

iasa

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phonographic bulletin

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PHONOGRAPHIC BULLETIN

Review of the International Association of Sound Archives
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Léo La Clare, Treasurer

This issue opens with a report of the Treasurer, including an explanation of the proposal to raise the annual dues of the Association as stated in the Notice To All Members by David Lance in the Phonographic Bulletin No. 14 of May 1976. The Executive Board invites all members to read the Treasurer's report and to take notice of its important contents.

problems of documentation

The main theme of this issue is related with problems of cataloguing, indexing and computerisation in sound archives. Many archives have their origin in the enthusiastic efforts of pioneers, who at first were "only" interested in the acquisition and storage of great collections of recordings. Other archives were established to contain the "by-products" of social or scientific research as was the case with some Oral History collections. Most of them discovered problems of documentation only after some time, when it was already too late to start new and sophisticated systems of cataloguing and indexing. This issue can perhaps help to think about these matters by listening to members of the staff of distinguished institutes, where part of the problems were solved and where even computerisation was introduced as a means to that end. More articles on these subjects will follow in future issues of the Bulletin.

other contributions

Mr. David Lance contributed a report on the constitution of a United Kingdom National branch of IASA and Mr. Wilfried Zahn, chief sound engineer at the Deutsches Rundfunkarchiv in Frankfurt/Main introduces the lecture which he will give at the forthcoming annual meeting of IASA in Bergen.

Dr. Rolf Schuurmsma, Editor.

It is my sad duty to report to you on the critical state of IASA's finances. Since its establishment in 1969, IASA has been operating with small budgets due to the fact that its membership fees have always been low and its membership small in numbers. Membership fees initially set at \$ 10.00 U.S. institutional and \$ 3.00 U.S. individual have not been increased except for minor upward adjustments in converting from U.S. dollars to Dutch guilders (\$ 10 and \$ 3 to df1. 30 and 9), and then to Canadian dollars (df1. 30 and 9 to \$ 11.50 and 3.50). The number of members has grown only moderately from 90 reported on 1 September 1972 to 156 reported on 1 August 1975. Thus IASA's annual receipts have increased from approximately \$ 480 Canadian reported in September 1972 to approximately \$ 1,300 Canadian reported in August 1975. Annual expenditures were severely limited between 1972 and 1975 in order to be held lower than revenues but expenditures have inevitably risen faster than revenues due to increased costs for printing and postage. Thus it was possible to report a surplus of roughly the same amount in August 1975 (\$ 130 Canadian) as that reported in September 1972 even though annual revenues had increased to £ 1,300 in 1975 as compared to \$ 480 in 1972. Given that costs for the printing and postage of the Phonographic Bulletin and for postage of IASA's business correspondence will increase at a greater rate in 1975 and 1976 than in past years, due mostly to inflation, it is estimated that expenditures for normal operations from August 1975 to August 1976 will amount to \$ 1,500 Canadian whereas receipts are estimated at only \$ 1,300 Canadian for the corresponding period, leaving an estimated deficit of \$ 200 Canadian. Unfortunately, unusual expenditures incurred since August 1975 must be added to the expected deficit on normal operations for 1975-76. These unusual expenditures include the reprinting of back issues of the Phonographic Bulletin which at first printing were not copied in sufficient numbers to meet present and future demands. It should be noted that this necessary expenditure was delayed from previous years. Also included is the printing of a revised edition of the leaflet to reflect changes in the payment of IASA dues in Canadian rather than Dutch guilders, which is to be made to the

treasurer rather than to the secretary, and the printing of new stationary to meet the needs of the Executive Board and to indicate changes in the membership of the Board. Thus, IASA's financial statement as of 31 December 1975 indicated a deficit of \$ 1,476 Canadian. Obviously, IASA needs increased revenues not only to pay, over the next two years, the recently-incurred debts, but also requires substantially increased revenues to maintain a normal level of operations over the next three to five years. Indeed, IASA's revenues should be increased to provide better services to members. The most practical and efficient means of increasing revenues is of course to raise membership fees.

Until such time as fees can be increased, the Executive Board is attempting to increase revenues by recruiting new members by encouraging individual members to have their employer-institutions take up institutional memberships, and by selling back issues of the Phonographic Bulletin. New members are being recruited by the distribution of the IASA leaflet which includes a membership application form, and by convening national or smaller group meetings such as that recently held in the Imperial War Museum in London. Copies of the leaflet can be requested from the secretary by those members who can distribute them to interested parties. Members of the Executive Board have personally encouraged some individual members to request institutional memberships from their employer institutions and all individual members are hereby urged to take similar action. Back issues of the Phonographic Bulletin have already been sold and I suggest that members order back issues if any are missing from their personal collections and those of their employers. At its meeting of 17 March 1976, the Executive Board decided that back issues of the Phonographic Bulletin will be sold in yearly sets (2 or 3 issues per year depending on year of publication) at \$ 5.00 Canadian per set. The stock of back issues represents an asset which will bring in revenues as these are sold over the next few years. While attempting to increase revenues, all reasonable measures are being taken to limit expenditures for the printing and postage of 1976 issues of the Phonographic Bulletin, without hindering the quality of this publication.

The need for raising fees has been recognized for some time already, it having been a subject of discussion

at the 1973 annual meeting held in London. Although the 1974 meeting in Jerusalem voted 10 to 6 against raising fees, the Executive Board announced at the 1975 annual meeting held in Montreal that it would propose a fee increase to be discussed and voted upon at the 1976 meeting. Following its meeting of 17 March 1976, the Executive Board is recommending that fees be set at \$ 25 Canadian for institutional membership and \$ 10 for individual membership, effective 1 January 1977.

The proposed increase is obviously substantial but is absolutely necessary to pay off IASA debt over the next two years, and is justified on a continuing basis over the next three to five years to provide customary, and even perhaps better, services to members through IASA publications and conferences. The psychological impact of the increased fees can be both harmful and beneficial in that it may deter some individuals but should attract a greater number of institutions who will be impressed by the promise of professional quality services, offered by an association whose fee is at least at \$ 25 Canadian. In this regard, the proposed IASA fees are comparable to those of the Association of Recorded Sound Collections which charges \$ 10 U.S. for individual membership but which requests an additional payment of \$ 3.00 U.S. for airmail postage to members outside of the United States and Canada. The International Association of Music Libraries apparently charges 85 French francs (\$ 17.85 Canadian) for individual membership, although Canadians join IAML through the Canadian Association of Music Libraries whose fees are \$ 35 and \$ 20 Canadian for institutional and individual membership respectively (CAML turns over to IAML 40 Swiss francs or \$ 10 Canadian for each individual member). As a major contrast to the proposed fees for IASA membership are the fees of the Fédération Internationale des Archives du Film which are 2,500 Swiss francs (\$ 1,000 Canadian) for full membership, 1,250 Swiss francs (\$ 500 Canadian) for associate members, and 350 Swiss francs (\$ 140 Canadian) for observers.

NATIONAL BRANCHES OF IASA: A POLICY FOR THE FUTURE?

David G. Lance, Keeper of the Department of Sound Records of the Imperial War Museum, London.

On the 28 April 1976 a one day seminar took place at the Department of Sound Records of the Imperial War Museum. As a result of this meeting a United Kingdom national branch of the International Association of Sound Archives was formally constituted. The first officers of this branch of IASA are Timothy Eckersley (Chairman) and Tony Trebble, BBC Sound Archives Librarian (Secretary).

Although Article IX of IASA's Constitution states that "Members of the Association in any country may be constituted a National Branch of the Association", the United Kingdom initiative is in fact a precedent. It may, therefore, be of interest and perhaps even encouragement to colleagues in other countries to have this report on the British experiment. The conveners

of the UK national group meeting, namely Timothy Eckersley, Tony Trebble and the author of this report - decided to try and form a national branch for two reasons. First, as a means of providing more frequent contact between IASA members than the annual conference by itself allows. This was felt to be particularly important as many members of the Association are in any case unable to attend the international gatherings. Secondly, it was decided also to use this first meeting as a recruiting exercise. At the time plans were laid there were only seven paid-up UK members of IASA, a total unrepresentative of the number of sound archives in this country.

As a result of the inaugural meeting, not only was a UK national branch constituted, but eight additional members were enrolled in the Association. This increased British representation by more than 100%. Both in giving substance to Article IX of the Constitution and by increasing IASA membership, the meeting therefore can be judged a success. The long term benefits of this initiative are, however, another question to which I will return later in this report.

In organising the inaugural meeting some fifty institutions and individuals in Britain, known to have a serious interest in sound documentation, were identified and listed. Many of these had no prior knowledge of the existence or the purposes of IASA. So as to give a focus to the meeting and persuade such people to attend, the gathering was organised in the form of a seminar, at which four papers were presented by staff of the Imperial War Museum on subjects relating to sound archive work. This proved to be a successful device. Twenty five people attended the seminar, which was a total somewhat higher than the organisers had expected. Although only eight of the twenty five duly subscribed as members, the remainder at least felt it worthwhile to travel - in some cases quite long distances - to attend a seminar dealing with sound archive matters. At this early stage there are still grounds for hope that more of them may yet join IASA.

The institutions represented at the meeting are listed below: -

British Broadcasting Corporation, Sound Archives
British Council, Recorded Sound Section *
British Institute of Recorded Sound
British Universities Film Council
Bury Art Gallery and Museum, North West Sound Archive *
Cambridge University Audio-Visual Aids Unit
Cambridge University, Centre of South Asian Studies *
College of Librarianship, Wales *
Edinburgh University, School of Scottish Studies *
Foundation for Film and Science, (Utrecht)
Imperial War Museum, Department of Sound Records
India Office Library and Records
Inspectorate of Ancient Monuments and Historic Buildings.
Ironbridge Gorge Museum Trust
Keele University, Department of Adult Education *
London Borough of Lambeth Archives
London University, School of Oriental and African Studies
Open University, Audio-Visual Research Unit *
South Yorkshire County Archives *
Welsh Folk Museum

Institutional or individual membership was taken out by representatives of those institutions marked with an asterisk.

Such a diverse range of institutions was truly IASA in a microcosm. By adjourning for lunch in a local pub a serious endeavour was therefore made to emulate the spirit as well as the form of IASA's international meetings.

The day ended with a business meeting, the purpose of which was to establish whether those people present felt sufficiently interested in IASA to join the Association and to form a national branch for regular meetings. There was a sufficiently positive reaction to these questions, particularly from a few non-members, to justify the establishment of a UK branch at least as an experimental venture. Professor John MacQueen of the School of Scottish Studies, for example, observed that as a folklorist he was surprised to discover how much his institution had in common with the Imperial War Museum. The medium of sound archives thus provided a sufficiently substantial binding link to draw such strange bedfellows together.

It was agreed at the business meeting that the national branch should endeavour to meet twice a year. Tony Trebble agreed to host the second meeting which will be held at the BBC, probably in November 1976. With the formalisation of the UK branch it was also decided that the next and all subsequent meetings will be open only to IASA members of institutions which are seriously considering membership. This should prevent representatives regularly attending meetings but never joining the Association.

It is obviously too early to draw firm conclusions from the experience of this one meeting. It is clear, however, that the personal contacts which it is possible to make in a national setting provide an extremely effective opportunity to recruit new members for IASA. I would, therefore, tentatively suggest that IASA recruitment would be best organised by the appointment, through the Executive Board, of national secretaries. For inaugural meetings of national branches it does seem important, in the light of the UK experience, to offer a formal programme whose content will induce members and potential members to attend. It is equally necessary to have a follow-up meeting planned in advance so as to provide a tangible event with which to maintain the momentum of the initial meeting.

The long term benefits which can be achieved

by national branch meetings obviously depend upon the energies of at least a few enthusiasts. There are no grounds on which to assume that the UK branch will now be self-sustaining. Like the parent international body, national branches must either move forward or go back; they cannot stand still. What direction the UK national branch moves in must remain to be seen and will be reported in the Bulletin in due course.

PRESERVATION AND STORAGE OF TAPE RECORDINGS

Excerpts from a lecture to be held at IASA meeting Bergen 1976.

Wilfried Zahn, chief sound engineer at the Deutsches Rundfunkarchiv, Frankfurt/M.

Remarks on Studio Tape Recorders

The proper choice of tape material for archive purposes has to be done very exactly because the sound recordings which will be kept in the archives have to be kept free from any quality loss.

Which are the specifications of a magnetic tape for archive purposes?

1. print through must be as low as possible
2. it must be mechanically safe and have excellent spooling properties to avoid damaging of tape edges
3. it must have a wide frequency range with good response (± 1 db within the audio spectrum) and low distortion
4. it must have low noise and high dynamic range

ad 1. This is obviously the most critical point. Print through of minus 58 to 60 db should be aimed at. During manufacturing of magnetic tapes some compromises have to be made because the electromagnetic properties of the tape material are dependant from a lot of parametres which interfere with each other. Any gain at one end causes a loss on the other one. During the last time some tape manufacturers have made it possible to produce tapes with low noise - high output characteristics and very low print through at the same time. These types of studio tapes are the very best ones to be kept in archives.

ad 2. In practice the use of tapes with overall thickness of about 50 um has proved well. This is also useful with respect to print through which is heavier with thinner tapes. Conductive backcoating is very useful and nearly seems to be necessary because it optimizes spooling properties and avoids drop-outs caused by dust particles.

ad 3. All modern types of tapes which are usable for archives are good in this point.

ad 4. In this field there are only few tapes which have the wanted specifications if one looks upon low print through at the same time.

Remarks on print through and storage conditions

Like almost all parametres of magnetic sound recording the problem of print-through depends on the frequency - more exact on the wavelength. Print through has its maximum at about 380 um wavelength which corresponds to 1 khz at tape speed of 15 inches per second. One may deduce from that, that print through may be a little bit higher when recording at 7.5 inches per second because the maximum print through frequency is one octave down and in this range is sensitivity of the human ear is somewhat lower. Echoes are therefore less disturbant at the same audio level. Print through effect depends on temperature and time. One therefore has to stress the fact that any tape which shall be stored in archive shall never be exposed to temperatures much higher than room temperature because print through will be much higher with rising temperature.

Therefore it seems to be useful too, to keep recording machines as cool as possible. After twice the time after recording the print through rises for about 0.5 dB. The loss is so the same after storage from one to two minutes or from one to two years or from 10 to 20 years. The signals remaining on the tape due to print through effects are unstable. They can be erased to a certain amount by bending the tape mechanically. I was able to measure an erasure of the printed signals on the tape at about 5 dB due to the bending at the guide rollers on a Studer A 80 recorder. Spooling back and forth also reduces the level of the remaining printed through signal. The Polyester base material of modern tapes does not need controlled storage temperatures and relative humidity. These factors yet are the main ones with respect to print through effects. Storage at temperatures around 20 degrees Celsius at relative humidity fo about 50 - 60 % is looked upon as an optimum.

Measureings

A number of tapes are measured in the Deutsches Rundfunkarchiv. (Frequency response at 7.5 and 15 ips; unweighted noise level (dynamics) and print through).

All measured tapes are according to the above mentioned wanted noise and frequency response performance. With respect to print through there is a difference between the best and the worst of more than 10 dB!

(Agfa PER 525:63dB - Ampex Grand Master: We also measured old types of tape; Agfa F (1950) 50dB! and Agfa FR (1954) and BASF L extra 0,53). All these old tapes had been stored at controlled temperature and had echoes at levels between 52 and 54 dB below reference level which is good for around 25 years of storage. Another old tape which had been exposed to higher temperatures as it had been stored beside a heating pipe had echoes at - 40 dB! Dynamics and frequency response was worse than with our modern tapes but audio quality was still good. (measured on Studer A 80 at 7.5. and 15 ips . half-track (STEREO) and reference fluxivity of 510 nWb/m. Measurements at 30 ips (old tapes) on Telefunken M5 full track at 190 nWb/m.)

Report on Studio Tape Recorders

In the studios of the Deutsches Rundfunkarchiv we are using beside older types of Recorders (Telefunken M 5) Studer machines A 80, A 67 and A 77. A 80 and A 77 are used since 1972, A 67 from the beginning of 1976. After 1.500 working hours there was no electrical or mechanical trouble and the measured performance was just the same like in the beginning. Head life can thus be estimated to 2.000 to 2.500 hours (A 80). A 77 is a semiprofessional type. It has all good performances of a modern tape machine but has to be handled very carefully. It is not constructed for heavy duty performance! Modern LH long play tapes should be used only on this machine, otherwise heads wear rapidly. With careless handling tape damaging can not be excluded because of the missing of a logical tape moving sensor device. As far as one can see until now the A 67 is excellent indeed. Relation between price and performance is excellent and the construction is really solid-state for optimum performance under heavy conditions for a long time. It seems to be predestinated for smaller studios as well as for portable use when one does not need a large machine with all its good properties.

PROGRAM OF THE TECHNICAL SESSION Wednesday 18. August 1976

- 1-Communication by Robert Carneal, Library of Congress, Washington DC read by Gerald Gibson (theme as yet unknown)
- 2-Preservation and Storage of Tape Recordings by Wilfred Zahn, Deutsches Rundfunkarchiv, Frankfurt/Main
- 3-Summary of Smaller Contributions made by Various Sound Archives by Dr. Dietrich Schüller, Phonogrammarchiv der Osterreichischen Akademie der Wissenschaften, Wien.

INTERNATIONAL ASSOCIATION OF MUSIC LIBRARIES (IAML) and
INTERNATIONAL ASSOCIATION OF SOUND ARCHIVES (IASA)
PRELIMINARY PROGRAM OF THE ANNUAL CONFERENCE OF IASA

Bergen (Norway), 15 - 20 August 1976

Sessions are open to all members of IASA and IAML unless otherwise stated.

Sunday 15. August

- 9-15 Registration
- 12 IASA Executive Board (members only)
- 15-17 Opening Session, The Student Centre, Main Hall
- 18 Reception in Hakonshallen, given by the City Council of Bergen

Monday 16. August

- 11-13 Business meeting (IASA members only)
- 14-16 Record Libraries Commission of IAML: Details not announced

Evening: Visit to Bergen University (Folk music section, and materials from archives of theatrical history)

Tuesday 17. August

- 9-11 Copyright in sound archives
- 19 Excursion to Fana (Folklore, dancing, traditional food) or Excursion to Trolldhaugen (Grieg's home) (Alternate choice, see Thursday)

Wednesday 18. August

- 9-11 National sound archives
- 14-16 Technical session

Thursday 19. August

- 11-13 Scandinavian sound archives
- 19 Excursion to Trolldhaugen (Grieg's home) or Excursion to Fana (Folklore, dancing, traditional food) (Alternate choice, see Tuesday)

Friday 20. August

- 9-11 Record Libraries Commission of IAML: Details not announced
- 11-13 Business meeting (members only)
- 15-17 Closing session: reports of the chairman
- 19 Farewell dinner, Fløien Restaurant.

For further information contact
The Student Centre, Bergen,
Annual meeting of International Association of Music Libraries.

CATALOGUING AND INDEXING SOUND RECORDS AT
THE IMPERIAL WAR MUSEUM

(Based on a paper read to the IASA seminar at the Imperial War Museum on 28 April 1976: Roger Smither is deputy head of the Imperial War Museum's Department of Information Retrieval, London).

The Museum's Department of Information Retrieval has an overall responsibility to assist all the Museum's collecting with their cataloguing and indexing problems. Within that brief, its principle work so far has been with film and sound records, and its staff are thus by practice and inclination, if not by formal training, primarily audio-visual archivists. They are also, by the same route, hardened pragmatists. If these two statements so early in this paper appear unduly emphatic and tinged with overtones of pride, the reason relates simply to the most important lesson of this whole area of the archivist's life, which is the need to cultivate a healthy suspicion of all pedlars of ready-made solutions. To claim we are pragmatists is to claim we practise what we preach; and to claim we are audio-visual (rather than book-centred) in our orientation distances us a little from the front ranks of those I sometimes think we are justified in considering the "enemy" in this context. I ask you to distrust all those who offer you ready-made answers to your problems - but of course I expect you to distrust me less than the rest.

In advising on cataloguing and indexing systems four years ago for the then new Department of Sound Records, Information Retrieval leant heavily on the experience already gained and the systems already developed in working with the Department of Film. The reasons for this were partly practical - it was the closest to relevant experience that we had; there were also, however, reasons of principle, most obviously the desirability of keeping Sound Records within the bounds of such standard practices as we felt we were succeeding in establishing. We supplemented this borrowed experience by reading and visiting extensively in the world of sound archivism, but even so some gaps remained in our knowledge that we had to fill by abstract theorising. The results we came up with have survived four years without major change, which is gratifying, but in those four years we

have found several areas where small improvements were needed, which is predictable and, I would even say, healthy. The best possible cataloguing systems - and, to an even greater extent, the best possible indexing systems - come only partially out of the thin air of preliminary study and theory. They must then be modified, reinforced, even redirected, in the light of your perception - more specifically, your developing perception - of your own and your users' true needs. Furthermore they will inevitably reflect the available resources of staff, finance, time and services, which are no constants. I do think minor tinkering in the light of your changing view of the desirable and the possible is anything to be ashamed of, and I would distrust any scheme which could not accept such tinkering - especially if I represented an organisation only just embarking on a new medium. What you must avoid, obviously, is trapping yourself in a situation where the necessary tinkering is no longer minor, and it is here that preliminary study and theory (which I naturally do not wish to undervalue in any way) will save your bacon.

To return from my generalised homily to the Museum's own experiences: I should like to talk first about indexing, where the Museum's procedures (although developed entirely "in house") are in no theoretical sense unique or superior to others - in fact, possibly the most useful information for you is an explanation of why, if we do not need a unique system, we do not use a standard one.

I should like to offer that explanation in a rather roundabout way, beginning by talking briefly about the Museum's interpretation of the purpose of an index. Actually, although the distinction is in practice often blurred, we recognise two functions. The first is to indicate to the general user of the archive, or "student", parts of the collection with bearings on his areas of interest. For many archives, this may be the only function worth bothering with; certainly, for all archives which regard themselves as centres for general historical study, it will be the primary indexing purpose. Even if subservient, however, the second function is not negligible it consists of precisely identifying for the professional researcher (the man or woman usually associated in our minds with the radio or television project on a tight budget and time schedule) those parts of the collection which accurately meet is or her closely defined needs. Although recognising both these functions, the Museum operates only one index, and uses only one type of index card, of conventional appearance. On it appears a heading, or keyword, and a passage

of descriptive text explaining the context of the occurrence of the keyword item in the particular reel of tape identified in the space provided. The wording of the descriptive text indicates which of the two functions the occurrence primarily serves.

Our Sound Records index remains as yet unproven, in that it has not hitherto had widespread use on behalf of outside enquirers. We can already guess, however, at the difficulties and shortcomings it is going to manifest in meeting the functions explained in the preceding paragraph. To begin with, let us consider the index in its secondary mode - the tool of the professional researcher. Nine times out of ten, the professional researcher comes close to being the indexer's ideal client because, in the vast majority of cases, this sort of enquirer ties his request to at least one, and possibly several, areas of concrete detail, and concrete details or solid facts are mercifully free from definition problems. A Sopwith Camel, after all, can not be anything but a Sopwith Camel; Paris (France) is unquestionable Paris (France); and Anthony Eden is only occasionally Lord Avon. Enquiries including such details are easily answered, index entries covering such details are easily made, and whole areas of the index catering for such subjects can be left (with certain basic safeguards) to look after themselves and expand, in the knowledge that nothing can go wrong. Professional research, however, raises another problem, which is the amount of extra information the researcher would like to have provided. Ideally, for this purpose, the index ought to indicate for each entry details such as recording quality and duration, as well, perhaps, as extra factors such as the accent of an interview subject, or even his eloquence or style of delivery. At this point our Departments - and probably most archives - run head on into difficulties both administrative and ethical. In administrative terms, to provide such a service could be achieved only at a huge and unacceptable cost to the rate of indexing work, to say nothing of the patience and good nature of indexers. The ethical question involved is the question of formalising value judgments, which any evaluation of style or eloquence must involve and which archivists generally and wisely are wary of contemplating. We do not offer this service to professional researchers, therefore, as we do not feel it is incumbent on us to do their

job at the expense of our other work, fond as we are of them. There are, however, ways in which some of the information the service should offer is available through a careful cross-reference between, or reading together of, index and catalogue entries, and I shall return to this later.

The problems raised by the general user or "student" are very different. The general user, typically, is not in any particular hurry and his concern is with the actual material of the recording without special stipulations as to length or quality. This would tend to make these enquiries rather than those of the professionals the indexer's ideal, were it not for the kind of questions the "student" asks, questions that tend, in the majority of cases, to take an abstract or conceptual form. That is not to say, of course, that you never encounter an amateur interest in specific aeroplane types, or that you never meet a professional interest in "morale" or "opinions on pacifism", nevertheless the basic tendencies are there, and the reasons obvious. The "student" has time, and a willingness to let the material dictate his next move; the researcher, while not inflexible, tends to need material to fit in with a scheme or outline already determined: the student, therefore, thinks generally, and the researcher specifically. The student's willingness to browse is a help, but the problem of conceptual indexing is still there, and it is there that the real problems begin. Where we could all agree that a Sopwith Camel is a Sopwith Camel, we know that one man's bitter resentment is another's fond reminiscence - the first's disorderly rabble is the second's splendid bunch of high spirited chaps - and even that the incident one man calls an air raid a second will insist on calling a blitz. How can one sort out the synonyms and quell the emotions? How do you establish a common language that can cover all interviews, unite the practices of all indexers, and bridge the gap between index and users?

"Vocabulary control" is a simple phrase, but is camouflages an extremely complex subject. When every word considered requires discussion, cross-referencing, comparison and evaluation, the production by an archive of its own thesaurus of preferred terminology is a hair-raising task. If started "de novo", from first principles only, it takes an enormous amount of time and patience, and still involves the dispiriting near certainty that it will not be right first time. Therefore,

by all means, use someone else's established thesaurus or classification system, provided - and do please not this qualification - that you can find one that really suits your needs. There are in existence several highly specialised published classification systems; nevertheless, the chances are that for most users the most accessible system is UDC - Universal Decimal Classification - so I shall confine my comments to some words on the advantages of UDS, and an explanation of why, in spite of those advantages, the Museum is not using it.

UDC is well established, international, multi-disciplinary and transcends language - those four points are the reasons why it must be attractive to any new archive. The last two attractions need, however, to be looked at more closely. The fact that it is truly multi-disciplinary is its drawback for the specialist archive (in exactly the same way as a general archive would have problems with a specialist thesaurus). The Museum's collection, for example, can hardly be at home in a general system in which war and military matters are covered by a share in one or two tenth parts of a tenth-part of the whole - less than 2% of the entire system. As for the transcendence of language, it must be remembered that this means that for accurate and competent use UDC requires understanding (and for preference training) to an advanced degree in both indexer and user. There are two other points of experience, which I offer you for what they are worth - these are, first, that all existing users of UDC in the audio-visual field of whom I am aware have tended to introduce non-standard adaptations, so that even trained personnel are not totally at home in sister archives; and second, that a recent symposium of film researchers held in London expressed a fairly strong degree of antipathy to UDC number classifications as opposed to conventional keywords.

The Museum's way through this maze was, as you might expect of professed pragmatists, compromise. We have attempted to build our own language control structure, but we have tried also to avoid the quagmire of building up a formal thesaurus from theoretical foundations. The process used is fairly shapeless, but goes something like this: From the most relevant-seeming available source, a tentative framework of the probable structure of the index is drafted (in the case of the Museum's Department of Sound Records the model was the Film index; the Film index itself was based on preceding experience with some of the old indexes acquired with parts of the collection, on earlier efforts at thesaurus compil-

ation, and on borrowings from UDC and other systems); within the loose constraints of this preliminary structure, a small number of indexers is allowed to work for two to three years, with little supervision, indexing parts of the collection as they are catalogued in the ways the material itself seems to suggest; finally, at the end of that period, an opportunity is made for a pause, a look-around and a "pulling together" of the index, when duplicate terms and other inelegances are sorted out, with a more formal structure resulting. Thereafter, indexing is more strictly controlled, although further change is not totally ruled out. This account is somewhat formalised: in practice, the second and third stages may overlap extensively, especially if the archive is fortunate (as the Museum generally is) in attracting intelligent indexers. The optimum position is one where a single figure (a kind of project-leader, although this again sound too formal) has overall responsibility for the shape of the index, but takes no decisions without consulting or informing the other members of the staff. This ensures several viewpoints on a given question, and also minimises time wasted on going twice over the same ground. That factor of time wastage cannot be eliminated, however, it can only be faced bravely when it comes, and can be made somewhat more bearable by the gradualist approach I have outlined, which at least offers the satisfaction that your documentation is conducting a kind of dialogue with your material and is not simply being imposed on it. A trivial but symbolic tip: you feel the trauma of modification less if you resist the temptation to keep having your working vocabulary control framework neatly typed on sheets of paper; better to use a stack of hand-written cards for your first year or so, as you scarcely notice the effort or angst of re-writing or re-ordering them. There is time enough for type-written neatness after you have some time and confidence under your belt.

Asked to provide more serious tips on indexing, I would offer the following half a dozen or so. Avoid starting groups of terms which have no obvious boundaries - a common trap in interview material is "attitudes". "Attitude to outbreak of war in 1914" - splendid; but then where do you stop between that and, say, "attitude to over-heating problems of Crusader tanks in Western Desert caused by radiator leaks", and how do you grade the resulting mountain of cards? The point made earlier about definition problems being easier at the factual end and more difficult at the conceptual and indicates the desirability even in conceptual areas of pinning your in-

dexing term to something fairly solid, and letting your users do the creative thinking. Avoid slang or language that will date; avoid like the plague involving yourself in political or emotional controversy. A useful device here, incidentally, is the humble inverted comma. Label an index card "Atrocities" and you are in trouble; label it "' Atrocities' " and you may include anything that someone else has called on atrocity, without committing yourself. Make sure, in those areas of the index where your archive expects and is expected to go into some specialist detail, that you can pitch your index entry at the correct degree of detail - "Military Engineering" of "Bridge Building" or "Bailey Bridges"; ensure also, however, that the hierarchy is clear, both to indexer and user. Finally, if in two minds whether or not to make an entry or create a cross-reference, my inclination is always to say "put it in". It is easier to pull it out later than to find it again and put it in; and your users are less likely to object if you offer them too many alternatives, than if they find too few.

My last index-related suggestion bridges the gap to cataloguing. We consider it highly desirable, where possible, that cataloguing in indexing be made a single operation carried out at one time. Where one person listens to an item and in one session writes his or her catalogue card and index entries, he or she can write each in the light of the other: the index card can expand upon details for which the catalogue synopsis has no space, and catalogue entries can be arranged to supply (or at least to imply) information which cannot be recorded on individual index cards. This sort of inter-dependence is frowned on by some theoreticians, but we find it very useful. When indexing happens as a separate and subsequent process, not necessarily carried out by the same person and based mainly on the completed catalogue card, opportunities for error are bound to intrude and, more important, opportunities for improvement must be excluded.

I had not intended to be so verbose about indexing, and will try to be less so about cataloguing. I started the indexing section with a statement of the Museum's understanding of the purpose of indexing, so let us do the same for cataloguing. We see the primary purpose of catalogue-type information as being to tell us about the material we possess, in all the detail necessary for our own house-keeping purposes; the secondary purpose (which overlaps the first extensively, but it is not identical to it, and may well ultimately take a different physical form) is to provide for interested outside parties a guide to the material in the

in the collection. I emphasise the word "guide". No catalogue can aspire to be a substitute for reference to the collection it covers; it can only aspire to be a kind of filter making sure that the components of that collection (and the time of its administrators) are not used unnecessarily. In fact, a negative definition is quite tempting: a catalogue exists to show people which parts of the collection are certainly not what they need, to enable them to make their selection from the balance; the catalogue, in other words, provides the short-list rather than the answer itself.

Cataloguing, much more than indexing, is an area where established rules and standards make the archivist's life easier by reducing the number of decisions he or she must take. Rules and standards only, however; the advice against unquestioning acceptance of anyone else's complete system is still appropriate. The arguments for standardisation and compatibility - and I do not for a moment wish to deny that they are very strong - must be measured against the crucial factor of complete suitability to the archive's own needs. There is wide divergence between the needs of book librarians and audio-visual archivists (as anyone who has attended a discussion attempting to establish the "Author" or "Title" for an interview, or the "publisher" or "edition statement" for a film or cassette will know only too well); there are also important distinctions between the cataloguing priorities of different types of collections within a single audio-visual medium. In sound recordings, I suspect at least four different catalogue formats could be justified (or four variations of a single format), to cover classical music; sound effects; the material generated by an archive in pursuit of its own special interests and to its specifications (in the Museum context, the oral history interview projects); and finally, material acquired by an archive in a "like it or leave it" condition, such as radio material. Although it probably sounds like it, I am not really telling you that you need several different (and preferably purpose designed) catalogue systems in each archive; all I am asking you to do is think carefully through all your requirements before selecting or designing your basic system, to make sure that all those requirements will be met, and remember that, even within your own archive, those requirements may well differ enough for different areas to suggest variant designs in catalogue cards, catalogue pages, or whatever method you are

using. A single card-format would be wasteful if up to half the data fields were redundant in any one use.

The Museum's catalogue card - which you may have seen - is basically an "interview format, fairly obviously designed with military subjects in mind. I think there are ways in which we could probably design a better card now, and it might be instructive to consider these points, rather than staying longer in the area of pure theory.

First, I think perhaps we over-specialised our card in the military direction. This specialisation has more of less justified itself in use over large areas, but still looks a little odd (even in a war museum) when labels like "decorations and awards", "service", "arm of service" and "rank" are applied to industrial workers, let alone pacifists. There are also occasions when over-specialisation can lead to confusion even in their own terms - for example, we had problems ourselves sorting out the sorts of fields named above between the Royal Flying Corps, Royal Naval Air Service, and Royal Air Force.

Another point to watch in the detailed or specialist catalogue format are those areas where the entry is generally, but not invariably, the same: "Country of Service - Great Britain", for example, or "Language - English". The problem here is that of identifying the cases where a blank or non-entry stops meaning "the answer is what it always is" and starts to mean "we do not know what the answer is". The two examples I just gave are not vitally important, but this sort of uncertainty can be a real liability in the "Copyright" section, for example. Perhaps these days we would print some of these fields with the standard answer filled in, so that even the fact that it was crossed out would tell us something, like "the language certainly is not English" with the reference "we are trying to find out if it is Finnish or Hungarian.

Another point omitted at first from our catalogue but incorporated so successfully in the film catalogue that we would seriously recommend it to other archives is a discreet little lapse from cataloguing orthodoxy hiding under the label "Remarks". This area of the catalogue entry (which of course could be suppressed from any printed catalogue if we wished) contains the subjective reaction of the cataloguer to the material catalogued - he or she is permitted, or rather encouraged, to comment on the interest, style, intelligibility, or even the political or ethical

slant of the interview, speech, report or whatever. We recommend this practice for two reasons. The first is that the knowledge that this kind of safety valve exists helps cataloguers retain their proper objective "cool" while completing the remainder of the catalogue entry. The second is that the provision of an indication of the personal reaction of a single man or woman to the item catalogued - clearly understood to be the reaction of just one person, with no special claim to "typical" status - is of great benefit to users of the documentation, and can go some way to supplementing the bald data recorded in the index entries, or indeed the catalogue text. It is not market research, but we have the word of outsiders that it is much better than nothing.

To bring myself down from these heights of self-congratulation, I will mention finally another area where we encountered difficulties: this has been in establishing clearly the description of the different generations of recording medium with which the catalogue deals. Items in the Museum's collection can already cover three generations - the original medium (the disc acquired or borrowed; the tape used at the interview); the current working or listening copy; and the archival preservation copy. A fourth generation, of "easy access" copies (on cassettes, perhaps), is not an impossibility. Our original failure to allow for all this information both indicates our own original ignorance of the full implications and requirements of sound records cataloguing, and points out the value of having a system that is not completely inflexible.

In closing, I would like at last to introduce a word I have not yet used - computer. Those of you who have heard of the Museum's conversion to purpose-built computer-based system for cataloguing film and sound records called APPARAT may be surprised and possibly relieved) at this silence, but there are reasons for it. The first is that I do not wish to poach on the territory of David Penn's paper on the benefits and problems of computerisation. The second is that I did not wish to imply, or to allow you to infer, that anything I was saying had only to do with computers; and the third is that I hope my reticence hitherto strengthens my chances of now making the contrary implication - that computer-based cataloguing systems should have only to do with conventional cataloguing lore. I hope that if I now say that everything that has been gone before remains true under our computer system, it may help some of you shed a little of the instinctive distrust, if not

fear, of automation which many people feel, and which I shared myself some years ago. Think of a computer as a fantastically quick, thorough and efficient but painfully literal minded and totally unimaginative filing clerk: a computer system should not require of you much adaptation than you would have to make to accommodate this unlikely human being. Our introduction of APPARAT was a watershed which has given us the opportunity to retrieve some of the errors I have been enumerating and which has also afforded me a slight evaluation from which to survey our progress to date and report you. Like geographical watersheds, however, the site itself need not be especially impressive, and proud as we are of APPARAT, I prefer on this occasion to subordinate our pride in the latest manifestation of our principles to the principles themselves. Still, those of you who wish to ask questions about APPARAT are welcome to do so; you need only to be warned that I can be as verbose about that as I am about cataloguing and indexing.

SOUND ARCHIVES: TOWARDS COMPUTERISATION

David Penn, Keeper of the Department of Information Retrieval, Imperial War Museum, London.

I believe the Age of Faith in the computer has passed. We archivists no longer believe in an incomprehensible, all powerful machine that would somehow, sometime, soon, effortlessly pour forth the fruits of an archive, all neatly arranged, and lay them at our feet as we sat back and relaxed in the warm glow of that prestige which is such a welcome fringe benefit of computerisation.

The computer has lost its mystique, and is now clearly seen as an extremely expensive tool whose use can only be justified if it brings well defined benefits. It is also appreciated that the highly trained professionals who write programs for and operate computer installations are usually just as ignorant of and have equally curious misconceptions about our subject field and professional methods as we have of theirs. This situation will change somewhat as more and more computer organisations seek markets in the library and archival field, but at present it is most unwise to assume that such organisations have sufficient knowledge of the purposes and methods of archives to be able to provide worthwhile

instant solutions to our problems.

As an example of this, the archivist demands that variations, idiosyncracies and illogicalities in the spelling, syntax and punctuation of a record be preserved, since to alter them may actually corrupt the denotative or connotative meaning of the original. Conversely, the computer operator will always tend towards standardisation and strict logics, to ensure ease of data handling. Always remember that the computer system must be fitted to the archive, not the archives to the system. Here, incidentally, the sound archivist is in a better position than his documentalist colleagues, since he is dealing primarily with 20th century language, which has attained a reasonable degree of standardisation in spelling.

The computer originated as an arithmetical aid, and continues to employ a binary arithmetical basis for the performance of strictly logical tasks. Its primary virtues are speed and reliability in carrying out routine operations capable of precise definition, combined with great capacity for storing information.

By contrast, the human brain remains the best machine for matching a question posed by a fallible, illogical human being to data prepared by other all-too-human people. A computer is capable of perfect memory and logical ordering, but it is incapable of thought or understanding or intuition or leaps of the imagination. Human understanding will always remain a major strength and advantage in the operation of a manual system. A computer system, to be worthwhile, must use its strength to complement and reinforce these human virtues. Care must also be taken to keep to a minimum the disadvantages inherent in complex and sophisticated electronic equipment and strict simple logic.

The entire implication of what I have been saying so far is that the use of a computer will not enable an archivist to put up his feet and relax. Far from it, he is going to have to work very hard and think very clearly and logically from the first discussion about the justification of using a computer at all until the day he stops being involved with the fully operational system. As Herr W. Buchmann of the Bundesarchiv, Federal Republic of Germany, said in 1975 "As far as I know, none of the West German archives has so far achieved a distinct easing of its archival work by applying methods of electronic data processing".

What computerisation can do is to make more efficient and accurate use of information

gathered by the hard working archivist and assist in its wider dissemination.

Specifically, an efficient computerised system can be developed to offer some or all of the following tangible advantages:

- a. It can process very large volumes of data extremely quickly, without tiring, and without loss of accuracy;
- b. It can reduce clerical work and improve the accuracy thereof by carrying out such logically definable tasks as cross referencing, sorting or re-ordering of data according to selected criteria, making selective listings, putting in added entries or merging two or more discrete files;
- c. It can simplify, improve the accuracy of and greatly reduce the burden of proof-reading and editing data, a subject that I shall return to in more detail later;
- d. It can produce multiple indexes, assuming of course that there is a need for them, from information held in its data store. It can also produce automatically indexes in circumstances where this would be impossible or uneconomic using conventional resources.
- e. It can offer the options of pre-co-ordination in the construction and operation of indexes;
- f. It can offer, at a very high price, greater access to information by free text searching facilities. The Bundesarchiv and the General State Archives in Italy have already done much work in this field, using the Siemens Golem II and IBM STAIRS programs to study complete transcriptions of documents, but I am not sure that this facility would ever be intellectually or financially justifiable for sound archives unless they envisage the computer based storage of completely transcribed sound records and contemplate major linguistic studies involving the preparation of concordances;
- g. It can offer, again at a high price, the ability to break down complex compound Germanic, Latin or scientific words, and sort and index them according to their separate parts. Again, this is perhaps of greater usefulness in the scientific field;
- h. By the production of a suitable output tape, printed catalogues can be generated by photo-typesetting techniques with very little additional editorial, clerical or proof-reading effort;
- i. The statistical analysis of data is possible. This is particularly useful for the housekeeping of very large collections and invaluable if sound archives ever have to introduce the sort of complex conservat-

ion and copying programmes employed by their colleagues in the field of film; such conservation and re-copying programmes could well become a necessity when more is known of the shelf life of recording tapes.

- j. Greater physical security can be provided for data, since in a computerised system, several generations of data base are maintained, and output is usually produced in multiple copies. Cheaper conventional methods such as microfilming can attain the same degree of security, however, for those archives that still hold only a unique copy of their catalogue or index;

Besides these tangible benefits, there are one or two intangible ones. Any such major scheme is going to be so expensive and so disruptive that it will ensure that cataloguing and indexing are given much greater prestige and weight, thus producing a "roller-coaster" effect that will help to keep up the momentum of these vital activities for many years to come. The design and implementation of a computerised scheme oblige the less well organised archives among us to take a long, hard, cool, analytical look at what they have been doing, the functions they are required to carry out, and the changes necessary in order to fulfil these functions in a satisfactory manner, and to maintain high standards of accuracy and consistency in the preparation of data.

When the archivist comes to consider whether or not computerisation is for him, he must always remember that only he is capable of identifying and defining the problems that exist within his institution, and of stating in principle what is required to solve these problems. Any laxity in this area can result in very expensive problems. Because of my failure to be fully aware of the overall length of some sound record interviews being recorded here at the Museum, I made a cardinal error in underestimating data capacity when specifying the maximum length of a sound record synopsis. This problem came to light too late to avoid the need to incorporate an expensive and slightly clumsy modification to the program.

It is for the computer expert to suggest whether or not systems can be designed to cope with these requirements and the processes and costs involved. The archive must then decide whether or not there is a real gain to be achieved by computerisation, and if so, whether that gain is economically justifiable.

This is the process known as "systems analysis", and I cannot emphasise sufficiently that the archive and not the computer experts must take the leading role in these discussions. It is of course a two way process: the archivist will certainly open the computer man's eyes to problems he had never envisaged in his worst nightmares, and the computer experts will provide many worthwhile additional ideas, and open up possibilities that would never have been considered when only traditional methods were available. Nevertheless, the main framework of the system should either be prepared by the archive, or, if it is produced externally, every step of that system must be closely studied, considered, adapted if necessary and specifically approved by the archive. This stage of the proceedings cannot safely be left in the hands of the computer advisers. Always remember that computerisation is only worthwhile if it improves the intellectual standard of your archive. Resist any suggestion that would result in a reduction of your existing standards. Avoid ingenious ploys suggested to get around limitations in existing systems. The system should always be modified to meet the needs of the archive, and never vice-versa.

This little rhodomontade brings me to the perils of existing "package systems" sometimes touted as instant, painless and above all cheap cures for archival problems. The costs of systems analysis and programming are very high, being between £ 20,000 and £ 50,000 for a complete archival system designed "de novo" in 1976, depending on where and by whom the work is done. It therefore makes sound economic sense to adopt, or adapt under licence, existing systems, providing they meet the archive's requirements, or can be made to do so for a small cost. In the field of indexing, for example, several rather cheap and specialised programs intended primarily for bibliographic citations have shown little promise from the archival point of view, largely because they employ fixed length data fields with insufficient data capacity. Some other more flexible packages, such as "FAMULUS" and "STATUS", written for ICL machinery, have greater potential. The Imperial War Museum's own archival system, known as "APPARAT", which holds information on both film and sound records, was written specifically for us in 1975, since no existing system met our requirements, and cost £ 25,000. Because of our financial strictures,

"APPARAT"s' indexing facility is not as well developed as we would like, and it is not impossible that we will enhance it in the future by the adoption of an existing indexing package.

I must also warn against the blind adoption of book library systems. As we are all very well aware, our Librarian colleagues have of late been evincing a powerful interest in what they choose to call "non book media". With that enthusiasm so characteristic of the newly converted they have tended to assume that their essentially bibliographic and title orientated systems, whether simple or sophisticated, can easily meet the needs of their brethren in audio visual fields. There may be much truth in this in the lending library and educational resources field but it is a dubious claim where archives are concerned. Libraries have tended towards a utilitarian, housekeeping approach towards their manual and computerised systems while archivists work more from a scholarly, descriptive point of view, with greater emphasis on quite large quantities of free text. Mr. Christopher Ravilious, in his 1975 International Federation of Library Associations "Survey on the cataloguing of non-book materials catalogued by Libraries", carried out under a Unesco contract, states "... their functions as co-ordinators of archives causes them to approach the task of devising data formats with pre-conditions other, and in general more rigorous, than those of libraries. As will appear, the chances of formulating an International Standard Book Descriptor (Non Book Materials) capable of satisfying all the communication needs of sound and visual archives are minimal". Mr. Ravilious is here talking of international standards for data exchange, but I consider that his point has a wider application throughout the field of archival documentation. The early versions of the Library of Congress "MARC" system had insufficient data capacity or flexibility to work well with non book media. Later versions are better, and several potentially very powerful and flexible multi media systems are now being developed, such as the Council of Europe's "EUDISED" or the British Library's "MERLIN".

"MERLIN" is designed to be a national media cataloguing system, and its intention is to offer, by the late seventies, what will be the Rolls Royce, or perhaps the Concorde, of the cataloguing world. Every imaginable facility will be there, from the most sophisticated editing procedures to microfiche output to

computer typesetting, and all at very low cost to the participating institution and with a back up advisory provided by very skilled staff. I will say again, however, that most of these systems are being designed by people with bibliographic background, and when faced with a stubborn archivist asking for more, they have tended to say "Oh, no problem, we can write a sub-routine for is". This, all to frequently, is the computer man's way of avoiding an unpleasant issue.

I am, of course, being desperately unfair to a number of people who are trying very hard to help us, but I do so to make a very serious point. These big national and international cataloguing systems are very much the coming thing, with developments well advanced in the USA, UK, East Germany and the USSR, and it is absolutely vital that the end result justifies the hundreds of thousands of pounds of man-years that they will cost. It is therefore incumbent on any institution that is not a book library, and that expects to use such a multi-media system, to get in on the proceedings at a very early stage, to make sure that its particular needs are going to be met in full, and to refuse to be put off with promises of little sub-routines tomorrow.

There is one area of systems design, the editing facility, in which economies must resolutely be avoided. One of the major advantages of computerisation is that it allows correction of, amendment of, or addition to data without the danger of further corruption of the text. For preference, a system should allow the alteration of single characters, and at very worst should require that no more than a single line be re-processed in order to amend an entry. It is dangerous, false economy to demand too little of a proposed computer system. If it will not meet a need, or improve on the existing situation, it is a waste of money. An archive should also be wary of non-standard practices intended to save time or money. We originally adopted a non-standard shift system for upper and lower case letters in order to reduce the number of non-textual shift characters. This worked perfectly on the computer, but no way could be found to make Computer Output or Microfiche equipment accept it. A conversion program had therefore to be written to insert standard ICL shift characters. We also wished to use a 160 character line fiche output. This

is an industry standard, but is infrequently used. When combined with upper and lower case text, it proved to be of poor visual quality. We have therefore reverted to 132 character line fiche for such output.

To summarise, sound archives in 1976 have the choice of an expensive system designed specifically for them now, or, if they are fortunate, a slightly less expensive system incorporating one or more existing packages under licence, or in some countries of waiting form a cheap nationally developed scheme scheduled to be running from two to ten years.

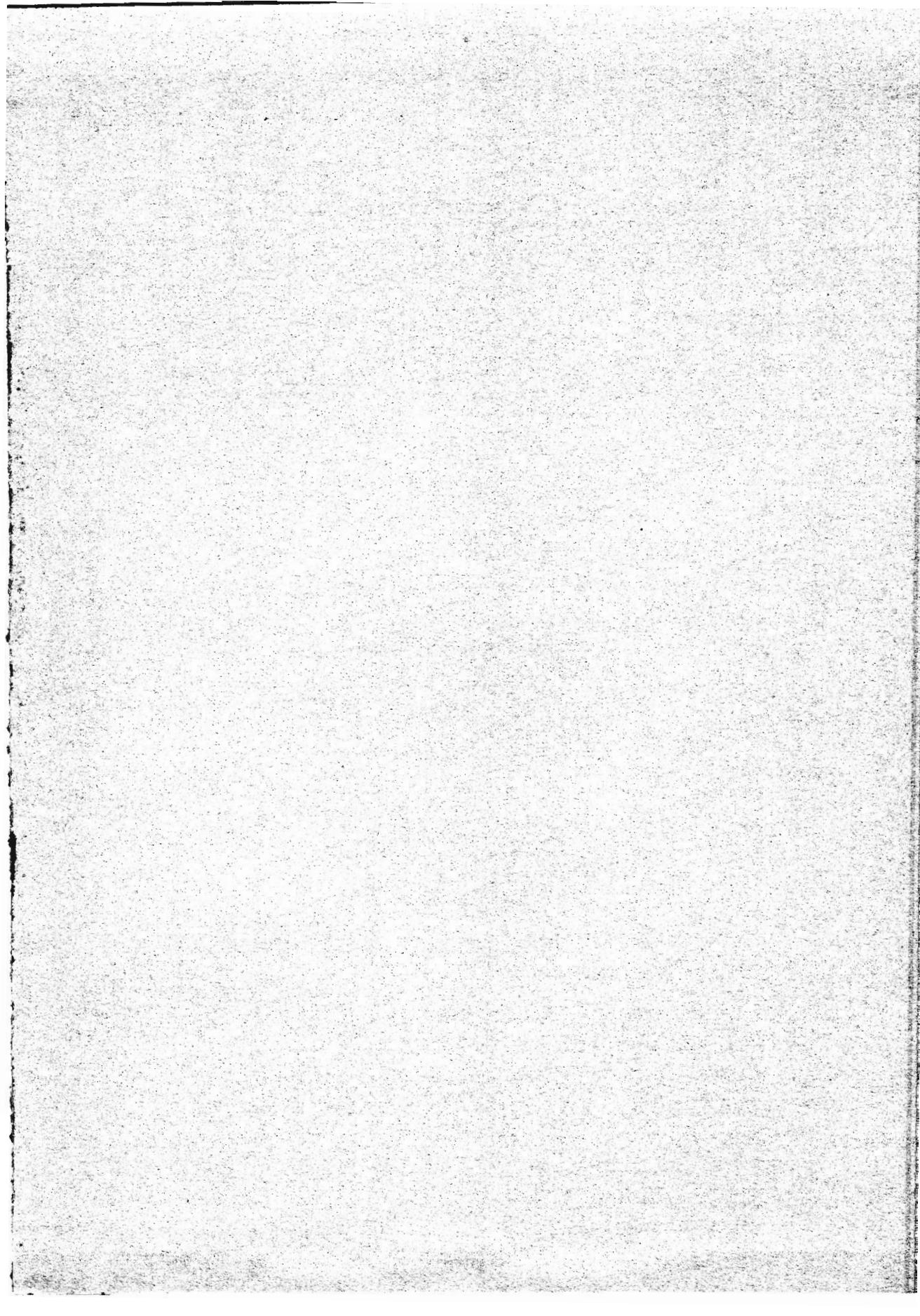
I would like to close with a few remarks about problems and costs involved in computerisation.

Firstly, any major scheme is going to be unbelievably disruptive, and will tie up much staff time. It is very important to involve all levels of staff responsible for documentation at a very early stage. There is a natural antipathy to the unknown and to disruptive change, and it is wise to ensure that staff have a clear understanding of the reasons behind and progress of the new scheme, and have every opportunity to voice their misgivings and put forward their own suggestions. This will of course reduce their cataloguing and indexing output. I must confess that we took insufficient account of this here. Secondly, a new computerised scheme is going to have to be run in parallel with the old manual scheme for several months, or even years, during the "de-bugging" of the new system and the conversion of existing documentation to the new format. The major bottleneck in such a conversion, incidentally, is the proof reading of each converted entry. This dual running imposes a real financial and physical strain. Thirdly, if you think the major non-recurring expenditure of tens of thousands of pounds on systems design and programming is large, you will find that the non-recurring cost of converting your existing data base is enormous. When machine time, data preparation costs, staff time devoted to proof-reading and so on are calculated the true cost ranges from £1 to several pounds per record. Thus, if you have one thousand catalogued items, conversion will cost at least £1,000, and possibly two or three thousand. If your present documentation is a disorganised mess, your conversion costs are going to be much higher. There is an old computer man's adage: "GIGO", "garbage in, garbage out". This is not absolutely true, since programs can be written to do some straightening out for you, but such programs are very complex and thus expensive, and will require a lot of thought and effort on the

archives part in order to make sure that they really will carry out their function. You have the choice of spending time and money either on complex programs to sort out the muddle, or on getting your data in order by manual methods before it is processed by a simpler and cheaper computer system.

Rest assured that you are not going to have to buy your own computer. Even the largest archive, unless it can justify very expensive "on line" continuous access to its computer data store, will be using at most only a few hours of computer time per month. This can be purchased at cheap "off peak" rates, and will produce for the archive output either on paper or on microform (which can offer considerable savings in cost and bulk). These computer-produced indexes, catalogues and lists are then used in conventional fashion.

The costs of computing are getting cheaper, thus balancing out to some extent the rising costs of systems analysis, design and programming. The latest generation of computers are quicker, have greater information capacity and thus enable the hirer to get his work processed for lower costs than is possible on their slower predecessors. Many machines operated by government or local authorities are not nearly used to capacity at present, and their operators are usually only too glad to find new and worthwhile users. It should also be borne in mind that the use of computers is ever widening, and this buyer's market may not last. It is therefore wise to establish a firm claim to any surplus machine time as soon as you are able to do so. Finally, once your system is up and running, your existing documentation converted, and your older system phased out, you should find that the on-going running costs compare favourably with those of your old manual system. From then on, you may not be able to sit back, but at least you will be able to enjoy the greatly increased quality of the fruits of your labour.



CONTENTS

- 1 Editorial
- 1 Special report on IASA finances Léo La Clare
- 3 National branches of IASA: A policy for the future? David G. Lance
- 5 Preservation and storage of tape recordings Wilfried Zahn
- 6 Program of the technical session
- 6 Preliminary program of the annual conference of IASA
- 7 Cataloguing and indexing sound records at the Imperial War Museum Roger Smither
- 12 Sound archives: Towards computerisation David Penn