

The Journal of Documentary Reproduction

JUNE • 1941

*Recent Developments in Public Record
Microfilming*

Microphotography at Work

Sessional Papers Project

Checklist of Newspapers on Microfilm

Volume 4 • Number 2

A QUARTERLY REVIEW OF THE APPLICATION
OF PHOTOGRAPHY AND ALLIED TECHNIQUES
TO LIBRARY, MUSEUM AND ARCHIVAL SERVICE

THE JOURNAL OF DOCUMENTARY REPRODUCTION was established to meet a need for an independent, critical, impartial periodical in this field, and is published on a cooperative nonprofit basis. It deals with problems confronting scholars, scientists, archivists, librarians, editors and other concerned groups. The JOURNAL, in attempting to meet this need, urges other periodicals to continue disseminating helpful news concerning scientific aids to learning, and seeks their cooperation, as its editors and publishers are motivated only by the spirit of scientific inquiry and service to scholarship.

The Editorial Board is assisted by members of several organizations interested in the scope of a professional periodical devoted to the use of photography and related processes in reproducing materials in print and manuscript form. Improvements and new procedures are appearing so rapidly that a central source of information is essential, particularly if science and scholarship are to receive the greatest benefits from the application of these means to definite educational ends.

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THE JOURNAL OF DOCUMENTARY REPRODUCTION

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The Sessional Papers Project

EDGAR L. ERICKSON

AFTER A regrettably long, yet unavoidable, delay, the Committee on the British Sessional Papers¹ is now able to announce its plans for microcopying the British House of Commons *Sessional Papers*.² In dealing with this problem the Committee has always been mindful of the necessity of keeping the cost to the subscribers as low as possible, and at the same time of offering microcopies which will best meet the requirements of scholar usage and of library practices. It was also confronted with the necessity of formulating a plan which will make the project self-amortizing, since, contrary to original hopes, a foundation grant has not been obtained to defray the cost of a master negative.

The Committee found that there are only two practicable duplication processes which can be utilized for this project, namely, microfilm and microprints; and after a thorough consideration of each, it has decided in favor of microprints. The Committee, accordingly, has signed an agreement with the Readex Microprint Corporation of New York (Mr. Albert Boni, publisher, president) for the duplication in microprint form of the *Sessional Papers* for the nineteenth century. Both the decision and the agreement have received the unanimous official approval of the Executive Committee of the American Historical Association. In the words of Dr. Conyers Read, secretary, "This means that the American Historical Association through its duly constituted officers, has approved and endorsed the action of its Special Committee on the British Sessional Papers."

¹The members of the Committee are C. W. de Kiewiet, Frank J. Klingberg, Milton R. Gutsch, Warner F. Woodring, and Edgar L. Erickson, Chairman. This is a special committee of the Committee on Historical Source Materials of the American Historical Association, Herbert A. Kellar, Chairman. Dr. Kellar has worked closely with the Committee on the British Sessional Papers in all of its negotiations.

²This collection is also known as the *Parliamentary Papers* and the *Blue Books*.

Some of the technical and functional qualities both of microprints and of the Readex projector which influenced the Committee in reaching its decision deserve brief mention.

In no other duplication process has compactness, with its resulting economy in library space, been obtained with so little sacrifice of convenience to the reader and to the librarian and of safety to the microcopies. This result is achieved through the medium of the microprint sheet and of the Readex. The microprint sheet is a specially developed photographic paper, 9 x 6 inches, on each side of which one hundred pages of documents are microprinted in sharp contrast. These micropages are systematically arranged in groups of 10 pages to a line, so that micropages 0 to 9 compose the first line, 10 to 19 the second line, and so on up to page 29. Hence, an 800-page volume is duplicated on four sheets of microprints. The title, volume, page and other identifications appear in black print of normal size at the top of each sheet. So compact is this page arrangement that the specially designed cases which will hold nearly 6000 volumes of the *Sessional Papers* can be stored on 5 feet of shelf, instead of approximately 1000 feet required for the original volumes. So convenient is the form in which microprints are issued and so well identified are the contents on the sheets that no special problems of cataloging are created for the librarian. The microprints, furthermore, can be read with unusual facility in the Readex. One simply lays a sheet on the moveable tray located in the base of the projector; and by a slight turn of the dials which manipulate the tray, any one of the 100 pages on the exposed side of a sheet can be located in an instant. Selecting one page out of the hundred requires an instant's computation instead of the minutes necessary to run microfilm back and forth until the desired page is found. Protected as it is under a glass cover, the microprint sheet cannot be abraded and torn, when in use, by the friction of contact with moving parts.

Not only is the microprint sheet constructed so as to prevent excessive curling, but it has amazing properties of resolution and definition, and its prints have a sharpness of contrast. Technically speaking, a microprint sheet is composed of a white sheet of paper to each side of which is laminated a film of cellulose acetate, which, in turn, is impregnated with dye. The two layers of cellulose acetate give a countertension which pre-

vents the paper from curling. The paper serves as a reflective screen and the cellulose acetate as the medium which holds the microprints. This uniting of a combination of dyes with cellulose acetate and the laminating of the latter to paper gives, in effect, a grainless photographic dye paper on which, for the first time, there can be produced black prints on a white background, and on which Mr. Boni has copied printed material reduced 300 diameters (one ninety-thousandth the original size) which is distinctly legible under a microscope.

Microprints, moreover, have a depth equal to the thickness of the cellulose acetate layer. Thus a surface abrasion does not obliterate the microprints, as is so often true in film copies.

In the light of these facts and on the basis of satisfactory tests microprints of especially difficult parts of the *Sessional Papers* which Mr. Boni has submitted to the Committee, the Committee is convinced that the contents in the *Sessional Papers*, difficult as some of them will be to reproduce, offer for microprints no serious problems of resolution, definition and contrast.

The Committee also believes that the microprint paper has a durability and microprints a permanence which more than justify the expenditure required for the purchase of microprint duplications of the *Sessional Papers*. Sealed as it is between the two layers of cellulose acetate (a substance which has an estimated life of about 300 years), the paper screen in microprint paper is protected against decay. Microprints which have been exposed continuously to sunlight for a period of eight months from inside a window have suffered a slight fading; however, the microprints continued to be distinctly legible in the Readex. This test would be the equal of 100 years under conditions of normal library storage and usage. On the basis of the results of this fading test, Mr. Boni will guarantee microprints for fifty years, and he is positive that they will still be serviceable at the end of a hundred. Upon personally examining the results of this test, which is still in progress, the Committee has concluded that Mr. Boni's claims are not exaggerated. One need but call at the office of the Readex Company to view the evidence and to judge for oneself the soundness of the above conclusion.

Before terminating these comments on the permanence of microprints, one further observation is pertinent. That concerns the superior

performance of the Readex in the projecting of sensitive shades and tones of color. Blues, browns, reds, greens, yellows, pinks, etc., are reproduced on the screen with remarkable fidelity. In the light of this fact, microprints would have to fade far more than the Committee believes is likely before they will lose their legibility.

It has already been indicated that the Readex is a highly satisfactory reading projector. Technically it is the product of a sound and ingenious application of relatively simple basic principles of reflection and refraction. Two inexpensive 150-watt lamps, which have a life of 1000 hours, supply the light. The light of either one or both of the lamps is effectively canalized from its source to the exposed surface of the microprint, and from there is reflected through a refractive lens to two plane mirrors which are inclined and spaced so as to project an image, ranging in magnification from ten to fifteen diameters, on a nonglare translucent screen. One cannot but marvel at this arrangement which makes possible the reflecting of sufficient light from so tiny a surface to illuminate so large a screen image. By shortening and lengthening the distance of the last mirror in the circuit from the screen, both a variable magnification and a constant focus are obtained. The focus is sharpened by a slight raising or lowering of the lens. Both of these focusing operations are regulated by simple, accessible controls. The screen is slightly inclined for the convenience of the reader, and the screen image is soft, clear and sharp.

The Readex does not overheat. In spite of the concentration of light on the tiny area of a microprint, very little heat develops at that point. A microprint exposed continuously in the projector for several hours will not be damaged by the heat. Likewise, being five-ply mahogany, the cabinet does not become hot when in use, and well-placed vents in the base and in the top of the cabinet provide a circulation of air which draws off heat.

Although the screen of the Readex is smaller in size than that of a newspaper projector, its area, in effect, is much larger than that of the latter. This effect is achieved by the mobility of the tray on which the microprint copy rests; that is, the copy and, consequently, the screen image as well, can be shifted in both a longitudinal and a latitudinal direction, so that any desired part of an exceptionally large frame can be

focused on the screen by a slight turn of the control dials. This fact will make possible the copying of the whole of large charts or maps in the *Sessional Papers* in single exposures, which though large in frame, will not exceed the limits of the Readex screen.

Readex may also be used to project film copies as well as microprints. Mr. Boni has not yet publicized the fact, but he will shortly make forms available for the mounting of short film strips for use in the Readex. This should be welcome news to libraries which have large stocks of microfilm, for microfilm so mounted will acquire the same facilities in cataloging and reader usage that microprints possess.

In passing, it should be mentioned that Readex has also been found useful in commercial fields. Already a number of textile, hosiery and paper manufacturers, insurance companies, philatelists, doctors, agricultural experiment stations, and science laboratories are using this apparatus. In reality this use in the commercial field has served as a testing ground for Readex, as it has enabled its sponsors to detect flaws and to correct them. The educational field receives the full benefit of these tests, for the Readex now being manufactured for libraries and scholars is a finished product, seemingly free of "bugs," and at \$150 is moderately priced.

In reaching its decision the Committee was greatly impressed by the economy of duplicating historical materials in microprint form and by the feasibility of extending this form of duplication to other historical collections.

The first public announcement concerning the reproduction of the *Sessional Papers* in microform appeared in this JOURNAL in March 1939. The announcement stated that if a grant could be obtained to pay for the master negative, microfilm copies of the collection could be supplied at a cost of five cents per foot, 32 pages to the foot. At this rate the estimated total of 4,000,000 pages which constitute the nineteenth century portion of the collection would have cost each subscriber about \$7000. As a result of the above announcement and of personal letters addressed to historians and librarians of about 60 universities and colleges in the United States and Canada, about 30 institutions expressed a desire to have the project carried out so that they could purchase film copies as required to complete their files. Since then a number of

others have manifested interest upon learning of tentative plans to microprint the collection. But the plans to microfilm the collection did not materialize; they were supplanted by plans based on the utilization of the revolutionary microprint process which was rapidly nearing perfection.

This change of plans was due not only to the practical advantages in form which microprints hold over microfilm copies, but also to the great reduction in the cost to the subscribers made possible by microprinting the collection. The latter consideration became all the more important when it became obvious that the cost of producing the master negative must be borne pro rata by the subscribers. This additional expense would increase the cost in microfilm to between \$8000 and \$10,000. To the Committee this cost seemed almost prohibitive. An attempt, nevertheless, would have been made to proceed with microfilm had not Mr. Boni submitted a proposal to microprint the *Sessional Papers* and to supply each subscriber with a complete set of the nineteenth century volumes at the price of \$5000. Only when one realizes that there are over 5800 volumes of about 700 pages each in this period can one appreciate how large a quantity of historical materials is being offered at so reasonable a price. Notwithstanding that fact, the Committee weighed the proposal for a year and a half before it finally signed an agreement with Mr. Boni. That much time was required for the Readex company to make essential changes in the Readex and to develop the microprint paper to the point of satisfying the Committee requirements. The Committee believed that microprints held so many advantages over microfilm, that whatever the inconveniences caused by the delay, they would be more than offset by the final results. From the outset the Committee has taken its responsibility to the scholars and to the libraries seriously, and not until it was satisfied that microprints and Readex had been perfected and that the officials of the Readex Corporation were reliable, both financially and morally, did the Committee conclude the agreement.

The wide divergence between the cost of the *Sessional Papers* in microprints and in microfilm arises from the economies inherent in a large scale production of microprints. The cost of producing microprint duplications decreases as the number of duplications increase. Each microfilm duplication costs the same, regardless of the number. The

cost curves of microprints and microfilm cross at ten duplications.³ For ten or fewer duplications, microfilm is the more economical; for more than ten duplications microprints hold the advantage. The additional expense of preparing the master positive matrix for microprinting makes the master-film stage of the microprint process more costly than that of the microfilm. Once the master positive matrix is prepared, the microprints can be turned out at a rate approaching that of a printing press. Further economies derive from the elimination of the processing in liquid-solutions which is required for microfilm, and in the printing on both sides of the photographic paper. The first 10 duplications absorb the increased master film cost of microprints; after 10 the cost of each duplication decreases. In the case of the *Sessional Papers* the price of \$5000 for microprints of the nineteenth century collection is based upon 25 duplications. Although the number of subscribers will no doubt exceed 25, there may not be 25 libraries that will require the entire collection. As will be disclosed below, the Committee has agreed to graduated price increases for the subscribers of less than the total issue, in order that the price of the total issue will not exceed \$5000.

The above facts concerning costs suggest a logical basis for determining which of the two processes should be adopted for microcopying projects in the future, when the decision rests on the basis of cost alone. These facts also reveal that there is a distinct field for both microfilm and microprints, within which one does not compete with the other. The cost of large projects can be so greatly reduced by doing them in microprints, that it seems reasonable to conclude that the way is now open to consider the microcopying of numerous other important collections, the reproduction of which heretofore has been precluded by the cost alone. In due course the matter of issuing the British *Sessional Papers* of the twentieth century, including the current ones, and of the eighteenth century will be probed; and it is also possible that *The Journals, The Proceedings, The Public Petitions* of the House of Commons, and the *House of Lords Papers* which are not duplicated in those of the Lower House, to mention a few, may be in sufficient demand to warrant microprinting them.

The Readex Company has scheduled an extensive publishing pro-

³This is Mr. Boni's estimate.

gram. Already the Sabin, Evans and HARRISSE bibliographies on Americana and the Church *Catalogue of English Literature* have been issued in microprint form, and other offerings will follow in close order. As the program expands to include historical materials, a number of skilled camera operators will be required to produce the master negatives. While several special operators are being trained by the Readex company for this work, it is likely that Readex will find it necessary to utilize the services of the several well-equipped film laboratories to help produce the master negatives. Such a co-ordination of services would help greatly to extend the field of microcopying; it would also redound to the benefit of all concerned: to the film laboratories, to the Readex company, to the libraries and, above all, to the scholars.

Let us now consider the terms of the agreement between the Committee and the Readex Microprint Corporation, and the plans for carrying out the project.

In substance the terms of the agreement are as follows:

1. Given twenty-five pledged subscribers to the whole or part of the nineteenth century volumes of British House of Commons *Sessional Papers*, the Readex company will supply microprints to the subscribers at the following rates:

- a) The complete set for the period 1801-1900, or 4,000,000 pages, at \$1.25 per 1000 pages.
- b) 3,000,000—4,000,000 pages at \$1.37½ per 1000 pages.
- c) 2,000,000—3,000,000 pages at \$1.50 per 1000 pages.
- d) 1,000,000—2,000,000 pages at \$1.62½ per 1000 pages.
- e) 500,000—1,000,000 pages at \$1.75 per 1000 pages.
- f) 200,000—500,000 pages at \$1.87½ per 1000 pages.

2. The Readex company will reproduce the *Papers* as rapidly as the subscribers can purchase them.

3. The Readex company will finance the producing of microprints, and, naturally, will have complete charge of the technical operations.

4. The Committee on the British *Sessional Papers* will have complete charge of the preparatory work of establishing a bibliography, of collating, of compiling a master checklist of the contents of the volumes, and of editing antecedent to the microcopying; it will publicize the project and solicit the subscriptions. For this work the Readex company will allow the Committee \$4000.

5. The Readex company will supply sample microprint copies of selected pages, maps and charts of the *Sessional Papers*, which, when accepted by the Committee as fulfilling the requisite standard of quality, will thereafter serve as model samples which the Readex company obliges itself to equal in the final product.

6. The Readex company agrees that for the subscribers the price of the Readex projector shall not exceed the present price of \$150.

The Committee believes that the above terms constitute a fair, practicable working agreement. By it the Readex company is given the freedom necessary to handle the technical end and the Committee the control necessary to insure the subscribers microcopies of high quality. At a cost of not more than one-fourth that which was required to purchase the original papers for this period, when they were still obtainable, the subscribers can obtain a complete file of the *Sessional Papers* (bills, House of Commons papers, command papers and annual alphabetical indexes), bound as they should be, according to the official cumulative indexes. The offer is all the more attractive in view of the facts that no library in the world has a complete file of the *Sessional Papers* for this period and that many of the incomplete collections held by libraries have not been correctly collated.

It is hoped that volumes for 1801-30 can be issued between August 1941 and June 1942. In that period there are 536 volumes containing about 281,000 pages. This total is composed as follows: To 1825 there are 395 volumes of 205,000 pages; to 1820, 280 volumes of 141,000 pages; and to 1815, 188 volumes of 95,000 pages.⁴ If the subscribers cannot take so large a first installment as the first 30 years within the next year, the installment will be reduced to one of the lesser units. By drawing upon the broken files of several libraries in the United States and Canada, it will be possible to obtain for copying a large part of the volumes for these early years. Arrangements are being made to obtain in England microfilm copies of the papers which cannot be located in this Hemisphere. At the moment the prospects are promising for issuing complete files for this early period.

⁴The figures were compiled from the tables of contents by an actual count of the volumes and of the pages listed therein. The number of pages in the last paper of each volume in most cases had to be estimated, since only the page number of the initial page of each last paper appears on the tables of contents.

Before the work of microcopying can begin, it is necessary to compile a checklist of the papers, to collate them and to edit them for copying. Each of these tasks involves a vast amount of tedious, exacting labor.

In compiling a checklist one encounters considerable difficulty in ascertaining the contents of some of the volumes. The complications arise from the fact that the tables of contents of the volumes for the first six sessions are handwritten, that some of these tables are incomplete, and that none of the papers listed therein is numbered. Further complications arise from the fact that for the 1801 session the paper number is not printed on the individual House of Commons papers, and that for the session 1801 to 1836, inclusive, the command paper numbers are not printed on those papers. The problem of identifying the papers becomes easier, beginning with the 1806-07 session, since the tables of contents thereafter are printed; but even these tables contain frequent errors and omissions. Only by checking the number, title and pagination of each paper listed in the tables of contents against both the paper itself and the cumulative index can a complete bibliography be compiled. At this writing the author has been able to obtain film copies of all except a few of the tables of contents through 1830.⁵ Nearly all of the papers, including the bills, have been identified through the 1806 session. It will not be possible to clear up some of the "snags" until the work of collation has reached a more advanced stage. A preliminary checklist of the papers in each installment will be made available, probably in mimeograph form; ultimately, if arrangements can be made, a composite checklist will be published in more substantial form. There is need for such a one.

The problem of collation will be quite involved in the case of the files before 1820, though Mr. Dornbusch of the staff of the New York Public Library has rendered invaluable service by identifying nearly all of the papers (except the bills) issued prior to 1816, and by locating in the United States and Canada a great many of the papers missing in the

⁵The author is indebted to Dr. Lydenberg, Mr. Henderson, Mr. Sawyer, Mr. Carruthers, and especially to Mr. Dornbusch of the New York Public Library; to Mr. Childs, Chief, Documents Division of the Library of Congress; and to Mrs. Cabeen of the Columbia University Library for their kindly assistance in the obtaining of the tables of contents of the *Sessional Papers, 1801-1830*. Thanks to the foresight of Mr. Childs, photostat copies of the tables of contents of the volumes for the early years have been obtained from London. By his untiring efforts Mr. Dornbusch has done an excellent piece of work in collating most of the early papers.

files of the New York Public collection for the early period. Aside from the bills, the New York Public and the Library of Congress, together, have nearly complete files after 1815, though small gaps exist in 1817 and in 1825, and a sizeable one in 1819-20. It is strange that libraries in this country either have neglected to search for the bills or they have been unsuccessful in their efforts to obtain them. The bills in reality are as important as the other papers in the collection. As a result nearly all of the volumes of bills before 1820 will have to be microcopied in England. In so far as it is possible to be selective, only those volumes which will give prints of sharp black and white contrast will be microcopied, but in all cases only distinctly legible microprints will be issued.

Considerable editorial work will be required in microprinting the *Sessional Papers*. This arises from the necessity of establishing the text and of transposing contents, such as maps and charts, which do not have page numberings. In order that the systematic page arrangement of microprints will not be disrupted, the unpagged items will be placed at the end of the volume. Editorial markings will indicate all such transpositions. The transpositions might appear to be serious inconveniences, but in reality the facility with which pages on a microprint sheet can be located will reduce to insignificance this apparent inconvenience.

In final analysis the Committee believes that it has effected arrangements which will make possible the reproduction of the *Sessional Papers* in the most satisfactory microform and at the lowest cost possible. The decision now rests with the scholars and with the libraries. Given the support which the Committee believes it is justified to expect, the work can be launched immediately. The Committee hopes that its efforts have not been in vain.

Microprint

M. LLEWELLYN RANEY

MICROPRINT is a hybrid term commonly applied to a reproduction on paper rather than film, though filming starts each process. A photostat, however reduced, does not qualify, because every photostat represents fresh lens action and is, therefore, not a print.

The microprint may be from an inked plate on ordinary paper or it may be a chemical deposit on light-sensitive material. There has also been experimentation with printing directly from microfilm with ink. The sensitive coating has heretofore generally been a silver emulsion, but attention is now being given to so-called "diaz" papers, where the coating yields a dye image instead of a silver salt. This is the principle employed by the Readex Microprint Corporation, and since, under the sponsorship of an American Historical Association committee, it has come to offer so important a set as the *British Sessional Papers of the House of Commons* for the nineteenth century, the method should be widely understood.

The diazo solution has three essential ingredients. These are (1) a diazonium compound, (2) a phenolic material and (3) a weak organic acid. If the first two combine, a dye results. The presence of the acid prevents such reaction. The acid can be neutralized, however, by exposure to ammonia gas.

The game then is to confine the dye formation to the area covered by the text we want reproduced from film strips superimposed. The method is first to apply an intense light. This gets through the clear portions of the film and decomposes ingredient no. 1 on the paper beneath. With ammonia then brought into play, the dye forms only where the text lay.

Since ammonia vapor exposure constitutes the only processing and this requires no dark room, and since diazo paper is much cheaper

than photographic paper, this is an economical method where enough copies are required to justify the triple process of double filming followed by paper printing. This number is set at 25 subscribers in the case of the *Sessional Papers*.

The availability of this process for record use turns on permanence. Is the dye stable? Will the background discolor? Do the residual chemicals attack the cellulose fibers of the paper base? Competent chemists give us considerable assurance on all three scores.

As to the dye image, there are many formulae, not all of which yield stable results. Each requires expert testing. While the result in right formulae may well lack the permanence of metallic silver, prolonged exposure of suitable samples to ultraviolet radiation is reported by Professor Leonard A. Sayce, of King's College, at Newcastle, to have produced only slight loss of density.

As to darkening of background, this should not occur with suitable ingredients since once the diazonium compound has been decomposed during the printing process it can never recover its ability to form a dye. With unsuitable ingredients, however, atmospheric oxidation may give rise to undesirable colored products.

As to the attack of chemicals, this should not result, since, while even small concentrations of sulphuric acid will cause disintegration, the acids employed in diazo papers are weak organic ones, like citric acid.

Now what about the Readex Corporation's formula? We do not know what it is but can only test the product. Such tests the National Bureau of Standards has been making. The latest known report is dated May 24, 1941. It stated that specimens recently left "fade very much less than the specimens we previously tested," and "it would appear that prints of this kind would remain legible for a period of 50 years or more. Additional improvement in resistance to fading is desirable of course." And since in the Readex process the image is carried in an acetate film lamination on the diazo paper, the Bureau expresses an interest in "making a fading test of the combined base and acetate sheeting without the diazo dyes present in order to find whether any fading occurred without the sensitizing material being present."

At this stage the product is offered to the public and subscriptions are

solicited. It should be added that we at Chicago were cautioned to keep our samples unexposed, particularly to direct sunlight. Left on an office table for several months, the background has darkened but not enough as yet to affect legibility.

Finally, while no microprint is equal in clearness to a good film, the Corporation has undoubtedly scored a triumph in its Readex. It has made reflection reading possible at far higher reduction ratios than ever before. This comes particularly of its ingenious lamp which employs two condensing systems operating from the same source and also places a reflection dome over the image so as to send back there any light scattered by the image and not collected by the projection lens.

Here, then, we have an exceedingly challenging choice. All librarians will join in hoping for a successful conclusion to the experiment, for if it succeeds it opens the way to cheap publication in very low edition ranges. It would admirably close the gap between microfilming and photo-offset printing or typesetting. The octavo sheets of microprint, carrying 100 pages on each side, are easily filed and consulted.

Microphotography at Work

J. PERIAM DANTON and CHARLES ELFONT

TWO EARLIER articles in the JOURNAL attempted to describe the setting up of a rather complete microphotographic department in a university library, the criteria of service and use which were employed, and to present certain other pertinent facts.¹ The Editor of the JOURNAL has suggested that a report of actual experiences in the fields of operation and service of this type of microphotographic program might be helpful to other institutions. This article is the result of that suggestion.

The information recorded here will not be likely to be of much assistance or to offer anything new to the very large, well-established laboratories in university libraries or elsewhere. The experiences at Temple University may, however, be suggestive in at least three main respects to libraries with smaller laboratories, to those about to enter upon a program of microphotography and to institutions considering the inauguration or the expansion of such a program. One of these potential avenues of help lies in a description of the ways in which microphotography and the film collection have actually served the faculty and students of the University or have otherwise benefited the institution. The second is the presentation of difficulties encountered and their solution, pitfalls blindly stumbled into and dangers to be avoided. In short, it may reasonably be supposed that if such troubles are placed on record, other libraries, by being forewarned, may be saved disappointment and much waste of time, energy and money. The third is a consideration of the limitations in type of work which should ordinarily govern the program of a laboratory such as that described in the JOURNAL articles just referred to. The article is divided roughly to

¹*Journal of Documentary Reproduction*, I (Fall, 1938), 297-315, and II (September, 1939), 221-24.

correspond with these three main aspects. That is, part I deals with types of service rendered, types of material produced and its use; part II discusses technical matters of photographing, processing, printing, etc.; and part III suggests very briefly limitations in types of work which can be satisfactorily undertaken.

I

Of the Fourteen Points at which microphotography challenges the printing press, the first, second, fourth, fifth, sixth, tenth and eleventh seem, if our experience thus far is any criterion, to be most likely to bring the greatest benefits to university libraries.² That is, film appears to be of the greatest value—immediate and potential—to the university as it enables the library to: secure material otherwise unobtainable; lessen the handling of precious originals; replace the perishing; complete special collections; facilitate scholarly exchanges; further classroom projects; and save space.

Concrete examples of each of these have presented themselves in the experience of the past three years, and some of the more interesting and suggestive illustrations are reported briefly below.

The contribution of microphotography which most strikingly appeals to the imagination is probably its ability to make available at low cost very rare, costly, or completely unobtainable graphic materials of all kinds. In common with other university and research libraries, we have thus provided for our faculties easy access to a wealth of printed and written documents which otherwise could not have been secured at all, or could have been secured only with great difficulty. Some have been purchased from outside agencies, important examples being the approximately 2000 titles in the University Microfilms' project of books printed in England to 1550—a body of source or near-source literature of great value to research workers in the fields of English, government, history, law, sociology, religion, etc.; the *Maryland Gazette, 1745-1835*, photographed from the original in the Maryland State Library by Yale University; *Poor Richard's Almanac, 1733-1766* and the *American*

²M. Llewellyn Raney, "University of Chicago Exhibition," *Journal of Documentary Reproduction*, III (December, 1940), 230-31.

Weekly Mercury, 1719-1746 from Graphic Service; the first fifty rare volumes of *Justus Liebig's Annalen der Chemie* and thirty early volumes of the *London, Edinburgh and Dublin Philosophical Magazine and Journal of Science* from Bibliofilm Service in Washington; Geofroy Tory's *Horae*, 1525, from the New York Public Library; Gio. Francesco Fortunio's *Regolo Grammaticali Della Volgar Lingua*, 1516, from Harvard and Aldus Romanus Manutius' *Aldi Manutii Romanii Institutionum Grammaticarum*, 1518, from the University of Chicago. Others have been photographed by the Department of Microphotography and among those may be cited Larned, *Literature of American History*, 1902, a copy of which the Library was unable to locate for purchase; a University of Indiana doctoral dissertation on the early development of principles and standards in schoolhouse construction in the United States, an item eagerly desired by a member of the Teachers College; five of the earliest volumes to complete the file of the *Berichte der Deutschen Chemischen Gesellschaft*; MS. Cotton Domitian A XI (ca. 1308), filmed from Photostats of the British Museum copy, and a complete set of the breakdown by tracts of the Philadelphia 1930 census data—primary source material for the sociologist.

In all, since September 1940, the instructional and research activities of fifteen different departments of the University have thus been furthered.

The use of film—both that produced by the Department and that purchased—has shown a sharp increase and has now reached a fairly considerable rate: "circulation" during 1938-39, when the Library was just entering upon its program of microphotography and its microfilm collection was naturally very small, totaled 17 reels; in 1939-40 the corresponding figure was 119, and for 1940-41 the volume jumped to 415 reels.

Not long ago the Library's Periodical Department was suddenly faced with an unexpected and unprecedented demand for certain volumes of *Niles Weekly Register*, a journal which is somewhat fragile at best. It was immediately apparent that the volumes would soon be completely and literally used to pieces if 30 or 40 students handled them even over a short period of time. The volumes in question are now being filmed, and since the reproductions will in this instance satisfy

the need just as well as the originals, the latter will hereafter be preserved and the film substituted for them. This is one of several examples of microphotography's second and third contributions.

A request from a patron for early catalogs of the University, wanted in connection with a historical study, was reminder that the collection of these catalogs was incomplete. Actually 16 issues were lacking. Six were located in and borrowed from the Registrar's Office, three similarly borrowed from the Philadelphia Free Library. All were filmed, and thus a special and important collection, representing a significant segment of institutional history and development, was made more nearly complete.

Journal articles and chapters from books have been made available on film for students and faculty in the departments of chemistry, German, French, history, physics, psychology and sociology, often as substitutes for interlibrary loan. Some of the Library's own material has similarly been filmed for the use of persons elsewhere.

The ways in which microphotography can supplement classroom instruction and projects are virtually endless. The head of the French Department, for example, substitutes wall projection of a film copy of the works of Marie de France in the British Museum manuscript already referred to for the critical edition of Warnke. The instructional purpose: to show students in a graduate seminar the appearance of the actual manuscript and the ways in which Warnke changed or corrected the text and to show what the language actually was in England at the time rather than what someone thought it should have been. Similarly, a microfilm positive, taken from Photostat negatives of the Bodleian manuscript of the *Chanson de Roland* is projected for a seminar, the errors in the manuscript pointed out and elements of paleography graphically presented. Projection has been utilized in like fashion for the presentation of long, complicated chemical and mathematical formulae and for diagrams of the historical development of experimental chemistry and physics apparatus.

One of the best known and most advertised benefits of microphotography is its space-saving, and therefore, also money-saving potentiality. The *New York Times* on film requires less than one-twentieth of the space of the bound rag-paper edition; a parallel saving is effected by sub-

stitution of the *Philadelphia Inquirer* on film (since January 1940) for the paper edition as permanent file. A number of other metropolitan dailies are, of course, producing film editions of their papers.

While these are possibly the most important and spectacular types of aid from microphotography, other adaptations of its uses are virtually limitless. As a permanent record of Library exhibits, microfilms are made and filed; prints have also been employed for articles about exhibit work and as illustrated answers to inquiries from other institutions. Also worth mentioning is replacement of stolen or mutilated pages, especially from expensive volumes and volumes in a set. A similar useful service has recently been carried out on a somewhat regular and comprehensive scale: that of filming lost or otherwise lacking single volumes of expensive out-of-print sets and series. Perversely, the missing volume appears more often than not to be the one desired; virtually every library is familiar with this annoyance and can employ microphotography as a means for its elimination.

Interesting, too, was a film project dealing with Russell H. Conwell, founder of the University. One of Dr. Conwell's admirers was preparing a cartoon strip of his life for syndication. The regular single-copy publication expense, however, would have prohibited completion of the project so the Department filmed the cartoons, produced twelve sets of prints and thus met an unusual syndication problem. Some other work has been done for persons outside the University, but the extent of intramural orders has thus far consumed most of the Department's time.

II

Equipment and a working laboratory layout which were rated by an outside surveyor as among the best in the country were the chief assets of the Department when the present Technician in Charge first joined it in October 1938. Although some elementary experiments had been carried on during the summer of 1938, operations were not put on a regular service schedule until October of that year.

Work was handled by three student assistants who had had no previous microphotographic experience. All of them, however, had some knowledge of general photography. With this "staff," working

on a part-time basis, an attempt was made to put the Department immediately on a regular production routine. This ambitious haste led to many unnecessary pitfalls.

The large-scale and difficult task of filming sixteen tightly-bound German scientific journals, each running about 1400 pages, was the first undertaken! Production was irregular and although the work was of "average" quality, it certainly did not represent the best which could be done under such favorable laboratory conditions. This was due mainly to the staff's ignorance of fundamental microfilming facts, and to the inability of the administration to provide trained supervision.

Instead of conducting scientific experiments to determine the most satisfactory developing procedure, a hit-or-miss program was entered upon. The results were indefinite and unfavorable. Much valuable time and material were wasted and at the end of the first year no standard developing process had yet been adopted.

Total production for the first year, October 1938 to June 1939, was 1000 feet of microfilm negatives, supplemented by several hundred prints. Of this total, however, 300 feet of film had to be discarded because a heavy brown stain or deposit caused presumably by improper use of developer DK-20 made it unreadable. A better and more graphic illustration of certain fundamental facts could hardly be found. The first of these is that a full-fledged program of microphotography should be entered upon with some caution and only when there is reasonable assurance that adequate technical supervision will be possible. In the second place, it will mean substantial savings in the end if a new department spends its first months on experimentation and standardization rather than in an attempt to enter immediately into full-scale production. These statements, of course, do not apply to libraries simply considering the purchase of reading machines and the building up of microfilm collections, but only to programs involving photographing, developing and other processing techniques.

Nonetheless, during this first hectic year many valuable contributions were made and lessons learned which led to smoother operation in subsequent years. Some important changes, for example, were made to the Photorecord camera which was (and still is) used by the Department.

Work was originally done with the Photorecord with instructions supplied by the Folmer Graflex Corporation, manufacturer of the camera. This meant that (1) the unit was retained in its portable setting and (2) focusing was accomplished by the scale provided with the camera. Both of these facts caused much difficulty and eventually necessitated alterations.

(1) Vibration of the supporting column, and hence camera, caused by the electric air compressor which operates the latter, especially when the unit is in position for high reduction work, resulted in many blurred negatives. This was remedied by removing the camera support from its portable base and mounting it on the wall of the camera room. The mounting, being of the bracket type, permits the camera to be used when necessary as a portable affair.

(2) Accurate focusing was another problem. The scale supplied by the company was found to be unsatisfactory, either due to faulty construction or to inexperienced use by the operators. The use of the scale was eliminated and ground glass focusing, aided by a small magnifying glass, was substituted. This change not only improved focusing, but it also helped the operators to keep all copy material centered and within the 35mm. frame used. It also eliminated many ruined exposures previously caused whenever the operators forgot to remove the swinging arm which supported the focusing scale from its working position directly in front of the lens.

Much difficulty, the result, primarily, of uneven illumination, was experienced with the light as supplied by the original unit of two lamps. This was overcome by the addition of two lights to the unit, so that four photofloods, instead of the original two, lighted the material before the camera.

Another serious camera problem was one of exposure. Most exposure problems were the result of variation in reflected light intensity from different colored papers. This was remedied by putting a variac transformer (i.e., rheostat) on the circuit to enable the operator to regulate the intensity of light being used. Readings were made by placing a General Electric foot candle meter, in a specially constructed stand, directly over the material to be copied. (The standard camera setting eventually adopted is described below.)

Little work was done by the Department during the summer of 1939. When the 1939-40 school year started, the present Technician in Charge was promoted to that position. He concentrated all effort on a program of standardization and improvement, rather than on an attempt to increase output.

Eastman High Contrast Positive film was adopted for most work and Eastman Micro-File film (later changed to Du Pont's Microcopy) was used on jobs requiring a panchromatic emulsion. A standard exposure of one and one-half seconds at $f:16$ was used and the only change ever permitted to the camera set-up was control of light intensity by use of the transformer. As a result of exposure experiments, a constant light meter reading of 100-foot candles was found most satisfactory, but the reading would naturally differ somewhat with varying laboratory light conditions, developing procedure, etc. Eastman's D-11 was accepted as the standard developing formula, after a series of working tests, and all developing is done at 68°F . Test strips, in $2\frac{1}{2}$ inch lengths, are usually made before the entire roll is processed, unless the developer has just been mixed.

The result of such standardization was the doubling of production in all branches of work. And this was accomplished with a staff of two, instead of the previous three. (Also to be considered is the fact that during the second year, just as work was progressing smoothly, the assistant to the Technician in Charge had to be replaced. This caused the loss of much time for lengthy explanations and instructions.) In spite of the personnel change and the continued condition of working with an insufficient staff, the program of standardization was completed.

The Department was closed during the summer of 1940 to enable the Technician to conduct a microphotographic study on a grant made to the Library by the Rockefeller Foundation. He enrolled in the course, Microphotography for Libraries, at Columbia University, and during the summer and early fall paid intensive visits to the microphotography departments at Bibliofilm Service, Brown University, Graphic Service Corporation, Harvard University, Holbrook Microfilms, Inc., the Library of Congress, the National Archives and Yale University.

When the Department was reopened in September 1940, first efforts

concerned general improvements drawn from the summer's study and observation. While work continued with High Contrast Positive film, the density of negatives was reduced by cutting shutter speed to one second (aperture kept at f:16). This resulted in better definition of lines and proved more satisfactory for reading machine use.

Although the Department has no equipment for the purpose, positive printing was attempted with considerable success. The method: the film negative was cut into strips of one-foot length. These were brought into contact with regular positive film under the pressure of two glass plates and were placed on the enlarging easel directly beneath the enlarger. The light from the enlarger was used to expose the positive prints. Timing by estimate was, of course, used. The positive film was then developed as test strips in five-foot 35mm. tanks.

The production of positive film increased the scope of the Department's service for it enabled members of the faculty to use this type of reproduction for classroom projection. It also permitted the Department to prepare highly satisfactory positive film slides.

Such work was done for the Chemistry Department, but in a manner different from the usual slide-making procedure. Regular photographs of chemistry laboratory equipment were first made with a $3\frac{1}{4} \times 4\frac{1}{4}$ inch Speed Graphic camera. These negatives were placed on an Eastman film viewing box and were masked with black paper. Microfilms were made from the negatives on the Photorecord and the result was a set of excellent 35mm. positives for projection.

Throughout the year this process was continued with great success and at times it was adapted to the microfilming of Photostat negatives. Many Photostats came to the Library from foreign countries and other libraries, and since there is no Photostat service available at Temple, the Department of Microphotography filmed these negatives and thereby made available 35mm. film positives which are actually more satisfactory, since they are more like the original documents than the Photostat negatives.

Improvements were also made in the Department's printing process. The Saltzman enlarger, with its Cooper-Hewitt "cold" light unit, worked remarkably well. But difficulty was encountered in finding a satisfactory and at the same time inexpensive paper. While work done

with regular photographic enlarging paper had been successful, it proved far too expensive. Photowrit paper, which was tried next, had many shortcomings. It was difficult to control exposure with this paper and its great sensitivity required that the work be done in dull red light. Actually, the lighting problem and the resulting fogging of the Photowrit were so serious that the Department made most of its prints in total darkness, using a timing system for development.

This year, these problems were overcome by instituting the use of Photostat "L" paper, following usual enlarging techniques. This paper, which can be obtained in various degrees of contrast, is extremely cheap and can be handled in the relatively bright light used for bromide papers. Its use has been most successful and with it more than 650 prints were turned out in eight months.

Changes have also been made in the film washing procedure. Instead of removing the film from the Stineman reel after fixing, it is not touched until washing is completed. Then it is wound loosely, under water, and taken in a pan of water to the drying reel. Here it is sponged, small section by small section, and wound on the reel, the main body of the film always being kept in water. This process provides thorough washing and helps avoid many emulsion scratches which were caused by the former "loose, out-of-the-reel" process.

A recent change in film usage has also helped increase efficiency. Du Pont's Microcopy, which is now used when a panchromatic emulsion is necessary, has great latitude and offers a degree of contrast which seems most satisfactory on a reading machine. In addition, this film has great resolving power and renders fine definition in all work.

Changes made to the Photorecord by the Folmer Graflex Corporation have greatly improved the quality and quantity of the Department's work. The lamp-house facilitates focusing, enables the operators to keep all copy straight and perfectly centered and allows maximum use of each frame of film. The new lens is superior to the original one and the lever which permits the film to be advanced without passing air through the system is of great value. Since the camera was renovated in October 1940, the Department has suffered no serious mechanical difficulties. Blurring, due to faulty film advancing, has become a thing of the past.

Not only has the total production been enormously improved and

somewhat increased, but much waste has been eliminated. Although it was not uncommon for operators to discard entire projects during the first two years of the Department's existence, no such action has been necessary during the past year. The greatest number of refilmed frames on any project has been three out of 2000—obviously a very low percentage, due to standardization, and care, especially in removing film for drying.

Increased knowledge and experimentation have made possible a satisfactory and money-saving repair service. Each of the three reading machines in the Library has been completely overhauled and cleaned and one was corrected for a serious mechanical disorder.

Much time during the past year has been spent on experiments and outside studies. In spite of that fact there has been a twelve and a half per cent increase in the production of microfilm negatives and a doubling of the number of paper prints made. The total output for the academic year was about 2250 feet of microfilm negatives and 1050 projection prints. This has been accomplished with a staff of two, working a total of 38 hours weekly.

While the Department can never hope to act as a substitute for a Photostat service, it has frequently done such double duty. Since Temple has no Photostat service, the Department helped some professors by copying transcripts and other academic records. While the results were satisfactory, such a procedure could never be put on a production basis as a Photostat substitute. It works well only on short orders.

The Department now not only has the laboratory layout it had when work started in October 1938, but to this physical excellence it has added procedures which have resulted in work of vastly increased quality and quantity. The Department is past the hectic, struggling stage. It now knows what it can do and how well it can do it; it also knows what sorts of work it should not attempt. It is at a point where it can go on a full-time schedule of quality production. And at the same time its increased efficiency can help extend the scope of its activity to become a community, as well as a University, service. Through the Philadelphia Bibliographical Center an offer of such service to the libraries of the Philadelphia Metropolitan Area has recently been made.

III

Like many other scientific and technological developments, microphotography, in this relatively early period of its history, is likely to suffer, and may, indeed, already have suffered because those who have turned to it have expected more than a given level of equipment can produce. When the anticipated results have not been forthcoming there is a tendency to assume that microphotography itself is at fault and that its contribution is of little or no value. It is important, therefore, to decide precisely what sorts of work a laboratory will be called upon to perform and then discover what equipment, procedures and personnel will be necessary to carry out the program.

Specifically, laboratories of the general nature considered here have at least three major limitations. These concern the extensive duplication of master negative film, the reproduction of extensive newspaper files and projects calling for the filming and processing of many thousands of pages of material. A well-equipped, "moderate-sized" laboratory can actually accomplish these types of activity after a fashion, but it cannot do so as cheaply, as rapidly or as well as can the larger laboratory having big cameras, positive printers and continuous processing equipment. The librarian or other individual ultimately responsible for a microphotography department should realize the inappropriateness of attempting large-scale projects without the necessary equipment. If such projects are undertaken with inadequate facilities the result will, at the very least, be inferior film or excessively high cost or unjustifiable delay in completion. There may be all three, but in any case there is pretty certain to be disappointment.

Parenthetically it may be suggested here that few institutions need to provide the type of laboratory which is able to undertake every variety of work in virtually unlimited quantity. A few such laboratories, carefully distributed on a regional basis, should suffice for the country's needs. To these we should add a much larger number—possibly fifty to a hundred—of the moderate sized, or "basic" laboratories, equipped to do most kinds of work. And finally, we should hope for at least one good reading machine in all but the smallest and least important libraries.

Some Recent Developments in Public Record Microfilming

DANIEL F. NOLL

FOR SOME years, properly authenticated photographic copies of records have been admitted in evidence by the courts whenever good reasons could be given for the inability to produce the original documents. More recently, the higher courts have ruled that a microfilm copy of a bank check made in the routine course of a bank's operations had all the validity of the original.¹

Over the past several years, a considerable amount of microfilming of Federal government records has been undertaken by such agencies as the Bureau of the Census, the Social Security and Railroad Retirement boards and many other agencies where destruction of the original records after microfilming was not contemplated. The primary purpose of such projects was to duplicate original records which were rapidly disintegrating from intensive use or to preserve a security copy. Other microfilming, such as the copying of the "master" Topographical Survey maps with all corrections and changes since the last published edition was undertaken to provide military and other map-makers with the latest available information. Still other cases have arisen where limited publication by microfilm is cheaper than small editions of some types of material in mimeographed or printed form.

Before microphotography became important in record work, Federal statutes provided for the disposition of records on the recommendation of the Archivist of the United States that such records had no permanent value or historical interest, and prescribed procedures for the regular elimination of useless records. In May of 1939, Representative Arthur J. Elliott of California introduced a bill for the disposition of essential records after microfilming even though such records had permanent value or historical interest. This bill received presidential

¹*Journal of Documentary Reproduction*, III (March, 1940), 79-80.

approval on September 24, 1940 as Public, No. 788, 76th Congress. It provides for destruction of such records after microphotographing in a manner and on film that meets the minimum standards of quality approved for permanent photographic records by the National Bureau of Standards. Such microfilm copies are to be placed in conveniently accessible files and provision made for preserving, examining and using them. When this has been done, the head of the agency may, with the approval of the Archivist of the United States, dispose of the originals.² With the enactment of this legislation, the way for widespread utilization of microphotography in public record work was cleared.

It has been estimated that the Federal Government in Washington alone occupies over 25,000,000 square feet of floor space, of which possibly 4,000,000 square feet are required for the storage of records. Probably one half of these records are completely inactive. Records are now pouring into some agencies in Washington in such volume that belt conveyors have had to be installed where the mail is being opened! If the space cost is estimated to be \$1.50 per square foot per year—and \$2.50 is not an uncommon cost for space rented in private office buildings in the Capitol—it is evident that savings of two to three million dollars per year would be made possible by more widespread use of microfilm. In many cases the salvage value of filing cabinets, plus the receipts from the sale of wastepaper, offset the labor and material costs of microfilming. In others where the microfilming of files in their present condition would result in the perpetuation of useless errors and misfiling, however, it may be necessary before filming to incur additional labor costs. In extreme cases, the savings in space charges over several years must be applied against the microfilming and file reorganization costs before microfilming begins to pay its own way. Unfortunately, the salvage value of filing cabinets and receipts from the sale of wastepaper revert to miscellaneous Treasury funds and not to the agency converting the records to microfilm form. Frequently, also, space-savings are not immediately reflected in the operating expenses of an agency. The expenses of microfilming and record reorganization, therefore, have to come out of current budgets, regardless of the ultimate savings.

²*Journal of Documentary Reproduction*, III (December, 1940), 309-11.

These factors probably explain why microfilming of records has not been more extensively undertaken under the provisions of the Elliott Bill. Still another factor, however, may be the fact that certain applications of microfilming are only now in the process of development. Microfilm equipment as used by banks has been so perfected after some years of experiment and use that no special skill is required on the part of the operator; the exposed film is automatically developed in commercial laboratories whose materials and processes readily meet the requirements of the National Bureau of Standards. With reasonable care in use, the "life expectancy" of microfilm may well equal that of records on 100% rag-stock paper. Since few records are on paper of such high quality it may be assumed that microfilm copies will last longer than the original records. Furthermore, a file of records, once put in order and microfilmed, will always be "in order." Individual documents cannot be misfiled after microfilming. In Public Record microfilming where the destruction of originals may be contemplated, considerable attention must be given to the accuracy of the copy. In the commercial world, some risks can be taken, but a public officer must be very circumspect in certifying a microfilm as a true or complete copy of a file of government records. He must use a technique that will assure him that the total number of images on the microfilm equals the total number of pages in the file of records. In a private business, microfilm camera operations could be set up in such a manner that the likelihood of error would be negligible. The keeper of a public record, however, cannot regard any error as "negligible." If the operator drops two sheets into a rotary camera at one time, only the top sheet will be photographed. In a file of miscellaneous records where most of the records are single-faced, the operator may neglect to reverse an occasional sheet with legend on both front and back. The person certifying to the completeness of the microfilm record must be protected against such omissions.

In general, for accurate work, it has been found necessary to number each page to be microfilmed with an automatic numbering stamp, beginning with number 1 for the first page of the first document in the file and continuing in numerical sequence until the last page in the file has been reached. Therefore in inspecting the film, it is not necessary to compare in detail the contents of the original document with

the microfilm image but merely to check for breaks in the series of document numbers assigned for microfilming purposes and for imperfections in the film itself, the processing, or for operational disorders.

In a card file where both the back and the face of the card are to be microfilmed it may be possible to number only one side of the card; but this may not be practical, if there are no entries on both faces of each card that establish beyond a doubt which of the two images on the microfilm belong to the same card. One might assume that on the microfilm the image of the back of the card *follows* the image on the face. But what if the operator drops the card into the camera so that the back is photographed first? To eliminate some of these opportunities for error, it may be advisable to stamp the same document number on *both the face and back* of each card. This can be done very simply with most types of automatic numbering stamps.

The Elliott Bill requires that microfilmed records be maintained in "conveniently accessible" form. This calls for a kind of indexing specially adapted to the microfilm technique. Figure 1 illustrates one such method. An alphabetic arrangement is keyed into the system of document numbers. Note of the name appearing on each 100th card is made an integral part of such an index. Where a large number of names are grouped together in one alphabetic series, the usual two- or three-letter divisions of an alphabetic file are of little assistance. If there are three-to-five-thousand Johnsons, for example, an entire reel of film would be inadequately indexed by ordinary alphabetic divisions.

The label, dry-mounted on the outside of the carton in Figure 1, is a photostatic negative of a typewritten index sheet which may also appear on the microfilm at the beginning and/or end of each reel. The photostat negative does not smudge and the photostatic method permits the reduction in size of the original typewritten index to the space available on the carton. Some saving in the cost of labeling cartons could be effected by the omission of the photostat label. The person using the microfilm can rely on the index appearing on the microfilm. If reference is infrequent, the extra cost of the photostat label would not be justified. If reference is frequent, however, the photostat label is desirable. In a similar manner, indexes can be adapted to folders numerically, alphabetically, or chronologically arranged.

The advantage of keying in the assigned document number with a name, folder serial number, or a date is that no matter where the searcher stops the microfilm in the reader, he knows at a glance his approximate location in the file and does not have to turn back 20 or 30 images to determine the folder number or name. He knows at once whether he has gone too far or not far enough. This is an important difference in searching a file of original records and a microfilm copy of the

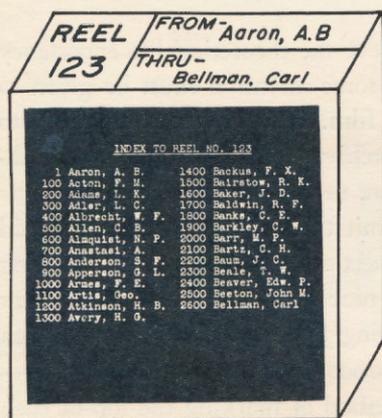


FIG. 1. One Method of Indexing
Adapted to Microfilm

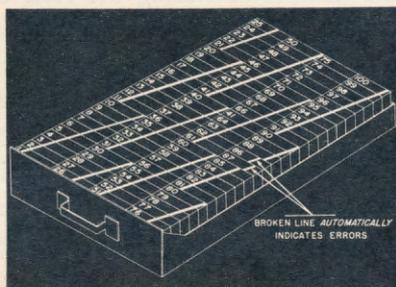


FIG. 2. One Method of Marking
Carton Top

same. In the original file, one sees the file guides, the folder numbers, etc. In the microfilm reader, the searcher looks at individual documents within the folders. The index in Figure 1 is one solution to the problems created by these differences.

Objections to the labor cost of stamping a number on each document may well be raised, and more experience in microfilming may develop more satisfactory techniques. One development along these lines is to perforate the folder or other identifying number on all the documents contained in the folder. From ten to twenty pages can thus be perforated at one time. Cross-indexing is reduced and the searcher can still determine at a glance the folder number of any image that appears on the reader screen. The procedure does not, however, establish the "completeness" of the file. If the folder contained a fixed number

of documents, no problem would be involved. Since few folders are of this type, it has been suggested that the number of pages in each folder might be entered on the first document in the folder. This might be somewhat less expensive than stamping a number on each document, but difficulties in inspecting the film might offset these savings. All told, the stamping of a special microfilming document number on each page is more satisfactory, except in those special cases where the original arrangement of the file provides some other form of control.

If the microfilm negative is to achieve the theoretical life expectancy indicated by accelerated aging tests, some attention must be given to the manner of storing the reels of film. Perhaps the simplest is to deposit the film with The National Archives where the optimum conditions of temperature and humidity are maintained at all times. If the frequency of reference does not permit this transfer, the film should be stored in special film storage cabinets equipped with a humidifying device. Such cabinets usually contain nine drawers, each with space for 100 reels of 16mm. microfilm. Estimating 3000 documents per reel, such a cabinet will be sufficient to store 2,700,000 documents on the 900 microfilm reels. Figure 2 illustrates one method of marking the top of each carton with a diagonal stripe for each unit of 10 cartons. This facilitates the location of a reel whose number is known to the searcher and makes unlikely the return of a reel to an incorrect location in the drawer. A translucent ink is used to mark the diagonal stripe, about one fourth of an inch wide, so that other legends on the carton will not be obscured. Different-colored stripes may be used to indicate different series of records. Protection of the legend on each box is probably best obtained by spraying or brushing a transparent lacquer or artist's fixative over the legend on the top edge of the carton.

The Elliott Bill places on the particular agency the direct responsibility for undertaking the microfilming in a manner and on a film approved for permanent photographic records by the National Bureau of Standards. Approved film is available with an adequate life expectancy, but the conditions of use must also be taken into consideration. If frequent reference to the film is required, there is always the possibility that rolls of film will be misplaced or that mechanical abrasion

of the film or a mishap in handling may destroy the legibility of the film image. In some cases, it has been found advisable to make two negatives of each set of records. Some modern microfilm cameras are so constructed that two films may be loaded in separate magazines and two pictures taken of each document. One of these negatives may then be deposited with The National Archives, and the other retained by the agency for reference purposes. Microfilm can also be duplicated whenever the original negative begins to show signs of damage through use.

The Elliott Bill also provides for the admissibility in evidence of properly authenticated copies reproduced from the microfilm negatives. This calls for care in the preparation of certificates by the camera operator and possibly by some more responsible officer of the agency. In general, the legal department of each agency will have its own ideas as to what form of certification will meet its legal requirements.

One great drawback to a certificate at the beginning or end of a reel is the custom, borrowed from motion picture practice, of splicing corrected images or retakes into their exact location in a microfilm reel. "Retakes" are rarely necessary, but accidents will happen. Faint writing on a colored paper may not be legible on the microfilm and although microfilm cameras are provided with remarkable safeguards against such contingencies, a retake will be required. Also, documents may be overlooked and omissions will have to be rectified.

Perhaps the best method is to perforate a very fine hole in the film, about $1/50$ of an inch in diameter. This will be magnified on the reader screen to substantial proportions. A perforation in the film image will indicate that a corrected copy will be found elsewhere. A perforation between two images will indicate that documents have been omitted. Various shapes of perforation may be used to show various types of corrections. One government agency has developed a system of perforations to indicate changes in the entries on an active set of records. Such equipment requires a degree of refinement unnecessary on inactive records where retakes or omissions of an entire document are to be indicated. Retakes or omissions may be spliced at the end of each reel, after the original certifications and followed by special retake certification, or better yet a special retake reel included at the end of each major division of a file. For example, a series of records by states may

have as the last reel of each state series, a State Retake Reel where all corrections indicated by perforations may be found for all the reels of that state. The labor cost of splicing to the individual original reels will thus be eliminated.

Figure 3 illustrates a perforating apparatus which can be constructed from a standard 16mm. rewind set, a wide field tubular magnifier or low-power microscope, and a hand punch. A 15-power magnifier has been selected to enable the person making the perforations to read the

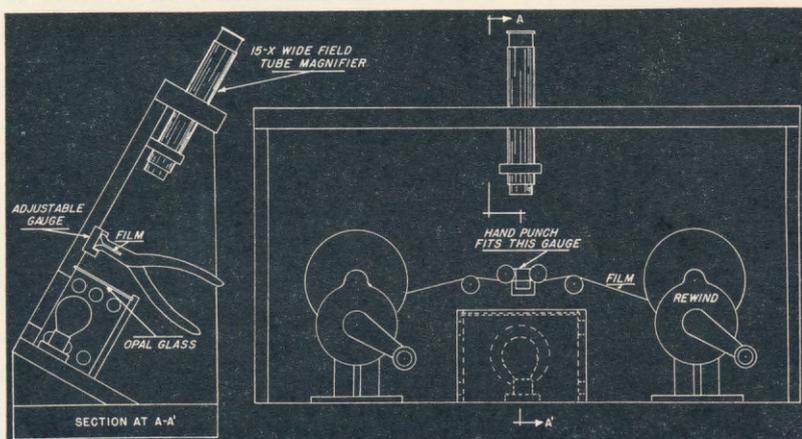


FIG. 3. Perforating Apparatus

document number on the microfilm image. The tubular type is preferable because the three inches from the bottom of the tube or objective lens to the film allows plenty of room for the manipulation of the hand punch. Other types of 15-x magnifiers can be operated only with more eye strain and the working distance between the lens and the film is reduced to about one inch.

When the image to be perforated has been located in the magnifier, provision must be made to hold the film stationary. The punch is then guided to its approximate position by gauges, and the exact locations of the punched hole are determined by centering the punch with the aid of the magnifying tube. Cross hairs may be installed in the lens system for more exact centering of the punched hole.

SUMMARY

The objectives of this article would be defeated, if the reader were to obtain the impression that the techniques of microfilming were not yet sufficiently developed or that the precautions to be taken were too complicated for the average government agency faced with an immediate need for the release of space now occupied by bulky record files.

One government agency was faced with the problem of releasing 100,000 square feet of floor space occupied by records which for twenty years had been considered "essential" records to be retained forever. The Elliott Bill offered a solution to the problem, but even here the cost of the film and the time required to feed 700 million pages through the cameras appeared prohibitive. Careful planning of the work and detailed analysis of the records, however, showed that only a modest amount of microfilm would be required for records that were genuinely essential. With the assistance of The National Archives, it was determined that only one eighth of the 700 million records were of any permanent historical value. The nonessential records could be separated from the essential at a rapid rate, releasing almost 80,000 square feet of floor space and 18,000 steel four-drawer file cabinets for reuse by government agencies. Bids have not yet been taken for the waste paper, but it has been estimated that at current market prices for waste paper from fifteen to twenty-five thousand dollars will be returned to the United States Treasury from this record improvement program. Microfilm is only indirectly responsible for this, but the Elliott Bill suggested a solution, and the cost of careful planning has been repaid many times.

NEWS and TECHNICAL NOTES

AGFA ANSCO FINEX DEVELOPER

After four years of investigation into the problems of fine grain development, the Agfa Ansco Research Laboratories have perfected a new fine grain developer which is being marketed under the name "Finex." The advantages of extreme fine grain, no loss in inherent film speed, ready to use liquid form and long useful life with tested replenishment system are claimed. These advantages are obtained through the use of an entirely new developing agent which extends the developing action deeper into the emulsion layer and reduces the clustering of silver particles, thereby producing smoother, finer grain with no loss of inherent film speed.

Developer and replenisher are packaged together with a graduated measuring cup for replenisher and a 24-page booklet on fine grain processing. A 16-ounce bottle of developer and two 8-ounce bottles of replenisher, both in liquid form, as supplied in the standard package is sufficient to develop 30 rolls of 36 exposures each on 35mm. film. Finex is available through regular

dealers in photographic supplies.



DIRECTORY OF MICROFILM SOURCES

Announcement has been made of the publication of a *Directory of Microfilm Sources, Including Photostat Services* compiled by Ross C. Cibella, Librarian, Hall Laboratories Inc., Pittsburgh, Pa., for the Special Libraries Association. The Directory is alphabetically arranged by the name of the institution of library supplying microfilms and/or photostats. Libraries having a collection of material on microfilm or possessing reading equipment have also been listed. A geographical index and an index by type of copying equipment for approximately 214 institutions is included. There is a special section on charges for microfilm containing other useful information.

The publication is photo-lithographed from varitype script and contains approximately 56 pages. Specimen order forms for 27 institutions are reproduced in facsimile. It is priced at 75 cents and is available from the Special Libraries Association, 31 East Tenth St., New York.

DOCUMENTARY REPRODUCTION IN
CEYLON

In a letter recently received by the Editor of the JOURNAL Dr. Andreas Nell of Colombo, Ceylon, stated that the Ceylon Historical Manuscripts Commission, of which he is a member, has become very much interested in the problems of documentary reproduction. The Archives of Ceylon have a Leica camera with accessories for copying, and the Technical Assistant is now in the process of assembling apparatus to undertake the copying of some valuable old documents. Individuals interested in this activity may communicate with Dr. Nell in care of the D. B. Union Club, Colombo.

HUNTER MILLER DIARY ON
MICROFILM

The Columbia University Libraries have put on microfilm David Hunter Miller's *My diary at the conference of Paris, with documents*, which was published privately in 1924 in an edition of only 40 sets of 21 volumes and one box of maps. It is one of the most important sources for the study of the Paris Peace Conference. Dr. Miller, a leading authority on international law, was appointed special assistant in the Department of State in 1917, and served as legal advisor to the House Mission in 1918. With Sir Cecil Hurst he

drew up the first draft of the Covenant of the League of Nations.

The film is 35mm. perforated, 750 feet in length, 5576 exposures, two pages per exposure, suitable for use on the Argus or any standard reading machine. Maps are reproduced in usable form with one exposure for each quarter section. A price of \$65 for a positive print has been fixed with the expectation that enough orders will be received to absorb the cost of the negative. Orders will be filled as rapidly as possible in the order of their receipt. Address the Director of Libraries, Columbia University, New York, N. Y.

MINELUM LIGHT SOURCE FOR
VIEWING MICROFILMS

A compact self-contained electric light source has recently been placed on the market by the Blue Diamond Products Company, 4310-21st St., Long Island City, New York. It consists of a sheet of flashed opal glass masked to the size of a double frame 35mm. exposure mounted on a metal case containing two small flashlight cells and a lamp with reflector. A switch is provided on the side of the unit to turn the light on and off. By reason of its small size the unit may be used to advantage in conjunction with a viewer or lens for checking short lengths of microfilm. It is available from the manufacturers at the above address or

through regular dealers in photographic supplies.

tion, 9 Rockefeller Plaza, New York, N.Y.



NEW DU PONT POSITIVE FILM

Du Pont 35mm. Fine Grain Safety Positive is a new and improved film for use in documentary reproduction. As the name denotes, it is an exceedingly fine grained positive type stock, having an effective resolving power of the order of 100 lines per millimeter. The inherent contrast level is high. When processed in any suitable "positive" developer, it produces a clean contrasty image with a pleasing blue-black tone. The speed, while less than that of Du Pont's regular print stock, Safety Positive, is adequate for practical purposes. These photographic characteristics make Fine Grain Safety Positive admirably suited as a companion product for Du Pont Safety Microcopy Negative. In common with other Du Pont products supplied for documentary reproduction, a safety base is used to support the emulsion.

Fine Drain Safety Positive is available in the usual bulk lengths of 100 feet and upwards, either perforated or unperforated. Professional quantities are sold direct. Price and other information will be gladly furnished on request. Inquiries should be addressed to Du Pont Film Manufacturing Corpora-



O LE FA'ATONU AVAILABLE ON MICROFILM

The Library of Congress has microfilmed *O Le Fa'atonu* the official publication of the Government of American Samoa, for the period August 1903 through December 1940. This file, the only complete one in the United States (except for one issue) contains about 2300 pages.

From 1903 until 1910, the paper was printed entirely in the Samoan language. Since January 1911 it has appeared in parallel columns of Samoan and English. This feature makes the file one of the largest bodies extant of the Samoan language in printed form.

The paper has been microfilmed one page to the frame at about 13 diameters reduction on perforated film. Positive prints are available from the Photoduplication Service, Library of Congress for \$30.



REEL HOLDER FOR STUDENTS READER

Several users of the Students Reader (described in the JOURNAL, III, p.258-62) have developed reel or film holders to facilitate the use of long lengths of film. One of these consisted of two cardboard boxes which were suspended from the slots in the side of the reader. Another

consisted of velvet-lined metal boxes similarly attached. The device herewith illustrated was brought to the

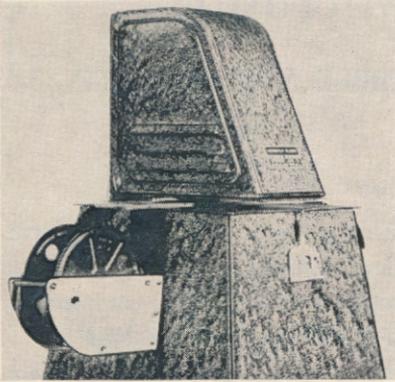


FIG. 4. Reel Holder of Aluminum, Wood and Gas Line Metal Tubing

attention of the Editor by Dr. Julian P. Boyd, Librarian of Princeton University and was constructed by Mr.

Duffield of that institution. It consists of two reel-holding brackets made of sheet aluminum, a small piece of wood and some gas line metal tubing.

With these attachments caution must be used. The glass flats should be corner-rounded and polished on the ends to prevent cutting or abrading the film. The flats must be removed from the projection head and opened when each series of images is inserted for viewing. If this is not done, the film is liable to damage. Valuable film or any negative from which positives are made cannot be dragged through the glass flats without removing them from the projection head and opening them, as this will invariably result in some damage to the film.

Preliminary Checklist of Newspapers on Microfilm

—GEORGE A. SCHWEGMANN, Jr.

FOREWORD

DURING the past few years thousands of volumes of newspapers have been reproduced on microfilm by various agencies in the United States. Some of these microfilm reproductions represent the only complete or usable copies of rare or disintegrated newspapers, while others are of current publications. In either case, however, the production of these microfilms has exceeded all attempts to list them in some central catalog in order that their existence or locations might be made known to potential users.

The need for a central index to microfilms of newspapers has been suggested from various directions. As a result, the Union Catalog of the Library of Congress has undertaken to maintain a separate union catalog of newspaper microfilm entries to be supplied by the various microfilming agencies. This preliminary checklist is the first attempt at publication of that catalog.

The list is known to be incomplete but it is purposely being published in this form with the hope that librarians everywhere will be stimulated to report their holdings to the Union Catalog in order that continuations may be published from time to time. Wherever possible the cost price of positive prints has been listed. In instances where price information is not given, inquiries should be addressed to the library or source listed as supplying prints.

It is a pleasure to acknowledge the generous assistance of Mr. Frederick G. Kilgour who supplied the information regarding the Harvard College Library project for microfilming foreign newspapers, of Mr. John K. Boeing, Manager of the Commercial Division of the Recordak Corporation, for a list of newspapers microfilmed by that organization and

of Mr. Eugene A. Tilleux, who supplied data for the Ohio newspapers microfilmed by the W.P.A.

KEY TO SYMBOLS

- AU University of Alabama, University, Ala.
CtY Yale University, New Haven, Conn.
DLC Library of Congress, Washington, D.C.
ICU University of Chicago Library, Chicago, Ill.
IHl Illinois State Historical Society, Springfield, Ill.
IP Peoria Public Library, Peoria, Ill.
IR Rock Island Public Library, Rock Island, Ill.
IU University of Illinois Library, Urbana, Ill.
InG Gary Public Library, Gary, Ind.
KHl Kansas State Historical Society, Topeka, Kan.
KyLoF Filson Club Library, Louisville, Ky.
MB Boston Public Library, Boston, Mass.
MBelm Belmont Public Library, Belmont, Mass.
MBrock Brockton Public Library, Brockton, Mass.
MH Harvard College Library, Cambridge, Mass.
MNS Smith College, Northampton, Mass.
MPiB Berkshire Athenaeum, Pittsfield, Mass.
MiU University of Michigan, Ann Arbor, Mich.
MiU-L University of Michigan, Law Library
MoHi State Historical Society of Missouri, Columbia, Mo.
NN New York Public Library, New York, N.Y.
NR Rochester Public Library, Rochester, N.Y.
OCl Public Library, Cleveland, Ohio
OHl Ohio State Archaeological & Historical Society, Columbus,
Ohio
OkHi Oklahoma Historical Society, Oklahoma City, Okla.
P State Library and Museum, Harrisburg, Pa.
PHl Historical Society of Pennsylvania, Philadelphia, Pa.
PP Free Library, Philadelphia, Pa.
PPTU Temple University, Philadelphia, Pa.
PU University of Pennsylvania, Philadelphia, Pa.
TKL Lawson McGhee Library, Knoxville, Tenn.

NEWSPAPERS

AMERICAN SAMOA

Pago Pago. *O Le Fa'atonu*

Aug. 1903-Dec. 1940; 3 reels (lacks July 1938; Apr.-May 1915; Oct.-Nov. 1920. The latter 4 issues never published); \$30; copies available from DLC; positives in CtY, MH, MiU-L, IU, NN

ARGENTINA

Buenos Aires. *La Prensa*

July 1938-Nov. 1940; 36 reels; \$432.72; copies available from MH

AUSTRALIA

Sydney. *Sydney Morning Herald*

July 1938-Dec. 1940; 52 reels; \$312.30; copies available from MH

BELGIUM

Brussels. *L'Indépendance Belge*

July 1938-Mar. 1940; 8 reels; \$95.28; copies available from MH

BRAZIL

Rio de Janeiro. *Jornal do Commercio*

Jan. 1939-June 20, 1939; 4 reels; \$45.62; copies available from MH

CANADA

Montreal. *Montreal Gazette*

1939-1940; 20 reels; copies available from Montreal Gazette

Ottawa. *Ottawa Evening Citizen*

May-Dec. 1940; 7 reels; copies available from Ottawa Evening Citizen

—*Ottawa Journal*

July 1939-Dec. 1940; 15 reels; copies available from Ottawa Journal

Toronto. *Globe and Mail*

June 1938-Dec. 1940; 31 reels; \$216.04; copies available from MH

Winnipeg. *Winnipeg Tribune*

July 1938-Dec. 1940; 30 reels; \$335.04; copies available from MH

CHINA

Shanghai. *China Press*

Oct. 1938-Nov. 1940; 16 reels; \$188.88; copies available from MH

—*North China Herald*

Aug. 1852-July 1856; Aug. 1856-Dec. 1858; Jan. 1860-Dec. 1861;—reels; copies available from MH

COLOMBIA

Bogotá. *El Tiempo*

July 1938-Nov. 1940; 29 reels; \$261.72; copies available from MH

DENMARK

Copenhagen. *Berlingske Tidende*

July 1938-Nov. 1940; 32 reels; \$335.42; copies available from MH

ENGLAND

London. *Daily Advertiser*

Mar. 25, 1731-Dec. 31, 1769; 32 reels (85 missing issues); copies available from DLC

—*Daily Herald*

July 1938-Nov. 15, 1940; 18 reels; \$101.95; copies available from MH

—*News Chronicle*

July 1938-Nov. 15, 1940; 18 reels; \$106.84; copies available from MH

—*Grub Street Journal*

Jan. 8, 1730-Dec. 29, 1737;—reels; copies available from MH

—*Times*

1785-1940; 850 reels (some missing issues); \$6,750; copies available from

- Recordak Corp., 350 Madison Ave.,
N.Y.C.
- Manchester.** *Manchester Guardian*
July 1938-Jan. 1941; 24 reels; \$133.56;
copies available from MH
- FRANCE**
- Paris.** *L'Action Française*
May 13, 1938-May 31, 1940; 6 reels;
\$67.80; copies available from MH
- Le Figaro*
1902-1907; Jan. 1909-July 1914; 1920-
1922;—reels; copies available from ICU
- Le Temps*
1861-1917; 115 reels; \$875; copies avail-
able from ICU; positive in ICU July
1938-Mar. 1940; 6 reels; \$46.88; copies
available from MH
- [Dreyfus case]
Approximately 1000 feet of French news-
papers of the 1890's relating to the Drey-
fus case; copies available from MH
- GERMANY**
- Frankfurt.** *Frankfurter Zeitung*
Sept. 1938-June 1939; 7 reels; \$80.28;
copies available from MH
- Munich.** *Völkischer Beobachter*
July 1938-Feb. 1940; 10 reels; \$73.40;
copies available from MH
- Prague.** *České Slovo*
July 1938-Apr. 1939; 5 reels; \$56.52;
copies available from MH
- Vienna.** *Neues Wiener Tagblatt*
July 1938-Feb. 1940; 11 reels; \$132.24;
copies available from MH
- HUNGARY**
- Budapest.** *Pesti Hirlap*
July 1938-Apr. 1940; 15 reels; \$168.78;
copies available from MH
- IRELAND**
- Dublin.** *Irish Times*
July 1938-Sept. 1940; 14 reels; \$150.78;
copies available from MH
- ITALY**
- Milan.** *Corriere della Sera*
July 1938-Mar. 1940; 6 reels; \$46.24;
copies available from MH
- Rome.** *Giornale d'Italia*
Dec. 1938-Mar. 1940; 3 reels; \$20.60;
copies available from MH
- JAPAN**
- Tokyo.** *Japan Advertiser*
July 1938-Apr. 1940; 7 reels; \$52.44;
copies available from MH
- LATVIA**
- Riga.** *Latvijas Kareivis*
July 1938-Feb. 1940; 4 reels; \$41.76;
copies available from MH
- NETHERLANDS**
- Rotterdam.** *Nieuwe Rotterdamsche
Courant*
July 1938-Feb. 1940; 18 reels; \$206.34;
copies available from MH
- NEW ZEALAND**
- Wellington.** *Evening Post*
July 1938-Nov. 1940; 27 reels; \$231.42;
copies available from MH
- NORWAY**
- Oslo.** *Aftenposten*
July 1938-Dec. 1940; 31 reels; \$328.44;
copies available from MH
- PERU**
- Lima.** *El Comercio*
July 1938-Jan. 15, 1941; 57 reels;
\$428.16; copies available from MH

POLAND

Warsaw. *Czas*

Jan., Mar., May, June 1939; 4 reels;
\$40.44; copies available from MH

SPAIN

Barcelona. *La Vanguardia*

Oct. 1938-Dec. 1938; June 11, 1939-
June 1940; 5 reels; \$51.42; copies avail-
able from MH

SWEDEN

Stockholm. *Aftonbladet*

July 1938-Aug. 1939; 13 reels; \$148.32;
copies available from MH

—*Social Demokraten*

July 1938-Nov. 15, 1940; 24 reels;
\$224.52; copies available from MH

SWITZERLAND

Geneva. *Journal de Genève*

July 1938-Aug. 1940; 6 reels; \$41.76;
copies available from MH

Zürich. *Neue Zürcher Zeitung*

Jan. 1939-June 1940; 24 reels; \$283.50;
copies available from MH

UNION OF SOUTH AFRICA

Cape Town. *Cape Times*

July 1938-Aug. 1940; 26 reels; \$255.18;
copies available from MH

U.S.S.R.

Moscow. *Izvestia*

July 1938-Dec. 1939; 3 reels; \$30.24;
copies available from MH

—*Pravda*

July 1938-Dec. 1939; 4 reels; \$51.28;
copies available from MH

YUGOSLAVIA

Belgrade. *Politika*

Oct. 1939-Nov. 1940; 11 reels (lacks

Feb., June, July 1940); \$107.16; copies
available from MH

U.S.—ALABAMA

Montgomery. *Daily Alabama Jour-
nal*

Feb. 19, 1850-Dec. 31, 1853; 6 reels
(95 missing issues); copies available
from DLC; positive in AU

—*Daily Confederation*

May 1858-June 1860; 4 reels (35 miss-
ing issues); copies available from DLC;
positive in AU

—*Tri-weekly Flag and Advertiser*

Jan. 12, 1847-July 11, 1848; 2 reels (52
missing issues); copies available from
DLC; positive in AU

—*Weekly Alabama Journal*

June 11-Dec. 21, 1850; 14 feet (2 miss-
ing issues); copies available from DLC;
positive in AU

—*Weekly Flag and Advertiser*

1847-1849; 11 feet (21 issues); copies
available from DLC; positive in AU

U.S.—ARKANSAS

Little Rock. *Arkansas Gazette*

Jan. 1938-Dec. 1940; 38 reels; copies
available from publisher

—*Arkansas Gazette* (daily)

May 10, 1865-Dec. 30, 1875; 18 reels;
copies available from DLC positive in
OkHi

—*Arkansas Gazette* (weekly)

Nov. 20, 1819-Nov. 17, 1868; 14 reels;
copies available from DLC; positive in
OkHi

Van Buren. *Arkansas Intelligencer*

Feb. 15, 1846-June 26, 1847 (17 missing
issues); Mar. 13, 1857-Oct. 1, 1858 (29
missing issues); 1 reel; copies available
from DLC; positive in OkHi

U.S.—CONNECTICUT

New Britain. *New Britain Herald*
Apr. 1937-Nov. 1940; 30 reels; copies available from publisher

U.S.—DISTRICT OF COLUMBIA

Evening Star
July 5, 1853-Dec. 1918; 387 reels; copies available from DLC; positive in DLC

Washington Post (daily)
Dec. 8, 1877-Mar. 25, 1905; 129 reels (21 missing issues); copies available from DLC; positive in DLC

Washington Weekly Post
Jan. 2, 1894-Dec. 25, 1900; 5 reels; copies available from DLC; positive in DLC

U.S.—FLORIDA

Bartow. *Courier Informant*
June 9, 1881-May 31, 1884; Mar. 30, 1887-July 18, 1888; May 13, 1893-May 4, 1898; May 11, 1898-May 25, 1911; 11 reels; copies available from Recordak Corp.

U.S.—GEORGIA

Atlanta. *Atlanta Constitution*
July 1936-June 1937; 14 reels; copies available from MB

Macon. *Macon Evening News*
Jan.-Dec. 1940; 7 reels; copies available from publisher

—*Macon Telegraph*
Jan.-Dec. 1940; 8 reels; copies available from publisher

U.S.—ILLINOIS

Chicago. *Chicago Daily News*
Apr. 1935-Dec. 1940; 100 reels; copies available from publisher

—*Chicago Daily Times*
Oct. 1937-Nov. 1940; 38 reels; copies available from publisher

—*Chicago Daily Tribune*
June-Oct. 15, 1937; Jan. 1940-Dec. 1940; 33 reels; copies available from publisher

—*Chicago Tribune*
1849-1856; 1919-1939; 519 reels; copies available from Chicago Tribune, (ICU); positives in ICU, Chicago Tribune

—*Greek Star*
1904-1940; 28 reels; \$216; copies available from ICU; positive in ICU

Galesburg. *Galesburg Democrat* (weekly)
Jan. 5, 1854-Dec. 23, 1857; Sept. 1, 1858-Dec. 28, 1860;—reels; copies available from IHI; positive in IHI

Jonesboro. *Jonesboro Gazette*
1849-1900;—reels; copies available from IHI; positive in IHI

Knoxville. *Knoxville Journal* (weekly)
Oct. 5, 1849-Mar. 21, 1855; 2 reels; copies available from IHI

Madison. *Madison Intelligencer*
Nov. 12, 1862-Nov. 5, 1868; 2 reels; copies available from IHI; positive in IHI

Oquawka. *Oquawka Spectator* (weekly)
Feb. 1848-Dec. 1908; 18 reels; copies available from IHI

Peoria. *Peoria Journal-Transcript*
Nov. 1937-Dec. 1940; 39 reels; copies available from IP

Rock Island. *Rock Island Argus*
Dec. 17, 1855-Dec. 1866; 20 reels (includes issues of various Rock Island newspapers for the period 1851-1855); copies available from IR

Sangamo. *Sangamo Journal*

Nov. 10, 1831-Dec. 26, 1849; 5 reels; copies available from IHi

Springfield. *Illinois State Journal*

Jan. 1880-Dec. 1920; 221 reels; copies available from IHi

—*Illinois State Register*

Jan. 1880-Dec. 1920; 237 reels; copies available from IHi

U.S.—INDIANA

Bloomington. *Daily Pantagraph*

Aug. 1937-Dec. 1940; 29 reels; copies available from publisher

Gary. *Gary Evening Post*

1909-June 1921; 42 reels; copies available from InG, ICU; positives in InG and publisher

—*Gary Tribune*

1907-1912; 2 reels; copies available from InG, ICU; positives in ICU, InG and publisher

U.S.—KANSAS

Abilene. *Abilene Chronicle*

1870-1873; 1875-1876;—reels; copies available from KHi; positive in KHi

Ellsworth. *Ellsworth Reporter*

Dec. 21, 1871-Dec. 2, 1875; 1 reel; copies available from KHi

U.S.—KENTUCKY

Lexington. *Lexington Herald*

July 1935-Sept. 1940; 46 reels; copies available from publisher

—*Lexington Leader*

Jan. 1934-Sept. 1940; 63 reels; copies available from publisher

Louisville. *Louisville Courier Journal*

Nov. 1937-Sept. 1940; 48 reels; copies available from publisher

—*Louisville Daily Focus*

Jan. 28, 1831-Jan. 30, 1832; 2 reels; \$20 copies available from ICU (perforated film)

—*Louisville Public Advertiser*

Apr. 28, 1819-Dec. 31, 1825; Jan. 3, 1827-Dec. 31, 1830; Jan. 4, 1841-May 14, 1841; 9 reels (incomplete and lacks 1826 entirely); copies available from DLC; positive in KyLoF

—*Louisville Times*

Nov. 1937-Sept. 1940; 34 reels; copies available from publisher

U.S.—MAINE

Bangor. *Bangor Daily News*

Jan.-Dec. 1940; 12 reels; copies available from publisher

U.S.—MARYLAND

Annapolis. *Maryland Gazette*

1745-1820;—reels; \$95; copies available from CtY; positive in MdBp

Baltimore. *Baltimore Evening Sun*

Sept. 1937-Dec. 1940; 50 reels; copies available from publisher; positive in MdBp

—*Baltimore Sun*

Sept. 1937-Dec. 1940; 57 reels; copies available from publisher; positive in MdBp

U.S.—MASSACHUSETTS

(?) *New England Reporter*

Aug. 3, 1843-Jan. 9, 1845;—reels; copies available from St. John's Seminary, Brighton, Mass.

Belmont. *Belmont Courier*

1889; 1914-1917;—reels; copies available from MBelm

Boston. *Boston American*

Aug. 1936-Aug. 1939; 39 reels; copies available from MB

—*Boston Daily Globe*

Aug. 1936-Jan. 1941; 94 reels; copies available from MB

—*Boston Daily Record*

Aug. 1936-Aug. 1939; 24 reels; copies available from MB

—*Boston Evening Globe*

July 1936-Feb. 1940; 44 reels; copies available from MB

—*Boston Evening Transcript*

Jan. 1833-Dec. 1862; Jan. 1916-Jan. 1941; 365 reels; copies available from MB

—*Boston Gazette*

1719-1742;—reels; copies available from Graphic Microfilm Service, Waltham, Mass.

—*Boston Herald*

Aug. 1936-Jan. 1941; 102 reels; copies available from MB

—*Boston Newsletter*

1704-1742;—reels; copies available from Graphic Microfilm Service, Waltham, Mass.

—*Boston Post*

Aug. 1936-Jan. 1941; 77 reels; copies available from MB

—*Boston Recorder*

1840-1842;—reels; copies available from MB

—*Boston Sunday Advertiser*

May 1938-Aug. 1939; 8 reels; copies available from MB

—*Boston Traveler*

July 1936-June 1940; 50 reels; copies available from MB

—*Boston Vindicator*

Jan.-July 1847;—reels; copies available from St. John's Seminary, Brighton, Mass.

—*Christian Science Monitor*

1908-1920;—reels; copies available from publisher

July 1936-Nov. 1938; 29 reels; copies available from MB; positive in MB

—*New England Weekly Journal*

1727-1739;—reels; copies available from Graphic Microfilm Service, Waltham, Mass.

—*The Pilot*

1829-1940; 63 reels (for 1829-1938); \$425 (for 1829-1938); copies available from St. John's Seminary, Brighton, Mass.

Brockton. *Brockton Enterprise*

Jan.-June 1903; Oct.-Dec. 1903; Jan.-Dec. 1904; Jan.-Mar. 1936; Aug. 1938-to date;—reels; copies available from MBrock

Pittsfield. *Berkshire Eagle*

Apr. 1, 1939-to date;—reels; copies available from MPiB; positive in MPiB

—*Pittsfield Sun*

Sept. 16, 1800-Sept. 27, 1906;—reels; copies available from MPiB; positive in MPiB

Quincy. *Quincy Monitor*

Apr. 1886-May 1898;—reels; copies available from St. John's Seminary, Brighton, Mass.

Springfield. *Springfield Republican*

Aug. 1936-June 1937; 11 reels; copies available from MB

U.S.—MICHIGAN

Detroit. *Detroit News*

Jan. 1900-Dec. 1913; 149 reels; copies available from publisher

—*Detroit News* (home edition)

Apr. 1935-Dec. 1940; 153 reels; copies available from publisher

—*Detroit News* (made-over edition)

Apr. 1935-Dec. 1940; 236 reels; copies available from publisher

Muskegon. *Muskegon Chronicle*

Oct. 1938-Dec. 1940; 14 reels; copies available from publisher

Saginaw. *Saginaw News*

March 1938-Dec. 1940; 31 reels; copies available from publisher

U.S.—MINNESOTA

Minneapolis. *Farm Market Guide and Farmers' Union Herald*

1924-1934; 1 reel; \$6.90; copies available from ICU; positive in ICU

St. Paul. *Farmers' Union Herald*

1935-1940; 1 reel; \$3.80; copies available from ICU; positive in ICU

U.S.—MISSOURI

Aurora. *The Menace*

June 3, 1911-Dec. 25, 1915; 1 reel (70 missing issues); copies available from DLC; positive in MNS

Carrollton. *Carrollton*

1872-1888;—reels; copies available from MoHi; positive in MoHi

Fulton. *Fulton Gazette*

1877-1898;—reels; copies available from MoHi; positive in MoHi

Kansas City. *Kansas City Journal*

1855-1866; 11 reels; \$96.57-\$128.76 (depending on subscribers); copies available from KHi; positive in KHi

Lexington. *Lexington American Citizen*

Sept. 1855-Jan. 1857;—reels; copies available from MoHi; positive in MoHi

—*Lexington Express*

Jul. 1844-June 1846; Aug. 1852-Apr. 1853; May 1853-Jan. 1855; Aug. 1859-Sept. 1860;—reels; copies available from MoHi; positive in MoHi

—*Lexington News*

Apr. 1889-Apr. 1891; Mar. 1895-Apr. 1897; Apr. 1897-Apr. 1899;—reels; copies available from MoHi; positive in MoHi

—*Lexington Register*

May 1870-May 1873; May 1873-Apr. 1876; 1885-1886;—reels; copies available from MoHi; positive in MoHi

—*Lexington Sentinel*

Aug. 1876-Mar. 1881;—reels; copies available from MoHi; positive in MoHi

—*Lexington Union*

Jan. 1862-July 1865;—reels; copies available from MoHi; positive in MoHi

New London. *Ralls County Record*

1865-1890;—reels; copies available from MoHi; positive in MoHi

St. Joseph. *St. Joseph Commercial Cycle*

Jan. 5, 1855-Dec. 5, 1856; 1 reel (21 missing issues); copies available from DLC; positive in MoHi

St. Louis. *Daily St. Louis Intelligencer*

Jan. 1, 1850-Dec. 31, 1851; 3 reels (134 missing issues); copies available from DLC; positive in MoHi

—*St. Louis Daily New Era*

Mar. 6-Dec. 29, 1859; 2 reels; copies available from DLC; positive in MoHi

—*St. Louis Daily Union*

Aug. 17, 1846-Apr. 6, 1849; 6 reels (118 missing issues); copies available from DLC; positive in MoHi

—*St. Louis Dispatch*

Dec. 12, 1865-Nov. 1, 1866; 1 reel (132 missing issues); copies available from DLC; positive in MoHi

—*St. Louis Evening Pilot*
(weekly)

Jan. 6, 1855-Nov. 15, 1856; 1 reel (3 missing issues); copies available from DLC; positive in MoHi

—*St. Louis Star Times*

Jan. 1939-Apr. 1940; 14 reels; copies available from publisher

U.S.—NEW JERSEY

Newark. *Newark Sunday Call*

May 1934-Sept. 1940; 26 reels; copies available from publisher

Paterson. *Paterson Evening News*

Jan. 1939-Dec. 1940; 26 reels; copies available from publisher

—*Paterson Morning Call*

Jan. 1939-Dec. 1940; 22 reels; copies available from publisher

U.S.—NEW YORK

New York. *Freedom's Journal*

Mar. 16, 1827-Mar. 28, 1829; 1 reel (1 missing issue); \$4.15; copies available from NN; positives in MiU, NN, and many other libraries

—*Jewish Daily Forward*

Aug. 1897-Apr. 1940; 231 reels; copies available from NN

—*New York Call*

May 1908-Sept. 1923;—reels; copies available from NN and *New York Leader* (successor to *New York Call*)

Oct. 1, 1923-Nov. 12, 1923; copies available from NN

—*New York Herald Tribune*

1841-1940; 789 reels; copies available from publisher

—*New York Mercury*

1756-1758; 1780-83; 7 reels (including the Newark Supplement); copies available from NN

—*New York Times*

Jan. 1914-Dec. 1918; 73 reels; copies available from publisher

Jan. 1939-Dec. 1940; 58 reels; \$175 per year; copies available from publisher

—*New York Times Index*

1860-1904;—reels; copies available from NN

—*New York Tribune Index*

1894-1900;—reels; copies available from NN

—*New York World Telegram*

Nov. 1935-Dec. 1940; 82 reels; copies available from publisher

Rochester. *Anti-Masonic Enquirer*

Sept. 1829-Dec. 1833; 2 reels; copies available from NR

—*Douglass' Monthly*

Jan. 1859-Mar. 1862; 1 reel (14 missing issues); copies available from DLC

—*Frederick Douglass' Paper*
(weekly)

June 26, 1851-Dec. 14, 1855; 2 reels (no missing issues); copies available from DLC

—*New National Era*

Jan. 12, 1871-Jan. 4, 1872; Jan. 9, 1873-Jan. 1, 1874; 1 reel; copies available from DLC

—*North Star*

Dec. 3, 1847-Dec. 21, 1849; 1 reel; copies available from DLC

—*Rochester Daily Advertiser*

June 1828-Oct. 1853; 26 reels (lacks Jan. 1829-Mar. 1830; Feb. 1834-Apr. 1839; July 1846-June 1847; Feb.-May 1849); copies available from NR

- Rochester Daily Advertiser and Telegraph*
Jan. 1829-Apr. 1830; 2 reels; copies available from NR
- Rochester Daily Democrat*
Feb. 1834-June 1854; 30 reels (lacks July 29, 1836-Sept. 12, 1836; Aug. 27, 1837-Nov. 30, 1838; July-Dec. 1846); copies available from NR
- Rochester Daily Telegraph*
July 7, 1818-Nov. 26, 1828; 2 reels (lacks Sept. 7, 1825-June 25, 1828); copies available from NR
- Rochester Daily Union*
Aug. 1852-Dec. 1856; 8 reels; copies available from NR
- Rochester Democrat and Chronicle*
Jan. 1876-Dec. 1904; 149 reels (lacks July 1877-Sept. 1878); copies available from NR
Jan. 1938-Dec. 1940; 56 reels; copies available from publisher
- Rochester Observer*
Feb. 1827-Sept. 1832; 2 reels; copies available from NR
- Rochester Republican*
Dec. 1829-Dec. 1849; 5 reels (lacks Jan. 1, 1833-Dec. 31, 1835; Jan. 1, 1845-June 22, 1846); copies available from NR
- Rochester Times Union*
March 1918-Dec. 1923; 59 reels; copies available from NR
Nov. 1937-Dec. 1940; 45 reels; copies available from publisher
- Rochester Union and Advertiser*
Dec. 1856-March 1918; 216 reels; copies available from NR
- Rockville Center. *Nassau Daily Review Star*
Jan. 1939-Sept. 1940; 18 reels; copies available from publisher
- U.S.—NORTH CAROLINA
Raleigh. *Raleigh News and Observer*
Jan. 1937-Oct. 1940; 39 reels; copies available from publisher
- U.S.—OHIO
Akron. *Akron Beacon Journal*
1840-1939; 46,400 feet; negative in State WPA Office, Columbus
- Canfield. Various Canfield papers
1846-1900;—reels (perforated film); negative in State WPA Office, Columbus
- Cincinnati. *Cincinnati Enquirer*
1818-1939; 85,300 feet (perforated film); negative in State WPA Office, Columbus
- Cleveland. *Cleveland Plain Dealer*
1842-1939; 71,640 feet; negative in OCl; positive in OHi
- Columbus. *Ohio State Journal*
1811-1939; 55,075 feet (part on perforated film); negative in State WPA Office, Columbus
- Dayton. *Dayton Journal*
1808-1939; 32,800 feet; negative in State WPA Office, Columbus
- Toledo. *Toledo Blade*
1837-1939; 54,302 feet (part on perforated film); negative in State WPA Office, Columbus
- Warren. *Evening Mercury*
June 2-July 28, 1843 (perforated film); negative in State WPA Office, Columbus
- Trumbull County Democrat*
June 7, 1839-Nov. 23, 1841 (perforated

- film); negative in State WPA Office, Columbus
- Western Reserve Transcript*
Nov. 25, 1852-Dec. 29, 1853 (perforated film); negative in State WPA Office, Columbus
- Youngstown. Various Youngstown papers
1843-1903 (perforated film); negative in State WPA Office, Columbus
- Youngstown Vindicator*
1889-1939; 4,175 feet; negative in State WPA Office, Columbus
Oct. 1938-Dec. 1940; 38 reels; copies available from publisher
- U.S.—OKLAHOMA
- Doaksville. *Choctaw Intelligencer*
June 16, 1850-Jan. 7, 1852; 1 reel (6 missing issues); copies available from DLC; positive in OkHi
- Choctaw Telegraph*
May 3-Dec. 20, 1849; 14 feet (3 missing issues); copies available from DLC; positive in OkHi
- U.S.—PENNSYLVANIA
- Chester (?). *Chester & Delaware Federalist*
Sept. 7, 1814-Dec. 28, 1814; Jan. 4, 1815-Dec. 27, 1815; Jan. 3, 1816-July 24, 1816;—reels; copies available from Graphic Microfilm Service, Waltham, Mass.
- Johnstown. *Allegheny Mountain Echo*
June 1855-June 1859; 2 reels; copies available from Johnstown Tribune
- Johnstown Democrat*
May 1936-Dec. 1940; 42 reels; copies available from publisher
- Johnstown Tribune*
Dec. 1864-Oct. 1920; 164 reels (lacks Sept. 1866-Apr. 1867; Jan. 1-Feb. 4, 1869; Jan., Feb., 1873; Mar.-Aug. 1896; Jan.-Mar. 1906; Mar.-Apr. 1912; May-Aug. 1913; Nov.-Dec. 1918; Nov.-Dec. 1920); copies available from publisher
May 1936-Dec. 1940; 43 reels; copies available from publisher
- Johnstown Weekly Herald*
July 1888-May 1889; 1 reel; copies available from Johnstown Tribune
- Johnstown Weekly Tribune*
Sept. 1896-Sept. 1898; 2 reels; copies available from Johnstown Tribune
- Philadelphia. *American Weekly Mercury*
Dec. 22, 1719-May 22, 1746;—reels; \$40; copies available from Graphic Microfilm Service
- National Gazette*
Oct. 31, 1791-Oct. 26, 1793; 1 reel; copies available from DLC
- Pennsylvania Gazette*
—reels (double perforated film); copies available from PHI
- Philadelphia Inquirer*
July 1939-Dec. 1940; 31 reels; copies available from publisher; positives in P, PU, PPTU, PP
- Pennsylvania Journal & Weekly Advertiser*
1765-1771;—reels; copies available from Graphic Microfilm Service
- Sharon. *Sharon Herald*
May 1909-July 1940; 182 reels (lacks Jan.-Apr., Aug.-Dec. 1909; Jan., Feb. 1910; Jan.-Mar. 1913; Jan.-Apr. 1919); copies available from publisher
- Sharon Telegraph* (daily)
Feb. 1893-Dec. 1896; Mar. 6, 1900-Dec.

- 1915; 21 reels (incomplete); copies available from Sharon Herald
- Sharon Telegraph* (weekly)
1894-1914; 5 reels; copies available from Sharon Herald
- U.S.—RHODE ISLAND
- Providence. *Providence Evening Bulletin*
March 1938-Dec. 1940; 49 reels; copies available from publisher
- Providence Journal*
March 1938-Dec. 1940; 48 reels; copies available from publisher
- U.S.—TENNESSEE
- Knoxville. *Knoxville Register*
1821-1862;—reels (incomplete); copies available from TKL
- Knoxville Standard*
1846-Apr. 11, 1848;—reels; copies available from TKL
- Knoxville Statesman*
1853-1854;—reels; copies available from TKL
- Knoxville Whig and Chronicle*
1839-1869;—reels; copies available from TKL
- Tri-weekly Whig*
1859-1867;—reels (incomplete); copies available from TKL
- U.S.—TEXAS
- Clarksville. *Northern Standard*
March 4, 1848-Sept. 29, 1849; 35 feet
- (29 missing issues; 1 mutilated); copies available from DLC
- Dallas. *Dallas News*
Oct. 1885-Dec. 1922; 295 reels; copies available from publisher
July 1935-Dec. 1940; 93 reels; copies available from publisher
- San Angelo. *San Angelo Evening Standard*
Jan. 1938-Nov. 1940; 13 reels; copies available from publisher
- San Angelo Standard Times*
Jan. 1938-Nov. 1940; 24 reels; copies available from publisher
- San Angelo Weekly Standard*
Jan. 1938-Dec. 1939; 3 reels; copies available from publisher
- U.S.—VIRGINIA
- Richmond. *Richmond Standard*
Sept. 7, 1878-Feb. 18, 1882; 1 reel; copies available from DLC
- U.S.—WISCONSIN
- Madison. *Wisconsin State Journal*
Apr. 1937-Dec. 1940; 39 reels; copies available from publisher
- Milwaukee. *Milwaukee Journal*
1911-1920;—reels; copies available from Milwaukee Newspaper Index, WPA Project, Milwaukee, Wis.; positive in Milwaukee Newspaper Index
- Milwaukee Sentinel*
1837-1910;—reels; copies available from Milwaukee Newspaper Index; positive in Milwaukee Newspaper Index

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Fees charged.
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Technical description.
- "Library photography: the Department of Photographic Reproduction at the University of Chicago." *Library Journal*, 66:175 (Feb. 15, 1941) [G]
Fees charged.
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BOOK REVIEWS and NOTICES

CHOOSING FILM FOR YOUR CAMERA; A GUIDE TO SELECTION OF AGFA FILM. Binghamton, N.Y.: General Aniline and Film Corporation, 1941. 8op. 5½ x 7½ inches. illus., paper, 25c.

This booklet is intended to acquaint the amateur and professional photographer with the characteristics of the numerous Agfa films which are now available on the market. There is a descriptive section outlining in general terms the uses of various emulsions, and charts classifying the films according to use and subject. Exposure data, comparative film speeds and color sensitivity data, wedge spectrograms and filter factor tables are followed by general remarks on processing and developers (without formulas). Sixteen detail sheets for different films, containing characteristics, filter factors, film speeds, recommended developers with time-gamma and time-temperature curves, spectrograms, characteristic curve, resolving power, and other detailed information, are most important. There is an appendix of general photographic information. This publication is a most welcome addition to the literature, and in sup-

plying the photographer with exact information about standardized products will contribute greatly to the ease and precision of his work.

PHOTOGRAPHY IN SCIENCE, ART AND INDUSTRY; SPECIAL NUMBER, THE PHOTOGRAPHIC JOURNAL. London: Royal Photographic Society, April 1941. xxiv and p.124-218. 2 shillings 6 pence.

The annual special number of *The Photographic Journal* dealing with photography in science, art and industry understandably enough is devoted almost exclusively to photography in wartime. Significantly, one of the first illustrations is an enlargement of a 35mm. microfilm made from the Church of St. Bride in Fleet Street, which was practically destroyed in an air raid. The entry constitutes a record of the christening of Samuel Pepys the diarist. Throughout the number many similar projects both in the United States and in Britain are mentioned. Photographic inventories of homes and their contents (*see* "Microfilm Record of a Louisiana Plantation Home," JOURNAL, IV, p.15-18), the "Snapshots from Home League"

formed to supply men on active duty with pictures of their families taken if possible in their own homes, the National Building Record which is being implemented partly by photography by the Royal Institute of British Architects, are illustrative of some activities other than those which might be expected in wartime.

Photographic techniques, equipment and processes, including aerial mapping and reconnaissance, "camera guns" for recording and training in marksmanship, propaganda photographs and the like, in use in the field and at home are described at length and well illustrated. Industrial applications are discussed. New equipment and processes are also considered and photographic progress during the year as revealed in the literature is summarized.

It is a tribute to the enthusiasm and zeal of the Royal Photographic Society that such an excellent and informative number could be produced under existing difficult conditions. Photographers and others can well afford to study every word and consider how we in this country could best proceed if confronted with similar conditions.

PHOTO-OFFSET LITHOGRAPHY, by Donald Nicholson. Brooklyn, N.Y.: Chemical Publishing Company, 1941. 154p. 5½ x 8½ inches. illus., cloth, \$3.50.

About a year ago a qualified of-

ficial of the National Bureau of Standards remarked to the reviewer that within 20 years 90 per cent of the printing in the United States would be done by photo-offset lithography. In view of the great advances that have taken place in the past months his prediction would seem to be justified. New or improved equipment has appeared on the market with convincing regularity; shops have sprung up or expanded; applications have outstripped both new equipment and facilities. An example of a recent and important use of photo-offset lithography is the adoption by the armed forces of the United States of the process for field service with mobile units. There are other even more important military uses which cannot at this time be disclosed. As a result of this rapid evolution, there has been an understandable dearth of information about the process which would assist in the training of apprentices and beginners. Trade journals, books and professional publications have been more concerned with advanced problems. The present book is intended to supply this deficiency.

The essential steps in photo-offset lithography are discussed in five chapters which are: Preparation of Copy, Camera Work, Layout, Plate Making, and Press Work. Theory and specialized operations are excluded wherever possible and standard

methods are followed and fully described. The text is plainly written in understandable terms; well selected and intelligible illustrations, charts and formulas are used as required. No particular equipment is mentioned by name, but the discussion is phrased in general terms which are universally applicable. A good index adapts the book for easy reference to particular points.

It is quite true that no book alone can make a good process photographer, platemaker or pressman, but if this book were placed in the hands of every beginner and used in conjunction with shop work his training would be immensely facilitated.

A TEST OF LENS RESOLUTION FOR THE PHOTOGRAPHER, by Irvine C. Gardner. Washington: Government Printing Office, 1941. 15p. illus. and 2 enclosed test charts, 40c.

Issued December 27, 1940 as "Circular of the National Bureau of Standards C428" and available from the Superintendent of Documents, Washington, D.C., at a purely nominal figure, this publication is of immediate value to every photographer, and is of supreme importance to technicians engaged in documentary re-

production and microphotography. The abstract states: "This Circular provides the photographer with a set of charts by which the resolving power of a photographic lens may be numerically measured with respect to a definite scale of values. A detailed description is given of the procedure and technique to be followed in order that comparable values may be obtained by different observers. The test provides an objective method of testing a photographic lens."

The method described is a modification of one used at the National Bureau of Standards for testing aerial mapping lenses, and consists of resolution targets, 12 of which specially printed for the purpose on two inserted sheets are supplied. These are photographed under certain conditions and the resulting data are interpreted according to certain specifications. There is one criticism which might be made of the method, namely, that it is not truly objective as stated, for the results still depend to a certain degree on the visual interpretation of data. In the hands of a careful worker, however, the test can be of the greatest value in making usable determinations and comparisons.

EDITOR'S CORNER

The Writers

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Further Notes on A.D.I. Annual Meeting

On February 11 Dr. Watson Davis, President of the A.D.I. requested the major speakers at the Symposium to provide Dr. Tate with 500-word summaries of their remarks at the Symposium, in an article entitled "Microphotography in 1940," in the preceding number of the JOURNAL. Six replies were received, four of which were but one page long. One was in outline form. These and the papers by Mrs. Watrous and Dr. Bendikson were compared carefully with the article by Mr. Tilleux and with articles previously published in the JOURNAL OF DOCUMENTARY REPRODUCTION and the following facts or passages, not otherwise reported were selected for publication.

Dr. Bendikson concluded his tripartite grouping of microfilm uses by stating: "In certain specific instances microfilms are made for all three purposes, as in the case of newspapers, because the latter are frequently made to preserve and to consult, as well as to condense the bulk of the bound newspaper volumes into considerably smaller space." Mass destruction of records

by bombing "not only in one, but in many places at the same time," the fact that "there will never be sufficient document air raid shelters" and that original records "buried in underground storage rooms . . . will not be available for a long period" makes it "imperative that a strenuous effort should be made for a systematic and much more accelerated action" for microcopying.

Dr. Van Hoesen submitted a 7-page paper which supplemented, rather than reported, his remarks at the A.D.I. meeting. Because of its general interest, it may be printed *in extenso* in an early issue.

Dr. Seidell's summary statement adds the information that "by means of a widely distributed list of the abbreviated titles of the periodicals received by the [Army Medical] Library, it was made possible for those using the [Medicofilm] Service to learn in advance exactly what is available."

According to Dr. Metcalf, "the work of filming foreign language newspapers at Harvard University has been divided between the Graphic Service Corporation in Boston and the Recordak Corporation in Rochester." Prints are "on 35mm. non-perforate film."

Dr. Raney's outline indicates that the University of Chicago Library instigated the development of the S.V.E. projector (see note 24, *supra*, and text, JOURNAL, IV p.38. Positive

prints of the Supreme Court Cases have been ordered by seven libraries. The years for which the *Chicago Tribune* was filmed are "1923-33 and a section of 1849-56 thus far." The complete file (1904-40) of the *Greek Star* (Chicago) is also on film. A "city wide service" has been arranged which provides "inter-library transportation" of volumes to be filmed, "without cost to the purchaser."

According to Mrs. Watrous, cooperation by the Department of Agriculture Library with the Bibliofilm Service "includes all the reference work in connection with identifying and locating difficult and incomplete orders, as well as routine messenger work." She suggested, as a device for reducing bookkeeping operations, the "standardization of prices so that five or ten cent coupons can be used instead of cash." In conclusion she reminded the meeting that "libraries wishing to use microphotography without going to the expense of establishing and maintaining costly laboratories and expert technicians, may now rent cameras of the latest type and have the film developed commercially. This may offer another approach to the benefits of microphotography at low cost for libraries whose volume of work is not sufficient to justify large installations."

"India welcomed microfilm eagerly, having heard only vague rumors about it before," Dr. Poleman

reports. Funds for travel to the depositories for discussing such a service were provided by the American Council of Learned Societies. The cultural society owning microfilm apparatus at Tirupatur is the Sri Venkateswara Oriental Institute. Their machine "was set up by a group interested in the preserving of privately owned manuscripts through the medium of film and the establishment thereby of a bibliofilm library for the use of scholars everywhere. Its beginnings have been meagre but it is progressing and has agreed to cooperate with agencies in America." The Photorecord camera was left with the Royal Asiatic Society of Bengal, at Calcutta, on condition that a number of institutions were "willing to cooperate in making their collections available for copying." "The machine is . . . in the hands of a trained operator and photographer." Arrangements have been made for

"easy passage of film materials between America and India as far as government restrictions are concerned." Dr. Poleman believes "there is great strategic need for the permanent maintenance of a central, national clearing house or organization for the handling of microfilm for cultural and scientific purposes in this country, to which other countries may look for guidance. Any tendencies toward the distributing of such a service over a number of bodies with no central control would be unfortunate, if an international setup is to be maintained."

Colonel Jones stated that the eventual goal of the Army Medical Library is "a master card catalog or a world catalog of all medical books to be found anywhere. This is of prime importance to our institution and we believe that our needs in this field will increase rather than decrease in the future."

—E. A. TILLEUX.