

Again, there is little agreement among papermakers (on a world basis through time and space) with regard to defects in handmade sheets of paper. In certain countries at certain times, what was regarded as one of many defects, such as a papermaker's tear—a drop of water from the vatman's arm or hand that falls on a newly formed sheet making the paper thinner and more transparent in that place and creates a veritable "crater" that disturbed past manufacturers of handmade paper—is, in some circles today, deliberately brought about for its esthetic qualities.

"In all old paper, as well as in the handmade papers of the present day, there is a considerable variation in the thickness and finish, and in single books the leaves vary noticeably in weight.

"The tone of the old paper was

never entirely uniform, and, owing to the absence of chemicals in the manufacture, the grades of paper differed strikingly in colour." (Hunter, *History & Technology*, p. 224.)

On the other hand, with absolute justification, we probably are or should be concerned with flaws in our work (if we believe they are flaws); if we believe in the permanence of paper; if we give credence to our skills in multiplying perfect sheets to infinity; if we presume to produce papers with whatever properties are demanded of us; if we take pride in our craftsmanship and our capability to control the making of paper and not in being controlled by factors that, seemingly, may have been beyond the control of papermakers in the past. If, for example, we are faced with a heavy iron content in our water supply, if in preparing to beat

our stock or in adding dyes or fillers during beating our pH factor is 5 or below (indicative of an unacceptable acid content), we are in a position to correct any or all of these deficiencies and others. Or, we should be.

It is apparent, therefore, that there are users who demand and receive perfect, constant, beautiful papers that do what they expect beautiful papers to do. And, we have individuals, also involved in the process of papermaking, who seek out the "accident," search for the unusual, deliberately depart from tradition for esthetic considerations, use paper as a medium in its own right, and attempt to push beyond the very outer limits—if there are any—of the medium.

I salute both groups—for their similarities and their differences—and believe that papermaking can serve their several goals.

	PROBLEM	SOLUTION
AIR BELL	This may be a blister, a foam mark, or foam on the surface, caused by poor lifting or forming at the vat or imperfect drying felts.	Change your felts, and practice, practice, practice lifting at the vat to form a better sheet.
BACKMARK	A stain or slight ridge that may have been caused when a still-moist sheet of paper was hung over a rack or rope (not of horsehair).	Use any one of a number of ways of drying paper, including that of air-drying single sheets on racks or shelves of fabric, or in spurs of four or so, or between blotters and changing the position and the number from time to time.
BAGGY	As in a man's trousers at the knee: a sheet with a pushed-in center.	Repulp and reform the sheet.
BELLS—see AIR BELL		
BLACKENING	Dark area or areas on sheets caused by too much or uneven pressure when sheets are calendered, or resulting from excess moisture in the paper while it passes through the calender rolls.	Adjust pressure on rollers; allow paper to dry further before calendering; repulp the sheets.
BLANKET HAIRS	When couching on new or unbrushed felts or blankets, stray fibers may catch on the sheet and remain on the surface. If not noticed by the artist, these hairs could become troublesome in that they could absorb watercolor or liquid ink and spread or fan out along the hairline.	It is good procedure when removing handmade paper from felts after the first pressing to brush each blanket or felt as soon as you remove the sheet. Further, it would be worthwhile to treat all felts to a proper washing with soap and water regularly.

PROBLEM	SOLUTION
BLEEDING	Color edges dissolved by a liquid or staining out of a paper.
Check directions on dyes used; try more mordant; use a different brand of dye; experiment.	
BLISTER—See AIR BELL	
BLOW—See AIR BELL	
BLUE SPOTS	Spots on the paper surface (of any color) caused either by the reaction of the particular dye being used plus rosin or by a poorly prepared dye, which may lead to a speckled effect, as in a brook trout.
Repulp the sheets; look at the "defect" positively—you may want to obtain that particular effect again. Change dyes, and try again.	
BRISTLE MARKS	Marks caused by a stiff sizing brush when surface-sizing a sheet.
Use a softer brush and alter consistency of the size; try a less viscous sizing.	
BROKE—See CASSIE or CASSE	
BRUISE	This may be identified as a dark area surrounded by wrinkles. It may be caused, among myriad reasons, by uneven pressure. It would be especially noticeable on the papers nearest the outside felt or blanket.
There is not much you can do with such a bruise, except to make sure the book-binder's press, standing press, hydraulic press, or whatever other device you are using to remove water from the sheets initially is level.	
BUBBLES	This condition may be brought about when air is trapped between the felt and the sheet. A negative force is brought about, unless the felts are all dampened.
Be certain, when preparing for couching, that all felts are dampened—not dry and not sopping wet.	
BURST OR SMALL HOLE	As you might guess, a small hole could probably result from couching a too-wet sheet too quickly and unevenly. Or, it could also be the result of a wrinkled felt.
Straighten felts; couch carefully.	
CASSIE, CASSE, OR BROKE	There is considerable disagreement among individuals as to differences between retree, outsides, and broke, or cassie. Obviously, some of the terms derive from the French; they all imply that there is a fault or more in the sheet of paper; that they are seconds and therefore sold under the regular price or used as the outside sheets or wrappings on reams shipped from point to point. Usually, the best of the lot are retree, the next outsides and the worst broke.
Many mills repulp these seconds and ignore the old ways and terms.	

	PROBLEM	SOLUTION
COCKLED AND CURLED	<p>This undesirable wavy line quality in sheets of paper is the direct result of allowing a post of paper to remain in the screw-press (long ago) too long (among other reasons). This causes the edges of the sheets to dry while their centers are still wet.</p> <p>Papermakers have been and will be plagued with curled and cockled papers for generations upon generations. Paper breathes. It is hygroscopic. It cannot but be affected by humidity—always.</p>	<p>An old printmaker's suggestion would be to place these unhappy looking sheets between wet felts, press, keep overnight, and then transfer to a stack of clean blotters or equivalent, changing the blotters and the order of blotters until properly dry.</p>
DEAD BEATEN	<p>An overbeaten stock made into paper; it may be brittle and weak.</p>	<p>Keep better records of beating times and proportions of materials used; make tests more frequently.</p>
DYE SPOTS	<p>Uneven spots of strong-colored dye; may have been caused by undissolved dye or a fungus growth, which attracts the dye. May be a desired property of your paper.</p>	<p>Make certain all dyes are totally dissolved before using; keep all equipment and materials clean.</p>
FEATHERED	<p>A term used occasionally to describe a highly thinned-out deckle edge. Caused by pulp escaping under the deckle during the shake, or vatman's stroke.</p>	<p>This can be adjusted either by holding the mould more tightly to the deckle, sanding and planing the deckle or mould to create a tighter-fit, or by following Henry Morris' directions on page 68.</p>
FOAM DURING BEATING	<p>One of many causes for the appearance of foam in the manufacture of paper may be an excessive alkalinity of the stock furnished to the beater. You may discover that you are using rag that was not fully washed of bleach, if you are using rag; or, that your recycled paper stock has not been properly cleaned.</p>	<p>One cure is to treat the stock in the beater with alum so as to reach a pH factor of 5.5.</p>
FUR	<p>In the process of couching, if done improperly (the sheets not couched one directly over the other in forming a post), fur or patches of pulp on the felt from the previous sheet will stick to the newly formed sheet.</p>	<p>The gentle art of couching takes much time and infinite patience. Try again. And again.</p>
IRON SPECKS	<p>Iron rust or specks appear on the surface of your sheet.</p>	<p>The culprit may be your water pipes, vat, or tank or any other piece of equipment and/or tool used in your process. Clean. Waterproof. May also be caused by an oversupply of iron in your water supply. In that instance, you, indeed, have difficulties. Consult local chemists.</p>

PROBLEM

SOLUTION

NOT OR LUMP

Clots or tangles of very long fibers that create patches or dense shapes in the sheet when examined under strong light.

"The formation, or the lay of fibers in the sheet, can be improved by the use of certain gums that act as dispersing agents. For example, if the pulp fibers are a little too long, they will form clots or tangled lumps in the suspension, and the sheet made from this will be lumpy and cloudy. If you were to add about 1 to 2 % of deactylated Karya gum to the pulp, the clots would disappear, and the sheet would become quite uniform. Locust bean gum can be used, but it is not quite as effective. The paper chemical supply companies have recently come out with some synthetic materials that will act as well as the Karya gum. I think one might explain some of this with the analogy of trying to tie a knot in a bunch of eels. They are too slimy—the knots would not stay. The gums used in pulp seem to be surfactives that make the fibers slimy." (Harold H. Heller)

LINT

Unbrushed felts or blankets may deposit lint on the surface of new sheets. The lint may be picked off carefully with the use of a high-powered magnifying glass and a tweezers, or left alone, if you are afraid of damaging a sheet.

Wash the felts regularly and brush them after each sheet is removed from a felt.

POLE MARK—See BACK MARK**RIDGE**

A high area in the paper surface.

Probably brought about because the vatman's shake or stroke was not brought to bear upon the pulp in the mould and deckle during the formation of the sheet. Kiss off the pulp and try again.

RING MARKS

Cloudlike effects of color in dyed papers; caused by bubbles in lifting or forming the sheet on the mould.

Prior to forming sheets in a vat of colored stock, be certain to check the manner in which you dip your mould. The process, when properly carried out, does not permit bubbles to form.

SIZE STAIN

Amber-colored or other specks caused by improper sizing.

Be certain, especially when dyeing stock in the beater, that the size or rosin (if that is what you are using) is fully mixed in with the stock.

STICK MARK—See BACKMARK**WILD**

A term employed by papermakers to describe a highly irregular, as opposed to a well-formed or well-closed, formation of interlocked fibers in a hand or machine-made sheet.

See Knot or lump.

Art is as original & important
as it is possible to be. It
is out with clear knowledge
of what it means to say.

John Gardner - "on moral fiction"

Date	
Fiber	
Preparation	
Additional Care	
Beating	
Formation	
Drying	
Assistance	