Alta California and San Francisco Call

Making duplicate films for scanning:

Library Photographic Service (Preservation Department) at University of California has the limited role in the California Newspaper Project of reproducing master negatives for purposes of scanning. The microfilm section of this service is accustomed to, and well-equipped for, duplicating difficult old camera masters, as the institution holds large collections of film materials dating back 60 years and more, and requests for copies of these films are received with considerable frequency from institutions and individuals around the world.

The product created for CNP is 35mm duplicate negative film, on a modern, lower-contrast, direct-duplicate intermediate film. This film stock has an orthochromatic, gelatin-silver emulsion on a polyester base. A "vintage" contact printer especially well-suited to the work is employed, and the exposed film is subsequently developed in a continuous-strand, deep-tank processing machine. Metadata pertaining to certain technical aspects of both film generations (master and duplicate) must be collected as part of the process. These data include such information as reduction ratio, date of production, resolution, transmission density readings (20 altogether), minimum densities, density averages, etc. The finished product is put into approved enclosures and shipped to the scanning vendor.

I am assisted in the work by a senior technician, Robert Byler, and we coordinate the workflow through Andrea Vanek of CNP, a very fruitful collaboration.

The camera negatives:

The original film negatives were stored spliced together on 1000-foot rolls (on plastic film "cores"), which were in turn housed in metal film cans. Production dates are not stated on the film, but are estimated to have been between 1960 and 1970, the estimate being based on their characteristics, some of which are:

1. Cellulose acetate base with residual anti-halation undercoat
2. Film base thickness (7 mil, apparently, though not measured)
3. Source/ filming agent (generally Recordak Corporation)
4. Tools and techniques employed (see below)
5. Extent of deterioration (moderate overall)

The majority of the material was filmed one page per frame, in the "1A" format, a good decision on the part of the filming agent if it was not mandated by the ordering institution. Some of the newspapers were filmed in the "2B" position, however, and a significant number were done in what we are calling "one-half B", which is to say that half of each sheet is filmed in each frame, in the B position – sometimes referred to as

"comic" or "landscape", the length of the documents running across the width of the film. In the forementioned A-position method, the length of each document – or pair of documents – runs down the length of the film roll.

It is apparent that the cameras used in the original filming were Recordak Model C machines. There is abundant evidence to confirm this supposition. This model's swinging arm device, which incorporated the focusing aid and light meter, was inadvertently left in the field and photographed in some instances, and there is clear evidence of the use of the shifting or oscillating copy board which came with these machines.

The Model C design was an electro-mechanical marvel, extremely durable, facilitating high reductions for imaging large originals. It was nearly ideal for broadly-rendered, oversized architectural drawings, for example. These cameras were fitted with an earlier generation of the Ektar copying lens, however, which is inferior to the later Ektars and to the later, comparable designs from other manufacturers. Model C's also lacked the improved film pressure plate of subsequent models, although these platens may be replaced. The focusing method was rather crude and imprecise in practice, and lacking in visual or instrument focus confirmation. The consequence of these shortcomings is perhaps the most important characteristic for purposes of the CNP project: *medium to low resolution*. The determination of these resolution levels is necessarily subjective; since test objects (resolution charts) were not filmed by the vendor. Inspection of reproduced materials under magnification reveals soft and diffuse edges, line spread or irradiation, and a tendency to closure of small spaces within characters. As expected, resolution loss tends to be more-or-less in direct relation to reduction; that is, the greater the reduction the greater the loss in definition. The reduction ratios of the project films duplicated to date run from 13.5: 1 to 21: 1, with the lesser reductions having produced the medium levels of quality and the greatest ones the marginal or low levels. Generally speaking, in a good film reader the quality does not descend to the level of illegibility, but rather to the level of what may be described as "legible with difficulty" or at worst "decipherable". I estimate line-pair resolution to be on the order of 80-90 line pairs per millimeter which, again, and depending on character size, is adequate at the lower reductions and marginal or problematic at the higher ones. For purposes of comparison, I can state that the current cameras in Library Photo Service (preservation microfilm lab) are adjusted to reach around 150 line pairs per millimeter, and some manufacturers and filming agents claim even higher figures in their advertising literature.

The scanning agent for the duplicate films (OCLC) indicates that the duplicate films are scannable, and as of this date we await the results in terms of OCR error, on-line presentation, etc.

The splices in the film also help to date the filming. These are rather thick overlap splices, done with liquid adhesive, almost certainly made with the Griswold brand splicer that was used most everywhere at the time. Generally these splices remain strong and are sufficiently distant from the images to prevent imperfect contact in film duplication. Where tape splices were used significant problems have resulted, and these will be discussed below.

The old camera negatives for *Alta California* and *The Call* suffer from the following additional problems with respect to their film and digital copying:

1. "Wandering", mismatched, or inappropriate exposure and/or development..
2 Physical deterioration of the image structure and support material.
3 Physical condition of the newspapers at the time of filming, including original printing defects.

The first of these defects results in film density ranges that make reproduction difficult, as well as, in some cases, individual images that were effectively ruined by gross underexposure or overexposure. Here we refer to these anomalous individual exposures as "rogue" exposures. The incidence of this latter problem is relatively low, and credit must be given to the camera operators for getting acceptable exposures over the course of a large project that included many thousands of pages of difficult source documents filmed on a production basis and on older equipment. Mismatching refers mainly to images added to the reels by splicing in refilmed sections to correct errors or to add pages that were missing at the time of filming but found later. Process control was more challenging than it is now, with the result that the spliced-in sections do not match surrounding material in terms of image characteristics. In these cases the old-style contact printer employed in the photo service is useful, as it may be programmed for many different contact-printing exposures within a reel. This programming is done with the goal of making scanning more straightforward, although we have little doubt that some adjustments to thresholding are still needed on this difficult material. The scanning vendor asks that negative "background densities" fall between log .9 and 1.2, and every effort is made to achieve this, although the first-generation densities range from about .4 to nearly log 2.0

At the outset of the project OCLC was presented with three alternative versions of a single roll to enable them to choose the one with the best characteristics for their process. Lower contrast was preferred, with a "base-plus-fog" density of around .12. Some rolls of the *Call* have so much undercoat density (a pronounced blue or magenta tint that brings the non-imaged areas to about log .25 in visual transmission density) that we find it necessary to elevate fog density on the duplicate to nearly the same levels in order to bring the image densities into spec. This can result in a very low-contrast, low-definition copy.

The original film suffers from two types of deterioration: the degrading of cellulose acetate support – "vinegar syndrome" – and reductive-oxidative damage, familiar to many librarians as "microdots". The use of test papers and visual inspection indicate that the first of these two problems is not advanced in the films, although the tell-tale acetic acid odor is detectable in some. The second defect – redox, for short – is not widespread but is severe in some places. By way of review, redox occurs when migrant silver ion is created by oxidant attack typically catalyzed by heat and moisture, so that a colored, non-image form of the silver is deposited in a new place. In the finely-divided silver of ultra fine-grain copying films, this redeposit often takes the form of tiny dots – "microdots". Most of the dots in the films under discussion are confined to image edges outside the text area, however there are a few frames that are quite decimated by the phenomenon. Where tape splices are present, direct contact with the adhesives has in

some cases triggered broad areas of damage, apparently "wiping out" up to two-thirds of the frame in contact with the tape. Here the above-mentioned orthochromatic emulsion has been useful, since the color sensitivity of this material makes it actinic to some of the wavelengths passed by the blighted, colored areas, and an overall improvement is noted in the new copy. The effect of enhancement has been quite dramatic in some cases, however there is no question that some dots will record in the scans.

It should also be mentioned that some of these masters were used as reading copies and are scratched and abraded as a consequence.

The final limiting factor noted above is the physical condition of the newspapers at the time of filming. We can assume that many of the sheets were quite brittle, and in some cases there is significant text loss owing to pieces having broken off. Some sheets have tape repairs covering text. Patches of faint imprint occur – we call them "bald spots" here (it is possible that our age group influences the nomenclature) - and it is difficult for photographic copying to capture adequately the entire range of values on pages affected in this way. The full range of newsprint defects well-known to librarians who work with news collections is present: There are "rivers", articles razored out by patrons, etc.

It should be noted here that some years of *Alta California* were printed on such large sheets that the filming agent found it necessary to film these pages in halves, which, while it introduces no special film duplicating problems, raises issues for OCR and web presentation.

Conclusions:

Within the limited scope of this paper it is impossible to offer meaningful conclusions about the project as a whole. At the time of this writing we have seen only a few test scans of the material in this facility, and it is, after all, the province of the research users and library professionals to evaluate the end product. However, the following points from the perspective of a preservation microfilm lab may be germane to the general discussion:

1. The film duplication, scanning and web presentation promise to serve the dual needs of preservation and access.
2. The film duplicates are likely to be the preservation copy and the resource for whatever means of reproduction are chosen in the distant future.

Advances over the last few decades in materials, production techniques, and storage for microfilm have imparted a life expectancy of centuries to modern preservation microforms.

Having been brought up, so to speak, in the context of a range of traditional photographic processes, we anticipate that our greatest professional satisfaction will be derived from making beautiful images from beautiful objects, and duplicating flawed old newspaper films, made elsewhere, may seem little more than a thankless salvage operation, in spite of any care and expertise we may bring to it. On the contrary, the preservation role filled by this activity is of the utmost importance to us: the newsprint itself (where available) and the old acetate films are slowly but surely deteriorating.

Moreover, there is considerable doubt as to the longevity, authenticity and future accessibility of records in electronic form. And so we can think of no better way to spend our efforts in the interests of posterity, if such a grand term may be used here.

We are very pleased to have a small part in the effort to make these early California newspapers available online. It is not because we are Luddites, troglodytes, or technophobes that we persist with our now-old-fashioned processes, but rather because we recognize their unique advantages and ongoing value for preservation and access.

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