9

Identification of archive film and interpretation of historical data

9.1 INTRODUCTION

The identification of a reel of film is for two purposes:

- To identify the film title, actors and/or events, period, and the context in which the film was made. The evidence will be principally from the images, and from additional written matter on the film itself.
- To provide the restoring technician with information to produce an authentic restoration. This evidence will be from the images also, but in addition, from the film itself, from the gauge, sprocket holes, edgemarks, dyes, soundtracks and many other characters.

The two aspects above are related and date is usually critical. If the film is not dated the period may be estimated from the photographic material, the element. Identifying a colour process can sometimes date a film within a few years. Alternatively, recognizing an actor, or a theatre billboard in the image, may provide a date and help the technician decide how the film was made, and therefore how to restore it. The most difficult and ever-present problem that a film archive has to face every day is that of identifying materials that are either completely without opening credits or have them only incompletely.

At the end of the 1980s the Dutch National Archive took possession of an immense collection of about 2,000 titles that had been collected by a distributor in the early 1920s. They were mostly films without opening credits, or, at best, with credits translated into Dutch. The archive decided to tackle the work of identifying the huge collection over a period of several years and now almost the entire stock has been identified.

From that collection several masterpieces from cinema history, that had been forgotten or thought to have been lost, have come to light. The effort of the Nederlands Filmmuseum is a good demonstration of how working on collections of unidentified film means giving value to material that otherwise risks being forgotten. For example, let us imagine that an American archive has a French film stored away, important because it is believed lost, but its original title cannot be identified: that film is doomed, sooner or later, to decay and to die without anyone being able to intervene.

Identification demands a lot of experience. All the operations that are now being presented schematically eventually will become a daily working method. Eventually repetition provides the knowledge necessary to allow a worker to simplify and modify routines.

Identifying a film proceeds by a process of elimination.

9.2 THE NEW ACQUISITION

9.2.1 Before opening the can

Before anything else, you must try to ascertain where the film comes from. Look at the can label. If, for example, it has been deposited by a distributor that was active up

until the 1930s, it is almost certain to be a film produced in that period. A careful study of the source of the material simplifies the work of identifying it. Check the number of reels of that particular film and, of course, start with the first one, if possible. Sometimes the can label has no relationship to the film inside.

9.2.2 Opening the can

Normally it is the practice of film archives to substitute rusty old cans with new ones, either in plastic or metal, in order to better conserve the treasure. While this important step is being carried out, it is necessary to meticulously register any and all information that might otherwise be lost forever.

9.2.3 Taking the film out the can

First look at the edges of the film. From this first observation you can see if the film is black and white, colour or coloured (the different tintings show clearly on the border of a coloured film) and therefore already start to calculate an approximate date as to the decade. You will know that an Eastman Colour film can only have been produced after 1950 and that a tinted film base will have been produced before 1930. Of course, in order to analyse the technical information contained in a film you will have to begin to unwind the reel and observe the film frame by frame through some form of simple projector. This initial dating of the film as to its decade will help you to better select the information that you have to look for.

Observing the edges of the film, you will see immediately if the film can be unwound, or if it might be damaged in doing so. If it is a nitrate based film and it is already in an advanced state of decay, swellings on the edges of the film, can be seen, or whitish or powdery discoloration.

Looking at the edge of the reel, you may also see immediately whether the perforations are damaged or not. In the event that there is much damage, you may also find small holes along the edges corresponding to the tracks of the lost perforations. Every piece of evidence should be recorded

Now the film can be unwound, very slowly.

9.2.4 Unwinding film

Sound films almost always have leaders. When they are the original negatives, they can carry the title of the film, the reel number, the name of the producer or the distributor and the name of the laboratory. For example, films, even prints, from the ex-communist countries usually had leaders that permitted the immediate identification of the country where it was produced. On the leaders, the laboratories in the United States, France, the United Kingdom and Germany usually put instructions for the projectionist in the different national languages.

On sound film leaders there could be instructions for synchronizing the film with the records that accompanied it.

If it is a silent film, it usually will not have any original leaders, but ones that have been added later. It is possible that on these leaders a title has been written by hand that corresponds to that of the film.

9.3 THE IMAGE AS EVIDENCE

9.3.1 First impressions

Often after the leaders there may be several metres of a film that has nothing to do with the rest of the roll. It was quite usual for collectors or newsreel companies to use pieces of spare positive film as leaders, spliced onto the real film. In England this was called **gash** film, and the practice was particularly common with newsfilm.

If it is a silent film where sound has been added later (sometimes called post-synchronized) image area will have been reduced by the soundtrack that has eliminated the corners and part of the frame. Normally, to add sound to a silent film a very simple soundtrack was used that contained music, sounds and rarely dialogue. However, many studios continued using cameras with the silent film frame order until the early 1930s, so that these films have 1:1.33 frames interrupted by the soundtrack even though they have been shot in the sound era.

If the reel is from the head and it is the first reel, after the leaders you might find the credits; the film, the director, the studio etc. It may be that only some of the original opening

credits remain and that the title of the film itself is missing. Even then, sometimes only the name of an actor can be enough useful information to make a comparison with that in the filmographies. There are sufficiently complete filmography files for all the major national studios (at least for feature films) to permit the identification of a film's title even with only a few pieces of information.

9.3.2 Silent movies – intertitles

Very often the name of either the producer or the distributor is carried in the text of the intertitle. Knowing the name of the producer of the film is extremely important because this reveals its origin; information about the many distributors is less well recorded.

The intertitles normally contain either one or two series of numbers. If there is only one then it refers to the sequence of the intertitles. If the first one carries the number 30 then it is obvious that you are not looking at the first reel. This type of information is very useful in understanding the completeness of the material under study.

If there are two clearly separate numbers then probably one changes while the other remains the same. The unchanging number is the production number, while the other is the intertitle sequence number mentioned above. The production number may be on the intertitle, and there may be the company name as well. Alternatively the number refers to the distribution, but with the name of the distributor written at the side. The production number is useful in identifying a film, if the production company's catalogue is available.

9.3.3 Writing

There is usually at least one legible piece of writing as image in a reel of film: the name on a store window, the title of a newspaper, the name of a street, the advertising on a streetcar, etc. These are original to the shoot. The language in which they are written may tell us the country of origin.

9.3.4 Actors

A decisive element in identifying an untitled film is the recognition of the actors. If you can recognize an actor you have a good chance of finding the original title of the film. The actor may define the country and the period, and the filmographies should provide the rest.

By observing the hairstyles, clothing, automobiles etc., it is possible to acquire circumstantial evidence.

9.3.5 International collaboration

In general, someone, somewhere, will recognize an actor or provide the data that provides the lead. In 1993, the Cineteca of Bologna became the European Centre for the Search for Lost Films Project, proposed by LUMIERE in order to compile a list of films that the EU film archives consider lost, and help archives to identifying their patrimony.

9.4 THE FILM AS EVIDENCE

The film itself may be of great importance to the archivist – it may date the production or just date the print. Evidence will come from a wide range of different fragments of information:

- The film base
- The gauge
- Perforations
- Image size and ratio
- Edge data
- Number and frequency of joins
- The colour system/black and white process/tinted/toned/stencil etc.
- The element, negative/positive/duplicate/reversal/separation/colour/sound etc.

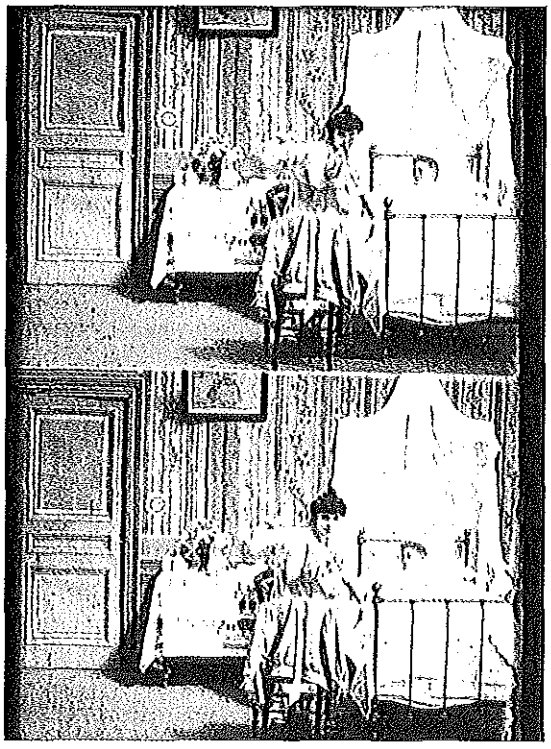
Since the very beginnings of motion picture film, it is believed there have been over 100 commercial colour systems, over 40 sound systems, at least 2,000 film laboratories worldwide, an unknown number of different film manufacturers and stocks and 100 years of innovations. A full list of all the pieces of evidence that could be useful is not possible and, indeed, does not exist. By definition, it also implies that certain identification is often not possible. In turn that means that truly authentic restorations are also not always possible. The FIAF/Gamma Group Madrid Project is a programme, started in 1999, to gather this information.


DER GERICHTSARZT
WEISS VON
DER TRUNKSUCHT DES VATERS
NICHTS UND HÄLT ROBERT
FÜR SEINE UNTAT FÜR
VERANTWURTLICH.
23.
"ECLAIR"

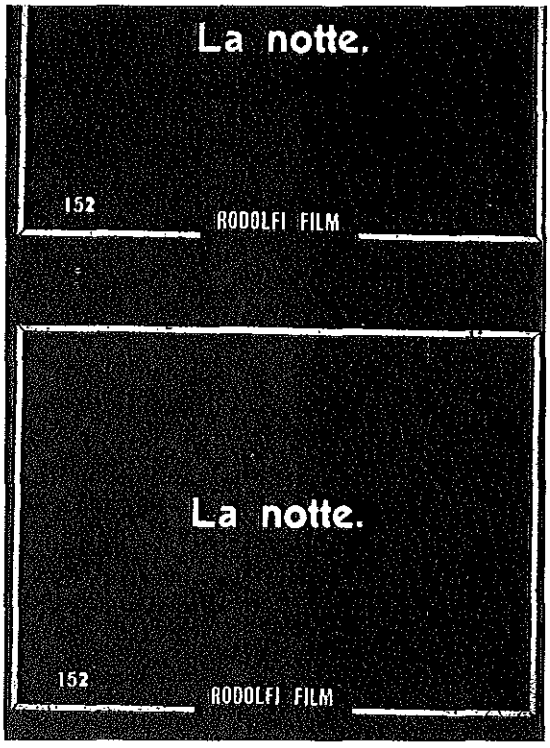
(*a*)


MOSES LEIDET UNTER
ALLEN, DEN HEBRÄERN,
SEINEN BRÜDERN,
AUFERLEGTEN UEBELN.

(*b*)



(*c*)

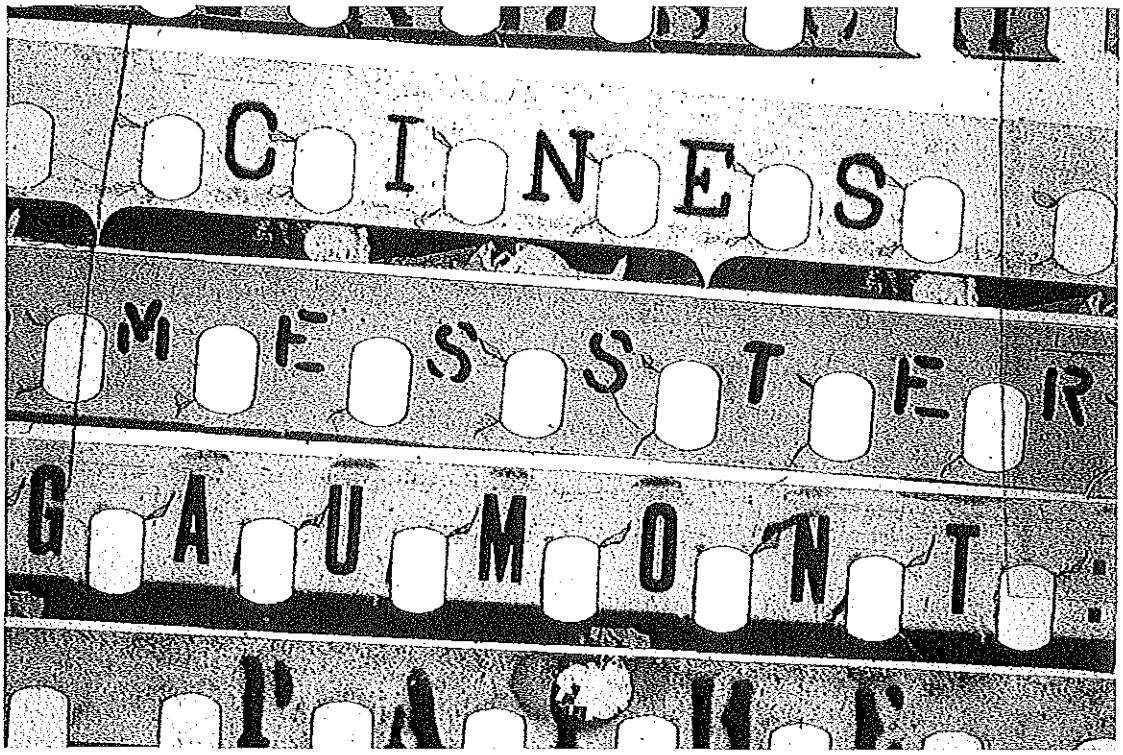

La notte.
152
RODOLFI FILM
La notte.
152
RODOLFI FILM

(*d*)

(*e*)

(*f*)

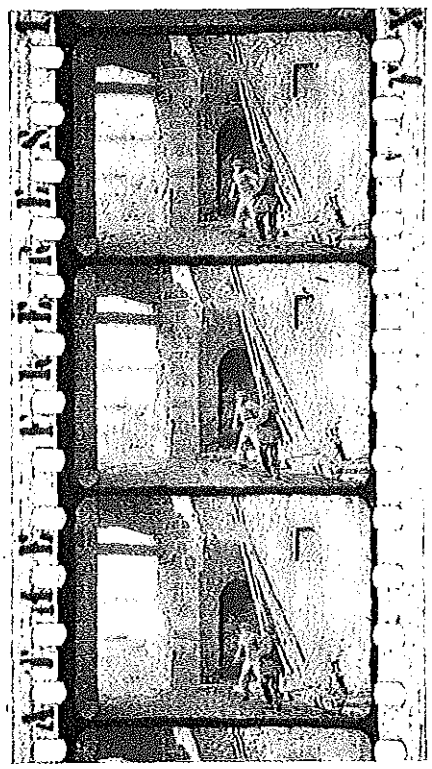
Figure 9.1 (*a*) Éclair intertitle; (*b*) Vitagraph intertitle; (*c*) clues to date in image; (*d*) intertitle with production company mark and intertitle number; (*e*) clue to date in image; (*f*) intertitle and company marks


CINES
MESSTER
GAUMONT

(*a*)

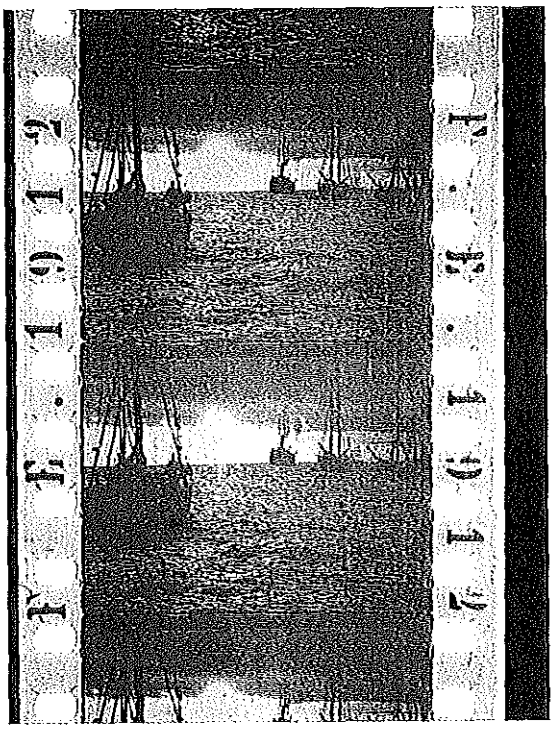

VITAGRAPH
Ed infatuandosi sempre
più, egli le racconta
fantastiche storie di
briganti.....

(*b*)

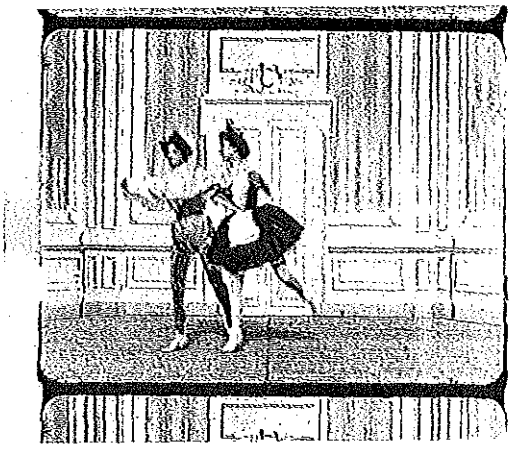


(*c*)

(*d*)



(*e*)



(*f*)

Figure 9.2 (*a*) A range of manufacturers edge marks: notice variation in perforations. (*b*) Italian Vitagraph intertitle on Kodak film made in 1924: more rectangular perforations. (*c*) Pathé edge marks. (*d*) Ambrosio edge marks. (*e*) Possible date code on edge 'barrel' perforation. (*f*) Lumière perforation

Many sources of technical data exist – nowhere near as complete as the data on cinema production, or on the content of newsfilms collections. The data is fragmentary, sometimes second- or third-hand and often difficult to locate. The bibliography to this publication contains as complete a list of references on films, manufacturers, laboratory practices and colour systems as possible. Unfortunately in many cases these publications are few and well scattered, and many archives and restorers will find access to them difficult.

9.4.1 Gauges, perforations and image ratios

In its almost 100-year history, the cinema has seen the appearance (and rapid disappearance) of a large number of film widths, differing in dimensions, images and the number of perforations. Most of these gauges are obsolete today and the equipment for preparing them or projecting them no longer exists. Some film archives have large collections of films in non-standard gauges.

The two principle gauges now used in professional cinematography are 16 mm and 35 mm. The form and dimensions of the perforations were standardized in the 1930s for both the gauges.

Perforations are a useful guide to date for the earliest films but after the 1930s the two 35 mm and one 16 mm standards prevailed, and in reality by 1920 the perforation type is really of little help in dating, except in a few specialist systems.

Images vary in ratio on the 35 mm or 16 mm film and these two may provide clues.

9.4.2 Edge data

There are three types of information to look for:

- special identification marks put on the copies by the production company;
- special identification marks of the raw stock manufacturers;
- special frame numbering sequences, on negative film and some prints, put there by the laboratory.

Special identification marks put on the prints by the production company

In the first 20 years of cinema history the main studios had very precise marks for their products. This discouraged copying – one of the first anti-piracy methods – and served as a recognizable symbol for buyers. The cinema was in its beginnings and every studio had established special techniques that were guarded jealously. Therefore their films contain a series of signs that often help in discovering the producer.

The bible of these early edge marks is Harold Brown's *Physical Characteristics of Early Films* (1990), published by FIAF.

Special identification marks of the raw stock manufacturer

While special marks made by the film producers on the film margins disappeared almost completely by 1920, those of the raw stock manufacturers are still in use today.

It has for many years been the custom of film stock manufacturers to produce a latent image of their names and often other marks on the edge, beyond the 35 mm perforations, of their films. These are processed as images during development. Some edge marks are stencilled letters not latent images. These marks are sometimes very faint, and if the printer exposes the entire width sometimes the edge marks from previous elements can be printed through to the print film and need to be looked for.

Example of film edge data – Kodak

The practice appears to have commenced in 1913 with the Eastman Kodak Company, who then printed the word 'EASTMAN' in large stencilled letters on one margin. This style was continued until about the middle of 1914 when the lettering was changed to a smaller style, and a dash was included two or three frames from the name. This continued throughout 1915. In the early part of 1916 the films had two small dots in place of the dash.

During 1916 the Eastman Kodak Company began a systematic series of the year symbols on their film stocks made in Rochester, USA, in a manner somewhat like the hallmarking of silver. A comparable series of marks on stock made at Harrow, in the UK, was begun in 1917. Stock made by Kodak in Canada from 1925 onward used another similar series of

THIS IS A DATE CODE CHART FOR EASTMAN KODAK MOTION PICTURE FILM. READ THE SYMBOLS ON THE EDGE MARKINGS OF THE FILM FROM LEFT TO RIGHT, AND COMPARE TO THE CHART. THIS WILL TELL YOU WHEN THE FILM WAS MANUFACTURED AND WHERE. WHITE PRINTING TELLS YOU INFORMATION ABOUT THE NEGATIVE, AND BLACK PRINTING TELLS YOU INFORMATION ABOUT THE POSITIVE PRINT. EXAMPLE: THE BLACK PRINTING READING LEFT TO RIGHT ON A PRINT OF "THE PRODUCERS" IS " + + ". THE CHART TELLS US THAT THIS IS A PRINT STRUCK IN 1968, WHICH INDEED IS WHEN THE FILM WAS RELEASED.

FOR FUJI FILM, THERE IS A 4 DIGIT CODE ON THE PERFORATIONS. THE FIRST 2 NUMBERS ARE THE YEAR THE FILM WAS MANUFACTURED. FOR EXAMPLE "8 3 J M" IS A PRINT MANUFACTURED IN 1983.

EASTMAN KODAK DATE CODE CHART

1922	1942	1962	● ■	1982	● ■	X
1923	1943	1963	● ▲	1983	X ▲	X
1924	1944	1964	▲ ■	1984	▲ ■	▲
1925	1945	1965	■ ●	1985	■ ●	▲
1926	1946	1966	▲ ●	1986	▲ ●	▲
1927	1947	1967	■ ▲	1987	■ ▲	▲
1928	1948	1968	+ +	1988	+ +	▲
1929	1949	1969	+	1989	X +	▲
1930	1950	1970	▲ +	1990	▲ +	▲
1931	1951	1971	● +	1991	X +	X
1932	1952	1972	■ +	1992	■ +	▲
1933	1953	1973	+ ▲	1993	+ ▲	▲
1934	1954	1974	+ ●	1994	+ ●	▲
1935	1955	1975	+ ■	1995	+ ■	▲
1936	1956	1976	●	1996	X ●	▲
1937	1957	1977	■	1997	X ■	▲
1938	1958	1978	▲	1998	X ▲	▲
1939	1959	1979	● ●	1999	● X	▲
1940	1960	1980	■ ■	2000	■ ■	▲
1941	1961	1981	▲ ▲	2001	▲ ▲	●

ONLY EXCEPTION 1948 CAN BE EITHER ++ OR ●●●

WHERE STOCK WAS MANUFACTURED

SAFETY – ROCHESTER
SAFETY – CANADA
SAFETY – ENGLAND
SAFETY – FRANCE

Figure 9.3 Recently produced flyer from Sabucat Productions, California, illustrating the Kodak date marks

marks. In the late 1940s this information was given by Kodak to the National Film Archive, in the UK – originally confidentially, but subsequently generally released.

No such marks were put on the stocks made by Kodak in France and Germany during the 1930s. French stock was marked simply 'Kodak France' and German stock, 'Kodak A.G.'.

In 1927 Kodak took control of the Pathé film stock factory in France. Thereafter, the Pathé stock was still marked with the name 'Pathé', but the Kodak UK symbols may be found on it as well.

The USA system of symbols repeats every 20 years, the UK system repeats every 19 years and the Canadian system every 11 years.

9.5 IDENTIFYING THE ELEMENT

9.5.1 Introduction

The term **element** is used here to define a stage in the sequence of production of a motion picture film. A camera negative, a projection print, a duplicate negative, a sound negative, a B roll cut negative are all elements and can all be elements of the same production. In English or American laboratories traditional jargon terms for each 'element', such as 'mute' for the camera negative and 'track' for the sound track are widely used, and the term element is not well known. **Element** is a useful general term and will be used here because there is no other equivalent.

Identifying the element can be very important in planning the sequence of events of a restoration. However, it is just as true that identifying the element may not be as quick or easy as it seems; a duplicate negative that has been carefully and well made can look very much like the original negative from which it is taken.

A useful technique is to look at the perforations of a film – sometimes it is possible to detect around them images of previous film perforations printed through by contact printing. As many as five images have been seen indicating the image is the sixth generation at least!

The following is survey of the main types of elements. Many of these, especially those that are used in the post-production phases (e.g. editing, mixing, synchronization, dubbing, titling, special effects etc.) rarely find their way into an archive. They are only used in the laboratory and, as soon as the work is finished, become useless and were usually lost or destroyed.

9.5.2 Positives

Projection prints are the most common material that is available to, or found in an archive, just as laboratories store the negatives and duplicates for their customers.

Subject → ORIGINAL NEGATIVE → POSITIVE PRINT

Both colour and black and white positive copies have a transparent base. Sound tracks

were variable density until about 1958, and variable area from 1935 to today. Magnetic tracks were in the usual track position, and even 'magoptical' tracks exist, in which part of the optical track is overlaid by a magnetic stripe applied after the film was processed (usually for an alternative language).

Most archive prints are **release prints**, that is, they were produced for display in a cinema and were one of many that were originally produced from the original negative until about 1925 but from duplicate negatives thereafter.

Prints with frequent joins at scene changes were 'pos cut' and were pre-1930; those in one piece were 'neg cut' and were from about 1925 to today.

More rarely the print will be an **Answer print** (or **first trial print**). This is, literally, the first graded copy printed from a cut negative; it was often thrown because it usually needed to be further corrected to satisfy the requirements of the producer. Answer prints in colour, especially those produced before the use of Video Colour Analysers in the laboratories, could be a far cry from the quality of the final copy. Originally they would be the first trial and error print made. The only way of identifying answer prints, if there isn't anything written on the can or at the end of the film, is to evaluate the quality, if possible by comparing it to another copy. However this may not always be helpful. Technicolor release prints could differ remarkably from each other, as the early systems were obviously not very repeatable. Some laboratories made 'answer prints' with no sound.

Even more rarely found is the **show print.** This was the final print made by the laboratory with all the grading corrections, and was often used for the first private shows, for premiers or as a selling medium. Most ended up with the producer or the director in their private collection!

Rushes (called **dailies** in the USA), are rolls of prints just as they were produced from the original negative as soon as possible after the shooting (and seen by the camera crew 'daily'). They vary in grading considerably. In the 1930s, and in the early days of negative/positive colour in the 1950s, they were often of poor quality. However, by the 1970s the quality was high. Rushes are rare in archives. They can usually be recognized if they are from a feature film production by being silent repetitions of the same scenes shot again and again.

Rushes were generally cut up and joined to produce an edited story called the **cutting copy**. This is usually very easily recognized. The rushes or specially requested new sections of print from the camera negative were (and still are today) joined, often simply by tape but before the 1960s by conventional splices, to put together the story of the final production by the editor. The positive prints are almost always written on (in pencil or crayon) to give special instructions to the negative cutter who will later join all the original negatives together to make the **original negative** element of the production. Sometimes lengths of white spacing, with written or coded explanations for special effects, are cut into the prints. These are sometimes much longer than the final film and were not intended to indicate the real length. Cutting copies are often very badly scratched and marked, even torn and dirty. They were always silent.

Once the editing phase is complete one has a **workprint**, a positive copy spliced with tape or glue, the result of the editor's work which serves as the basis for cutting the negative. Usually the quality of the workprint is quite bad, due both to the printing as well as to the fact that it is often scratched, dirty and torn. It can be useful in reconstructing the original editing. Sometimes a workprint was made crudely and cheaply from the cutting copy by printing onto reversal film.

Occasionally **rushes out-takes** are found. These are rush prints of scenes that were not used in the production and were frequently put back into the can in short lengths with or without rejoining.

9.5.3 The camera negative

This is easy to distinguish from a duplicate negative because it does not have any of the signs of having been produced by a printer. A step printer produces a darker or lighter frameline between the frames; a continuous printer produces a difference in density, sometimes very slight, between the exposed parts (the transparent frameline) and the

unexposed parts (for example, the borders and the edge areas between the perforations).

Original negatives have the following features:

- No border around the frame of any sort.
- The edge density between perforations is exactly the same as the density between the frame lines.
- No 'septum lines' of any sort – these are thin straight lines of density produced in a printer by masks and gate apertures of one sort or another not coinciding precisely and occur outside the frame area.
- If it is an edited negative it will have a splice between each shot.

It is almost always possible to identify non-edited material; these could be rushes that have not been edited yet. In this case it essential to know if the film has never been finished or if, on the contrary, it has been; then the non-edited material that you are identifying will most likely be rushes material that was never used and was termed **negative out-takes**.

Some laboratories use the term **'cuts and trims'** for cans of negative or rushes prints that have not been used in a production. It is not uncommon for producers to sell the cuts and trims to film stock shot libraries, after the editing is over, and cans containing several small rolls of scenes, original negatives and prints mixed up together in the same can will probably come from a commercial company such as this. This library material is often well used!

Sometimes cuts and trims are in loose rolls in which the individual lengths are not joined but simply interleaved in to make what is sometimes called a **'peeled roll'**. This is done by both editors with rush print out-takes, but also by negative cutting companies and laboratories during the negative cutting operation. A peeled roll of negatives is a good sign that the material is probably negative out-takes and has not been touched since the production was made.

9.5.4 Black and white duplicate negatives and internegatives

The other possibility, given that you have a negative, is that it is a duplicate negative of an original in black and white or in colour. In the preceding section you saw how an original negative can be distinguished from a duplicate. Duplicate negatives can either be combined, i.e. they contain both the scene and the soundtrack, or separated, in which case the soundtrack has been duplicated or re-mastered separately. Duplicate negatives have all the indications of being printed and:

- most frequently have negative perforations (BH type);
- often have a coloured base – blue, purple, lavender;
- frequently have sharp lower densities on the edges between the perforations;
- often have dark septum lines (see above);
- are usually denser than original negatives (this produces a better subjective quality), but this is not always a good guide;
- often have images of previous generation perforation around the perforations, but only if printed on certain printers;
- have no joins between scenes.

The last clue is the best, as the absence of a join between markedly different scenes is a sure sign that the element is a duplicate of original negatives that have been joined together.

Nowadays the quality of duplicates can be very good, especially if they have been made from dupe positives or interpositives made on special duplicating stocks. However, prior to 1926, when Kodak introduced the first film designed solely for duplicate negative production, the quality of the duplicates was not very good. They had a higher contrast than original negatives and a notable loss of definition.

In order to produce a duplicate or copy negative from an original negative the most common method used since the turn of the century is to print the negative to make a positive and print the positive to make a negative from this.

Subject
→ ORIGINAL NEGATIVE
→ PRINT
→ DUPLICATE NEGATIVE

Until about 1926 only two types of film stock were made, camera negative and projection print, although by varying the development time the contrast could be altered within certain

limits. If a copy negative was required, there seems to have been two ways of doing this.

1. To use the **projection print** as the master, and make a copy negative from it onto camera film. To do this and keep the contrast down was not easy and the resulting duplicate negative was often higher in contrast than the original negative.
2. To use two stages of camera film printing from the original negative. This could be used to produce quite good results from the very earliest times but was rarely done as the safelighting used to print onto camera film was darker and so printing was an awkward procedure.

Some film companies which needed large numbers of duplicate negatives continued to use a modified version of the first method but with quite acceptable lower contrasts until as late as the 1950s, in order to avoid purchasing the expensive duplicating stocks. They produced a **special low contrast print** (by underdeveloping normal print film) as an **interpositive**. Newsreel companies especially did this; they used duplicate negatives as a library of material for cutting into later issues without destroying the original programmes so that most newsreel issues consisted of a patchwork quilt of new negative and duplicate negative. A good example was the British Pathé Newsreel company.

The majority of duplicate negatives made after the early 1920s were made using specialized duplicating film stocks and by the mid 1920s most stock manufacturers made them. The sequence of stages was substantially the same as before but using the new low contrast blue-sensitive duplicating materials.

9.5.5 Black and white duplicate positives, interpositives or master positives

Subject
→ **ORIGINAL NEGATIVE**
→ **MASTER POSITIVE**
→ **DUPLICATE NEGATIVE**

Master positives used as duplicating stages can be recognized as such only after the early 1920s. Thereafter most master positives were intended for duplication only and did not have a dual function and were not acceptable as projection prints. Most had negative type (BH) perforations and were visually lower in contrast, with markedly low density blacks and sometimes grey or coloured bases. All three terms above are used in different laboratories but all refer to the same element.

9.5.6 Colour duplication elements

Prior to the introduction of tripack materials and colour development, the duplication stages of colour processes were difficult to identify without detailed knowledge of the process as a whole. However, Kodak started to introduce colour duplication materials in the 1950s, and recognizing colour intermediates after this is quite easy.

Initially and until today the most extensively used system uses Eastman Colour Intermediate film for both stages of duplication; for the preparation of the interpositive and the duplicate negative.

Subject
→ **ORIGINAL COLOUR NEGATIVE**
→ **INTERPOSITIVE**
→ **DUPLICATE NEGATIVE**

A colour duplicate negative is recognized by all the characteristics listed above for recognizing a black and white duplicate negative except that the base colour is orange due to the integral masking. A colour interpositive is unmistakable; it is a low contrast, low density positive with an orange suffusion due to the orange integral masking. The perforations of this material are always BH. 16 mm versions of this system do exist but are rare. Colour intermediate graininess and sharpness is not good enough for 16 mm.

Another system first introduced at the end of the 1960s uses a single stage and a reversal duplicating material also from Kodak called CRI or Eastman Colour Reversal Intermediate (CRI). This material was used until the early 1990s but is now almost obsolete as the new versions of Colour Intermediate improve in sharpness.

Subject
→ **ORIGINAL COLOUR NEGATIVE**
→ **REVERSAL INTERMEDIATE NEGATIVE**

This material is significantly finer in grain and sharpness than most intermediate materials but very critical to process. It is made in both 16 mm and 35 mm.

A CRI duplicate negative is immediately recognizable by the black reversal type surround to the image that includes the perforation areas.

9.5.7 Confusing terms used for intermediates

The labels on the outside of cans of black and white or colour intermediates or duplicating elements can be confusing and misleading. In the English-speaking world of the USA, England, Canada and Australia many different terms are used for duplicate negatives and intermediate positives. Not only are there national differences but also major differences between companies, especially the laboratory companies, some of whom have developed their own semi-technical jargon, particularly with respect to duplicating.

Some of the terms used are:

Intermediate – a general term that could refer to almost any stage in duplication that is not the original negative or a final print or simply mean that the film stock used is Eastman Colour Intermediate.

Internegative – a term used for an intermediate negative made from a positive. This could have been a positive print or a reversal original. In some laboratories it means a duplicate negative. Other laboratories use the term solely to mean Eastman Colour Internegative

- **Duplicate negative = dupe neg = intermediate negative = copy negative** – these terms are all synonyms.
- **Duplicate positive = interpositive = intermediate positive** – these terms are all synonyms.
- **Lavender** – originally lavender-coloured base B/W duplicating film from Eastman Kodak in the 1930s. Can refer to any duplicate negative.
- **Fine grain** – after the lavender film was discontinued until the present, a series of film stocks called Fine Grain Duplicating film have been released by Kodak for producing duplicate positives and negatives. Hence in many laboratories duplicate positives and duplicate negatives are called **fine grain pos** and **fine grain neg**. This slang usage has existed from the 1940s to the present day.

9.5.8 Other materials

Included among the film materials that might find their way into an archive are all the materials used in the production of titles, credits and special effects. These are negatives or positives destined to be passed through an optical printer and recombined in various ways so as to achieve the desired result. There are background or foreground images for credits, credits to be edited by superimposing, short sequences of intermediate materials incorporating simple effects such as fades dissolves wipes or other special transitions from scene to scene – a multitude of different elements.

If dealing with a silent film, you might find entire reels of positive intertitles that were inserted only at the time of editing the positives.

Some special effects involved quite elaborate intermediates but these can really only be identified by specialists in special effect production.

9.5.9 Colour separations on black and white stock

Colour separations were made for a number of different reasons:

1. Colour separation is a safe system for the preservation of colour negatives in a more permanent state than as dye images and these are recognizable by being three separate rolls of identical black and white positive images with differing tonal renderings. The positive images appear low contrast and high definition and with negative perforations.

   Generally these films have all the characteristics mentioned above, of duplication.
2. Negative separations in two or three separate rolls that have the characteristics of original negatives are usually camera originals. It is not always possible to identify for certain what colour system they were used for, since both bipack and

tripack camera systems were used to produce separations that were printed by a number of different methods.

3. Negative separations with the characteristics of duplicates (see above) can be from a wide range of origins. The commonest are separations made from a colour reversal original. For example, even as early as the late 1930s reversal Kodachrome was used as the original camera stock for a Technicolor print process.
4. In a few rare cases the separations were made on a single strip of film with the red, green and blue separation images in sequence, called **sequential frame separations**. Original negatives in this form will probably be animation film shot as single frames. Duplicates will be prints from these originals or may be from a wide range of less common systems.

All separations should be examined by a specialist in colour systems.

9.5.10 Reversal materials

Reversal materials are those film stocks processed to a positive image in one processing stage. Some films processed by reversal have negative images: for example, an image from a negative printed onto a reversal film will be a negative. Colour Reversal Intermediate is a stock designed for copying negatives in a single stage, but generally reversal films are either camera original materials or are for copying existing positives.

Recognizing reversal film is straightforward:' in a reversal film the parts **not** exposed by the light are dark (in other films they are clear). The unexposed parts of the film, for example the borders, the space between the perforations and the frameline itself, are dark, whereas in all other films they are transparent.

Reversal film was originally used for filming anything that did not require a negative in order to make a number of prints. Today black and white reversal is extremely uncommon and restricted to certain scientific use, but from the 1940s to about 1980 black and white reversal was widely used by colleges and small industrial film units. Colour reversal films are mostly non-professional or for specialized use, such as high speed photography or satellite recording, or are special high speed, fast process stocks for television news and current affairs. Over the past few years this use has diminished rapidly in favour of electronic news-gathering techniques or colour negative.

9.5.11 Colour reversal print systems

Several manufacturers made low contrast reversal camera original films which were designed to be printed. The camera original film was never projected but was treated as a printing master (just like a negative). The lower contrast of the camera stock resulted in a better exposure latitude than projection contrast films. All these were colour systems and a good example in use for over 30 years was the Ektachrome Commercial system from Kodak. Gevaert had a similar system.

9.5.12 'Direct' positives (and negatives)

For printing purposes, but especially for producing positive copies from work copies during editing, when cost is important and quality not important, several other film materials exist (or existed) to produce a 'direct' positive without using the complex reversal process. Sometimes a low quality duplicate negative was (and still is) made by this process. Most of these elements will appear to be reversal images with black areas outside the image. Some of these materials had quite bizarre chemistry and were not silver salt based technology at all. A notable system with a short but erratic life was MetroKalvar, in which the image consisted of bubbles of gas in the film matrix! The more conventional 'diapositive', or 'direct' materials on the market today are all silver based and use a simple negative type film process to yield a low quality and often low density image. These direct film stocks were probably first introduced in the 1960s.

The process, in graphic English laboratory jargon, results in a '**slash**' print, or '**slash**' dupe. 'Slash' is also used by some laboratories to mean any cheap and cheerful print of dubious quality. For readers less familiar with English slang, 'slash' has a host of meanings, all derogatory and some vulgar!

9.6 SOUND ELEMENTS

9.6.1 Identifying different types of print soundtrack

Sound is present on positive projection prints as an optical track, as a magnetic track, or even as a combination. In order to reach this 'combined' state sound has almost always been recorded as a separate element, edited and transformed into the required format and only combined at the last printing stages. Sound elements most likely to be discovered include magnetic originals, magnetic edited versions, optical sound negatives or optical sound positives.

In some cases, in order to produce a 35 mm soundtrack at lower cost, a 17.5 mm wide film was used, which is a 35 mm slit in two lengthways; so it has only one line of perforations, exactly identical to those of the 35 mm negatives.

Details of sound tracks are to be found in the chapter on sound restoration and in Part 1.

Magnetic sound track made its appearance in distribution copies with the advent of CinemaScope in 1955, introduced by Fox with the film *The Robe*. CinemaScope not only used an anamorphic lens to project the picture onto a wide screen, but provided stereophonic sound as well. This was made possible by the placing of four magnetic tracks across the film. Since they were completely separate, each one provided sound to different speakers that were strategically placed in the cinema hall. (The disadvantages of magnetic sound were mainly connected with the fact that the four tracks were applied or 'glued' onto the film after its printing and developing and then had to be recorded, which significantly lengthened, complicated and increased the cost of the film laboratory work.) Tracks tended to become unglued, demagnetized and, with use and the passing of time, lose the metallic layer of the track. Finally, not all cinema halls were ever re-equipped to handle magnetic sound, so copies were distributed that had both a single combined optical sound track as well as the four magnetic tracks. Slowly, the four magnetic tracks disappeared.

Stereophonic sound has returned to the cinema with the modern Dolby system, which used an optical sound track. A Dolby stereo copy can be identified only by looking very carefully at the sound track. It can be seen that the four tracks are not absolutely identical, as they would be in a mono sound track.

Magnetic sound on film returned to be very successful from 1966 until the late 1980s when magnetic sound tracks were applied to 16 mm reversal colour film used for news and current affairs. This was applied after slitting the raw film. Kodak's Ektachrome EF and VNF films were the most widely used.

Some 16 mm prints made with double bilateral tracks have, in the past, been 'post striped' with a narrow magnetic track covering one of the track images. This can then carry a different sound track from the optical. This system was used for two languages by several training film companies and by inflight movie companies during the 1970s. These prints are sometimes called MAGOPT prints.

9.6.2 Identifying sound-only elements

Separate sound elements are easily distinguished from picture elements – they are either magnetic tracks or have optical track images and no images. Some 35 mm, 16 mm and 17.5 mm was perforated and coated entirely with magnetic coating. Most 35 mm and 17.5 mm film was perforated and striped in the regions of use rather than all over and appears as clear film with linear stripes of coating.

A sound negative film element has a negative sound track in the sound position. The central area of the track will be low density, and the outer areas high density. The base is usually coloured or grey. If there are many blooped joins this could be an early original negative (pre-1953 approx.). If it has many scene changes and no joins this is a final track, probably made from a magnetic master if after 1953.

A positive film track on clear film with no picture and a high density image is probably a pre-1953 editor's work track (or a mistake by a laboratory that forgot to expose the picture!). Labels on cans are often very important in estimating what sort of sound a can contains and a lot of local laboratory terms have been used. Some useful ones to know (in English) are:

- **M+E** Music and effects – usually a track of all the mixed sound excluding the dialogue.
- **Mute** Not what one might expect. This refers to a picture negative for which there *is* a sound track roll.
- **Track** The sound track roll that goes with a mute.
- **Silent** This means there is not a track to go with this picture.
- **Sync** followed by an instruction: **Level** or **24 frame** etc. This indicates how a sync mark on the picture negative leader relates to a similar mark on a track roll leader, to assist an operator to get the two elements in sync. The presence of these instructions on a negative can, or the presence of the sync marks themselves, usually a big crayon X or S, or a hole punched in the negative leader, indicates that somewhere there is a sound element.