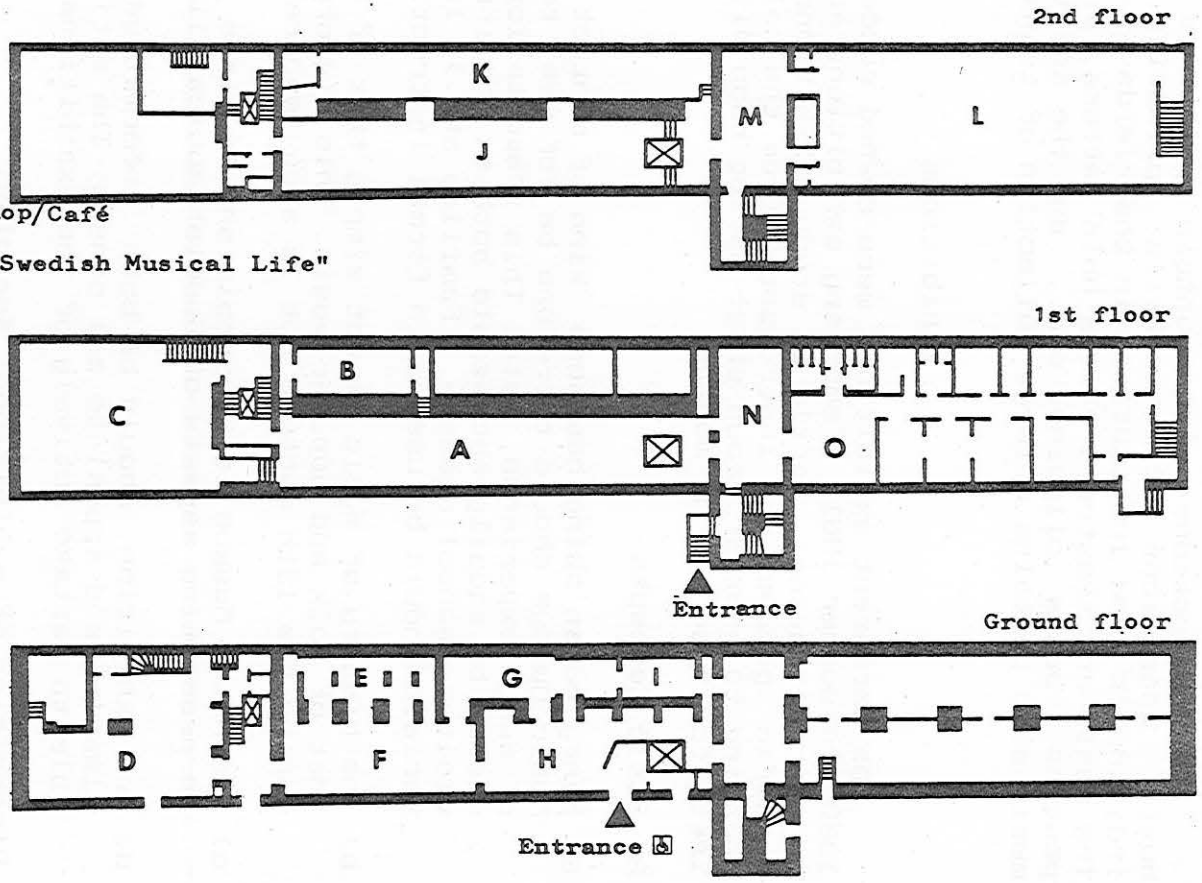
K Library

L Concert Hall

M Foyer - Temperary exhib.

N Reception - Museum shop

O Cloak-room.



music (from 1600 to 1850) is especially well represented. For the last few years the collecting policy has been to acquire instruments of later or even contemporary date.

The collections also contain paintings and and drawings, busts, medallions and memorabilia, primarily related to Swedish individuals and institutions in the fields of music and theatre. The music and theatre archives hold letters, pictures, programs, posters, press clippings etc., and the section of Swedish folk music also contains a large collection of transcriptions.

## Exhibitions

The permanent exhibitions were opened successively in spring 1980 and summer 1981. Temporary exhibitions are produced, partly on special topics, partly as study exhibitions. The latter show specific groups of instruments from the collection's holdings changing to another group after having been displayed in its entirety for a couple of months.

A. Basic Concepts

a) Every human being has some kind of contact with music. The Music Museum should therefore be "of use" to all, regardless of age, experience, etc. This presentation requires that the museum be equally accessable both to the individual and group visitor (school classes, families etc.). In addition, the materials should be useful in formal instruction situations.

b) The history of music is not simply that of art music but also that of folk and popular music. This history did not terminate during the 19th century but is a contemporary dynamic process.

c) The Music Museum in Stockholm should place particular emphasis on presenting aspects of Swedish musical life.

d) The exhibition should be both informative and esthetically pleasing and appeal to all senses. The entire public should be able to partake actively of the exhibitions.

Disposition of exhibitions: see plan.

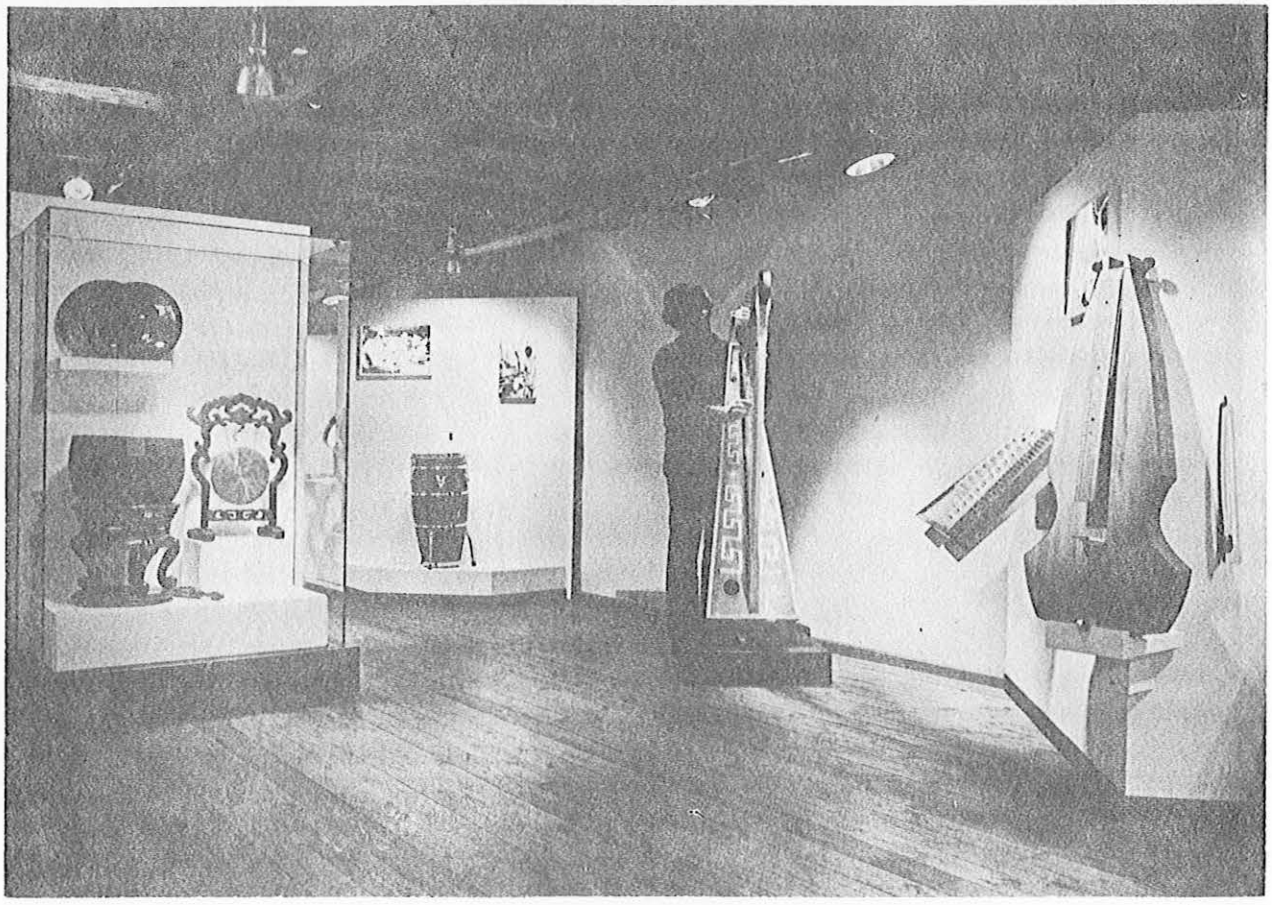
B. Pedagogical and aesthetical approach

In the historical section the emphasis has been placed upon presenting the instruments in their historical, cultural and social context, all of which have been visualized with the help of pictures (original to the extent possible, otherwise 4-colour reproductions at original scale), archival material, posters etc., plus other material borrowed from other museums.

All texts are in Swedish and English and are set to differentiate three levels of complexity.
The texts are screened on the walls and display cases.

Opposite page:
Top: Reception desk and museum shop.
Bottom: Exhibition room A: "The Sound Workshop"


INFORMATION



Documentary material about the individual instruments together with line drawings of the instruments (for identification) are consequently screened to the right, other texts to the left on the display cases.

Recorded music is presented via earphones at several stops along the visitor's walk through the exhibitions. These programms are kept very short and without detailed spoken comments, they will provide the visitor with an idea of what the surrounding instruments sound like in musical performances. There are about 15 of these stops in the permanent exhibitions.

To meet individual wishes of entering more deeply into matters of special interest a study room is planned in connection with the exhibitions, providing literature, tapes, sound-and-slide-programms etc.

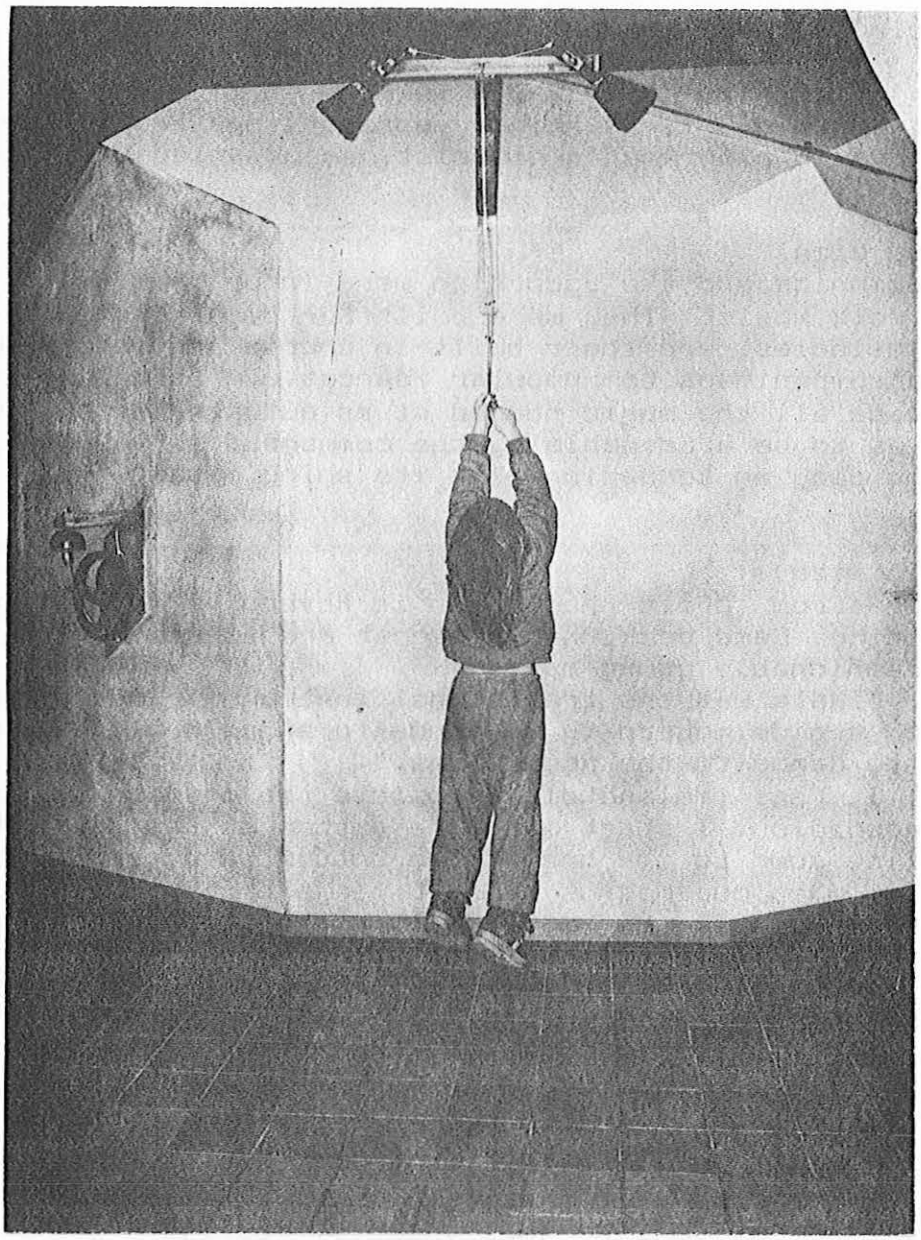
A professional designer was engaged to coordinate optimally the individual character of the rooms with their contents. Special attention was payed to the use of colours and lighting to create an appropiate atmosphere.
The labyrinthine character of the historical sections allows the most efficient use of the rooms and provide an effect of surprise when viewing the exhibitions.

Exhibition room D: "The Kloink"

3. Security

a) Burglary, fire:
The ground floor doors and windows of the building are connected electronically to a surveillance company, and so is the internal alarm system when the exhibitions are closed.
Display cases were designed by the architect and have subsequently been modified by addingh a specially designed locking device and improvement of the alarm system.
The fire alarm system is connected to smoke detectors.

b) Climate
The building is provided with a central air-conditioning and heating system.
Controlled air-humidification is possible but there is no form of dehumidification.



Exhibition room D: "The Kloink"

c) Lighting

The interior architecture of the building has presented severe difficulties in exhibition lighting, which have not yet entirely been eliminated.

On the ground floor, having the biggest windows of the whole building, the daylight problem is easily solved by keeping the (original) inner iron shutters permanently closed.

## An Example of Explanatory Texts from "Four Cross Sections of Swedish Musical Life"

All texts from one wall and display case of room G: "The Battle Cry".

A. Wall (G 6)

Headline:

The Folk Music of Industrialism

Exhibit:

Colour photo of oil painting, representing: People dancing on Midsummer Eve in a workmen's district, accompanied by an accordion and a violin.

Text (large size):

The harmonica and the accordion were industrialism's contribution to folk music. They were built for playing simple triadic major-key melodies, and their built-in chords provided a bouncing rhythmic accompaniment to popular dances. A single accordion could provide all the music needed at an outdoor dance. They were priced so as to be affordable by the commonest of labourers. Being able to play an accordion with its shiny metal trim brought status.

Text (small size):

"Magnus from Öfelt had been in Haverö to work with square timber cutting. Came back, had overcoat and accordion and was regarded a fashionable young man."

"Well, fiddle was the traditional instrument, of course, and it was such a nice modernity to dance to an accordion. They found it easier to dance to the accordions."

"When I feel melancholy I go into the chamber and take out Magnus's accordion. I start with the button at the top and let my fingers slide down to the one at the bottom, and this I feel as a relief. But when our Magnus himself plays, it is like listening to music from Heaven. He knows no less than twenty nine wlatzes, not counting all 'polskas' and 'polkettes'."

(Records of folk tradition which are not translated into English in the exhibition.)

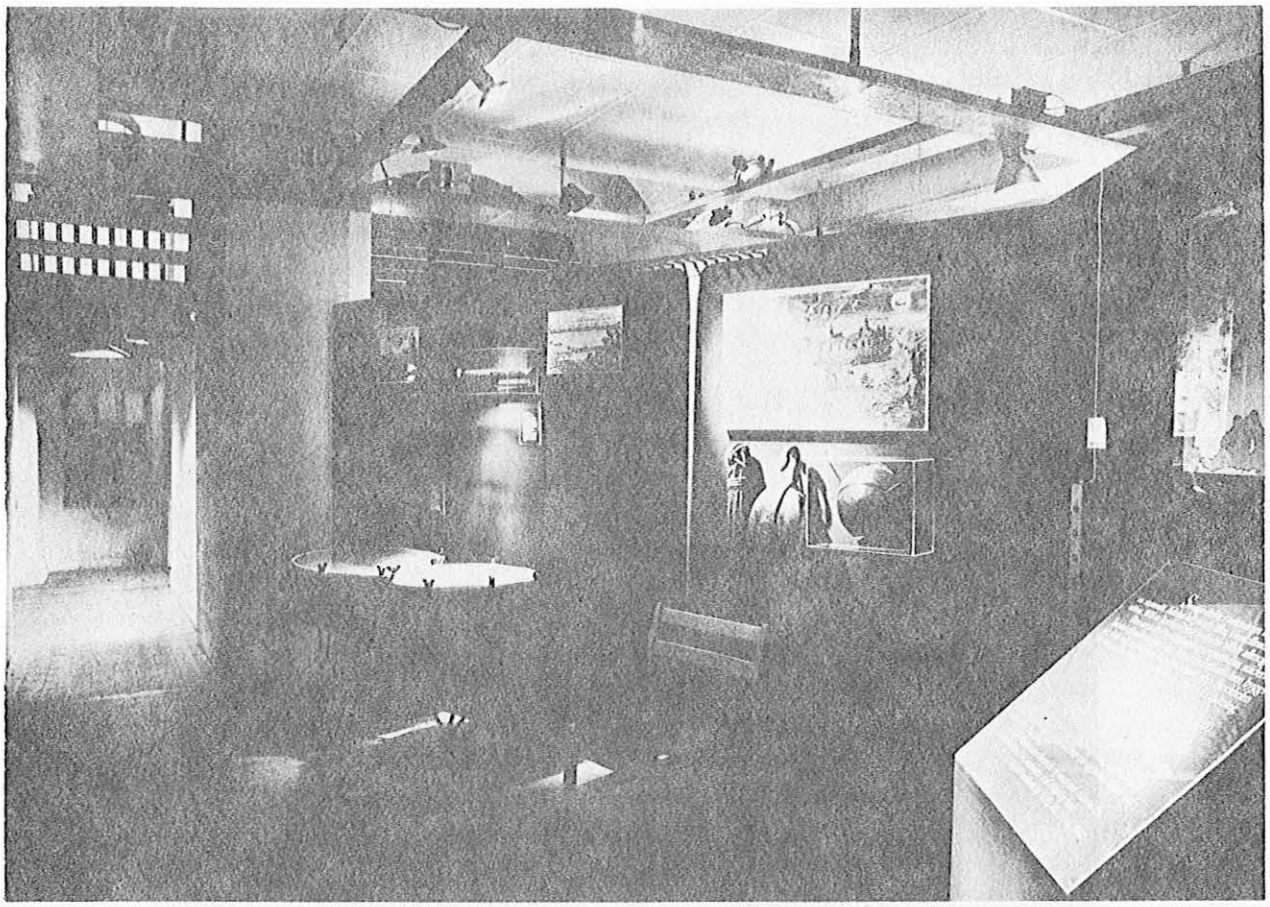
Text (large size):

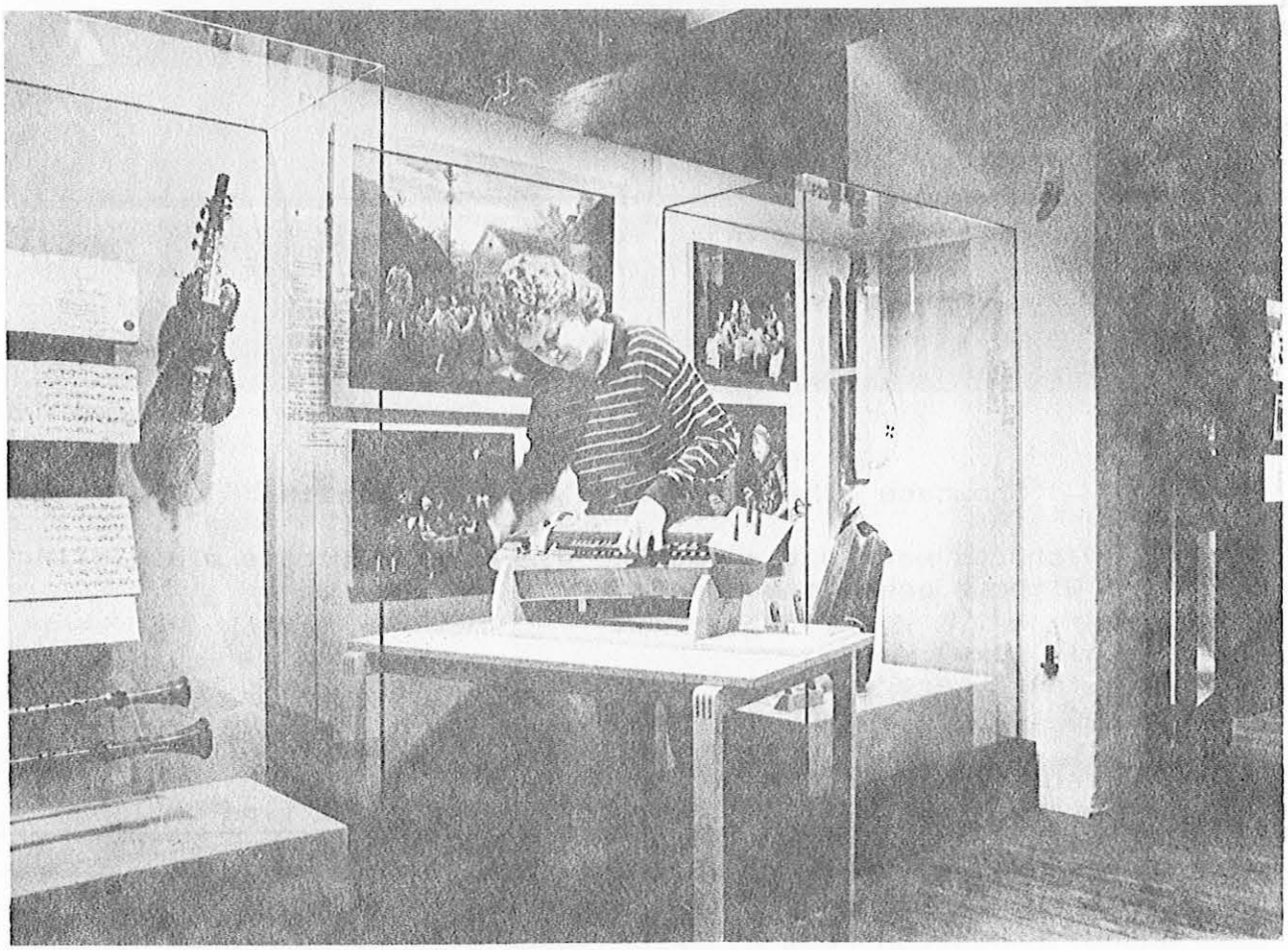
The accordion quickly drew criticism of those who were concerned with the traditional folk music. One or two major scales

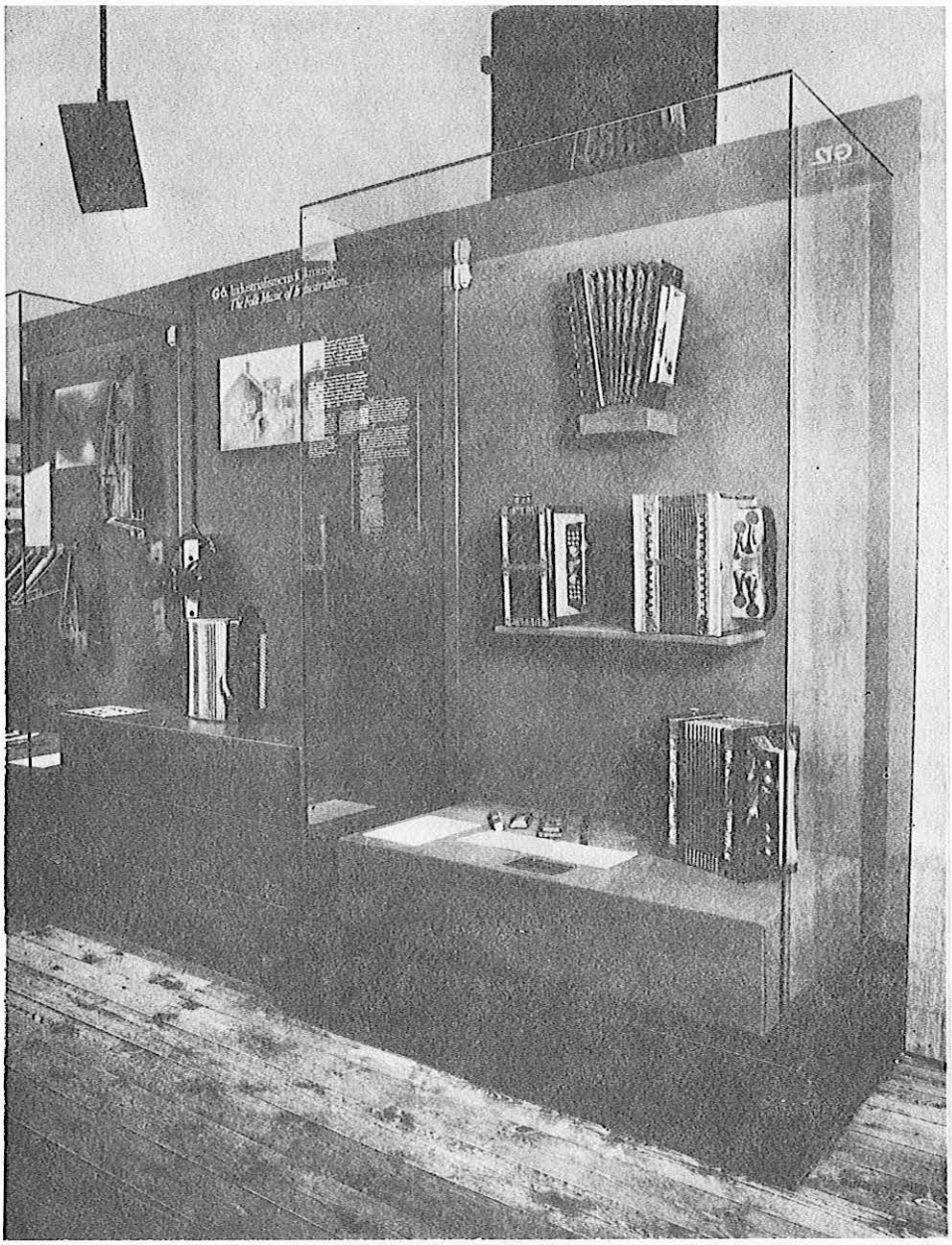
Opposite page:

Top: Exhibition room E: "The Imperial period"

Bottom: Exhibition room F: "In Bellman's Stockholm"







Exhibiton room G:
Showcase "The Folk Music of Industrialism"

and a few chords were not enough to play the intricate old violin melodies without great distortion.

Text (small size):

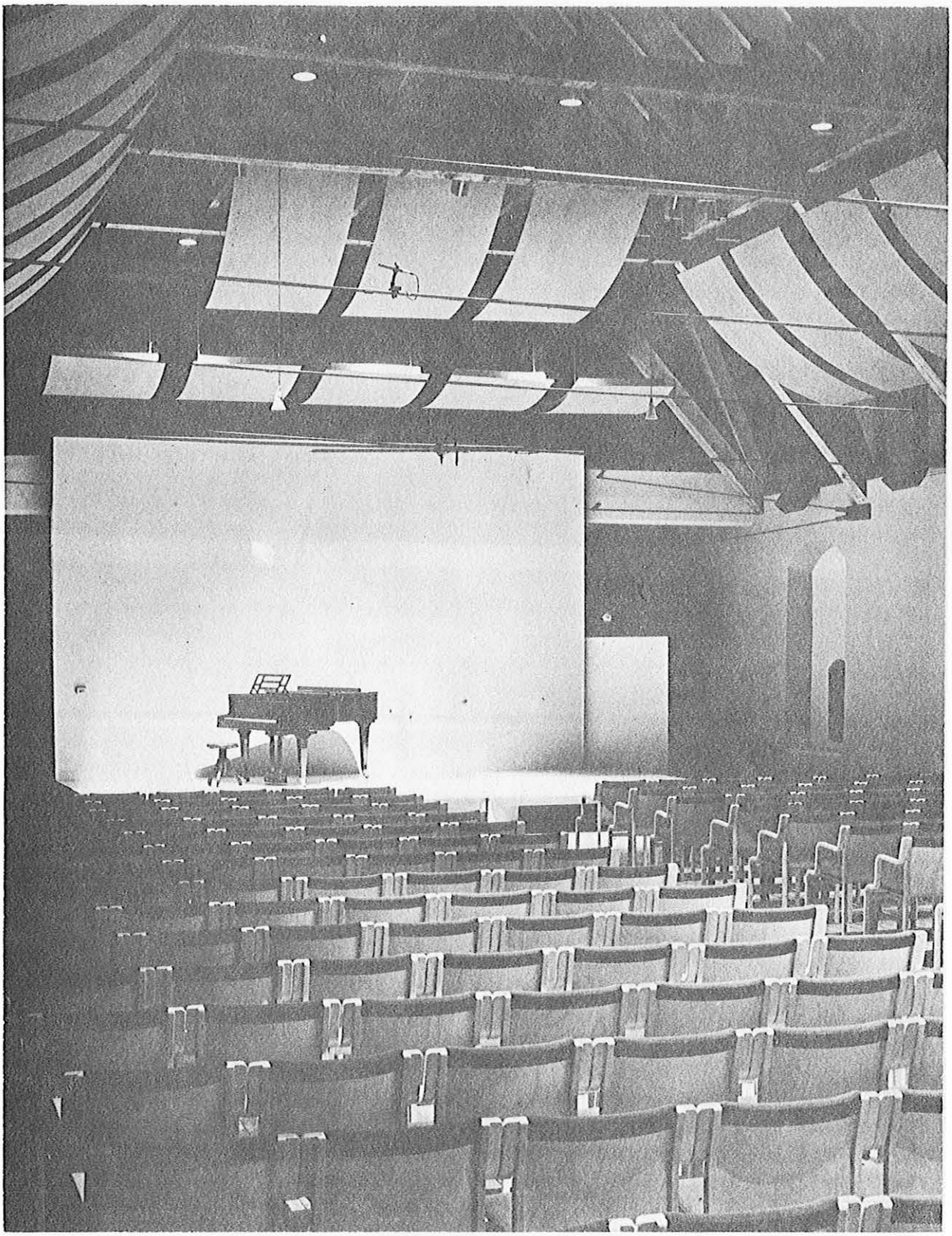
"If there were a special award for the person who had managed to find the best means of destroying all folk song and all folk music in a very short time, this award should be assigned to the inventor of the accordion. Nowadays it seldome happens that young country people find it worthwhile to spend time on learn-

Opposite page:
Top: Exhibiton room G: "The Battle Cry"
Botom: Exhibiton room H: "From Vaudeville to Punk Rock"


J.E. ÖST

ing to play the violin, since it is so much easier to become an accordion virtuoso."

(Extract from the preface of an edition of folk songs and dances for one melody instrument and piano, 1875.)



The Concert Hall

B. Display case (G 7)

Exhibits:

Accordéon signed Busson Paris (1840's)

Diatonic accordions, one and two rows respectively by the Swedish maker J. Malmling (1880's)

One row accordion signed Gessner, Magdeburg

Harmonicas

Tin whistle

Text (large size):

The accordion made its appearance around 1830 - not in the room of the farm hand, but in a distinguished middle-class setting. Elegant instruments were presented as "a charming pastime, especially out in the country". Steam power and machines brought mass production in their wake. Accordions became available even to those with less purchasing power. Gessner in Magdeburg and Hohner in Trossingen became the first large-scale manufacturers of accordions and harmonicas, respectively in the 1840's and 1850's.

Text (small size):

The first harmonica was made in 1821 by the young C.F.L. Buschmann in Berlin. It was made as a kind of tuning pipe for organs and other keyboard intruments. By 1822 Buschmann had developed his idea adding bellows, double reeds for blown and drawn air, plus pushbuttons. With this the accordion was created. Others made commercial use of both inventions. The harmonica and accordion spread quickly across Europe, the latter arriving very early in Sweden:

"In the late 1820's the vicar J. Dillner had an accordion given to him as a present from the countess Brahe. This was the first or one of the first accordions that were imported to Sweden."

"Hands on instruments":

A one-row and a two-row diatonic accordion are at the disposal of the visitors. The instruments are, of course, bought especially for this purpose.

Recorded music by earphones:

A traditional fiddle polska played on the harmonica.

A polkette played on a two-row Gessner accordion.

Very short presentation.

Birgit Kjellström

# MUSIKHISTORISK MUSEUM
# OG CARL CLAUDIUS' SAMLING, COPENHAGEN

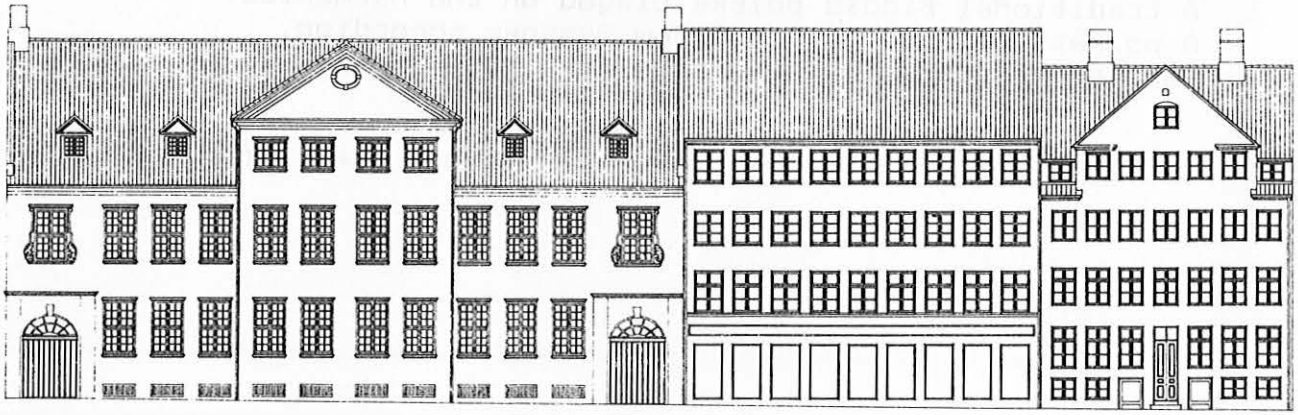
## Its History

There were formerly two important Danish museums devoted to music, each of which consisted of a collection of instruments, an archive and a library. Both were established at about the turn of the century - the Musikhistorisk Museum in 1898 on the initiative of Angul Hammerich, and the Carl Claudius' Musikhistorisk Samling, installed in a private mansion in Copenhagen, in 1906. Right from the start there was a close cooperation between the two institutions, for example at an early date Carl Claudius gave a part of his collection to the Musikhistorisk Museum.

Angul Hammerich and Carl Claudius both died in 1931 and it would have been reasonable to expect that the two collections would have been united at the same time. That appears to have been Claudius' original idea as well, but for reasons about which we can only speculate today he decided to bequeath his museum to the nation with the particular condition that the collection be maintained as a separate institution housed in the mansion at Carit Etlars Vey. Thus it came about that Claudius' collection, and the fortune attached to it, became the property of the State, whilst Musikhistorisk Museum continued as a self-governing institution whose operation was for the most part financed from the national budget. In 1977 a new agreement was drawn up incorporating Musikhistorik Museum and Carl Claudius' collection into one museum, and in 1978 work was begun on the arrangement of the new permanent exhibition. The new museum opened its doors to the public on December 15th, 1979.

## Its Buildings

From 1966 Musikhistorisk Museum was installed in the former manse of the Reformed Church, an 18th century building, while the Claudius collection still remained in the founder's villa at Carit Etlars Vey. In the 1970's the old houses adjoining the manse of the Reformed Church were acquired for the new museum and were restored according to the legislation of protected buildings;



which together with the row of houses Åbenrå 26-34 now provide the setting for Musikhistorisk Museum og Carl Claudius' Samling.

The entire museum has at its disposal a total area of 2.627 sq. metres. There are 29 display rooms, of which one is allocated to changing exhibitions and two to children's activities. There is a music and lecture hall with seating for 80 people. Six rooms are used for a library, an archive, a music collection and for research. Seven rooms comprise the administrative offices, the collection of recordings and of study materials, while six premises serve as workshop, attendant's room and store-room. Finally, three rooms are arranged as lunch rooms for visitors together with a kitchen.

Our three houses together constitute an intricate complex of stairs and passages and varied interiors. It may seem a rather rash claim to assert a coherence in this variety, but from the beginning there seemed to be natural indications towards a division into an old and a new section which we decided to respect, also with regard to the distribution of the subjects of the exhibition.

## Its Collections

If we look for a moment at the character of the two collections now integrated into one museum we will observe that the nucleus of each had been collected at the same time and from the same general point of view: to illustrate the instruments of European educated culture, with emphasis on the 17th to 19th centuries, supplemented by folk-music instruments mainly of the 19th centry and by ethnographic instruments mainly from Asia and Africa.

The total number of instruments today is about 4,000. In addition, the collections also hold paintings, drawings, busts, medallions and memorabilia associated with musical milieus and personalities. If we choose to view the new situation from the standpoint of the Musikhistorisk Museum it can be said that Claudius' collection contributed to it an improved quality in several areas but that it was not in the position of enlarging its coverage of music's cultural history with any significant new areas.

## Basic Concepts

Apart from the two existing collections and the protected buildings our practical solution was a new constitution which permits a complete integration of the holdings of the former independent museums. These considerations which have resulted in the exhibition in its present form, could be summed up as follows:

1. Formulation of the main problem:
   to unite the two museums in such a way as to create something new among Danish museums - different from just the sum of two existing collections of instruments.

2. General approach:
   to maintain the historical view with allowance for "closer reading" of various subjects of special interest.

3. Definition of the visitor:
the general, grown-up public - interested but with no special background. At the same time the exhibition should offer a reasonable amount of information to the student of musicology and musical instruments.

4. Disposition of the exhibition:

a) Old department:
a chronological tour through the history of the European instrumentarium from the Middle Ages to c. 1900. The frame of the period is given by the holdings of the two collections. Realizing that the exhibition can give a somewhat misleading perspective by concentrating so heaviliy on the musical practice of the educated classes of society, the chronological presentation is in one room interrupted to send the visitors off to a geographically arranged excursion in European folk music Anno 1975: on exhibition are instruments which in one way or another are still used in our part of the world, whether in an unbroken tradition, through a revival of interest, introduced by immigrants, cultivated by foreign labourers, or whatever.
Context: an attempt has been made to combine the history of the instruments with the general tendencies in the organisation of music life of the social strata that are covered by the collections.

b) New department:
various subjects have been chosen - partly by imaginative considerations as for their importance - partly pragmatically, i.e. considering the holdings of the collections. The close reading of every single subject may be based on for example systematics, technology, instrumentation of history.

## Pedagogical and Aesthetical Approach

The artifacts are displayed in various contexts whose nature is explained by means of photostats, pictures, texts and labels supplemented by recorded sound. In the new department this documentation is not consistent in its direction towards a particular level throughout the whole exhibition; the benefit of school classes therefore is at its best during guided tours. The museum aims at creating a close teamwork with the (primary school) music teachers.

The exhibition is influenced by the special aesthetic demands deriving from the quality of the buildings. It is deliberately presenting the instruments, thus avoiding any flavour of theatrical settings.

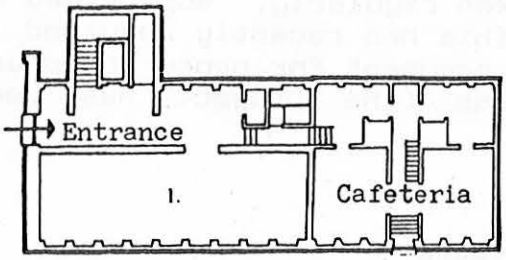
## Security

a) The buildings are secured against fire and burglary by an alarm system.

b) The artifacts are secured against theft during the opening hours partly by being displayed in locked show cases, partly by being observed by guardians.

# The Exhibition Plan

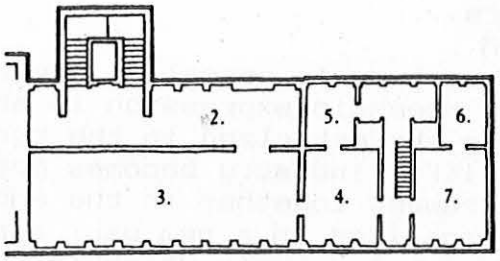
## The new department




GROUND-FLOOR

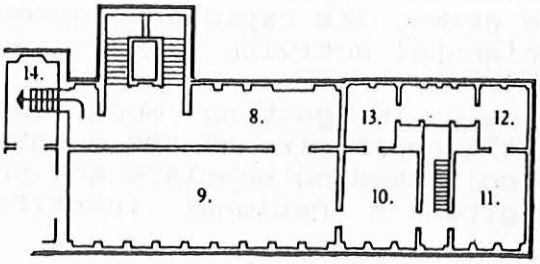
Entrance, cloak-room

1. Temporary exhibition




FIRST FLOOR

2. Notation, music-engraving, keyboard
3. Denmark: 18th-19th centuries
4. Denmark: Folk music - dance
5. Denmark: Folk music
6-7. To play with sound (for simple souls)

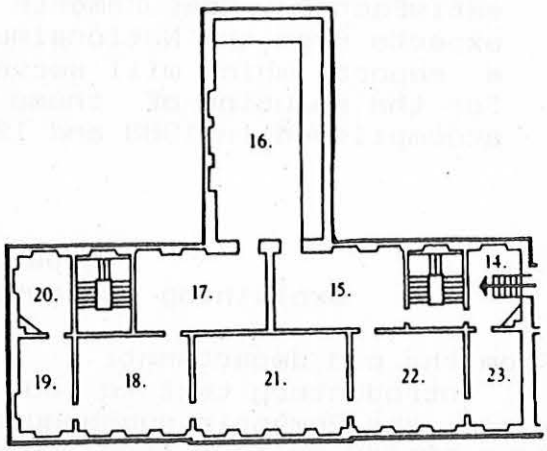



SECOND FLOOR

8. Classification, sound
9. Instrument and signal
   Instrument and musical expression
   Musical boxes, phonograph etc.
10. Instrument as handicraft
11. Reconstruction, copy, faking

12-13. Musical "relics"

## The old department

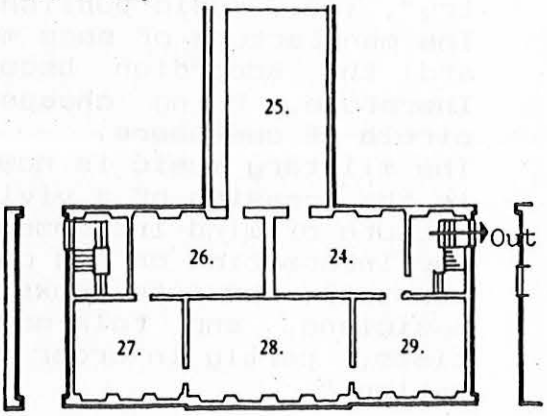



FIRST FLOOR

15. Middel Ages and folk music
16. European folk music today
17. 1450-1600: Renaissance
18. Consort ab. 1600

19-20. Basso continuo

21. 1650-1750: Baroque
22. 18th century: Guitar, clavichord, harpsichord
23. Early musical boxes




GROUND FLOOR

24. 18th century: Concerto, string quartet
25. 18th century: Tradition, fashion, experiment
26. Viennese classical symphony orchestra
27. Ab.1800: Guitar, tangenten flygel, hammerpiano, harp
28. 19th century: Military music, romantic symphony orchestra, saxophone, harmonium, accordeon, hammer piano
29. 1850-1900:brass,guitar,piano, harp

c) Currently, there are no means for any kind of restoration. The artifacts are secured against decay by a system of humidifiers. However, for lighting (especially the problem of daylight) and for the climatic conditions the situation is not satisfactory. Measurements are taken regularly, supervised by experts from the Nationalmuseet. This has recently resulted in a report which will serve as an argument for procuring means for the solution of these problems (the project has been accomplished in 1983 and 1984).

## Appendix of Texts
## explaining instruments and musical examples

From the old department:

Introductory text to room no. 28: The 19th century. Military music, the Romantic symphony orchestra...:

"THE PERIOD OF 1800-1900: ROMANTICISM

In the history of music the 19th century is normally covered by a name referring to a growing romantic expression in art. However, the period could also be characterized in the terms of important changes in social life: Industry becomes great industry and lots of people are crowded together in the enormous cities where music life is organized in a new way: partly the serious music - partly the popular music which is now written by composers who have specialized in dance and light music.

At the same time the conditions of an efficient distribution of music are created by - let us call it - the "music industry", i.e., music publishers dealing with mass production.

The manufacture of some musical instruments such as the piano and the accordion becomes more or less industrialized. Therefore, being cheaper on the market they reach a wider circle of customers.

The military music is now in its prime. Its rapid development is the occasion of a vivid experimental activity in the manufacture of wind instruments.

Our information on the country music is getting more substantial: the note books reveal the repertoire of the country musicians, and folk songs are collected by scholars and artists, partly in order to strengthen a national identification."

Illustrations from left to right:

Open air entertainment in the "Wiener Volksgarten", Illustrierte Zeitung (1889)

Concert in the "Tonhalle" in Hamburg, Illustrierte Zeitung (Leipzig 1845)

From the new department:

Texts from room no.9: Instrument and signal, instrument and musical expression, musical boxes...:

"INSTRUMENT AND MUSICAL COMPOSITION

Musical instruments are found in many forms with varying qualities as for the sound and playing technique.

Opposite page: Room no. 28 (new department)

The distinctive character of each type is tied up with that very musical culture which made use of it, and the instruments will change when the music changes.


Room no. 9 (new department)

In some cases the interrelation between the instrument and a definite musical conseption is very obvious. In this exhibition case are displayed 3 examples which can demonstrate that kind of a connexion:

1) European and Islamic oboe to-day
2) The development of the horn in Europe from 1700 to 1850
3) 4 different instruments in a European composition from about 1720

Outside the exhibition case we put on display some instruments which became of no importance for a vigorous musical expression. They therefore became superfluous and vanished for lack of stimulant.

TWO OBOES - TWO KINDS OF OBOE MUSIC

The Islamic oboe has got a circular plate beneath the reed. The European oboe has got no circular plate.

The Islamic oboist supports his lips on the plate. The European oboist takes the reed directly between his lips.

The Islamic oboist breathes continuously through his nose while he presses the exhaled air into the oboe with his cheeks. The European oboist breathes in the "normal" way. Now and then he has to make a short break because of the inhalation.

The Islamic oboe music will sound without breaks and with the same dynamic level all the time. Phrasing, i.e. the articulation of the music in periods is performed by means of melodic ornamentation. The European oboe music is articulated by menas of the breath and the tension of the lips both of which are employed for varying dynamics and phrasing.

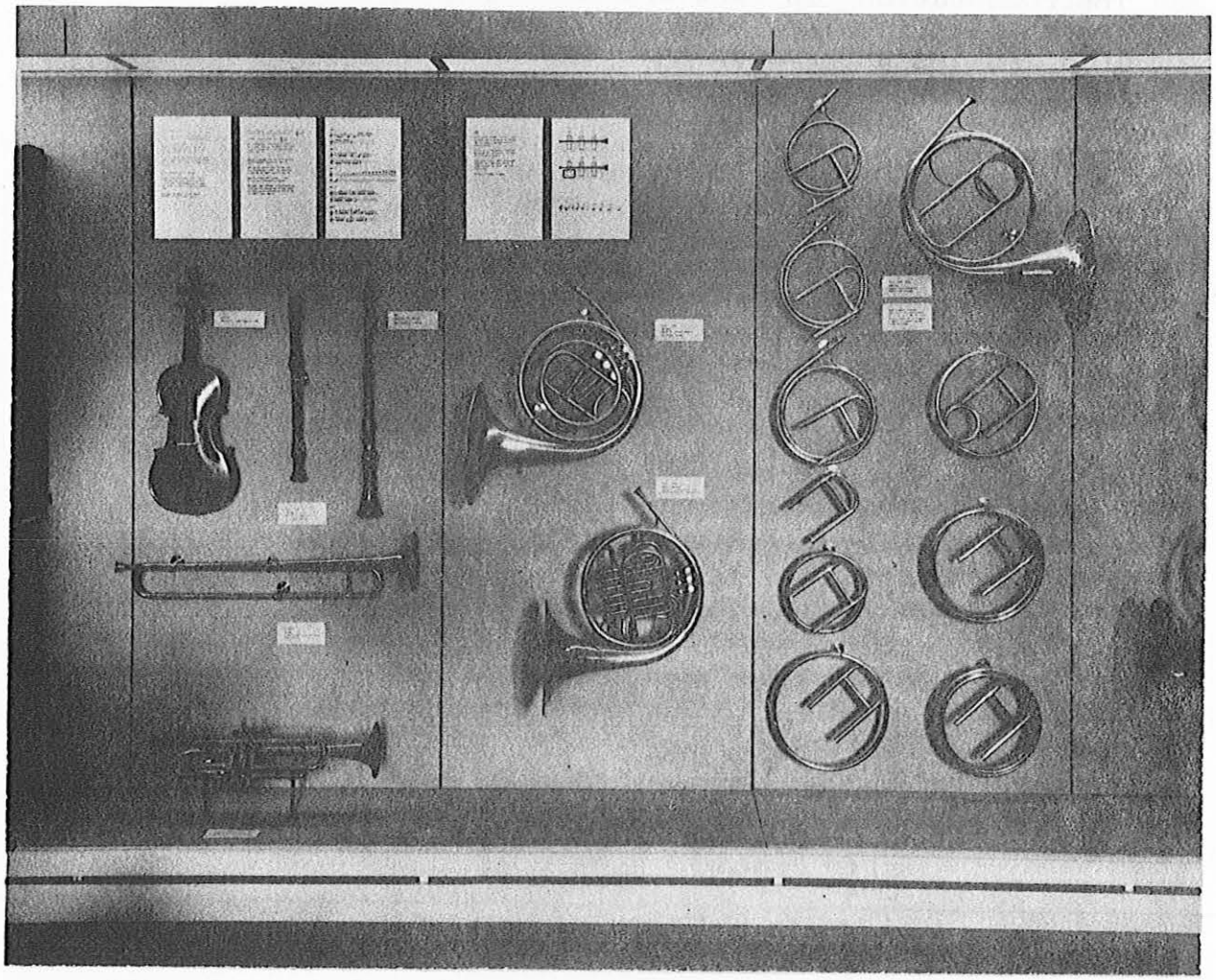
HORN - CROOKED HORN - VALVE HORN

1720:

The Baroque horn produces by overblowing the so called harmonics (look at the illustration).

Stepwise melody playing is confined to the key of the horn and performed in the topmost octave of the instrument.

The sound is strong and bright.



Room no. 9 (new department)

1750:
The invention horn can play in several keys: by changing the crooks you alter the length of the bore i.e. you alter the pitch of the horn.
Stepwise melody playing is performed in several octaves: you "stop" the notes into a higher level with your hand in the bell. The combination of stopping ( ) and overblowing ( ) produces a chromatic scale in the middle register of the instrument (look at the illustration).
The sound is weaker and darker than the sound of the Baroque horn.
1850:
The valve horn expands without any limitation into all keys by means of a mechanism for melody playing, the principle of which is that you quickly shift from one key to another:
The horn is constructed with 3 built-in different lengths of a tube representing respectively 1/2 tone, 2/2 tones and 3/2 tones.
The valves attach the 3 tube lengths one by one or simultaneously so as to fill out the interval of a fifth (look at the illustration).
The sound is strong and dark.

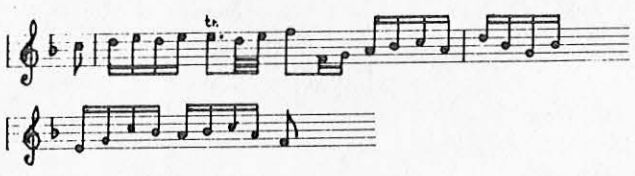
INSTRUMENTATION

Instrumentation is the art of composing for musical instruments.
This implies a thorough knowledge of the qualities of the instruments as for their sounds and playing techniques, so that you can use them in the best possible way.
Here we give a short example of instrumentation: how a composer decided to write music for the violin, the oboe, the recorder and the trumpet of his age.

FOUR INSTRUMENTS - ONE MELODY

Johann Sebastian Bach has chosen four solo instruments for his second Brandenburger concerto: violin, oboe, alto recorder and trumpet. At turns they present one and the same musical theme:
The violin and the oboe play the theme in the main key: F-major (ex. 1).

eks.1



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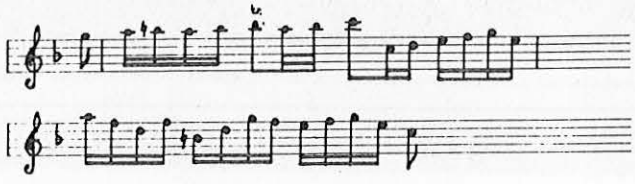

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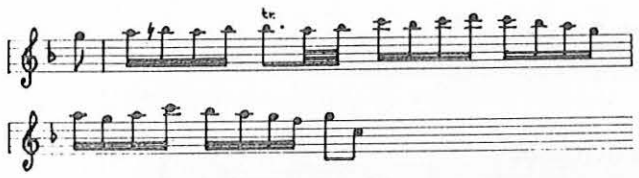
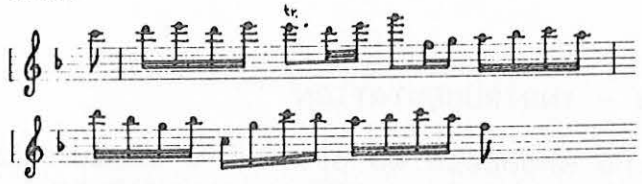


eks.5



The alto recorder is weak in its lower register, and its lowest note is:...
The lowest note of the theme is:...
The recorder's presentation of the theme does not take place until the music has moved to the key 5 steps further up: C-major (ex. 2).
The Baroque trumpet produces by overblowing the harmonics of the instrument (ex. 3).
The first presentation of the theme is performed in the same key as the recorder: C-major, and the last part of the melody is altered to a great extent (ex. 4).
The next trumpet solo is played in F-major 4 steps higher than the recorder presentation. Expanding in its topmost register the instrument is now able to present the original version of the theme with the exception of one single note (ex. 5).

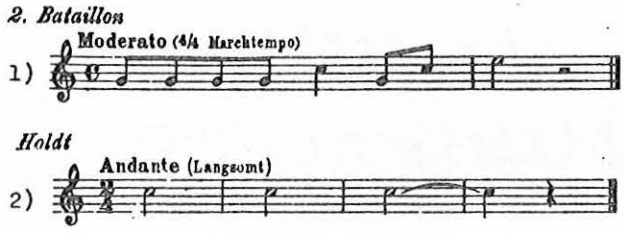
INSTRUMENT AND SIGNAL

The human voice is a wind-instrument with which we communicate by means of the words of the language.
If the distance of the recipient is too long we can reinforce the voice by means of a funnel (megaphone). But nowadays we more often make use of a microphone, an electric amplifier and a loudspeaker.
You can also employ a musical instrument for an announcement, a command, a call or a warning.
The sound of the instrument or the melody or the rhythm becomes a message without words, for instance when you:
execute the same piece of work - pray to the same God - fight the same battle - move on the same road - play the same game.

AN EXAMPLE

In the 19th century the military bugle served as an instrument of command.

In 1936 a military signal like this was still current in the Danish army: first the 'kendings-signal', i.e. to whom goes the order; then the signal for the execution of the order: (1) 'Second battalion' - (2) 'stop!'"




Translation of texts for recorded music in room 9:
"MUSICAL COMMUNICATION - INSTRUMENTATION

(1)

To the right in the showcase we present 2 oboes from the Islamic world and 3 from the European music culture. The European oboist takes the reed directly between his lips, and he uses his breath for the phrasing of the music - that is to shape the musical expression in phrases with intervals and varying volume as you are now going to hear in Carl Nielsen's romance for oboe and piano.

(2)

The Islamic oboist supports his lips upon the circular plate, and during the playing he constantly breathes through his nose. He presses the breath into the oboe by means of his cheeks. He therefore plays with one and the same tone volume and without intervals, and he shapes the musical structure by ornaments. Let us listen to an Islamic oboist from India. He is accompanied by a bowed instrument and a drum.

(3)

In the middle of the showcase you can see how the horn changes as for construction from the baroque to modern times. Let us compare the baroque horn with our day's valve horn. First you hear the old horn, then the modern instrument.

(4)

The horn with the large bell and the crooks is ment for stop technique, which makes it possible to fill in notes between the harmonics of the horn. These stopped notes however give a weaker sound, the result being a somewhat uneven scale. You now hear an ascending scale, first played on a valve horn, then on the old stop horn.

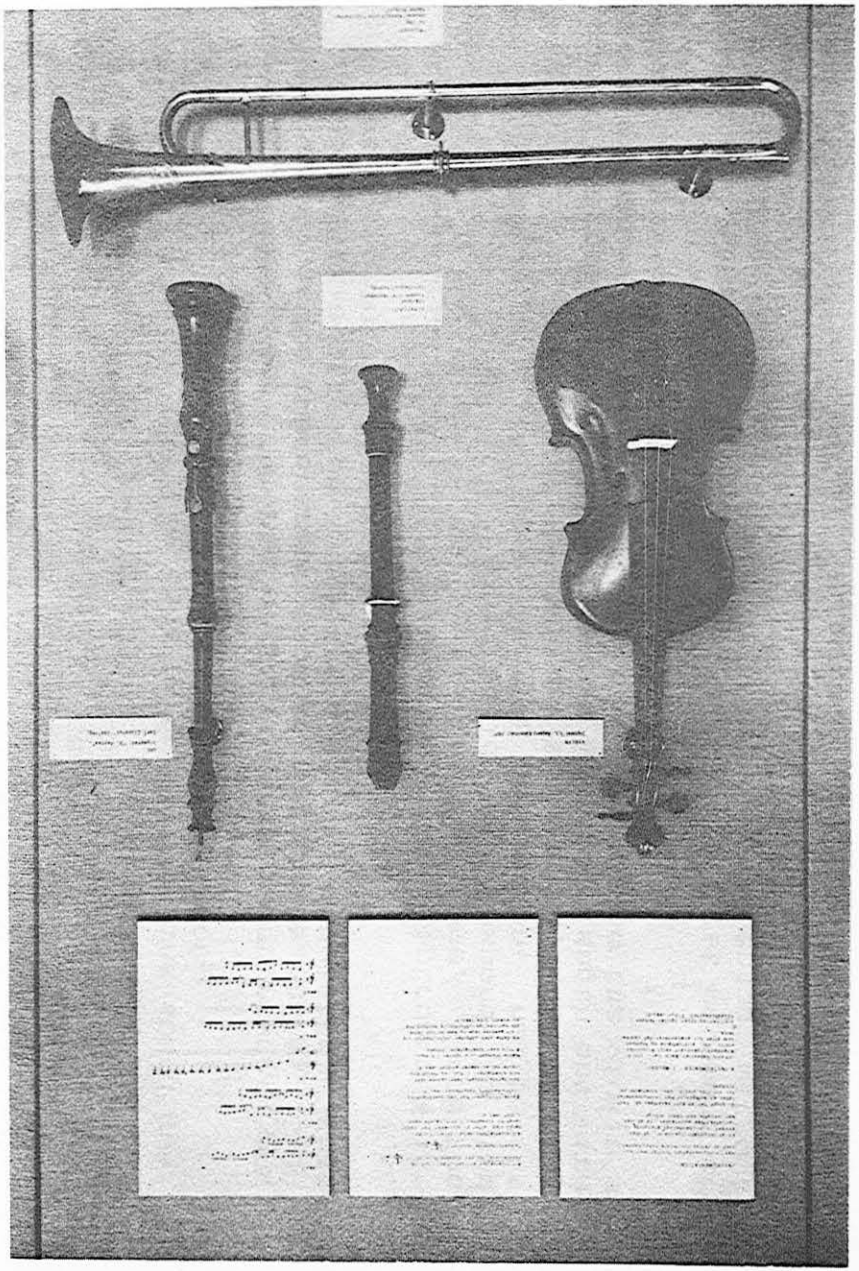
(5)

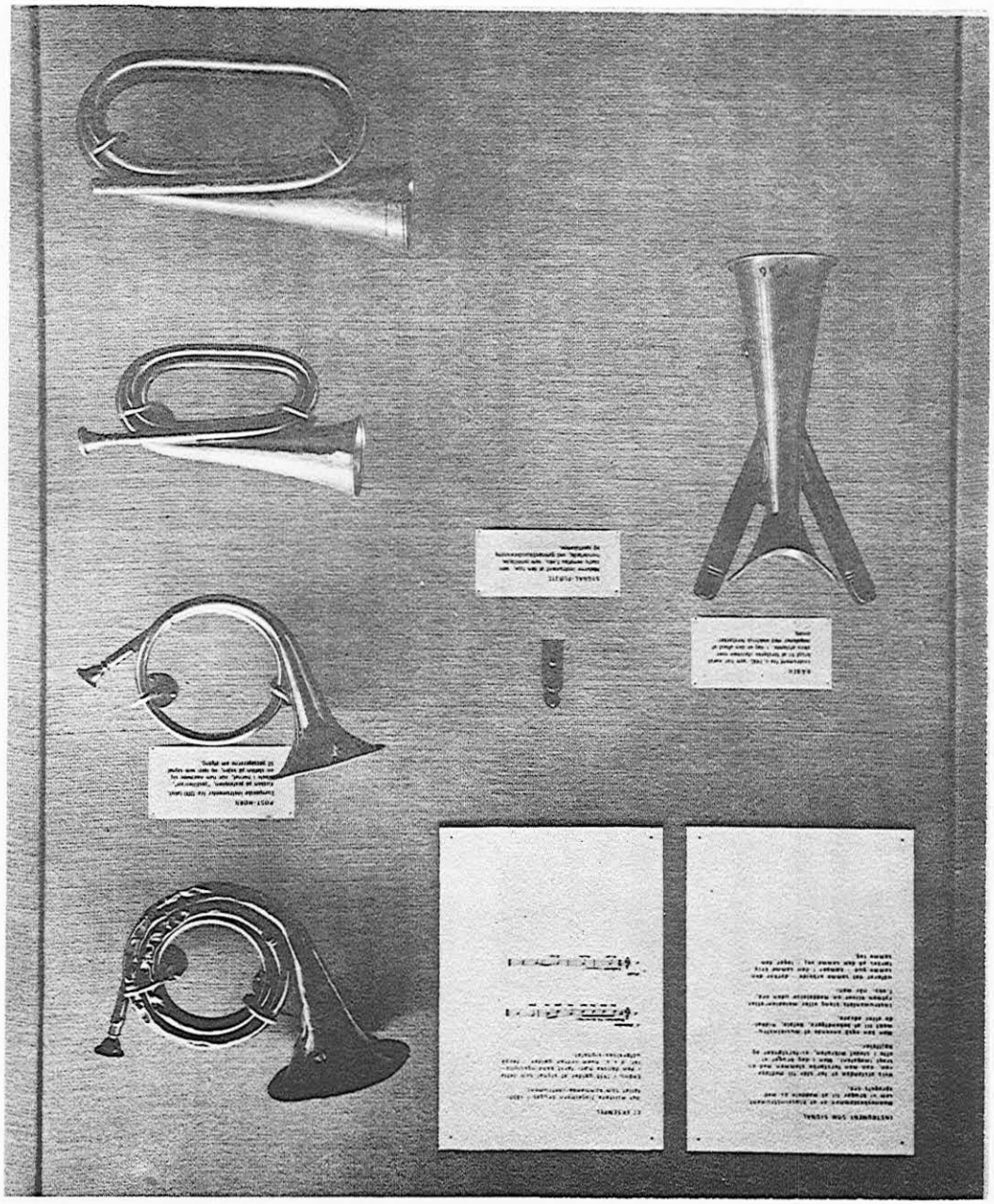
Stop technique seems to be a difficult process, a fact which is demonstrated by the next example from Mozart's second horn concerto.

(6)

The valve horn won the battle as medium of romanticism and modernism. And so Richard Strauss in his "Till Eulenspiegels lustige Streiche" is able to employ the valve horn as a most

Opposite page: Room no. 9 (new department)





suffisticated representative of the impudence incarnate.
(7)
The left part of the showcase deals with J. S. Bach's instrumentation of his 2nd Brandenburg concerto from c. 1720. Four very different instruments are supposed to take care of the same melody. The violin introduces this soloist theme and the oboe, disposing of the same tone range with a fine sound quality, repeats the melody in the same key, F-major.
(8)
The alto recorder is rather weak in its lower range, and moreover it lacks the deepest tone of the theme here. Bach postpones its appearance until the music has modulated - that is has moved into a higher key, C-major.
(9)
After a short orchestral interlude the trumpet introduces itself by a freely alterated version of the theme, since the harmonics of the baroque trumpet would not respond to the original melody. But after another modulation, now to the main key a fourth above the recorder's entrance, the trumpet gets its come back with the theme in its full length and with the exception of one note only, corresponding to the violin's first introduction of the soloist's melody.
(10)
Let us end this tape by playing the whole first movement of the 2nd Brandenburg concerto, so that you can enjoy without interruption the behaviour of the violin, the oboe, the recorder and the trumpet in Bach's intrumentation."

Mette Müller

## REPORT OF THE BASIC CONCEPTS WORKING GROUP

### Introductory lecture:
### Basic Concepts of Musical Instrument Presentations

Talking about the fundamentals of presenting musical instruments may seem redundant and even annoying at a time when the aesthetic and practical questions of setting up exhibitions dominate discussion, and educational ideas and programs on this topic are flooding our museums. The basic concepts behind any exhibition are certainly its least noticeable part in the eye of the average visitor, and probably also its least considered aspect in general. So far only one meeting has been devoted to musical instrument presentation [1], and it has taken eleven years to meet again under this heading in Burgdorf and another two years to gather in Scandinavia to further pursue this topic. The predominantly practical occupation of museum staff may serve as an excuse, or rather an explanation, for the dislike of the necessarily abstract considerations which are required here. The literature on the subject supports this view through its scarcity, and we will have to look for assistance from neighbouring fields outside the museum walls. It was for this reason that our colleagues from the three Scandinavian museums had originally asked Dr. Erich Stockmann to deal with this subject, and I could think of none more appropriate to talk to us about his ideas, his criticisms and hopefully also about his suggestions, than he. Unfortunately he cannot be with us.

If we accept the standard definition of the museum's task to be collecting, preserving, studying, and presenting then it becomes obvious that presentation, as the final step of this sequence, combines the results of the previous three. It is the most complex and most extrovert task from the professional's point of view, and the most necessary and rewarding one when looked at from the point of view of the public in its capacity as taxpayer and final addressee of all museum work. Thus, the collected instruments, after necessary preservation treatment, are made comprehensible to the public through the museum's presentation, based on the study of the material, historical, and cultural aspects involved. We, as visitors to a museum, feel entitled to the explanations and descriptions which accompany our displays, and would smile at the naivety of an exhibit without such information displayed like exotic rarities in some princely 16th or 17th century Kunst- und Wunderkammer. The interpretation of the individual instruments, their arrangement into ensembles, and the clarification of their cultural context is elaborated using organological methods, and it is this field of scholarly occupation which we will have to consider in the course of this talk.

It was in Copenhagen in 1972 that the Congress of the International Musicological Society devoted a Round Table to "Musical Instruments as Objects of Historic and Anthropological Research", with Dr. Stockmann in the chair [2]. In his introductory paper he describes the present situation of organological research which, he feels, suffers from the lack of theoretical and methodological

discussions, and the obviously limited inclination towards theoretical reflection [3]. Elschek in his contribution characterized the specialists from the fields of historical as well as from anthropological organology as entangled in their specialities and having largely given up the scholarly dialogue, the exchange of experience, and the integrating synopsis [4]. This, he writes, is not an illness specific to organology but symptomatic of the problems of all fields of musicology, which are only concealed by the quantity of information produced by a multitude of specialists. We may add that the mutual interest of musicology and organology in the objects of their research is anything but lively. The discussion of the feasability of a universal history of music during the International Musicological Congress in Berlin in 1974 clearly demonstrates the difficulties of integrating the geographically, historically or otherwise limited research into one common methodological approach [5]. Thus, the possibility of assembling the music, and the musical tools of the world under one common, theoretical roof, is questioned.

If this simplified sketch of the sciences, purporting to provide the museum curator with a firm platform for his more practical work, reflects the true situation (and I could not find a better interpretation), then the poor curator may well feel inclined to despair, and he may begin to envy Curt Sachs for the obvious ease with which he designed his picture of the musical instrument museum fifty years ago [6].

Accepting that the vast majority of instruments are exactly what the term describes, namely tools, we should decide whether these tools should be presented as objects in themselves, with their own historical and aesthetic value, or whether we should consider them merely as a means for achieving a higher hierarchic level, namely the interpretation of musical ideas. In the latter case the instruments become second class objects subordinate to the art they serve. In the case of European instruments of the past 400 or 500 years the result would be a museum of music with the instruments as marginalia, the core being an acoustical history book not unlike Arnold Schering's "Musikgeschichte in Beispielen" [7] with the omnipresence of audible music similar to the permanently visible works of art in their showcases. To me, this would be a strange conception.

Any tool will attract special attention in a demonstration of what it can do, and an instrument's function as a technical device for the production of sound will become immediately comprehensible through such a demonstration, in particular if offered as a live demonstration. For conservational, financial, and many practical reasons such demonstrations can only be considered as exceptions in most museums, although they are occurring regularly in the form of guided tours in some smaller collections. An interesting example of overcoming these difficulties was experienced by the participants of the 1981 A.M.I.S. meeting in Vancouver during their visit to the Ethnological Museum of the University of British Columbia. Many of the objects on display appeared strange and with little meaning to the visitor from another continent. However, at the push of a button, a few films could be seen, as a kind of audiovisual jukebox, one of these showing the making of a canoe from a log. In comparison to the demonstration of an instrument by insufficiently trained museum staff, or an unskilled musician hired by the museum, a well-made film seems more easily capable of reproducing a natural and true image of

the situation in which the object was made, or played. Why? Because in a film the complexity of conditions under which a certain procedure takes place can be reproduced more completely and more faithfully. A generation which has grown up with television will gladly accept the conversion of any kind of event into the optical medium of the film. In the case of musical instruments which are still played in the appropriate surroundings, e.g. many ethnographic instruments, the production of such films is feasible, though in practice anything but easy, and they allow an insight into the manyfold aspects of music making that is otherwise unimaginable. The Musée des Arts et Traditions Populaires in Paris incorporated such techniques into their study collection years ago, and CIMCIM members were shown the installations in 1971. As for myself, I was very much impressed.

Let me summarize this kind of presentation by greatly simplifying: the objects can be displayed in an aesthetically pleasing arrangement with simple labels for their indentification while the explanation of the musical, cultural, social, and geographic contexts is all dealt with in an audio-visual presentation. However, the museum of today, and probably also that of tomorrow, is showing, and probably will continue to show, little interest in a mechanized, prefabricated medium by which their actual treasures are in danger of becoming degraded to merely illustrative material for a television production; an observation that can, unfortunately, easily be made inpresentations of this kind.

The character of the three Scandinavian museums which we will visit during our journey does not lend itself to the extensive use of audio-visual means in the described manner, since their collections contain mostly historical instruments without a living tradition. We are therefore now entering more difficult, though more familiar, territory with the following considerations (the following appears to me to be equally applicable also to ethnic collections, regardless of their geographic orientation):

There are probably two main types of museum presentation which I would like to describe briefly. The travelling exhibition of Tutankhamun represents one kind and it serves as an excellent example of the amazement and fascination the museum visitor experiences in front of those stupendous objects in whose historical, religious or cultural background, however, he is hardly interested. He is fascinated by the costly materials used for their manufacture, by their unusual appearance, by these witnesses of exotic rites from an unknown culture, and is perhaps comforted in the knowledge that his own level of civilization is so much higher, and more rational. A totally different kind of amazement is that often observed in technical museums. Here the visitor meets with a sector of his habitual surroundings, and he can bridge the gap between his previous experience and the various intellectual demands put forth by the displayed objects with the aid of his technical comprehension. The visitor is thus making his actual knowledge and interest the starting point of a mental promenade through history. Coming to musical instruments, we may safely assume that every museum visitor has passively or even actively participated in a musical action of some kind, and we may be equally certain that he can find a connecting link between his personal experience and the contents of the museum presentation. Starting from the already known, he will be conducted deeper and deeper into history while his readiness for involvement is con-

stantly demanded.

At this point we should ask ourselves if a regressive exhibition would not be the appropriate form of a historical presentation, one that leads backwards from the modern orchestra, or other musical groupings, to earlier forms of ensembles and their instruments. I believe no one has tried such a method as yet, and there are surely many hazards on this path. In literature some chronological and synoptical tables have been compiled this way, e.g. in Samuel Marti's volume on pre-hispanic America, in the "Musikgeschichte in Bildern" [8], in which arrows pointing upwards, that is against the direction of reading, indicate the flow of time and duration of periods, surely a somewhat unsatisfactory method. Nevertheless, it seems interesting enough to be attempted, at least in a temporary exhibition, for the gaining of first hand experience. The occasional arrangement of concert programs in regressive order of time gives an idea of how rewarding this method can be.

Whether in a regressive or progressive presentation, instruments of earlier periods are often visually attractive and aesthetically pleasing, if not sometimes strange, in their appearance. Imagine the shape of a late 16th/early 17th century lute with its massive body and its tiny neck; think of the dulzian which looks so much like a heavy wooden cudgel; and let us not forget the 19th century dital harp or harp-lute from England, a piece of kitsch for the mantelpiece over the fireplace rather than a musical instrument. We should allow the visitors to notice these secondary aspects, to take their own pleasure in them, and to make their own discoveries. Instead of pre-programming every single step of his walk through the galleries and every detail of his interpretation, we should leave him with sufficient freedom for the use of his own imagination, and we should let him find his own way of looking at our presentation which he will do anyway, unless we manage to capture his imagination in some way.

It is generally accepted that we group instruments by their morphological components, and Stockmann rightly noted in this respect the similarity with Linnē's classification of plants [9]. Though the Sachs-Hornbostel method has indeed contributed greatly towards a systematic survey of the naturally grown families of instruments, it has at the same time pushed aside any other kind of approach from which a systematic order could be devised. If adopted, Hans-Heinz Dräger's proposed method of analyzing instruments also by musical and accoustical features [10] would have changed our presentations considerably. His system or other similiar ones could lead the way towards replacing the static, morphological and technological approach with a dynamic, more complex and more lively one. Indeed, since music is inseparably connected with the dimension of time, "dynamic" corresponds to "musical" while "static" is related to "unmusical".

The functioning of instruments and especially the possibilities of combination in ensembles can hardly be deduced from showpieces that are sitting in their vitrines with not more explanation than the usual indication of type, maker, place, date, and inventory number. Whether in typological or whatever order, the instruments will inevitably be looked at by the visitor as individual objects. Two violins, one viola, and one violoncello placed next to each other in a showcase, each with its own label, will not automatically make a quartet, but remain four single instruments unless the visitor receives explicit informa-

tion about this important type of musical ensemble. Children when practising their instruments are told that any musical expression must be exaggerated to become audible to the listener, and the musician's good intention cannot replace a well expressed presentation of a particular phenomenon. The apparent wordlessness - in a figurative sense - of many art exhibitions prompted an art historian to suspect that museum employees might do their exhibitions with regard only for their colleagues and not for the ordinary visitors. We should becareful that this imputation does not become applicable also to our field.

How can we make the instruments speak to the visitor? Above all by making them use their own language, by playing them and making them heard in demonstration or by acoustical reproduction. This demand is self-evident, and needs no further justification. The practical realization on the other hand raises many questions and will have to be discussed during the next days.

There is a large gap in comprehension between a static showpiece in its glass cage and a piece of music coming out of loudspeakers or a pair of headphones. There are many more aspects to be included in a presentation that aims at a somewhat rounded-off picture. How is the instrument played? On what occasions is it played? How does it combine with others? Who are the players? How is the instrument made? Etc. etc. Many of these questions find their answers in results of organological research, others are of a more general character and may be answered by historical, cultural, sociological or economic investigation.

The relevance of the consideration of environmental factors was also discussed in Copenhagen in 1972. Although our understanding of the relationship between certain social structures and the development of music or musical instruments is anything but developed, nobody could deny that musical or technical achievements must find certain prerequisites in the cultural, social and economic situation. As an example the evolution of the baroque oboe in France during a period of prosperity and consolidated political forces under the reigns of Louis XIII and Louis XIV finds its counterpart in the construction of the short-lived German shawm during a period of constant war and subsequent slow recovery from the country's devastations and impoverishment. Of course, this kind of observation does not explain bore diameters or other technical detail, but it throws some light on men's achievements under certain conditions; it is not the methodological approach that forbids deeper insights into many similar episodes but rather the lack of documentary material [11].

Nevertheless, there are many possibilities for creating a framework around the instruments on display with the aid of other kinds of objects. Paintings, drawings, and prints, either originals or reproductions (according to availability and conservational considerations), can convey a good deal of an instrument's previous environment. Still lifes, however, such as Praetorius's "Organographia" of 1619, or the well-known paintings by Baschenis, Bettera and Munari, make no further contribution towards the understanding of instruments which are exhibited. It is the reproduction of the complex situation in which the instrument is played that iconographical material should be used for, and not for the decorative purposes of creating an artistic atmosphere within the museum halls. Musical accessories and a broad variety of non-musical objects may serve our purpose well. The "Look of Music" in Vancouver provided two most interesting ex-

amples of the attempt to vivify the long-ago performance of specific musical pieces. One was the trio-sonata from Bach's Musical Offering, the other Mozart's wind-piano quintet of 1784. In both cases, the musicians seem to have just left the room, their instruments casually leaned against the chairs or deposited on the floor, with the music on the stands, the jackets, tobacco pipes and the many other little details which may have been found in the room, carefully arranged to make an almost perfect illusion of a musical party of two hundred and more years ago. The examples, however, demonstrate the principal limits of all efforts to present music in a static exhibit; the sound of the music dies away the very moment the musicians put their instruments down. Because of this problem, the musical instrument museum has to make use of various means to attract the visitor's attention to one or more aspects, each one supplementing the other. These more practical aspects, I believe, are part of the pedagogical working group's considerations. Therefore I only want to list the components indispensable to me in such a complex presentation:

An introduction into the nature of sound and its production; a systematic introduction to the various types and sizes of instruments, their construction, technological refinementn and decoration; the display of orginals, the museum's primary raison d'être, thus permitting at least a visual contact with music of other periods or geographical regions, of different social and ethnic origins; audible music as produced by, or intended for, the instruments displayed in the show cases (the philological, technical and esthetical materialization of this requirement could easily form the contents of another conference); iconographic or printed material and written or spoken texts explaining the instruments' use and cultural environment; non-musical objects illustrating musical events, personalities or phenomena.

The combination and accentuation of these components are to some degree subject to the type of museum under consideration. Museums specializing in musical instruments as the three at Trondheim, Stockholm and Copenhagen form a minority amongst those holding musical instrument collections. In most cases the possession of musical instruments does not even lead to the forming of subdepartments devoted to musical instruments within the more general framework of museums of cultural history, the decorative arts, the history of technology, or the like. I believe that the basic methods in all kinds of museums need not differ very much from each other if a common comprehension of the nature of musical instruments can be achieved on the grounds of their complexity, their background and function; regardless of the character and contents of a given collection, its size and type.

In many museums, and certainly in my own place of work, the present situation offers little reason for satisfaction. Occasional silent observation could help us in our search for an improved presentation of our treasures and a few minutes spent here and there in the exhibition halls will often provide us with a valuable and at the same time disillusioning experience. Eighteen years ago van der Meer required that in a presentation even an uninterested visitor should come to know the old instruments so that he would meet them with "Liebe und Ehrfurcht" (my attempt at a translation: with love and veneration) [12]. Amongst the visitors to our museums the older generation will appreciate and to some degree fulfill this requirement. The younger ones, especially when part of a school class, look differently at our

efforts: "Nanette Streicher? I don't know her, she hasn't introduced herself to me". There is no sense in ignoring such effusions which are no exception, and at the same time any immediate demonstration at this lack of respect would meet with incomprehension. The different reception of and the often indifferent attitude towards museums, their presentations, and the message they hope to convey should be taken as a challenge, to fulfill a continuous task that needs frequent reconsideration of their concepts and methods in order to draw a picture of the richness of what is perhaps the most important kind of human expression in past and future history.

Friedemann Hellwig

Notes

1. Studia Musico-Museologica, Bericht über das Symposium: Die Bedeutung, die optische und akustische Darbietung und die Aufgaben einer Musikinstrumentensammlung (1969). Ed. by the Germanisches Nationalmuseum Nürnberg in cooperation with the Musikhistoriska Museet Stockholm (1970)
2. Musical instruments as Objects of Historical and Anthropological Research, Round Table. In: International Musicolog. Soc., Report of the 11th Congress Copenhagen 1972, ed. by H. Glahn et al., Copenhagen 1974, pp. 131-165
3. Musical instruments, pp. 131-135
4. Musical instruments, pp. 151, 152
5. Aktuelle Probleme der Musikethnologie, Symposium. In: Gesellschaft für Musikforschung, Bericht über den Internationalen Musikwissenwissenschaftlichen Kongress, Berlin 1974, ed. by H. Kuhn and P. Nitsche, Kassel 1980, pp. 233-241
6. Curt Sachs, La signification, la tâche et la technique muséographique, Paris 1934, in particular p. 19 etc.
7. Leipzig 1931
8. Leipzig, vol. II/7, 1970
9. Musical instruments, p. 132
10. Prinzip einer Systematik der Musikinstrumente, Kassel 1948
11. Musical instruments, pp. 158-160
12. Gedanken zur Darbietung einer Musikinstrumentensammlung. In: Museumskunde, 1964/65, pp. 152-164

Examining and evaluating other colleagues' efforts is a delicate task during which we may easily find a splinter in the other's eye while becoming uncomfortably aware of the bar in our own. This is a bad position for anyone who has been invited to criticize. However, this uneasy feeling in this instance very quickly changed into an unsuppressable desire to study in all detail what had been achieved with a given collection under the prevailing circumstances. It became a great enjoyment to see unfolded before us the wealth of considerations, experience and practical work incorporated into the three Scandinavian presentations of musical instruments. What had appeared as a delicate and almost embarrassing task at the beginning turned out to be a rewarding and inspiring undertaking from which the work in one's own museum would directly profit. It was for this reason that the initial shyness soon gave way to a friendly impatience which permitted no waste of time in going into the exhibition halls in order to discover the ideas behind the displays.

In the practical procedure of examining and evaluating the presentations we made use of a few questions that had been formulated before the meeting and which proved a good starting point for our observations. Later on, they were to be combined with each other in order to arrive at a synthesis of the observations made. The questions were the following:

1. Do the presentations justify calling the museum a museum of instruments or a museum of music? Although we were aware that every intermediary degree between the two are possible we nevertheless stuck to these two terms which we found helpful in our investigations.

2. Are the objects found in systematic typological order or are they displayed in the categories of a history of music, or of general, social or economic history? If the previous question related to the museum in general the present one would specify the type of systematization used in presenting the museum's collections.

3. To what extent are the categories/principles used in the presentation comparable and compatible with the different cultural provenances of the instruments? This question refers to the consistency with which the systematization of the presentation allows a direct comparison between instruments from various cultural and social environments.

4. What extra-musical aspects are incorporated into the presentations in order to support the understanding of instruments and music? And how do they serve the museum's concept? It is obvious that non-musical objects may well help to illustrate musical or historical events and make them more easily understood by the ordinary visitor; on the other hand the danger of distraction is always present.

5. Does the content of the museum's collection justify the concept of the presentation? Practically every museum has certain weak spots in its collections which may render the illustration of a certain musical phenomenon or development in the manufacture of instruments difficult if not impossible. The basic concept behind a presentation must take this fact into consideration.

6. To what degree is the museum's proclaimed concept found to be in accordance with its materialization? This final question

sums up much of what has been examined above. At the same time it should provide an answer to the question of the degree to which the museum's concept is in fact understandable to its visitors.

7. In the course of our tour this catalog of questions proved helpful as a framework for our investigations. At the same time it allowed for the special character of each of the museums - the extent of their collections, their history, the influence of the personalities of those who formed the collections, the geographic situation, particular environment, etc., etc.

## Ringve Museum, Trondheim

In this museum only the newly installed exhibition halls were under consideration. We thought that it would be impossible to consider the old rooms with their very special and attractive atmosphere, arranged for museum use during the fifties, with the recently installed presentations. The number of halls to be examined in Trondheim was for this reason relatively small.

1. We found Ringve Museum to be basically a museum of musical instruments, with music used as illustration. The setting of the old farmyard and its living quarters, dating from the past centuries, also influenced the type and style of the recent presentation. It appears only natural to seek for these presentations a style which to some degree is in harmony with the old rooms. An ultramodern display (whatever that may be) would not have been appropriate in this building or in the rural surroundings in which the museum is situated.

2. It has been tradition in Ringve Museum to offer the visitor a guided tour through the exhibition rather than allow him to stroll around on his own. It is therefore the guide who largely decides upon the type of systematization in which the instruments are presented. With the guided tour varying to some degree from guide to guide we found it difficult to associate the presentation at Ringve Museum with one of the key words used in our catalog of questions.

The European instruments are presented, in terms of their physical layout, in a chronological fashion, but the tour, which included live performances, seemed to emphasize mostly the variety of sound produced by the stringed keyboard instruments. Obviously the flexible nature of live tours allows for other emphases, depending on the inclination, training, or whatever, of the guides. Furthermore, it will always be easier to use keyboard instruments for spontaneous demonstrations than plucked or bowed stringed instruments which need some preparation before they can be played.

The ethnographic instruments are presented typologically in the four basic classes as established by the Sachs-Hornbostel system. Musical examples to demonstrate the sound of many of them are provided by means of tape machines.

In addition there are study collections which focus on how sound is produced by these basic classes of instruments, and two exhibits which present the instruments in their sociological context (as used for dance and for religion). Photographs are used to help establish that context.

3. As the area for the museum exhibitions is rather limited in Ringve Museum, the groups of visitors will make different tours so that they do not interfere with each other. However, it seems to be normal that the groups first go through the sections of the European instruments before they enter into that of the ethnographic instruments. Thus, the European visitor is at the beginning faced with instruments that he may have already encountered both in museums and in the concert hall. It is afterwards that he learns about the four basic classes of instruments, and these are represented by four individual objects, forming the center of the hall devoted to ethnic instruments. Around this center each of the basic types is illustrated in more detail in

vitrines giving examples of this group of instruments from various continents, including Europe. While following a guide we wondered if it would not be wiser to begin the tour with a visit to the ethnic section of instruments. Here the visitor would be introduced to the principal types of instruments (also about their way of producing sound, as demonstrated at the rear side of the showcases), and he would learn about the various regional or national instruments belonging to each of the four classes. It would then matter very little if instruments from various geographic provenances and social levels were intermingled in this part of the exhibition. The subsequent visit to the European instruments would form a specialized presentation from one geographic region and a limited social environment. It would also be much easier to explain the relationship between the two neighboring exhibitions of European art and Scandinavian folk musical instruments.

We assume that some of the guides, forced by circumstances to begin their tours in the ethnic hall, may already have experienced the greater ease with which the visitors can be introduced to musical instruments if proceeding in the above sequence. If our observations were correct there is no need of any kind of rearrangement of the presentations except for the guides using a different entrance and exit.

There is only a minimal use of extra-musical materials except in the two sociological exhibits. In these, color photographs establish the context between music on one side, and dance and religion respectively, on the other. Elsewhere it is the guide who has to create the environmental framework around the instruments. We observed that many of the guides succeeded very well in this, even with only very short explanations. It is the personal contact between the guide and the visitor which becomes an indispensable aid in vivifying this context.

5. A visit to the museum's storage showed us (besides its exemplary tidiness and systematic order- the wealth of instruments which are accessible only to the specialist. We believe with regard specifically to the presentation of European instruments, that the museum owns sufficient objects to give a more complete chronological presentation, but apparently exhibition considerations were influenced by the pragmatic decision to put the museum's "treasures" together in the best facility. In the ethnographic gallery, the museum has sufficient instruments to concentrate solely on non-Western instruments, rather than introducing two or three European folk instruments, if it should wish to do so. However, as indicated above, the presence of the European instruments in a general and systematic introduction into musical instruments is well justified, in particular if this introduction stands at the beginning of the tour.

6. The museum founder, Victoria Bachke, wanted her museum to become a "living" and "sounding" museum. The former is achieved in the word's own sense by the fact that the visitor may see the collection only in the company of a guide. The concept of a "sounding" museum is justified through the regular demonstration of playable instruments (European stringed keyboards) and the use of tapes (in the ethnographic section). In fact, the guide is the interpreter of everything to be seen and heard in this museum. He can easily react to the visitor's questions and can thus help to fulfill the museum's concept in that the visitors may enjoy their visit even without any previous knowledge of music.

In the ethnographic section, the museum concept claims to use non-Western European folk instruments, but the latter appear under-represented, and, as a result, the integration of musical instruments in terms of a world-wide view appears problematic. Perhaps such a concept lacks validity, in any case, because non-Western instruments are found on a variety of social levels and cannot be grouped together as folk instruments. Again, it is in the guide's power to explain this partial contradiction.

We found Ringve Museum to be a very lively museum which offers to the visitor, regardless of how much he already knows about music, an excellent introduction both to the many varieties of instruments as well as to the sound that can be produced on them. The collections may not permit a complete survey of the history of musical instruments, but the visitor can take with him the idea that music is something wonderful, enjoyable and desirable. The rational analysis which we applied in examining the presentation of instruments in this museum seemed to form a strange contrast to the rural surrounding of the former farmyard, the quietness of the fields below the building and the spirit of hospitality with which every visitor is received in Ringve Museum.

## Musikmuseet, Stockholm

Similar to Ringve Museum in Trondheim, the Musikmuseet is housed in an old building, the crown bakery, which is the city's oldest surviving industrial building. It is currently protected as a National Monument. &s was the case in Trondheim we felt that this kind of historical framework would not leave its contents uninfluenced. The liveliness of the surrounding city, which appeared so noisy after the tranquillity of Trondheim, the rich cultural life and many other factors which are present in a country's large capital must have an unconscious yet perceivable influence on the way in which the museum presents its collections to the public.

In examining the presentations of the Musikmuseet we followed the drafted criteria although we found them to be somewhat insufficient. Nevertheless, all questions that were important to us were raised in their context.

1.The museum is named Musikmuseet, yet we found it to be more a museum of musical life. Music is offered to the visitor by the means of headphones which he can pick up at a number of fixed posts found during his walk through the museum, however, the sounds of music somehow appear to be of secondary importance when strolling through presentations which follow categories of a different kind. n fact, in this museum, musical phenomena are seen in the light of the historical events of the periods in which they occurred.

We found it appropriate to examine the sound workshop and treasury afterwards and to turn now to the Historical Section.

2. The presentations follow historical lines, and are divided into "four cross sections of Sweden's musical life". The exclusive occupation with the national musical history is a noteworthy feature in the presentations of the Musikmuseet.

The first section is devoted to "the Imperial Period", and this term covers the 17th century. It is the period during which Sweden got involved in the wars of central Europe and achieved great political power. It is here that the relations, especially with the northern part of central Europe, became apparent in the instruments on exhibition.

The second section is devoted to the 18th century and carries the heading of "Bellman's Stockholm". Carl Michael Bellman has been chosen to illustrate musical life mostly in the country's capital during the 18th century, for which end he is especially suited through his contacts with a wide variety of social levels.

"The Battle Cry" is the title of the third section, referring to the social revolutions in the country and the effects in particular on folk music.

The 20th century is entitled "From Vaudville to Punk Rock", and here the lighter aspects of music and the beginnings of reproduction techniques such as those of mechanical musical instruments are illustrated. This section leads up to the present.

We had difficulties in applying any of the terms formulated in question 2 with certain consistency. The four headings relate to political, personal, social and musical matters; perhaps the description as a presentation in the category of "social history" would be the best approximation.

3. The social context of musical phenomena and consequently

also of musical instruments has been found to be the most important point in this presentation. It can be described as very consistent and in full accordance with the proclaimed concept: that music is an expression of the time and surroundings in which it is created; that every cultural group thus creates its own musical form; and that this has been made the basic concept of the museum's permanent exhibition.

4. Extensive use has been made of extra-musical objects in order to make the various forms of musical life and the use of instruments understandable. Thus, non-musical objects have become important in the materialization of the museum's concept. We found the "shop of music and instruments" in the second section of the historical department a particularly charming example of this approach.

A number of headphones were available to the visitor, giving explanatory texts (because of the language problem only a few were listened to- and musical examples.

Extra-musical aspects are strongly represented in these presentations, although we feel that there are further possibilities not yet covered. For example the roll of the early trumpet, its use in the battle field and at the court, the organization of the trumpeters in guilds and their strict rules have not been mentioned although the trumpeter and his instruments offer themselves as a demonstration of the political power present at various events. In addition, we thought that it would be good to display more than one trumpet, that is, to represent the habitual appearance of at least two trumpets as used for many heraldic purposes. In the section representing 18th century Stockholm we wondered if it would not be possible to find better means for the visualization of the wide spectrum of society in which Bellman had contacts and the expression of these contacts in his music. We found that we gained a very delightful insight into the style of living of the period yet that the representation of musical aspects remained unsatisfactory.

We wondered if the three-dimensional objects should not remain the starting point of a museum and for this reason its primary focus. Thus, we also wondered if the instruments on exhibition did not deserve more attention from those who had prepared the display and consequently from the visitors (e.g. the extraordinary giant trombone called for more detailed explanations). We were aware that the amount of written or spoken (headphones) text is already the maximum that the visitor would want to read or listen to. Perhaps a slightly different accentuation of aspects and selection of instruments would make the visitor aware of the rich collections of instruments held by the museum.

5. The museum owns some 4000 instruments of which only about 250 are on exhibit. We found this figure to be very small and wondered how more instruments could be incorporated into the exhibition. For example, the various forms of musical ensembles could be demonstrated more clearly, such as the orchestra or the musical grouping in which the Bassetthorn appears. We believed that some of the showcases appeared rather empty and could be filled with further instruments. Thus, we missed the feeling of splendor and wealth which must have been present at the Swedish 17th century imperial court. The size of the 18th century orchestra could be more clearly demonstrated by the inclusion of a larger number of instruments. The dance master lacks his pochette. Etc., etc. A collection of this size undoubtedly con-

tains a number of instruments that could help to put more emphasis on the aspects of music and musical instruments in its exhibition. We believe that in this way many of the sociological aspects in the museum's concept could be even more clearly demonstrated, particularly in more recent periods (mechanization of wind instruments etc.).

6. We found the exhibitions to be in astounding accordance with the museum's proclaimed concept; we wondered however, whether more reference to musical phenomena should be made in many of the introductory texts and their subdivisions (for instance in "music in the home", "music for an audience", etc.).

We also wondered whether the space devoted to each of the four historical departments had been divided in the best way. The territorial expansion and political power which Sweden fought for in the 17th century found little expression in the rather compressed rooms. It was because of the larger amount of space allotted to the 19th century that we liked this section best.

Other permanent exhibitions considered included the sound workshop and the treasury.

The sound workshop, offering the visitor an excellent introduction into the nature and production of sound, is an excellent idea, and it stands rightly at the beginning of the visitor's promenade through the exhibitions. We discussed two points: firstly if the amount of space alloted to this department does not give it an unjustified weight at the expense of the historical exhibitions which appear to be cramped into the basement; secondly, we considered the question of the homogeneity between the sound workshop, which introduces the principles of sound production with the aid of musical instruments; and the historical exhibitions in which musical life in the history of Sweden is illustrated with musical instruments. At any rate, we thought that the sound workshop must be an indispensable part of any of today's musical instrument presentations.

The Treasury contains a number of instruments of the highest quality which did not find a place in the four historical sections. Here the instruments are to be seen without their musical, social and historical contexts which form the primary principle of the adjacent historical department. Among us we raised the question if the instruments from the treasury should not be incorporated into the historical sections.

We have understood and subsequently been able to find out ourselves that the building with its many small rooms and low ceilings restricts the flexibility of their use. For this reason we can see the difficulties our colleagues must have had with laying out the basic plan for the various parts of the exhibitions.

The permanent exhibition of keyboard instruments was still in preparation while we visited the museum. We asked ourselves the same question as in the treasury, namely, if these instruments should not preferably be incorporated into the historical sections.

Summing up, the musical instrument presentations in Stockholm were of particular interest to us in that they very consistently followed the basic concept of integrating musical instruments into categories of mostly historical and social character. We feel that wherever a similar basic concept is to be applied the Stockholm presentations will for a long time serve as the model.

## Musikhistorisk Musem og Carl Claudius' Samling, Copenhagen

The present museum has evolved from the combination of the previous Musikhistorisk Museum with the private collection of Carl Claudius. With the integration of the two collections into an enlarged complex of three houses a new concept had to be found for the new museum. It is now divided into a section giving a historical survey of music and musical instruments, and another section that deals with themes from the national history of music. There are also a number of varied aspects serving as a kind of introduction to the historical sections. We have therefore decided to deal separately with the two sections when applying our catalogue of questions, apart from question one.

The historical section:

1. This museum can easily be described as presenting both musical instruments and music. All subdivisions have been derived from these two principal subjects, and the contents of this museum correspond excellently with its name.

2. The new section (rooms 1-13) represents a sequence of rooms illustrating various aspects in a loose order. The amount of material shown under the different headings corresponds very well with the character and size of the available rooms, resulting in a stimulating promenade through rather diverse themes: notation, music-engraving, keyboards; Danish musical life in the 18th and 19th centuries; Danish folk music and dance; the classification of instruments; the nature and production of sounds; the use of instruments; the making of instruments; reconstructions, copies, and fakes; "musical relics"; etc. Just a few remarks are offered on some of these presentations. The exhibition on Danish music history gives us a very good impression of the musical activities in this country and in various social contexts. Excellent photographs serve as illustrations. We very much liked the rooms called "play with sound" (they have been cleverly arranged at the far end of the exhibition so that possible noise should not disturb other visitors). Here children can romp to some degree, using tubes and other simple objects for the production of sound. Much temperament that may otherwise prove harmful to museum presentations may here find a sensible outlet and thus serve the museum's intentions. We were less happy with a piano of rather good quality, however inadequately maintained, which could give the young visitor in particular the false idea that historical instruments are to be used as toys, not as serious tools for the making of music. Room 8 might perhaps be used as an opportunity to present a larger number of ethnographic instruments for which there is little room elsewhere (we would have liked to see all instruments in this room have labels giving their names, provenances etc.). We were delighted with the quality of the musical examples that could be listened to with earphones. Sounds from rural life, military actions, and of course from the concert hall gave an excellent idea of the wealth of acoustical phenomena. Perhaps it would be good to include signals and music played by the trumpet which is one of the most important signal instruments (room 9).

3. No attempt was made to find a common concept for these presentations; they have been arranged rather pragmatically as an

aid for a deeper understanding of the historical section.

4. Few extra-musical subjects describe the circumference of music making. Although no direct relation to the section showing the historical instruments has been established we nevertheless expect the extra-musical aspects touched upon to be very informative and stimulating to the museum visitor. The danger of giving too much weight to this section has been wisely avoided. The idea of including aspects of Danish music, surely of special interest to the Danish visitor, into this section appeared to be excellent, leaving the presentation of the overall development of musical instruments in Europe undisturbed (the representation of national aspects in an exhibition of general character must necessarily interrupt its natural continuity).

The new section:

1. As noted at the beginning of the previous section this museum presents both musical instruments and music.

2. The subdivisions of the historical section (rooms 15-29) follow a chronological order, arranged under headings taken from the history of music, and in some cases certain types of instruments have been assembled.

Room 15 gives a presentation of medieval musical instruments, showing both instruments of art and folk music. Together with the extensive texts found on the walls, this gives a very good impression of the use of instruments during that period and of the connection between the two sociological spheres. We liked the inclusion of copies supplementing the small number of originals held by this or any collection.

Room 16, characteristically bulging out from the ground plan and forming a kind of appendix to the main building, houses an exhibition of "European folk music today". We found the installation of this department to be a particularly good idea, making excellent use of the peculiarity of the building. It also gives a good idea of the constant relationship between the two main streams of music making, and of musical instruments used in folk music which are, to a great degree, directly derived from their medieval ancestors. This presentation shows folk music to possess roots in early history but to be something very much alive in our own time, thus easily bridging several centuries. Various groups of instruments, each representing one of the important countries of European folk music, give a good impression of the wealth that is still found today.

Room 17 leads back into the main guide line, presenting musical instruments from the renaissance. As in room 15 copies have been included to make the representation of the musical instruments of that period more complete.

It is in room 23 ("early musical boxes") that we felt slightly thrown out of the musical and historical order. We were also a little puzzled to find the aeolian harp together with musical boxes.

Room 25 lies exactly above room 16 and is used in a similar way, deviating from the chronological line. The room is called "tradition and fashion - experiment and renovation", and there are displayed "various types of instruments which for shorter or longer have been of interest to the composers and their audience". Many of the instruments which are difficult to include in the usual line of development, yet are often of special interest to the visitor, are shown in this room, for example the

musical glasses, the nail violin, the aeolian harp, instruments with aliquot strings, etc. At the same time successful experimenting is documented by such instruments as the pedal harp and the fortepiano. We thought this presentation, like the corresponding room one floor below, was an especially good idea, enriching the chronological order of the presentations.

3. The tour continues with rooms on the more recent musical periods. The instruments, presented under the various headings, have only the most basic information written on labels at their sides while the historical, musical or sociological context is established through texts that can be heard through earphones. These texts (they were available to the conference participants in written form) offer easy to understand introductions to the many questions of how the instruments were played, on what occasions, with what kind of audience, etc. etc. With the many rooms that a visitor passes on his way through the museum these texts have been kept rather short, touching upon only a shortened selection of questions. Their uniform style and well-worked-out wording does the best possible justice to the described phenomena.

It has been our impression that all texts were written by one single person thereby achieving the comparability and compatibility which finally results in the above mentioned unity.

4. Hardly any extra-musical objects have been incorporated into the historical display section. This part of the museum forms an exhibition of musical instruments whose explanation and demonstration are almost exclusively set forth by means of texts which directly relate to music, to the circumstances under which it can be heard, and to the instruments themselves. In addition, there are carefully selected musical examples.

The tow sections together:

5. The combined collections of the former Musikhistorisk Museum and the Claudius Collection allow for a very comprehensive presentation of the history of European musical instruments. No discrepancy can be found between the proclaimed concept and with what is found in the new museum's collections.

6. On examining the director's texts explaining the concept for the new museum, one will find that the main concern is not directed to the realization of historical, sociological or philosophical considerations. The presentations are always oriented to factual situations, concrete historical events, and easily understood developments. In her introductory text Mette Müller summarizes the basic conception of the old department as "an attempt ... to combine the history of the instruments with the general tendencies in the organization of musical life as found in the social strata that are covered by the collections". Exactly this has been achieved: not to superimpose a concept over the museum's collections and eventual presentations but rather to make the best use of what the museum holds. This is a very pragmatic approach which makes the answer to question 6 very easy: the concept and its materialization have to be in accordance with each other under these circumstances.

Summarizing, our little group realized that the main goal in establishing the presentations of this museum has not so much been the realization of a professional, that is, a musicological or other concept but the attempt to address the visitor and to

bring him into the closest possible contact with the collection (for conservational reasons this has to be understood in a figurative sense). The clear language used everywhere for the explanations and the excellently chosen musical examples together with an attractive style in the visual presentation of the instruments result in a museum that we expect to become a focusing point for all lovers of music and certainly a great attraction to those who have had little contact with music before.

Friedemann Hellwig
on behalf of the working group

## Ringve Museum, Trondheim

### General Comments

We approached the museum through the view of the prepared explanations from Peter Andreas Kjeldsberg and from guided tours - one a special tour for us by Jan Voigt and another as members of a regular general tour, "a group of puddings from the cruises", as Hélène La Rue called us. From Peter Andreas Kjeldsberg we learned that the purpose of the museum is to give the visitor an impression of the collection and the intentions of its founder and to offer an introduction to the development of musical instruments, especially keyboards.

### The Exhibitions

Ringve presents the visitor with a museum of museums - a history of museum techniques which we found very appealing. The farm house represents museum presentations common in the late 19th and early 20th centuries; the keyboard area, the best of post-World War II ideas; and the ethnological exhibits, a modern up-to-date installation. The length of the tour can vary according to the interests of those on the tour and the expertise of the guide.

We found the arrangements of the rooms pleasing and conducive to a good learning experience. In the farmhouse, each room presented a special idea in context - there was a Mozart room, a Chopin room, and a Victoria Bachke room. In the exhibit which we are calling the keyboard room, the chairs which rotated 360 degrees appealed to us very much for they offered rest to the visitor, focus to the presentation and security for the instruments. Many of us enjoyed the openness, the feeling of spaciousness. We suggest there be more labels for the visitor to see as he walks by so that he might know something about some of the instruments even if the guide does not discuss them. The labels might be of a larger type size. We also felt that the Norwegian folk section was too crowded for our tour group to see and understand. We recommend a rethinking of this area, for as the leading musical instrument museum in Norway, we feel that Ringve could and should provide the visitor with a better opportunity to learn about Norwegian music and instruments. In the ethnological exhibit we found a good, logical arrangement that was aesthetically pleasing. Its theatrical setting provided an element of surprise. The spotlight helped us as visitors to concentrate upon one group at a time. We were impressed that all the lights and tapes worked and that the audio-visual equipment was very discrete. We would find it helpful to have more illustrations of playing techniques, especially of the taped examples. Mounting a map to which the guide could point might be considered. Some suggested that the audio equipment could be changed at a minimum expense for better reproduction.

Additional Activities

a) Guided Tours

Victoria Bachke would be pleased that her visitors are presented with a "living museum", and a pleasant and informative visit. Ringve has selected attractive, intelligent guides who present a welcoming atmosphere and informed presentations. We noticed that it was an open atmosphere with few restrictions (unlike some of our own museums). The pace of the tour was good, not too much information but enough to satisfy most of the visitors. We admired how carefully timed were the remarks between the taped examples.

As for suggestions, we felt that the introduction of the tour might prepare us a little more for the entire scope of Ringve. We urge the guide to consider wherever the tour begins as the right place to begin (starting in the keyboard room, we were told that we started at the "wrong" end). We were pleased that we heard music early on in the tour. The tour guide might do more to establish rapport with the group - introduce herself, tell who she is (student in Trondheim?), find out something about the visitors (do they play or own instruments), in other words know the audience and play to it. She might have explained more about the barrel organ that she was playing as we all arrived.

Explanations should be more than fool proof, they should be idiot proof. For instance, when presenting the taped examples, explain that other instruments will be on the tape also. In the explanation about keyboard actions, a harpsichord action model of a sample jack might help the description. In the ethnographic room we all would have liked to know more about the function of the music, and some of us wondered if there might be some way to have illustrations of the players as the tapes were playing. We were all concerned about the security of the instruments. As alert as the guide might be, she or he was often busy answering questions while some of the visitors wandered freely around the room, sometimes touching instruments. While we appreciated being able to see the sansa taken off its exhibit mount we felt uneasy about its precarious return.

We regretted that we were not able to be part of the other types of tours, those for schools and visitors with specialized interests. One of us, however, attended part of a school tour and noticed with satisfaction how the same (ethnographic) exhibition could be used in a different way for a young audience. The guide followed a much less rigid scheme and adapted the tour in a pleasant way to this particular group. Recognizing that it is difficult, if not impossible to cover everything in one tour, members of our group did comment how they would have been interested in some discussion about wind instruments, or the platforms, or the religious functions of the clavichord; subjects which are no doubt covered in the more specialized tours. We share a concern about providing more for visitors who come more than once; we urge Ringve to move ahead on developing plans for a changing exhibition area.

b) Publications and Concert Hall

Ringve has done a superb job in developing postcards, recordings, posters, and checklists relating to the collections. For many of us, it was our only knowledge of the Ringve collections

until this visit and for many others it may be the only way to know of its treasures. The museum might consider preparing information sheets for the guided tours so that the visitors could have the names of the instruments and their provenance as they move along on the tour. The handsome concert hall (with its ingenious elevator to transport the keyboard instruments) is also an added asset, one that many of us would enjoy having.

Conclusion

We encourage the museum to document and record the history of the museum, the lives of Victoria Bachke and her husband, recollections of them by those still living in Norway and elsewhere, her collecting activities, and the many anecdotes about her and about the museum since her death.

A visit to the Ringve Museum, located as it is on a hill overlooking the beautiful fjord, is a magical experience that moves all who come. That the visitor is also treated to such excellent exhibitions and music in addition to the beautiful setting is a credit to Jan Voigt, Peter &ndreas Kjeldsberg and all the others involved in the life of the Ringve Museum.

Cynthia Adams Hoover

## Musikmuseet, Stockholm

### General Comments

There was no clear entrance sign outside to help direct the public in. Inside however the signs and labels were in Swedish and English, which was excellent. The main signs directing the visitor to the different parts of the museum are at the moment only in Swedish. It would be most helpful if these were also in English. A diagrammatic map of the museum would be a great asset as the building has such a complexand confusing ground plan. One specific problem is that of the noise which carries from one area to another. There is a great need for sound insulation. The open areas between rooms and also the uncovered stairways must constitute a security hazard.

The group agreed that the museum ably catered to all types of visitors, as was its intention.

The instruments were shown with other objects to indicate a cultural and historical context; in this case the social history of Swedish music. The other objects and archives material were used very well and the balance between the different materials was very good. Particular areas were seen as being especially well done such as the Music Shop in Bellman's Sweden.

### The Exhibitions

a) The Sound Workshop

It was wonderful to be able to play and try out different instruments. The examples were well chosen, and the group particularly liked the model showing the three different types of keyboard mechanism. This exhibition would have to be explained very carefully to children as the texts are too complicated even for adults. It was generally felt that the green and red color coding was not good. Wouldn't it be possible to use a system similar to the international warning signs which make use of different shapes as well? The key explaining the color coding system was not obvious and many of the party failed to see it the first time round.

To follow the exhibition systematically one has to cross the room repeatedly from side to side. Without clear indication of this route the line of thought was not always clear. Maybe this type of exhibition would have fitted better in a series of smaller rooms to be visited one after the other. If these rooms were acoustically isolated this would also be better.

The large headings and different levels of the text were good, but there were parts of the exhibition which were not explained well. In the section on brass instruments the valve was not explained at all; it was felt that this could have been shown quite simply. The large showcases in the middle of the room were not always directly related to the surrounding exhibition. This exhibition attempted to explain complicated basic concepts and the museum should be highly commended for carrying out a difficult job extremely well.

b) Kloink

This was enjoyed by all the group and the fact that the instruments could be made by the children themselves from simple

materials was a splendid idea. The design of the miniature building was very imaginative. The fact that one could buy a booklet about making these types of instruments was good, making it possible for interested visitors to carry on experimenting with sound in their own homes and schools. It was good that in this building where sound insulation is so difficult, there was this place in which children could make a noise. We would all have liked the opportunity to see a group of children using this area.

c) Four Cross Sections of Swedish Musical Life

These exhibitions were designed to show music in Swedish history and social life. They each gave a very good feel for the periods with an excellent coverage of social history. There was a very good balance of texts, instruments, and illustrative material as well as recordings. The large maps showing the different stages of Swedish history were very clear and helpful. It was felt that this whole section widens the understanding of the culture of the period. Certain sections, those on industrialization and the twentieth century, were felt to be particularly well done.

The beginning of these sections might need a little more explanation; perhaps a more prominent introduction would help (this is one of the places where it would have been helpful to have had the signs in English). The labels were very clear and systematic, but only occasionally there were slight inconsistencies. The use of headlines and different levels of the text was very good. In some cases only part of the Swedish text has been translated. Is the height of these labels easy for children to read?

The layout of these exhibitions makes imaginative use of very awkwardly shaped spaces. The use of temporary panels is good, making it easy to change the shape of a room. This can also help in adapting an exhibition when there is a change in the number of objects or the approach. We felt that these exhibitions had used the divided space to very good advantage; although there must be considerable problems in security and the management of school tours. In a couple of instances it was felt that the corridors were too narrow and crowded.

For non-Scandinavian visitors the introductory section of Bellman's Stockholm lacked sufficient explanation of who Bellman was. Although this is made clear as one progresses through the exhibition it was felt that there could have been an earlier explanation - perhaps a text by his portrait.

d) The Treasury

It was generally felt that the space alloted to the treasury exhibition was much too small. It might be an idea to have fewer objects, but change them after some time.

Audio-visual Means

The recorded sound illustrations were considered a splendid idea with a good selection of musical examples of appropriate length.

It was ideal to have chairs by the headphones. The tape equipment was very discrete. In some cases the volume of the music was a little soft. We all felt that there was the need for an indication of the contents of the taped programs, perhaps also

including the length of the examples. It would have been good to have had the instructions for using the headphones in English too.

Additional activities

a) Concert Hall

The concert hall had well designed acoustics, however it was very difficult to see from the back. A simple solution that might alleviate the problem would be to stagger the chairs so that people behind could see between the heads of those in front. It would also be good to make use of the area outside the concert hall for temporary exhibitions which might tempt the concert-going public to explore the museum. If there were problems with security these exhibitions could be made up of photographic material.

b) Shop

The shop was well stocked with the museum's own publications as well as those from other publishers which related to the collections. It also had a large selection of recordings of folk and historical instruments seen in the collection. A very imaginative idea was that of selling musical instruments.

c) Archives

We could only guess the richness of the museum's archives from the examples used in the exhibitions. Unfortunately there was no time to examine the contents in detail.

Hélène La Rue

## Musikhistorisk Museum og Carl Claudius' Samling, Copenhagen

### General Comments

The instruments are displayed together with pictures and drawings and are the main part of the presentation. The principles according to which the instruments were shown together were excellent, but in some instances these ideas were not sufficiently explicit, for example in rooms 9, 23, and 25 we found the combination of pianos, musical boxes, and aeolian harps confusing. In room 6 and 7 there was a fanciful display of toy-like sound and musical instruments, specially for children. Having a piano in this context, however, might lead to misunderstandings.

All kinds of visitors may visit the museum, specialists or not, on their own or in groups. Approaching music and musical instruments under a variety of headings, the museum succeeds in delivering its specific message, both in the manner of display and in the texts.

Because there were so many rooms covering such diverse subjects in this museum, we decided that each member of the working party would cover one or two subjects only. Later these observations were unanimously accepted by the group and are presented below.

### Exhibition Techniques

a) Sign-posting

It was a pleasure to see that the rooms were clearly numbered at the right places with direction signs in the corridors, staircases and inside the rooms. It would be useful to have floor numbers on the landings and staircases. As a matter of fact, because of the complexity of the building, it is necessary to devise a system which allows people to plan their visit according to the subjects of special interest to them.

b) Maps

They were well done and well placed, especially in the temporary exhibition of musical instruments of Africa.

c) Texts

There were sufficient labels, but we would like to see the catalog or inventory number included. This criticism will also apply to any catalog printed, as specialists in particular will need these references. It was good that in the African exhibition all the texts were also in English. In some rooms there is an introductory text, but it is not always visible at first sight (room 21). All of the labels were easy to read, but occasionally they were too far from the specimen or at an inappropriate place (room 16).

Although the texts were in general well conceived and nicely formulated, we made the following observations. In both the temporary exhibition and room 8 (classification and sound), the technical terms used should be explained. The excellent choice of bows shown in room 23 could have more information. The explanation on how the piano works is only given in room 26, while the in-

strument has been shown already several times before.

Some of the texts in room 2 and 3 seemed too long, though in rooms 15 and 22 this length was indispensable. In rooms 4, 16, and 25 they were short but sufficient. In the rooms showing instruments as handicrafts, reconstructions, copies and fakes, we wanted more explanation.

From a pedagogical point of view it is essential that the visitor has a clear introduction to the different subjects in each room. Therefore, it would be ideal if each room had a general title and an introductory text with titles and subtitles always placed in the same position. We realize, however, that this is difficult in a museum like this, which is housed in three dissimilar old buildings. These headings are even more essential when several subjects are presented in one room, like in rooms 2, 9, 21, and 23.

d) Audio-visual means

In this museum the visitor can listen to musical examples through headphones by pushing a button to start a tape recorder. The lists with references about the musical examples were considered very useful. Texts and musical examples were good and we especially liked the explanation of the basic elements in sound and music in room 8. In fact, combining elements from this very useful basic introduction with more elaborate demonstrations and models of the sound workshop of the Stockholm museum would in our opinion result in an ideal presentation of the subject. It was suggested to have at the entrance of the museum a handlist of the tapes and their duration, so that the public could plan their visit accordingly.

Special Exhibits

As requested by Mette Müller we paid particular attention to the temporary exhibition and the displays of musical notation and instrument fakes. As stated above we found the exhibition of African musical instruments very successful from all points of view. Although the manuscripts were beautiful, the musical notation exhibition was disappointing. Whereas the rest of the room showed the history of keyboard instruments, the notation was that of vocal music and that only over a short period of time. We felt it would have been more appropriate to have more explanations also, for instance, of the short octave keyboard, or keyboard notation itself. Missing also were books with printed notation.

The rooms showing fakes and reconstructions and the instrument as handicraft were very close together. This was confusing because some objects could have been shown under either heading. The distinction between reconstructions and fakes was not sufficiently clear and it should be mentioned why and for whom they were made. The épinette attributed to Franciolini should have an explanation of how to recognize this type of fake.

Conclusion

We feel that this museum could exploit the richness and diversity of its collections even more by providing the visitors with suggestions for different tours. These could be of different length and cover specific topics such as the history of keyboards. This could be done as simply as possible, just with an

instruction sheet.

In brief we did appreciate the whole of the museum because of the following qualities rarely found at the same time: unity, diversity, and richness. Also we liked finding that Mette Müller's personality and sense of humor appeared throughout the whole museum.

Josiane Bran-Ricci

## Introduction

The Conservation/Security group was concerned with ways in which conservation could be of service to the designer and builder of a display and also protect the interests of the objects themselves. Conservation is a discipline which encompasses many areas of museum operation, and its influence is felt in the realms of display design, storage, handling, shipping, the museum environment, and in the restoration of the instruments themselves. One of the most important interactions is the conservator's influence upon the display designer. Cooperation between conservation and design is essential at the formative stages of a display and the overall success of the result is the logical outgrowth of this cooperation. But the conservator is not referred to here as one particular staff member, nor is the display designer necessarily a professional in the field. In many cases it would be considered a luxury to be able to employ one of these two specialists in the mounting of a display. What is really referred to is conservation input during display design - an awareness by the designer of the factors which can influence the well-being of the objects being displayed. This was the objective of the Scandinavian Tour - to give the three major collections of musical instruments the benefit of advice from a wide range of musical instrument specialists from diverse backgrounds, and to abstract and generalize this material for the future use of all museums of musical instruments. Because this critique came after the formation of the display schemes of the three Scandinavian museums any improvement will involve a certain retrograde motion - a going backwards before one can again go forwards. But this will not be a great price to pay considering the accomplishments.

Problem: Conservation deals in invisibles - how did the group know, for example, that a certain instrument was well supported? How did they know what material was used for the supports? What as the breaking strain of the nylon line supporting the instruments? Could they judge the relative humidity without instruments to refer to? Because of these invisibles, and many more besides, it is very difficult for an observer with no inside knowledge to form a judgement. This is why a critique based upon a questionnaire can not be truly adequate to the task. The group also needed, in addition to the evidence of its own senses, some inside information upon each of the displays that it examined, which each of the three museums provided before the critique began.

Also, the diversity of materials of fabrication and the range of shapes and sizes of musical instruments make them one of the most difficult groups of objects to effectively assess for a critique of this kind. There are so many different ways of doing the same job, particularly in display design, that so-called guidelines often become simply personal preferences. So we tried to look at the design of the displays as an almost uncontrollable variable, there being as many variations as there are displayed collections of musical instruments; and to concentrate upon the areas we could see and feel and touch. In short, we isolated the treatment of the instruments from their aesthetic environment.

This brought up another consideration - the choice of materials and the layout of the display, were so interwoven with the areas of interest of the other groups that we might have covered ground which was far better covered by others.

As far as display of musical instruments goes, the conservator must have influence upon such factors as restoration, lighting and relative humidity, supports for the instruments, the materials used in the construction of the displays, and the ongoing maintenance of the object over the long term. These four areas were the subject of the group's activities and the critique was based upon the satisfaction of criteria in these four areas:

1. The Condition of the Instruments.
2. The Safety of the Instruments.
3. The Stability of Materials Used.
4. The Maintenance of the Instruments.

## 1. The Condition of the Instruments

### a) Extent of Restoration

Over long periods of use musical instruments change: the materials of which they are composed deteriorate and parts may be removed and replaced. After their playing lives are over the insidious effects of the environment cause a general decay, sometimes more quickly than when the instruments were in use. All the evidence of time and use may be found upon them and it is necessary to decide how much of this is desirable - what surface appearance, added pieces or structural changes should be left as evidence of the instrument's history, and what should be removed as unnecessary or distracting. In the context of the display of instruments the onus is largely upon the originator of the display, although the decisions that a curator makes must take into account the safety and integrity of the instruments themselves, and thus be in line with current thinking in the realm of conservation. The discipline of conservation, and its interaction with other museum functions, has developed strongly over the past fifteen years and the conservator's advice to the curator tends now to favor preservation of the status quo over major cleaning and restoration, although along with this development must go a form of public education. The museum visitor must not necessarily expect a clean and new appearance in displayed museum material, if indeed the truly well-informed visitor of the past ever did. If an instrument happens to be in virtually mint condition this should not be taken by the curator as an ideal to aim for in the restoration of other items from the collection (in fact, they should strongly question the reason for the excellent condition). Rather it should be regarded as a fortuitous example, valued for its intactness, and well protected for the future. It is impossible to return an instrument to some former condition without obliterating some evidence upon it, however slight, and as our analytical techniques and regard for the functional history of the object become more sophisticated we are obliged to leave as much evidence of usage upon the material under our care as is possible.

### b) Restoration to Playability

The evidence of restoration far in excess of that desired by current standards is visible in many collections, particularly in

keyboard instruments which in the past have received the full force of "restoration to playability". The three museums examined were no exceptions in this regard, although in some cases the absence of large scale restoration in the past had brought about a certain degree of "passive conservation". In the Musikmuseet in Stockholm a policy of having the staff conservator make reproductions of chosen instruments under curatorial guidance, rather than restoring them, has been implemented and it is to be hoped that from this will grow an established policy for the future protection of instruments. The making of an "exact" copy is financially and physically quite feasible where the museum is able to afford the services of a conservator/restorer, who in many cases will also be a skilled instrument maker. This results ultimately in the museum possessing both the original instrument intact and the working copy at whatever stage in the life of the original is desired. If, on the other hand, it is decided by the museum to restore the instrument in question to playability, the museum, and by inference the public, will possess neither. The choice is that simple.

c) String Tension

It is unnecessary for instruments to be kept at playing tension if they are part of a static display, and it is quite sufficient in most cases to de-tune the strings so that they are under very little tension but lie flat and straight in their correct places. Bowed string instruments where the bridge is held in place by strings alone may require a little more tension for the purposes of demonstration, in some cases at a semi-tone or a tone below modern pitch. In some of the displays examined it was apparent that distortion had been taking place quite recently. Not enough attention had been paid to authentic stringing, with regard to both material and diameter. It was felt that the number of instruments kept at playing tension should be reduced and a rotation established where the period of de-tensioning far exceeded that under tension. Actual demonstrations of the various instruments - a lively and very attractive museum activity - could be replaced with recordings and an explanation of the reason for this. This, together with attention to stringing and pitch, would greatly extend the lifetimes of several instruments. The suggested policy of creating reproductions rather than restoring originals to playability is emphasized here.

d) Dust

In all three museums filtration systems of some kind had been installed so that surface dust in open displays could be kept to a minimum. However, as long as a museum display is open to the public the settling of airborne particulate matter onto the objects will always be a problem. The displays of the Musikmuseet in Stockholm had only recently been totally dismantled and valiantly re-assembled for our examination, and in this case a litle dust on objects could well be ignored. When it was pointed out that at least two instruments in this display had visible dust on their surfaces the quick rejoinder from another member was: "Only two? Congratulations! I wish we could do as well in my museum!".

e) Bloom

In two of the three museums a slight white bloom could be detected upon some instruments, particularly on their horizontal surfaces. Deposits like this have long been recognized as the result of using aerosol humidifiers which disperse liquid water into the air (see reference 14 at the end of this report). Unless the water so dispersed is very pure it carries dissolved matter with it which deposits onto surfaces as the water evaporates. One of the museums had already changed over to an evaporative system although the deposits which were more difficult to remove were still visible on some instruments. These deposits are rarely difficult to remove from surfaces, although apparently a few instruments had given problems in this regard. It is generally recommended that evaporative humidifiers - for example steam systems - be installed in museums to remedy this problem; where an aerosol system has already been installed this can be partially alleviated by using purifying filters, although these also can cause problems.

f) Fingerprints

Fingermarks on metal instruments detract from their general appearance and all three institutions showed evidence of this common problem. The oil from the fingers provides an excellent medium for keeping salts from perspiration in close contact with the metal. Over a short time fingerprints will etch themselves into metal, particularly polished brass, with the result that they will begin to show up very clearly as discolored areas. The fingerprints we observed could, of course, have been extremely old and would certainly not be an indication, on their own, of recent injudicious handling. Cotton gloves should be worn when handling metal instruments simply as a matter of policy.

Removal of fingerprints, especially old ones, is extremely difficult without polishing, which in turn removes from the surface more metal than is desirable. Fresh prints can be removed before they begin to etch with a suitable solvent on a small swap of cotton wool. Wax or lacquer coatings can be applied to all polished objects but the effect, especially of lacquer, is never as good as that of the originally intended bare metal. It is far better, if a museum possesses highly polished items, to protect them from handling and from the environment and allow them to oxidize naturally and uniformly over a long period of time.

The above are a few major points that the group discussed and considered worthy of mention, although there were other minor points, specific to the displays under examination, such as splits to drumheads, cracks in veneer, dents in metal, which are common to all collections, and rarely indicate improper care. The care and restoration of musical instruments is dealt with in several sources and the reader is referred to those listed at the end of this report for more information. In all three museum displays examined there was evidence of good repair and upkeep and a general high regard for the appearance of the displayed instruments.

## 2. The Safety of the Instruments Displayed

This section, which deals with the museum environment, display techniques and security, occupied the group to the largest

extent. Unlike the other sections which represent the past and future of the collections, this one is firmly rooted in the present.

The Museum Environment

Much has been written about the museum environment and technical information is available from many sources (see listing at the end of this report). Knowing the problems that the climate imposes, this group looked favorably upon any attempt to alleviate them, particularly with regard to relative humidity. Lighting is generally easier to control. Because the museum environment is discussed in the works recommended in the bibliography only a short summary will be provided here followed by the observations of the group in relation to the three museums examined.

a) Relative Humidity and Temperature

Wood and skin are the substances most sensitive to alterations in relative humidity. The dimensions of these materials alter as they absorb and lose moisture from the air. A stable relative humidity is essential for the prevention of shrinking, cracking and other features, especially in joined wooden objects and tight skin. It is particularly necessary to avoid sharp changes in humidity. The upper acceptable limit for relative humidity is generally agreed to be that at which mold growth will occur - around 70% RH. Thus the safe upper limit is set at 65% RH. The lower acceptable limit occurs when organic fibers containing moisture begin to suffer damage due to embrittlement and as this usually occurs at around 40% RH, the safe limit is set at 45% RH. The lower value chosen in practice will vary between countries according to the practicality of maintaining high humidity levels in buildings during the winter months.

Corrosion of metal objects can be directly related to ambient relative humidity, dry conditions being ideal for their well-being. The perfect environment for a collection of musical instruments made of mixed materials cannot possibly exist. However, at 50% RH, metals with no reactive corrosion products will be quite stable and it is therefore better to bias conditions in favor of the wood and other organic materials on display.

In Scandinavia it is against the law to heat a public building above 20 degrees C. However, dimensional changes due to fluctuations in temperature are generally less serious than those caused by fluctuations in RH.

All three museums examined had humidity and temperature control systems in the areas which the group examined. Ringve and Musikmuseet had efficient and well-maintained systems while Musikhistorisk Museum required the additional assistance of several drum humidifiers in the newer part of the display area. Although RH may not have been as well controlled in this area, the group was gratified to find no evidence of damage due to dimensional changes of materials.

b) Light Levels

Sensitive objects like paper linings, textiles, music manuscripts and so on should not have more than 50 lux falling on their surfaces. Painted designs, varnished wooden instruments, and ivory instruments can receive as much as 150 lux and for metal objects 300 lux is quite acceptable. If fluorescent light-

ing is used the ultraviolet (UV) component must be reduced by filtering to less than 75 μW/lm, the acceptable level. Color distortion due to fluorescent lights can be corrected by using tubes with a color-rendering index of 85 or above.

Incandescent lamps can cause a heating effect if they are too intense or too close to the objects they illuminate. The surface heating of objects made of wood and other organic materials, while hardly beneficial, is in itself not as damaging as the effect of the heat on their moisture content. Heating will cause the objects to lose water from their surfaces and when the lights are extinguished they will cool and attain equilibrium with the surrounding humidity. This sharp cycling of moisture content can result in damage, although this effect is not very serious if the lighting levels are within those recommended above.

Lighting systems in the three museums varied from filtered daylight, to fluorescent tubes and incandescent spotlights; Musikmuseet having probably the best system in terms of low ultraviolet emission and controllability. Basically, this system consists of 100 W spotlights with individual dimmers installed in order to adjust the level of light falling on the objects from each spotlight. The previously cited publications provide recommendations for monitors for this purpose. The light levels of fluorescent tubes are not as easily controlled and if one requires less light one can remove tubes and substitute non-operative tubes. This idea is used in office buildings to cut down on power consumption but it does nothing for the appearance of a museum display. Other techniques available include the use of dimmers, and special tubes of low wattage. Ultraviolet radiation can be screened from fluorescent tubes by the installation of UV-absorbing sleeves. Where daylight is used for illuminating an exhibit, blinds or translucent curtains may be used to cover windows and thus provide protection from direct sunlight. UV-absorbent films can also be applied to windows.

One point that should be emphasized is that, although the recommended levels of light for sensitive objects appear very low, it is really a question of contrast. Thus, if a museum visitor moves relatively quickly between, for example, a stable and brightly illuminated object and a less stable object in lower illumination, the latter will appear dimly lit. To correct this and to allow the eye to adapt at its own pace, it is necessary to ensure that illumination throughout the display, at whatever level, is even, and that there are no great contrasts in light levels, or that the light levels in a display change by slow and even increments.

## Display Support Design

The handling of musical instruments in the museum is dramatically different from the handling during their working life. The rules are no different for any other museum object - when it becomes the property of a museum the conditions of its physical environment must change radically. As it is the role of the museum to preserve the object for the future, the physical handling of the object, as well as its support during display and storage, are most important aspects.

The adequate supporting of artifacts, no matter how light and structurally stable they may appear to be, is of greatest importance. Very often the effects of uneven or poorly distributed

supports only become evident after a very long time - what appears to be an adequate and stable structure in the short term may prove to have critical drawbacks when viewed over a period of years. Even structures of great apparent rigidity within the artifact have the capacity to slowly change shape to accommodate themselves to new and continuous stresses. This is especially so in wooden objects but there are many metal structures in musical instruments that can undergo the same changes. Preventing these changes from taking place is the prime function of display supports. The visual appearance of the amount or support is of secondary importance and this brings up the question of a potential conflict between design and conservation. What may be the safest and most secure way of mounting an instrument may not be the most pleasing to the eye. A compromise is often going to be necessary but one must never jeopardize the safety of the instruments in order to achieve this. Rather, the techniques of safe mounting must be adjusted, where possible, to suit the needs of the designer who in turn must be made to understand the needs of the instrument.

When designing a support for an object it is obviously necessary to take into account the force of gravity acting upon it and the best way to visualize this is by imagining the weight of the object acting downwards in vertical lines. A basic sympathy for the object, and a sensitivity to its weak points, are really all that are required to support adequately any instrument, no matter what the angle, weight or material. A publication listed in the bibliography (No. 3) treats these problems in a realistic and easily understood fashion.

Two examples should highlight the effects of poor supports:

1. It has been reliably reported that woodwind instruments will deform slightly if supported horizontally and held only at their ends (a descriptive name for this syndrome was coined during the Scandinavian Tour - it was named "banana-ing"). A woodwind instrument displayed horizontally must be supported in at least three places to prevent this sagging, especially in the majority of cases where the instrument is made in several joints. As it is recommended that the lappings of woodwinds be left slightly loose to avoid damage due to dimensional changes in the wood, sagging by movement about the loose joints will be immediately obvious. However, this kind of sagging, though damaging in the long term, must not be confused with actual bending of the wood which occurs only after protracted periods of stress, especially in environments where large humidity fluctuations take place. Boxwood is apparently very prone to this kind of distortion. Sagging can be alleviated in cases of two-point suspension by making the points fall one quarter of the instrument's length from its ends (see Fig. 1) although this is better suited to instruments made in one piece. Multi-jointed instruments

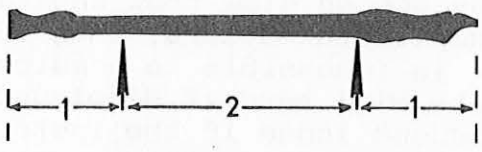



Fig. 1

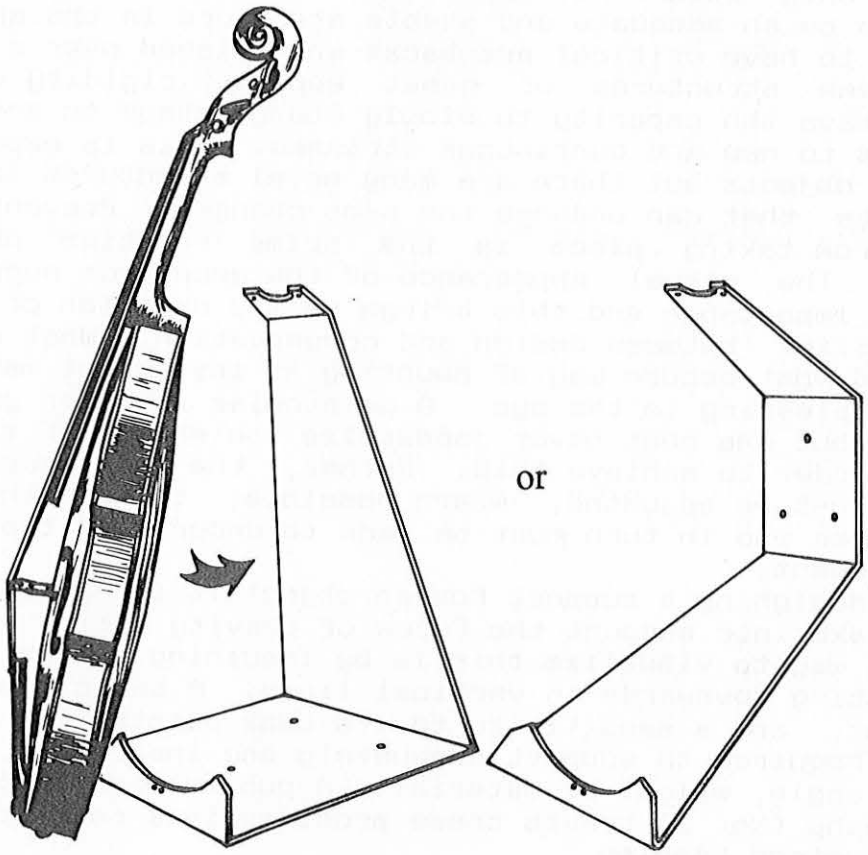



Fig. 2

must have more points of support although it is hardly necessary to support every joint see (see above drawing).

2. Most instruments of the violin or viol families can be quite safely and conveniently carried by their necks, or hung from their scrolls or heads, and this is standard practice for makers and dealers of new instruments. The neck joint is obviously made to withstand a great deal of tension and more force acts about the neck due to tension than would act on it due to gravity. However, a new instrument, or an instrument at playing tension, cannot necessarily be treated in the same way as a museum instrument. Without close examination it is difficult to say for certain that the neck joint is in thoroughly sound condition. With the violin one can be tolerably certain after a brief examination that no harm can come to it due to hanging in a display by its scroll, even for long periods of time, and if a little tension is left on the strings no harm can come to it. Larger instruments of the same kind need supports at strategic points, both in display and storage, or harm can result.

One of the biggest problems the conservator must face is that of convincing people that these effects do, indeed, take place. The changes in shape are so slow that they are not readily perceptible and, to complicate matters, they often do not take place as predicted. It is impossible to predict with certainty, for example, that a flute will bend if displayed unsupported, or that a cello neck will become loose if the instrument is hung by the scroll. It is the solitary exceptions - those cases where a physical condition is demonstrably the result of poor support - that

must prove the rule, and if the rules seem to all-encompassing and unnecessarily extreme it is because of these exceptions.

Of all the wide range of supporting methods available for artifacts, three systems were used predominantly in the three museums. Acrylic sheet (Plexiglass, Perspex, etc.) formed into supports was used in two displays and in one of these displays, monofilament line suspension was also used. In the third, a unique system of padded tublar brass clamps and saddles supported many of the objects and showed itself to be quite versatile. An interesting discussion arose from consideration of the various available supporting materials and methods. To a large extent, display techniques have followed design trends and it is quite possible to date an installation by the way in which the materials have been used. Acrylic mounts and monofilament lines represent a stage in display evolution - an attempt to render the supporting material as unobtrusive as possible. This intention rarely works to its fullest potential and many displays are marred by cumbersome pieces of plastic or lines reflecting the light. Used with care these techniques can be very effective, but in our examination of the three displays their use was no better, and no worse, than the apparently old-fashioned brass clamps. In fact the brass clamp system was seen to have a certain "aesthetic durability" and we felt that when bent acrylic and monofilament line are hopelessly out of date those brass clamps will still be there, still doing their job, and harmonizing well with their surroundings.

## Acrylic Supports

While plastic mounts may not be to everyone's taste, and in some display schemes would be distinctly out of place, they have been used to great effect and their advantages and shortcomings were examined by the group. Some museum personnel dislike the use of acrylic sheet for mounting and the following is a discussion of the more common criticisms.

Acrylic mounts can be ugly and obtrusive. This is true unless attention is paid to both function and finish. The material used must be sufficient for the job and not over-thick or too massive. Elegant shapes and non-functional curves should be avoided as distractions from the object displayed. All edges, corners and glue joints should be carefully made and very finely finished, either highly polished or smoothly and evenly scraped or sanded. Cracked or scratched pieces should be discarded.

Acrylic sheet is difficult to work. Provided that one has the basic tools, and a basic understanding of their use, this is not so. A number of publications concentrate on working with Plexiglass and other acrylic products of the same kind (see references 13, 15). The techniques are simple but working with plastics does require patience and time to achieve proficiency. The mess of dust and chips is easily removed with a vacuum cleaner but this must be done thoroughly as the dust holds a strong static charge, especially after working, and will stick to other objects.

Acrylic sheet yellows with age. Plexiglass, Perspex and other acrylics may have yellowed with time when they were first introduced. They do so to a much lesser extent now, especially if the lighting levels of the display are of the intensity recommended for sensitive museum objects.

Points noted during examination of this kind of mounting

technique concerned the appearance of the mounts, their function, the techniques used in their construction, and the padding that their contact surfaces require. A number of plastic mounts were made with unnecessarily thick material which, not easily being heat-formed, had to be cut and joined to form corners and angles. The result of this laborious process is never really attractive. In general, 5 mm thick acrylic sheet should be sufficient for almost all applications. If thicker material is considered necessary it should be used with great attention to its finished appearance. A typical mount of thin acrylic sheet is shown in Fig. 2. Quite complicated structures can be made with relatively simple techniques (Fig. 3). In another display, standard strips

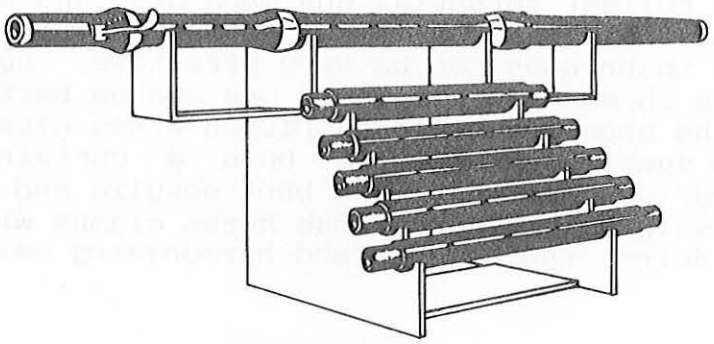


Fig. 3

of 2 mm acrylic, approximately 2 cm wide, were used throughout for all supports. While this kind of application cuts down tremendously on labor, it does create a monotony of forms and, in the case of complex shaped instruments like lutes, a bewildering number of supports. Some of these 2 mm thick strips were also observed to be bending under the weight of the instruments, although this kind of plastic can remain under stress without deformation or fracture for a long time. The polished edges of acrylic sheet can sometimes be very sharp and it is always necessary to pad contact surfaces to avoid scratching and cutting of the instruments resting on them. The lack of padding, and some resultant damage was noted in a number of places. Padding can be of stable polyethylene foam, felt, or any one of a wide range of materials, provided that it is proved stable and harmless to the artifact. It can be attached with non-rubber based contact cement, but this must be allowed to dry thoroughly before the mount is used. Self-adhesive foam plastic draft strips have been used for periods of a year without noticeable change, although no information is available on their long term stability.

A thin nylon security line should be used on all mounts where there is a possibility of the instrument toppling off due to vibration. This need not be a strong line as it will act simply as a passive restraint, neither does it need to be tightly in contact with the instrument. Small holes may be drilled in the plastic mount to secure this.

Monofilament Line Suspension

Many curators have had bad experiences with monofilament lines sed for hanging instruments for long periods, but there is no good reason to abandon this technique. Clearly, if a line of breaking strain far in excess of the weight of the instrument is used, there will exist a large measure of protection. Nylon or polyester fishing lines, which are normally used for this purpose, are not manufactured specifically for longevity and the breaking strains given do not allow for loads maintained over a protracted time or for knots, scratches and kinks in the material. In other words a line with a nominal breaking strain of x kilograms cannot be trusted to support anything of that weight for any length of time. It is common sense to use a material - any material - in such a way that it will not be over-stressed. A good rough-and-ready method to judge the adequacy of a support line is to gently lower the instrument until the line tightens and then to check for elongation of the line. If the line stretches appreciably it is not strong enough. Two factors, in addition to protracted longitudinal stress, can affect the stability of lines and these are degradation due to ultraviolet radiation (particularly with nylon) and extra stressing due to tight knots and sharp bends. If ultraviolet radiation is kept to an acceptably low level for protection of artifacts, the same protection will apply to the plastic lines. The weakening effect due to tying knots, on the other hand, is unavoidable although in a line of very high breaking strain this should be no problem. Passing lines around sharp corners, such as holes drilled in display case tops, should be avoided where possible, or soft padding can be inserted at points of stress.

In some instances, the failure of nylon or polyester lines as a support system has, in fact, proved to be more of a human failure - simply, the knots came undone. It is not as easy as one would imagine to tie a thick monofilament line tightly, and special knots have been devised to achieve this (Fig 4). In

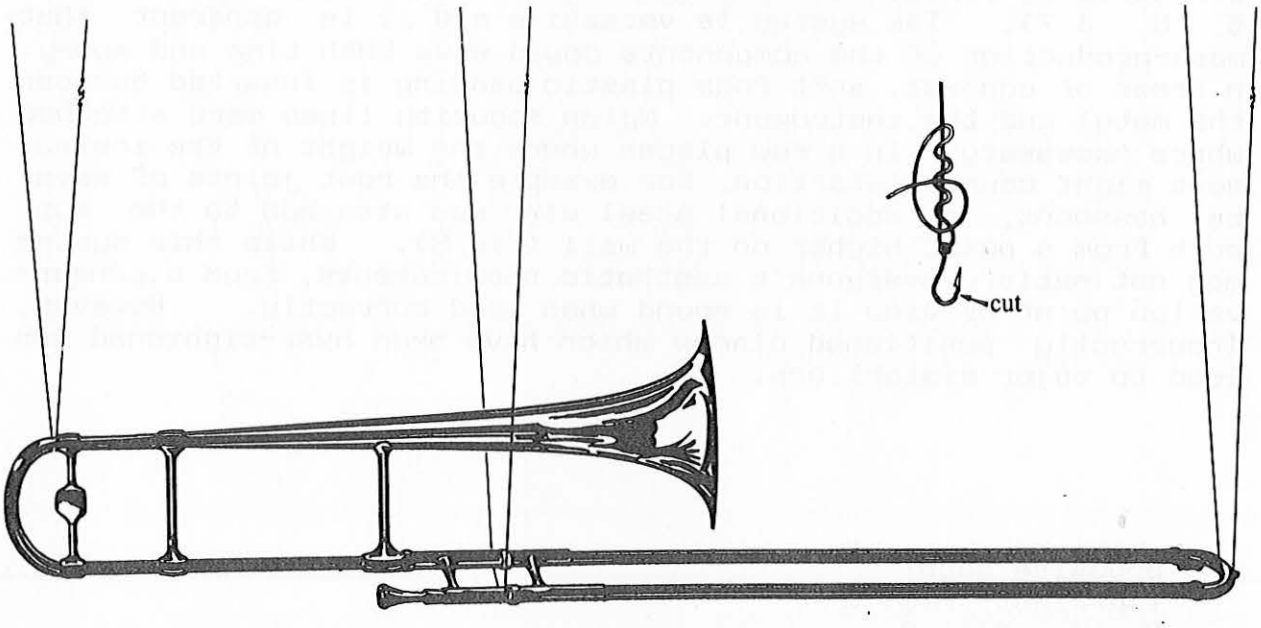



Fig. 4

addition, once the knot has been tied and the excess line trimmed off, the end of the line should be melted (a cigarette lighter will do, but the tip of an electric soldering iron is safer) to expand it and prevent it from slipping back through the body of the knot. The ordinary reef knots, quite sufficient on rope, will invariably slip if tied on monofilament line which has no rough, twisted surface to afford a grip. Knots in monofilament line can be very obtrusive because of their necessary size and it is desirable to tie them in some place away from the normal field of view, suspending the instrument on a loop instead of a single line. Fishing hooks with the barbs ground off can also be used in places where instruments need to be regularly removed from the display, as in Fig 4. The use of loops also avoids tying lines too tightly around instruments, particularly ones of wood or other substances likely to take an impression. Tubing of polyethylene, polypropylene, or other stable plastic may be threaded over the thinner lines to provide cushioning on delicate surfaces.

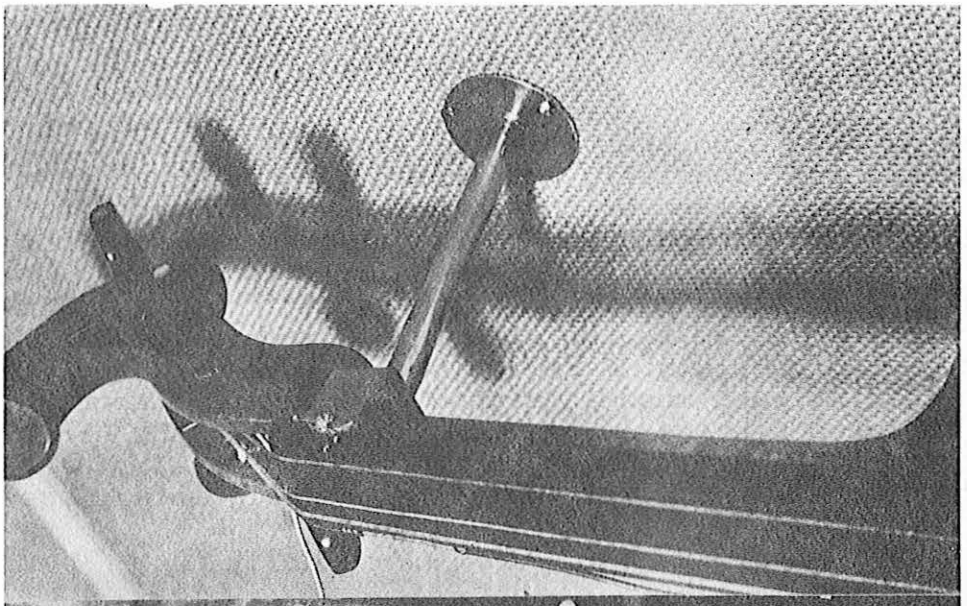
One point which must not be overlooked is that the suspension is as strong as its weakest link. A secure point of attachment must be chosen on the instrument - never a soldered bracket, keywork, or a glued attachment - and at the other end the line should pass around a secure point, firmly attached to durable material. If attention is paid to all of the above points the suspended instrument will be secure.

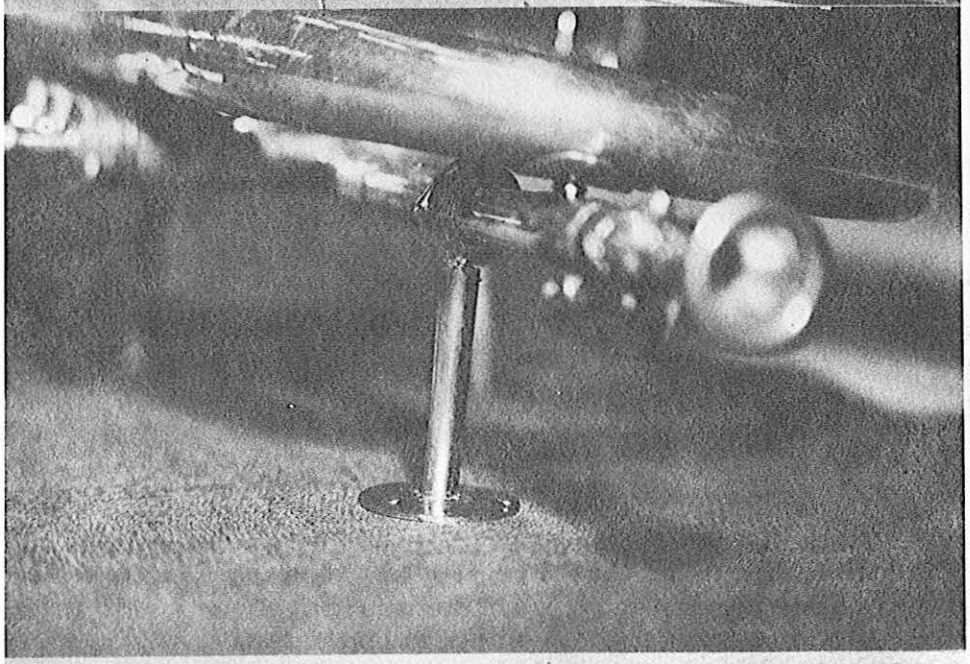
For aesthetic reasons there is a limit to the amount of material that can hang in a display case and avoid the clutter of several brightly lit lines at the top of the case. Judicious adjustment of lighting and a limit to numbers are the only solution to this problem.

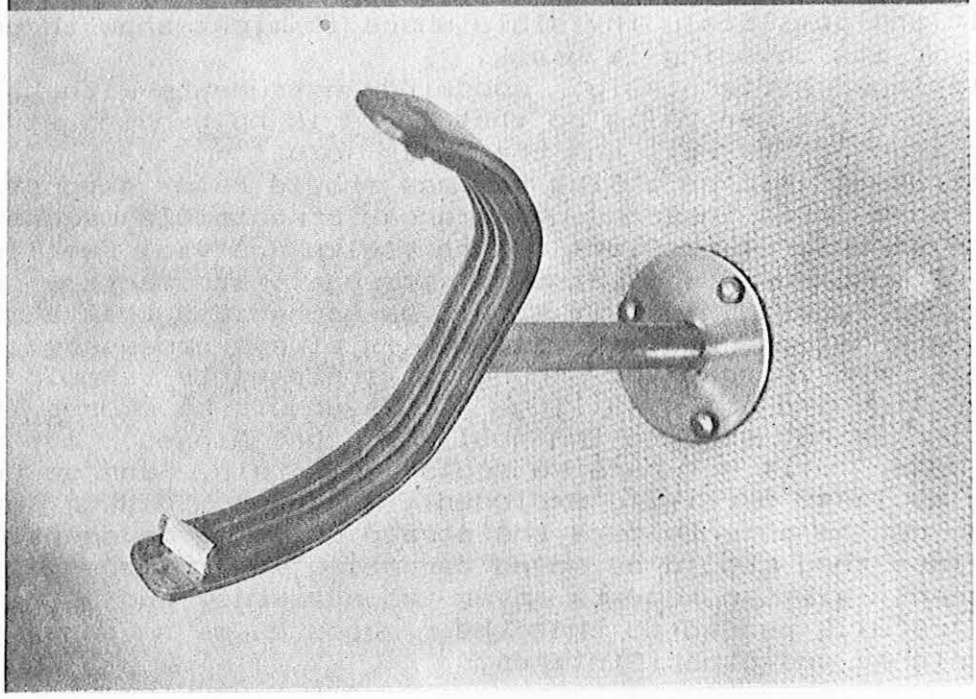
Tublar Clamps and Saddles

This system is used almost exclusively in the Musikhistorisk Museum in Copenhagen. Basically it consists of a number of standard units adapted to the particular needs of individual instruments by various clamps, saddles and supporting strips (Figs. 5, 6, & 7). The system is versatile and it is apparent that mass-production of the components could save both time and money. n areas of contact, soft foam plastic padding is inserted between the metal and the instrument. Nylon security lines were attached where necessary. In a few places where the weight of the instrument might cause distortion, for example the boot joints of several bassoons, an additional steel wire was attached to the support from a point higher on the wall (Fig 8). While this system may not satisfy everyone's aesthetic requirements, from a conservation point of view it is sound when used correctly. However, incorrectly positioned clamps which have been over-tightened can lead to major distortions.

Opposite page:
Top/right: Fig. 5
Center: Fig. 6
Bottom/left: Fig. 7







Other Support Methods

Instruments were also seen laid on flat shelves, the base of display cases, and specially constructed mounts of wood and textile. Generally, the various techniques, too wide in range and detail to be discussed here, were quite acceptable provided that the instrument was well supported. It is true to say that the system of mounting is rarely at fault, rather it is the application of the system to the structural requirements of the object that causes problems. A few points of interest were noted:

Vertically displayed woodwinds should always be supported inside with a loose fitting padded wood dowel where the structure of the instrument permits. It is not sufficient to simply stand oboes, clarinets, etc., on their bells, especially in a place

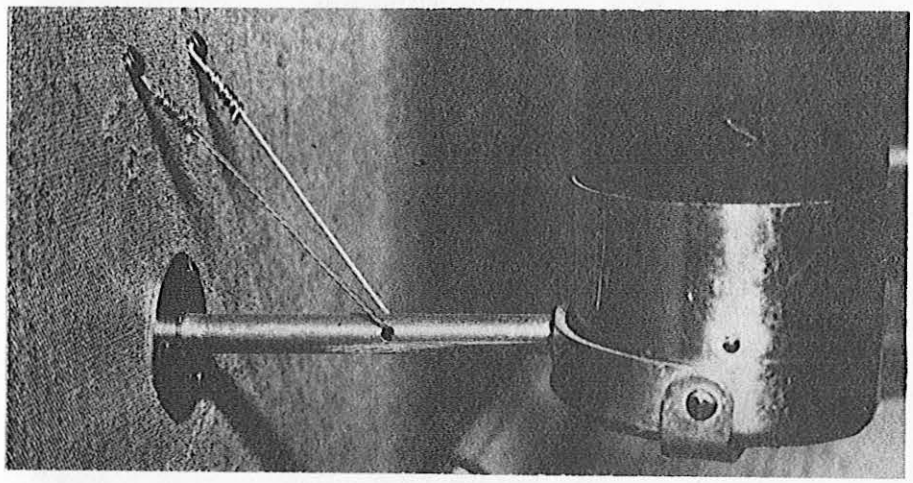


Fig. 8

where a bump to the display case would bring them down. It is also not sufficient to test the completed display by shaking the display cases - there are two possible results from this test, one of which will cause damage. A supporting dowel is very simple to install and completely invisible where it might show through fingerholes if its covering is black.

When displayed horizontally, woodwind instruments with bells should be supported centrally so that there is no bending strain between the edge of the bell and the upper joint.

Any instrument laid on a flat surface should have supporting blocks of some kind inserted under areas of possible weakness. Although the structural problems of the violin and viol families, and indeed of most bowed and plucked string instruments, have been mentioned previously, it should be emphasized that a supporting block under the root of the neck is always necessary.

Lid props and hinges of keyboard instruments should be checked for strength and stability. Lids should be closed when the exhibition is not open to the public so that hinges, especially wire ones, will not receive prolonged strain, and so that dust can be at least partially excluded. However, old or weak hinges may not be able to take the strain of daily movement and if doubt exists they should be moved carefully and infrequently.

Transparent plastic covers over soundboards and strings should be carefully padded so that their edges cause no damage to paints, varnishes and other finishes.

Hooks should have stable plastic tubing covering them so that they cause no scratching or denting. Heat-shrinkable polyethylene tubing from electronics suppliers works well as a resilient covering material.

Security

Security from theft and accidental or deliberate damage are the concern of the individual museum and specific guidelines are not usually of much help. Adequate surveillance by trained security personnel, burglar alarm systems, and so on are fairly obvious deterrents to the determined thief and rendering instruments inaccessible by barriers and glass cases will prevent damage from those who are unable to resist touching the instruments. A few specific observations may be mentioned here:

It seems unwise to use such terms as "treasury" when labeling certain areas of a display. However, if increased coverage by security personnel is given to such areas this will be offset.

It is always necessary to provide security guards for display of valuable instruments and it is a good policy to have the guards themselves acquainted with the nature of the instruments under their care. A few guidelines on the delicacy and intricacy of the objects and the need for care when dealing with them should be given. Guards should be situated in such a position that there are no blind corners limiting their vision. Routes can be mapped out so that every area of the museum is covered frequently but unobtrusively.

Barriers to prevent access to displays are a very effective protection against the casual touchers as they provide an obvious physical constraint together with a psychological one. They are quite useless against the determined thief.

Notices asking the public not to touch seem to be largely ineffective unless they are witty and amusing or are presented in bright colors. Either way they are a distraction. Sticking red tape onto the keys of instruments as a warning not to touch was not considered a good idea.

Transparent plastic covers over instruments or parts of instruments are effective restraints but they add nothing to the appearance of the display. In tight places where the museum visitor is close to the instrument they may be necessary.

Instruments either hanging or mounted on walls within reach of the public are susceptible to accidental and deliberate damage as well as theft. The group was concerned particularly with instruments of great fragility, like ivory woodwinds, or others of great value which, in some cases, were in very exposed places.

Portable instruments displayed in open areas can be attached to their mounts or some other convenient fixture with monofilament line to dissuade the casual thief or artifact handler. These will also prevent accidental dislodgement.

Mouthpieces, reeds, and other detachable parts of instruments can easily be stolen unless care is taken. A security line tied between, say, a mouthpiece and mouthpipe of an instrument can be quite unobtrusive. It is not sufficient to simply put in worthless mouthpieces, etc., and expect them to be stolen - if things are being stolen, no matter how valueless they may be, there is a problem which requires solution.

Glass cases provide the ultimate physical and psychological deterrents but even these, unless constructed carefully and

equipped with alarms, are not invulnerable. Alarm systems vary, and as each application poses its own unique problems it will not be possible to deal with them in detail here. Suffice it to say that every museum should have an efficient, regularly serviced burglar alarm system, for both its display cases and building.

### 3. The Stability of Materials Used in Display

The materials used for displaying instruments and other museum objects, either for mounting or for constructing their environment, must be of very high stability or their degradation will affect the displayed objects. For example, wood, cardboard, and other fibrous materials are often acidic and the glues used in plywoods and composition boards give off vapors that can be harmful to artifacts. Some woods used for display cases have been known to cause corrosion of the metal fittings used in their construction in addition to corrosion of materials displayed in them (References 2, 5) and it is apparent that the volatile acidic vapors from the wood are responsible for this. In addition, adhesives, textiles, and other materials used in construction can be the source of harmful vapors. Where a sealed display case is used it is therefore extremely important to ensure that the wood is of a species that has a low level of potentially harmful constituents and that it is well seasoned and comparatively dry, and that other materials do not contribute harmful vapors. In open spaces these substances are not considered a problem and cardboard and wood supports and forms should be confined to open, well ventilated areas, especially where a large amount of material is involved in the construction. Illustrated is an example of the use of cardboard form tubes at Ringve Museum (Figs. 9 & 10). Also shown are acrylic mounts in various forms combining to make a very effective center-piece to a display.

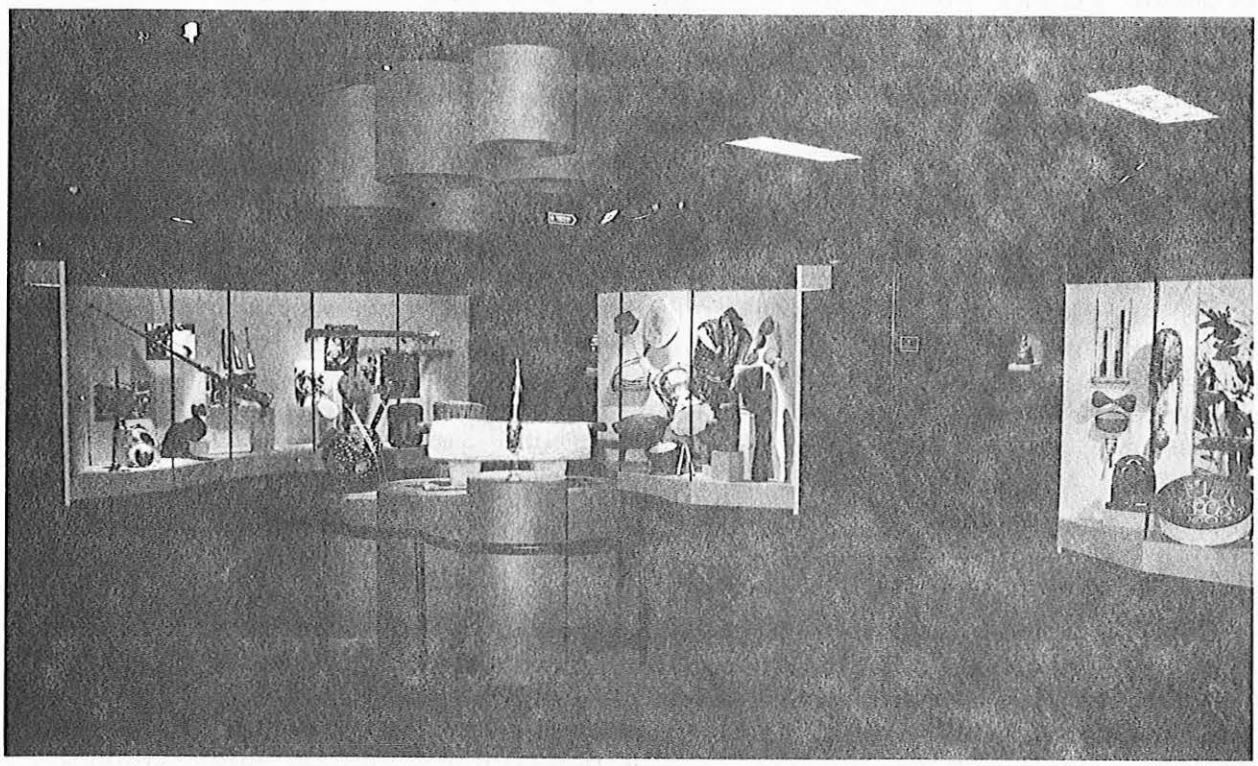
The problems with the yellowing of plastics and the possible degradation of monofilament lines have already been discussed. The yellowing of plastics and also the fading of pigments, dyes, etc., used in the display will rarely have any effect upon the objects themselves although it is important to realize that they are indicators of possible environmental troubles, especially excessive levels of ultraviolet light or generally excessive illumination. Damage due to failure of suspension lines is usually more conclusively demonstrated.

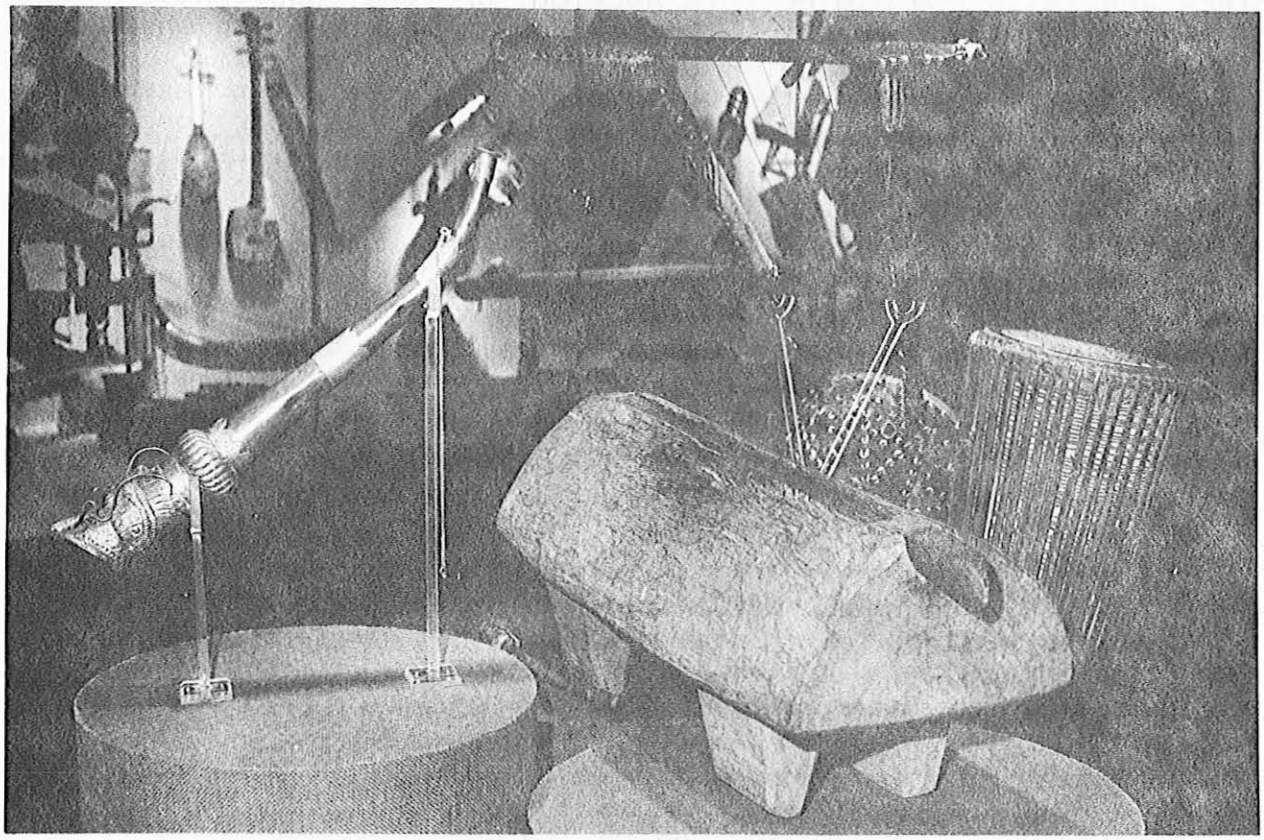
During the group's examination few, if any, examples of damage to instruments due to deterioration of associated components were seen. Of course, all three installations examined were relatively new and one would not expect to see the results of essentially long term processes so soon. There was little or no indication of potential problems in any of the displays which gives this whole section a welcome under representation.

### 4. The Maintenance of the Instruments Displayed

It is desirable to organize a routine of display maintenance for the inspection of each article of the collection. The in-

Opposite page:
Top: Fig. 9
Bottom: Fig. 10





strument itself should be checked for changes - string tensions can be adjusted when necessary, surface dust removed, and any other features given attention as needed. At the same time supports and mounts can be checked, nylon lines tested for strength, and so on. On these occasions notes should be taken of any changes made or observed. The environment should be monitored continuously and spot checks made of the suspected problem areas where necessary. It is important that the instruments on display be readily accessible for these regular checks. Tensions of drum heds and other membranes should be reduced wherever possible, although this may be difficult with many "ethnic" instruments where the heads are found glued, nailed or tied in place. Stable and suitable relative humidity and temperature are essential to the prevention of weakening or damage due to dimensional changes. Unnecessary tensioning of strings has been mentioned before, and tuning of instruments in rotation for short periods should be considered. Instruments which are not normally played should not be under tension, although an instrument with a loose bridge must have sufficient tension on at least two strings to keep the bridge in place.

It is a common misconception that the problems of objects end when they have been put on display in a museum. This is far from true and in many cases the acquisition by the museum of an instrument, and its mounting on display, can mean the end of its regular care and attention. The passive existence that instruments take on when they are installed in a display case must be punctuated by periods of care and attention. On-going care must not be limited to those instruments in a playable condition - ven an instrument that is in such a condition that it will never play again must be given regular inspection. Changes can and will take place and it is the aim of this section of the publication to suggest ways of retarding these changes wherever and whenever possible.

In all three museums the collections that the group examined had only recently been mounted, so the evidence of poor long term maintenance was obviously absent. We all hoped sincerely that this evidence would still be absent in years to come.

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Epilog

It is with great relief that the undersigned hands the manuscript of this volume over to Dr. István Éri of the National Centre of Museums, Budapest, Hungary, to whom Eszter Fontana had established contacts. Dr. Éri kindly offered to undertake the printing and mailing through the framework of the National Centre. However, at this moment sufficient funds have still to be found.

This issue is an example of the use of computers and the intercontinental exchange of data files between CIMCIM members: Robert Eliason edited the reports of the working groups at his Kaypro X, using the word processor Perfect Writer. He had this version transferred into a MS-DOS version for further editing by the undersigned. In Nürnberg, Barbara Hellwig wrote the remaining text with Wordstar 2000, using the Commodore PC 20 in the musical instrument conservation lab of the Germanisches Nationalmuseum. The final editing and lay-out was done by the undersigned on the same machine, the final printing on a Star SR-10 dot matrix printer. Additional help was recieved from the museum's photographic department.

June 1986 F. Hellwig