



Fig. 8-1

The root apices of the premolars and molars are "cut off" because the film was placed too close to the teeth in the maxillary arch when using the paralleling technique



Fig. 8-2

Radiograph of the mandibular molar region does not show all of the specific region on the film. The third molar has been "cut off". The film needs to be placed farther posteriorly



Fig. 8-3

High film density. The dark radiograph is due to an error either in exposure factors or in processing factors or in patient characteristics. (1) Exposure errors include high mA, high kVp, high exposure time, or short source-film distance. (2) Processing errors include fogged film; high developing temperature; films left in developer for longer than usual time; depleted, contaminated or exhausted solutions. (3) Patient characteristics include x-raying edentulous, pediatric, or small face patients without a corresponding reduction in any one of the exposure factors (mA, kVp

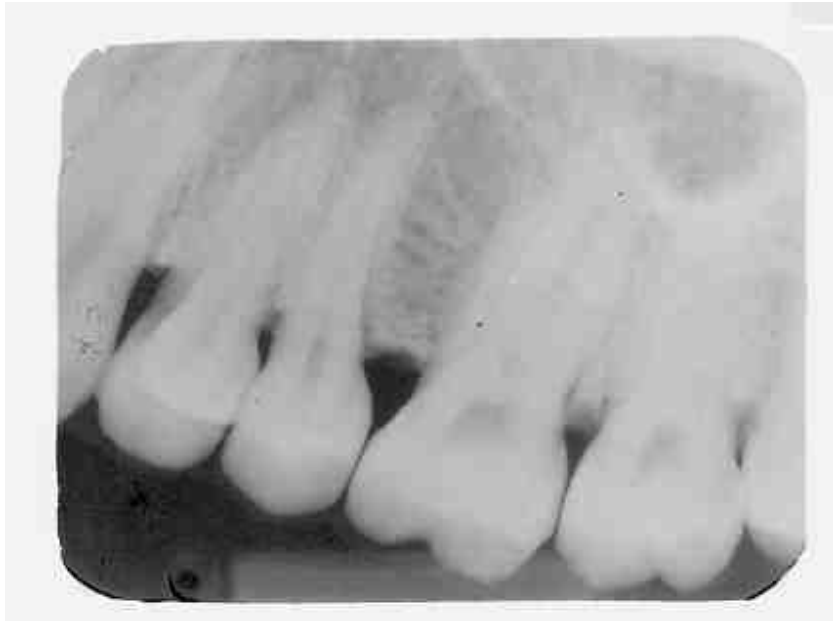


Fig. 8-4

Low film density. The light radiograph is due to an error either in exposure factors or in processing factors or in patient characteristics. (1) Exposure errors include low mA, low kVp, low exposure time, or long source-film distance. (2) Processing errors include low developing temperature, films left in developer for shorter than usual time, dilute solutions, or films left in fixer for an extended period of time. (3) Patient characteristics include x-raying big face or dense bone patients without a corresponding increase in any one of the exposure factors (mA, kVp, or time). (Low film density due to herringbone, tire-track, or honeycomb effect is discussed separately because of its characteristic radiographic appearance).



Fig. 8-5

Incorrect vertical angulation produces shape distortion in bisecting the angle technique: (left) foreshortening due to overangulation, that is, increased vertical angulation of cone (PID) in relation to the occlusal plane; (center) correct length of teeth without any distortion; (right) elongation due to underangulation, that is, decreased vertical angulation in relation to the occlusal plane.



Fig. 8-6

Foreshortening of maxillary teeth due to increased positive vertical angulation (overangulation) of cone (PID) in bisecting the angle technique. For mandibular teeth, foreshortening would be due to increased negative vertical angulation in relation to the occlusal plane.



Fig. 8-7

Elongation of maxillary teeth due to decreased positive vertical angulation (under-angulation) of cone (PID) in bisecting the angle technique. For mandibular teeth, elongation would be due to decreased negative vertical angulation in relation to the occlusal plane.

Fig. 8-8

Effect of changes in vertical angulation on mandibular teeth.



Fig. A

Foreshortening of posterior mandibular teeth due to increased negative vertical angulation. The lower border of the mandible is visible due to foreshortening.



Fig. B

Correct length of posterior mandibular teeth.



Fig. 8-9

Elongation of posterior teeth due to underangulation of x-ray cone in bisecting the angle technique. The apices of teeth are not visible because of the severity of shape distortion.



Fig. 8-10

Film curving. Shape distortion due to the curving of the film at time of exposure. The superior end of the film was inadvertently curved during patient x radiation. Notice the stretched-out (elongated) bone trabeculae superior to the root apices of the maxillary teeth.

Fig. 8-11

Changes in horizontal angulation.



Fig. A

Incorrect horizontal angulation results in overlapping of contact points of premolars.



Fig. B

Correct horizontal angulation results in visible contact points of premolars.

Fig. 8-12

Illusion produced by changes in horizontal angulation.

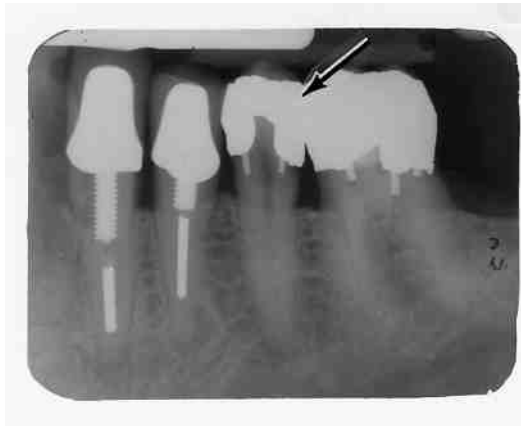


Fig. A

Illusion of a closed contact point between the second premolar and first molar due to incorrect horizontal angulation.



Fig. B

Open contact point visible when correct horizontal angulation is used.



Fig. 8-13

Cone-cut caused by improper alignment of circular cone (PID) with film packet. The cone of radiation did not cover the whole area of interest. The clear portion of the film was not exposed to x rays.



Fig. 8-14

Cone-cut caused by improper alignment of rectangular cone (PID) with film packet. The clear portion of the film was not exposed to x rays.



Fig. 8-15

Bent film. The black lines caused by creasing the film packet at the four corners produced breaks in the emulsion.



Fig. 8-16

Bent film. Film was accidentally crimped when inserting it into the slot of the bite-block. Similar small crescent shaped images have been erroneously interpreted by many authors as fingernail pressure marks. Clinically, it is difficult to produce fingernail pressure marks on a film.



Fig. 8-17

Blurred image due to movement of the film, patient, or tubehead.



Fig. 8-18

Double exposure.
The film was exposed
twice, resulting in a
double image.



Fig. 8-19

Double exposure.
The film was exposed
twice, resulting in a
double image.

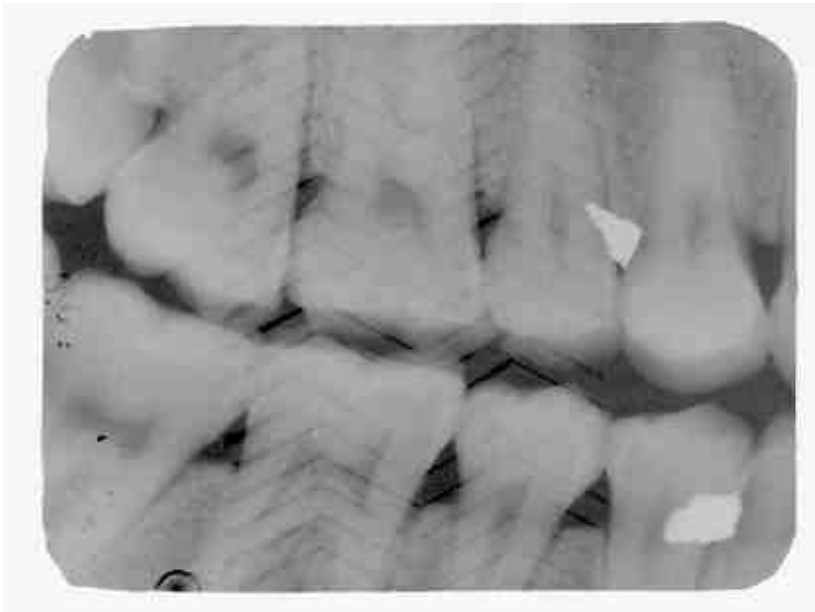


Fig. 8-20

Herringbone effect. The film was exposed from the nonexposure surface, that is, the printed back side of film faced the x-ray beam. The film is of low density (light) because the lead film-backing absorbed most of the x rays. Sometimes a honeycomb or tire-track effect may be seen.

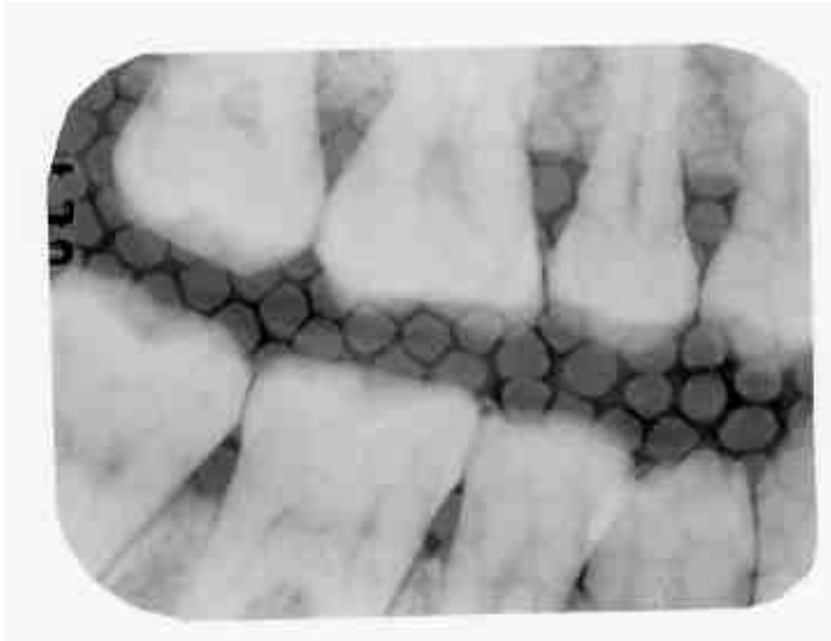


Fig. 8-21

Honeycomb effect. Cause is similar to that of the herringbone (or tire-track) effect. The film was exposed from the nonexposure surface. The film is of low density because the lead film-backing absorbed most of the x rays.



Fig. 8-22

The radiopaque images (arrows) are those of the maxillary posterior teeth of contralateral side. During exposure, the upper mesial corner of the film was erroneously placed occlusally to the contralateral maxillary posterior teeth.

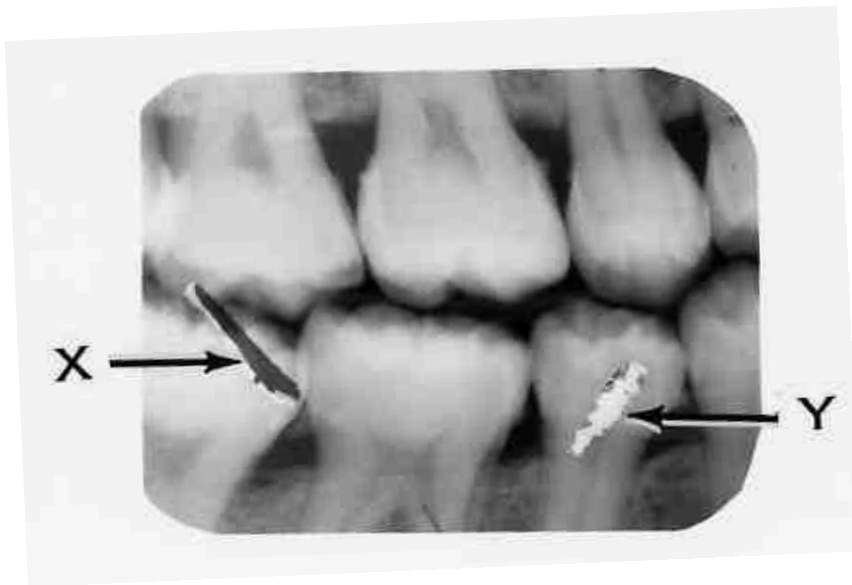
Fig. 8-23

Black protective paper stuck to film due to moisture contamination. Failure to blot film moistened with saliva results in the black protective paper (surrounding the film) to stick to the film emulsion. There is also slight cone-cut of the radiograph near the inferior border.



Fig. 8-24

The film packet was handled in the darkroom with fingers (gloves) contaminated with saliva. The black mark (X) is the moist black paper stuck to the film. The white clear mark (Y) is the emulsion torn away from the film.



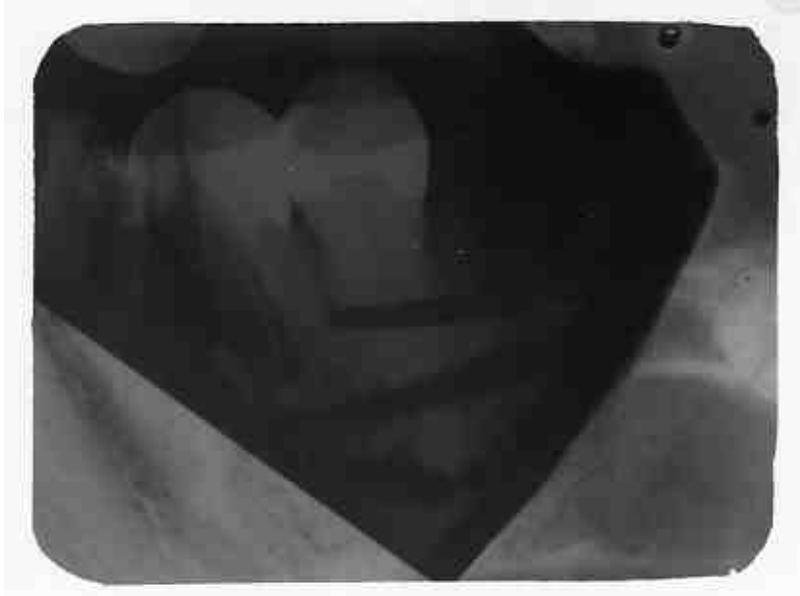
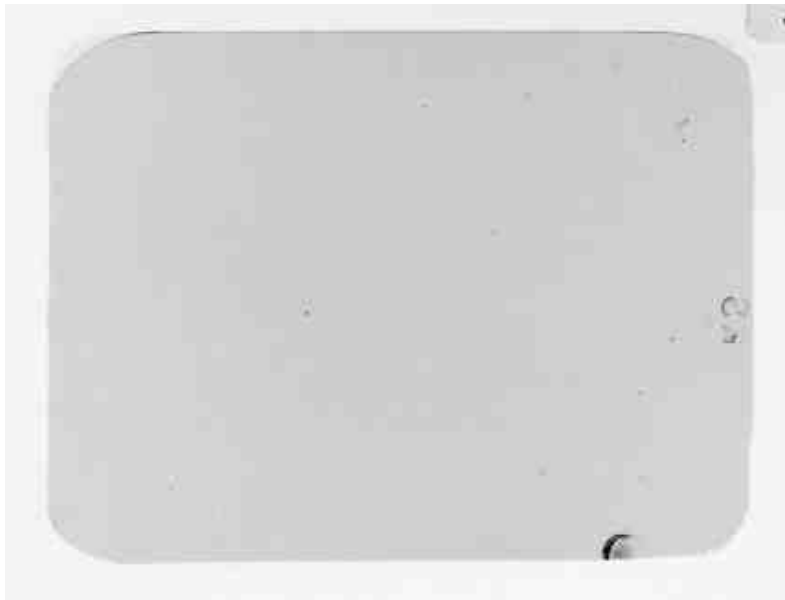


Fig. 8-25

Two films stuck
together in the
automatic processor.

Fig. 8-26

A clear film can result either 1) by processing an unexposed film, or 2) by placing an exposed or unexposed film first in the fixer (before placing it in the developer), or 3) by placing an exposed film in the developer and then leaving it in the fixer for several hours or days.



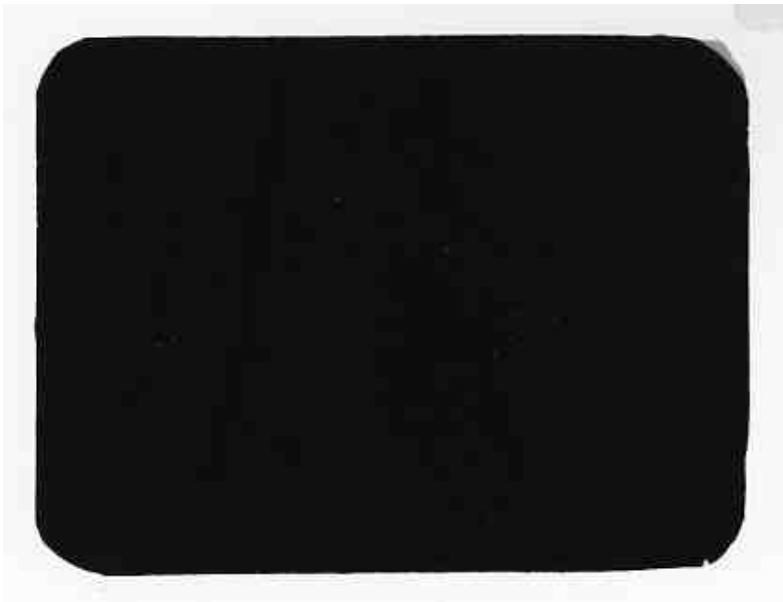


Fig. 8-27

Film exposed to light
(or x-rays) is
completely black after
processing.

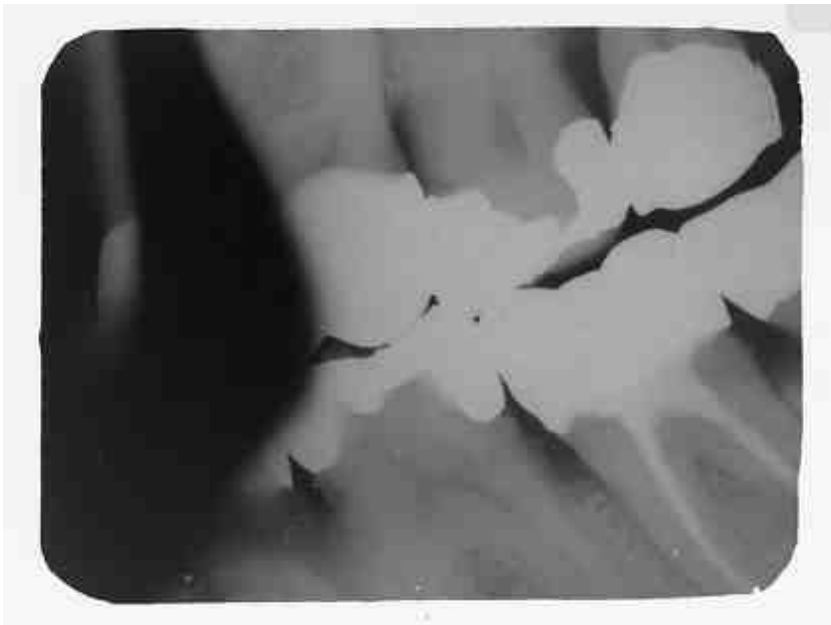


Fig. 8-28

Part of the film packet was accidentally opened in daylight and, therefore, became black.

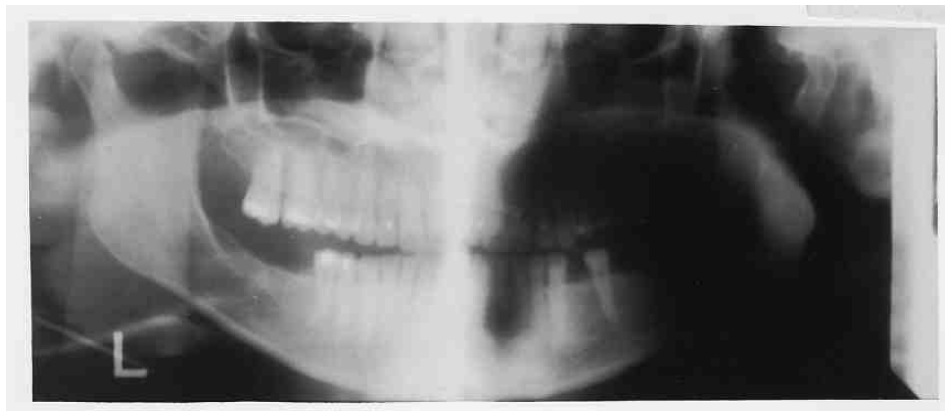


Fig. 8-29

Part of the film was exposed to light through a faulty cassette joint and, therefore, turned black.

Fig. 8-30

Reticulation (orange peel appearance) is caused by sudden extreme temperature changes in manual processing. For example, the developer temperature could be very high and the rinse water temperature could be very cold, the alternate swelling and shrinking of the film emulsion can cause reticulation. This artifact occurs mainly in manual processing; it has not been observed in automatic processing.



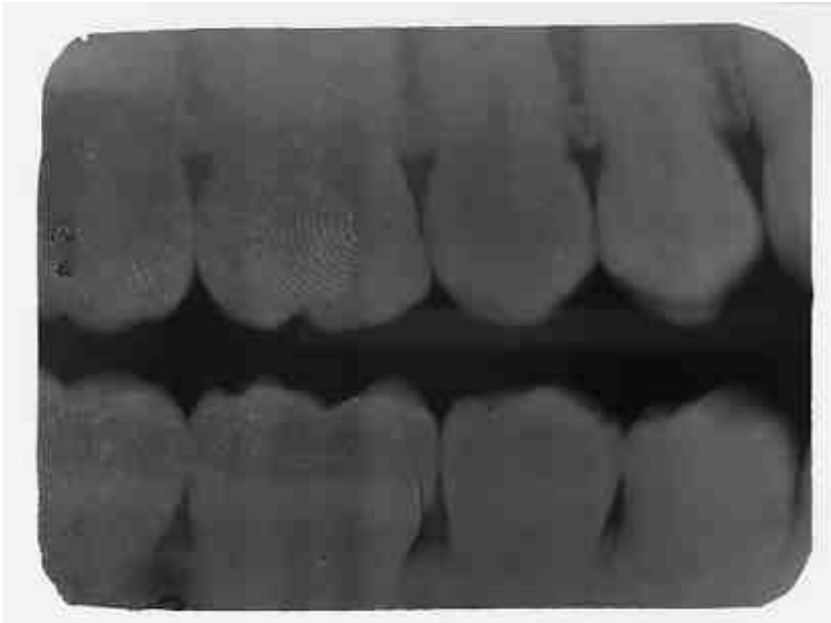


Fig. 8-31

Yellow or brown stains on film caused either by using exhausted or depleted processing solutions, or by insufficient washing of film. Operator's finger prints are also visible on this radiograph.



Fig. 8-32

Air bubbles clinging on film surfaces during manual processing prevent developer from reducing the emulsion beneath them. These air bubbles cause white spots on the film.

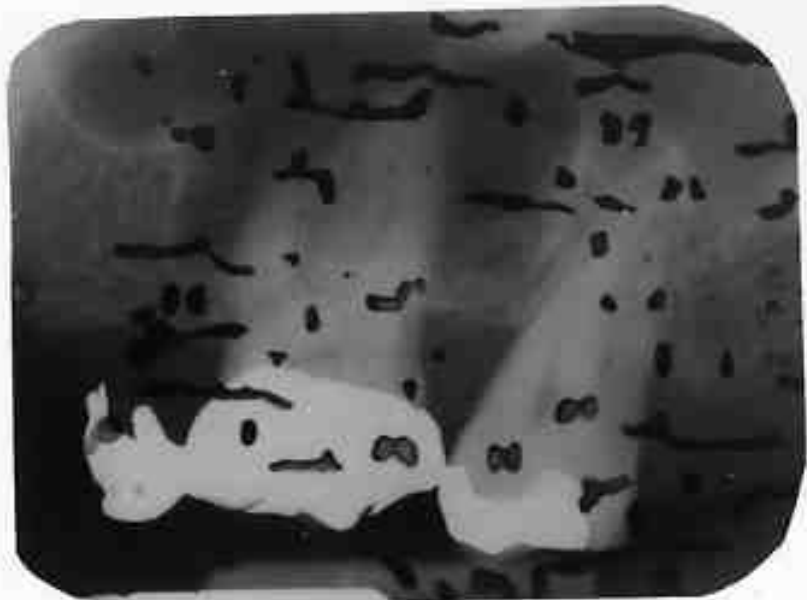


Fig. 8-33

Developer artifact.
Developer solution
splashed on the table-
top. Unwrapped films
were placed on the
chemically
contaminated table-
top before being
processed in the
automatic processor.



Fig. 8-34

Fixer artifact. Fixer solution accidentally splashed on the film before processing. The fixer cleared the undeveloped silver bromide crystals of the film emulsion.
(Courtesy, Eastman Kodak Co).

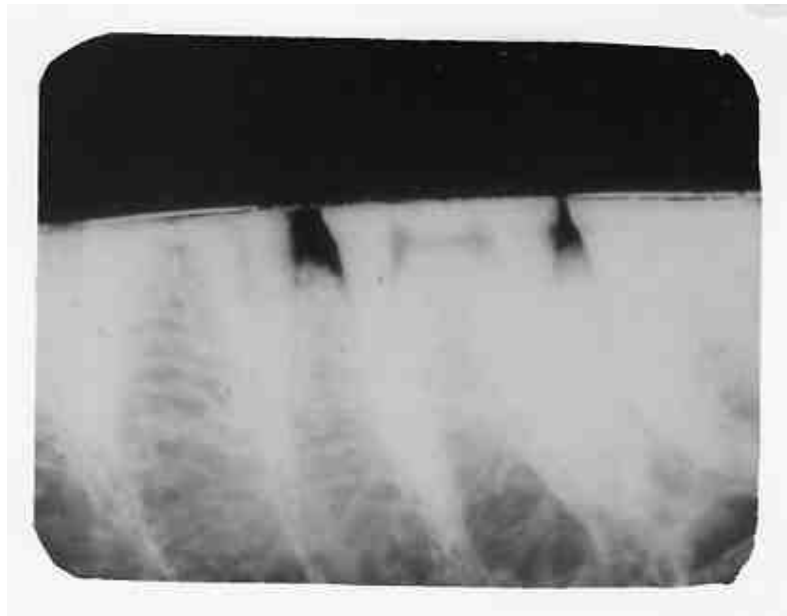


Fig. 8-35

In manual processing, the bottom portion of the film was immersed in the developer and then the complete film was immersed in the fixer. This same effect occurs if the level of the developer in the tank is low.

Fig. 8-36

In manual processing, if the top portion of the film is green, it means that only the bottom portion of the film was immersed in the developer and in the fixer.



If the top portion of the film is black, it means that the whole film was immersed in the developer but only the bottom portion was immersed in the fixer.

Fig. 8-37

Fogged film. The causes of film fog are:

1. Films used beyond the expiration date
2. Films stored at high temperature or high humidity
3. Films inadequately protected from scattered x-rays
4. Films processed at excessive time and/or temperature
5. Contaminated or exhausted solutions
6. Darkroom safelight too bright (high bulb wattage)
7. Wrong type of filter in safelight or cracked filter
8. Too long exposure to safelight
9. Light leaks in darkroom



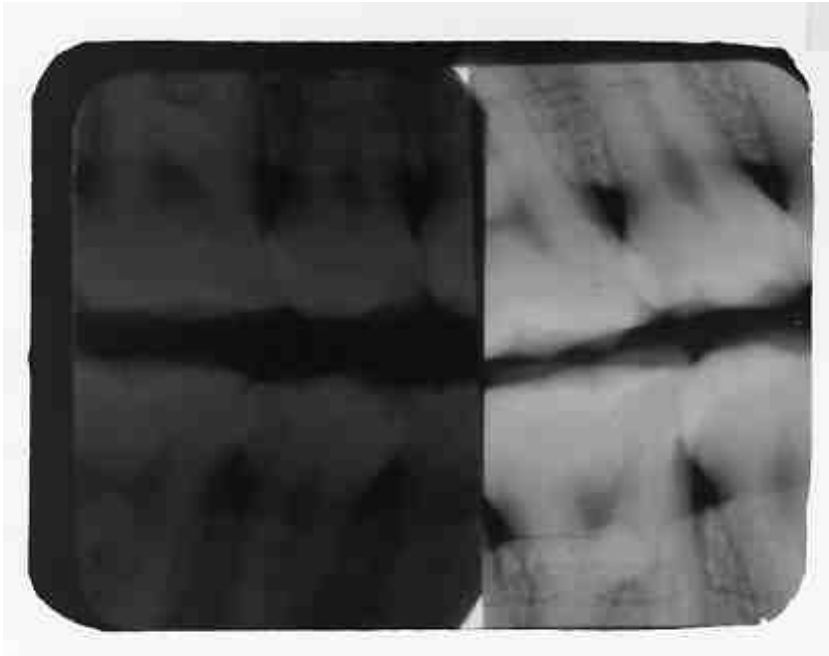


Fig. 8-38

Comparison of fogged
and unfogged films.

(Left) Fogged film;

(Right) Unfogged film.

Fig. 8-39

Coin test to determine darkroom light safety. In the darkroom, a coin was placed on an unexposed, unwrapped film and left for about two minutes before processing the film. Since the image of the coin is made visible by the surrounding fogged area, the darkroom is not light safe and should be checked for, 1) possible light leaks into the darkroom, 2) high wattage of light bulb in safelight, 3) wrong filter in safelight, 4) too short a distance between safelight and workbench, 5) cracked filter in safelight.

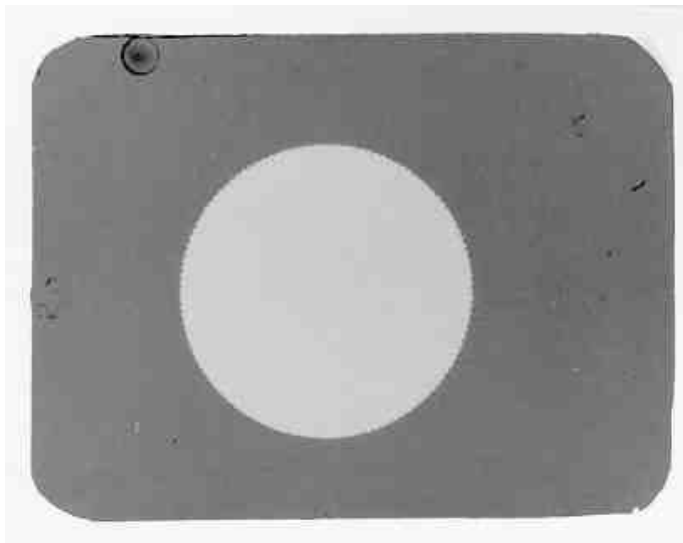




Fig. 8-40

Tree-like dark markings produced by a small charge of static electricity as shown on half a panoramic radiograph. Low humidity and dry film are contributing factors. Static electricity is generated by friction from rapid removal of film from its wrapper or from sliding film on the intensifying screen into the cassette.

Fig. 8-41

Two types of static electricity markings: (1) The smudge or star-like markings (on anterior teeth and left premolars), and (2) Tree-like markings (on right ramus). Although film friction is the most common cause for static electricity markings, sometimes protective latex gloves may be a source of static electricity and produce a black, smudge-like image on a radiograph.

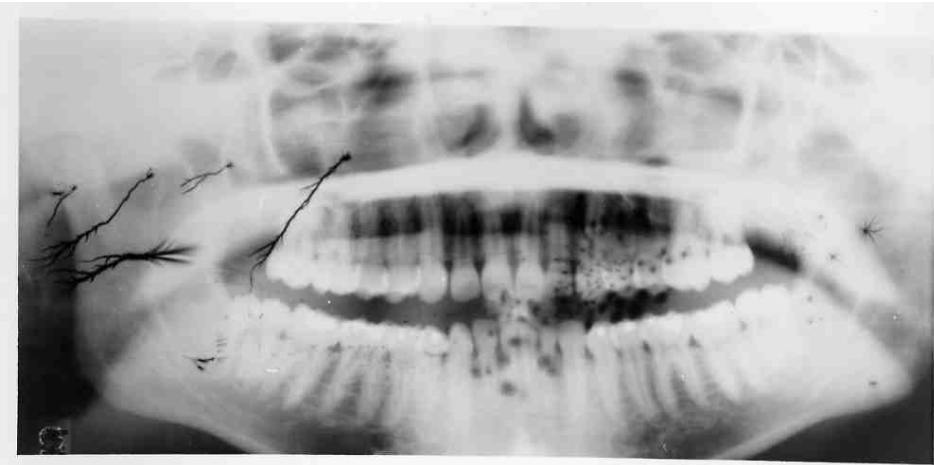




Fig. 8-42

Smudge or star-like
static electricity
markings.