

Digital Restoration from Start to Finish

Ctein



ELSEVIER

AMSTERDAM • BOSTON • HEIDELBERG • LONDON
NEW YORK • OXFORD • PARIS • SAN DIEGO
SAN FRANCISCO • SINGAPORE • SYDNEY • TOKYO

Focal Press is an imprint of Elsevier



Acquisitions Editor: Diane Heppner
Project Manager: Paul Gottehrer
Assistant Editor: Stephanie Barrett
Marketing Manager: Christine Degon Veroulis
Cover Design: Alisa Andreola

Focal Press is an imprint of Elsevier
30 Corporate Drive, Suite 400, Burlington, MA 01803, USA
Linacre House, Jordan Hill, Oxford OX2 8DP, UK

Copyright © 2007, Elsevier Inc. All rights reserved.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher.

Permissions may be sought directly from Elsevier's Science & Technology Rights Department in Oxford, UK: phone: (+44) 1865 843830, fax: (+44) 1865 853333, E-mail: permissions@elsevier.com. You may also complete your request on-line via the Elsevier homepage (<http://elsevier.com>), by selecting "Support & Contact" then "Copyright and Permission" and then "Obtaining Permissions."

 Recognizing the importance of preserving what has been written, Elsevier prints its books on acid-free paper whenever possible.

Library of Congress Cataloging-in-Publication Data

British Library Cataloguing-in-Publication Data

A catalogue record for this book is available from the British Library.

ISBN 13: 978-0-240-80814-7

ISBN 10: 0-240-80814-2

For information on all Focal Press publications
visit our website at www.books.elsevier.com

06 07 08 09 10 10 9 8 7 6 5 4 3 2 1

Printed in China

Working together to grow
libraries in developing countries

www.elsevier.com | www.bookaid.org | www.sabre.org

ELSEVIER BOOK AID Sabre Foundation
International

Fig. 9-16 This histogram for Figure 9-15 is typical of tintypes. All of the tones are compressed into the dark end of the scale. I've moved the scanner software Levels sliders in to bracket that narrow range in order to capture as much information as possible. It's a good idea to scan tintypes in 16-bit mode. The result is shown in Figure 9-17.

that the tintype's extremely dark; this is certainly a case in which you'd want to scan in 16-bit mode.

Figure 9-17 is the scan I made that extracted the maximum tonal information from the tintype. The red channel showed the clearest image with the least dirt and scratches, so I used it to do the partial restoration you see in Figure 9-18, left. At this point, I'm very close to having a good looking photograph; I still have to remove some scratches and dust specks and make some final adjustments to the tones in the shadows and the background.

HOW TO MAKE A PHOTOGRAPH LOOK LIKE A TINTYPE

This doesn't look anything like the original tintype. It looks like a modern photograph, with modern photograph tonality. Figure 9-18, right, shows my simulation of the tintype "look." I got that by applying the curves in Figure 9-19 to darken the restored image. So, which version is correct? That will depend on your objectives—on whether this is supposed be an aesthetically pleasing restoration or a historically accurate one.

Stitching Scans Together

Sometimes you'll want to restore a photograph that is larger than your scanner can accommodate. Scanning a photograph in sections is not difficult, but there are two problems to address when stitching sectional scans together: Some misregistration and slight differences in exposure might exist between the separate scans.

You won't want the scanner making different exposure and contrast adjustments for each section of the photograph, so turn off as much of the scanner's automatic exposure control as you can. Ideally, the exposures for all the sections should be absolutely identical. In practice, this

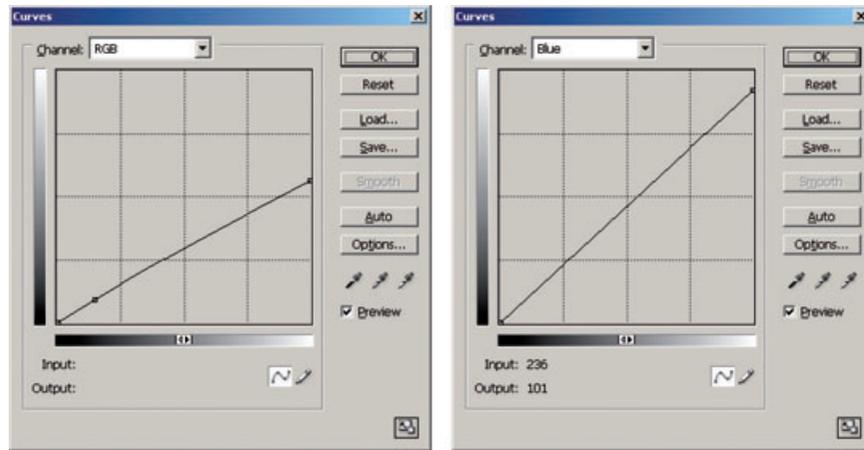


Fig. 9-19 A simple Curves adjustment turns a normal-looking photograph into one that looks like a tintype. The curve on the left darkens all the tones and lowers the contrast, so that the “whites” become grays, just as they are in a real tintype. The curve on the right adds a bit of yellow to the photograph because silver negative images are usually a little bit warm in hue. The result, shown Figure 9-18, right, is a faithful reconstruction.

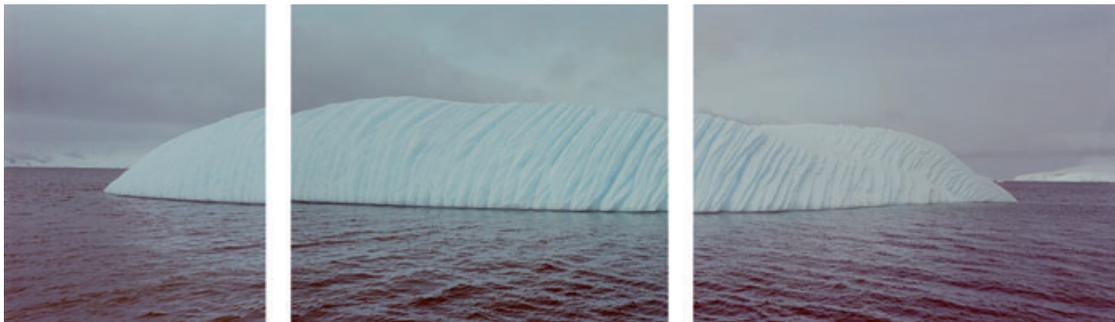


Fig. 9-20 I needed to scan this 6-cm by 17-cm negative in three sections because it was too big for my scanner. Here are the three overlapping scans I created. There is a slight color mismatch; there’s also a little bit of geometric distortion. (Original photograph copyright by Stuart D. Klipper.)

doesn’t always happen. The internal scanner calibration from scan to scan may not be identical. You should expect to see some slight exposure mismatches between the sections.

HOW TO COMBINE SCANS TO MAKE ONE LARGE PHOTOGRAPH

✓ Figure 9-20 shows three sectional scans I made from a 6-cm by 17-cm negative. This magnificent photograph of an iceberg by Stuart D. Klipper had been damaged and was in need of repair. First I aligned the scans so that they’d blend seamlessly when I merged them. I copied them into separate layers of a single file and set the layer opacities to 50% so that I could see how they overlapped. Figure 9-21 shows a close-up of the overlap between the center and right-hand scans. I registered the

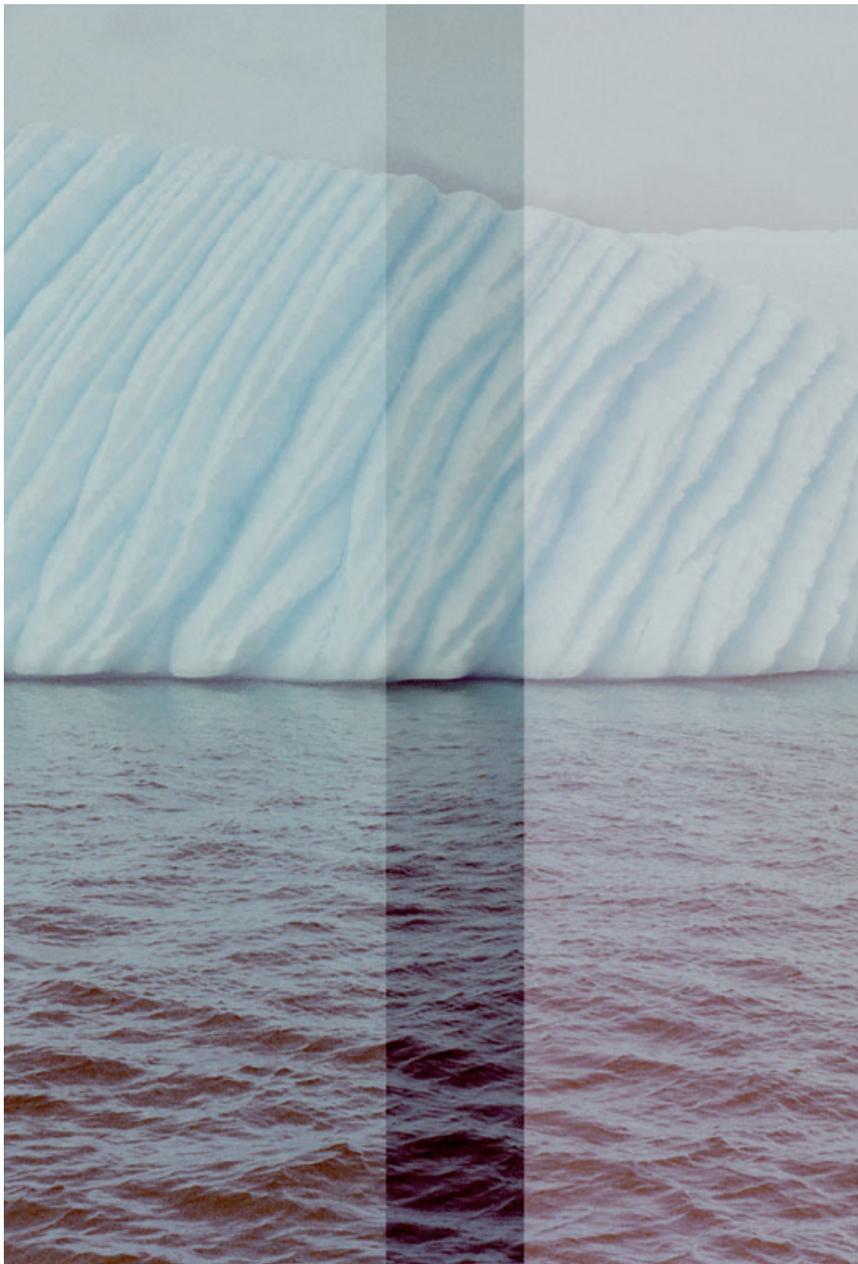


Fig. 9-21 Overlapping and aligning the middle and right-hand scans shows that they don't quite match up. The iceberg is perfectly superimposed at the top, but the wavelets at the bottom of the photo are misaligned. This is visible as a doubled image. I can fix this with Photoshop's Transform/Warp tool (Figure 9-22).

Fig. 9-22 In this screenshot of the Warp tool in action, I selected a rectangular region in the right-hand scan and created the Warp grid. By adjusting individual points in the grid, I can transform the left side of the scan so that it matches the middle scan perfectly. Warp creates a smooth transition from this bit of distortion into the rest of the rightmost scan.



**HOW TO COMBINE
SCANS TO MAKE
ONE LARGE
PHOTOGRAPH
(continued)**

two scans at a point at the top of the iceberg. The doubled images at the bottom of the overlap band indicate that one of the scans has a little geometric distortion.

In Photoshop, the Warp operation is the best way to fix that. It superimposes a 3-by-3 mesh on the layer (Figure 9-22). You can grab a point in the image and drag it to a new position and the rest of the layer smoothly warps to accommodate the change. Alternatively, you can manipulate control points at the corners of the mesh by their little solid-dot handles and warp the mesh that way.

If Photoshop's Warp adjustment doesn't give you enough control over the geometry of the image, turn to Picture Window, which has a much more powerful Composite Transform. You can set up to 63 control points in the Composite Transform mesh using the multipoint option. The Composite Transform does scaling, rotation, and warping all in one operation.

Once I had the three scans aligned, I set their opacities back to 100%. Now I had to match their colors. In Chapter 5, Restoring Tone, page ••, I told you about clicking on a photograph to create sample points in the Info window and to assign control points to curves (Figure 5-16). I set four sample points in the left-hand scan layer, right next to the bound-

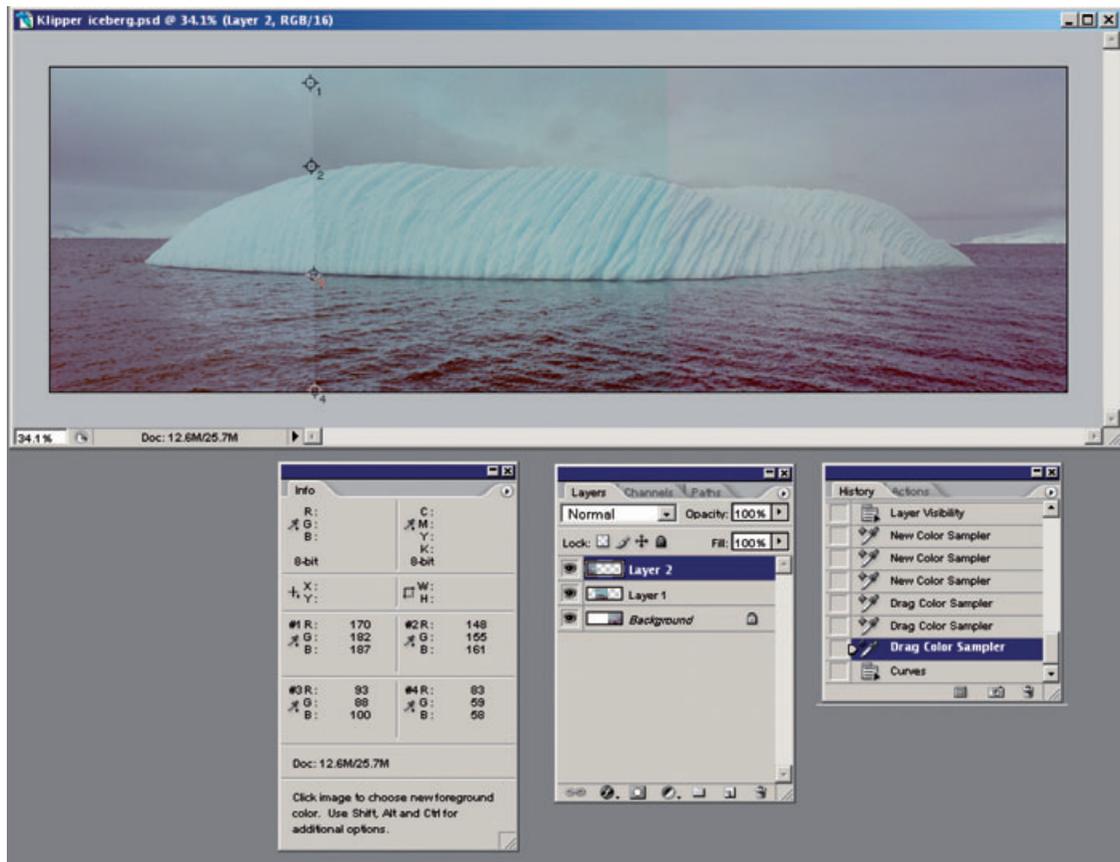


Fig. 9-23 This screenshot shows me setting up the sample points that will let me match the color between the left (Layer 2) and middle (Layer 1) scans in Figure 9-24. I set four sample points near the boundary between the scans that encompass a broad range of tones and colors.

ary with the center scan layer (Figure 9-23). All four points are actually in the region where the scans overlap; you can't see the overlap in the illustration because the upper layer opacity is 100%. That overlap's important because I use the sample points to compare the RGB values in the two layers.

I picked those points to represent a broad range of tones. The RGB values for the sample points are shown in the Info window. I made a screenshot of the Info window and pasted it into a new image window so that I could refer to the RGB values for the left-side scan layer while working on the middle scan layer. (If you don't want to clutter your computer screen with unnecessary images, you can print the screen with those RGB numbers onto a piece of paper for reference.)

I switched to the middle scan layer and launched the Curves tool. (I could have created a Curves adjustment layer associated with the scan

**HOW TO COMBINE
SCANS TO MAKE
ONE LARGE
PHOTOGRAPH
(continued)**



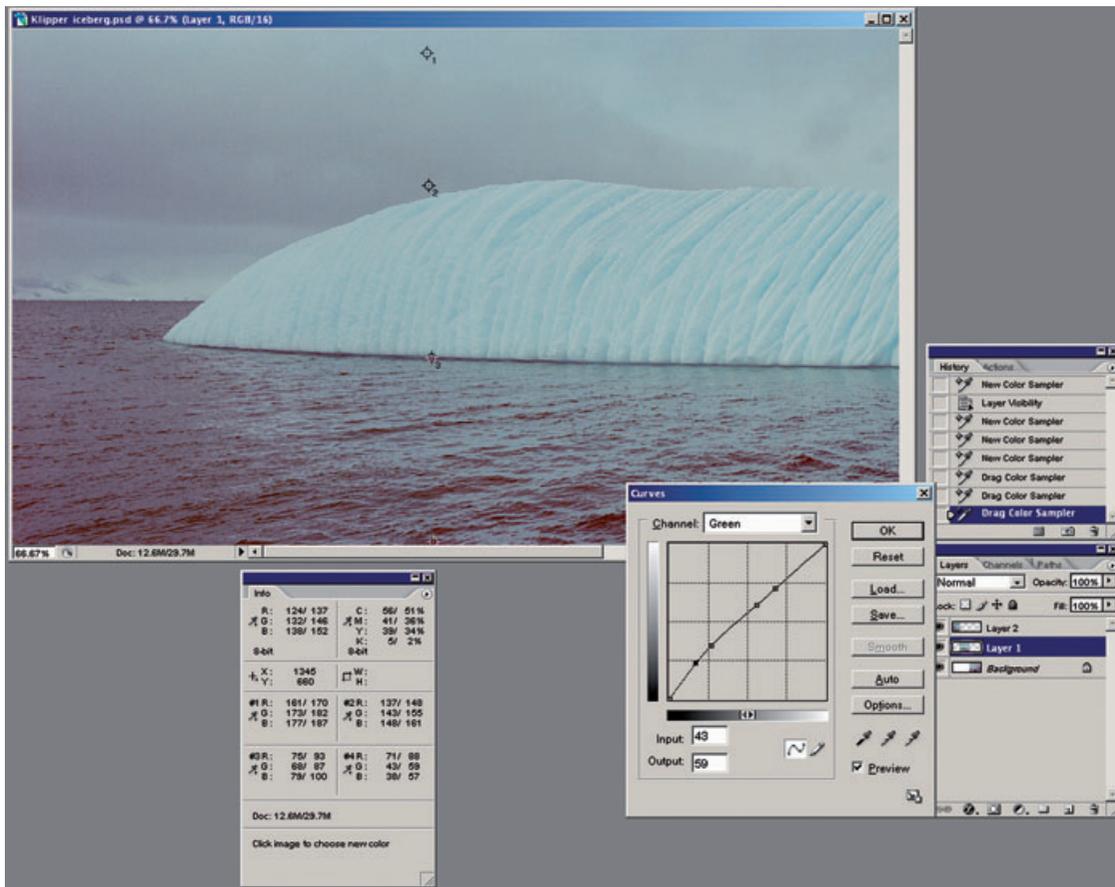


Fig. 9-24 This screenshot shows me making a Curves adjustments to the green channel of the middle scan that corrects sample point #4. Compare sample point #4's values in the Info windows in Fig. 9-23 and this figure. I've adjusted the Green curve for that point to make the two values equal (a value of 59). Doing this for all four points in all three channels produces a very good match between all the colors in the scans.

**HOW TO COMBINE
SCANS TO MAKE
ONE LARGE
PHOTOGRAPH
(continued)**

layer if I wanted to preserve the option of going back and readjusting the curves later.) I shift-control-clicked each of the sample points, creating four control points in the Curves window (Figure 9-24).

To match the colors between the two layers, I moved the control points in the individual curves so that their output values were the same as the ones I had recorded for the left-hand scan. For example, Figure 9-24 shows me working on sample point #4 on the green curve. That had a value of 59 in the left-hand scan, so I typed 59 into the output box for that curve point. In this manner I entered all of the sample-point RGB values for the left-hand scan into the curve control points for the center scan.

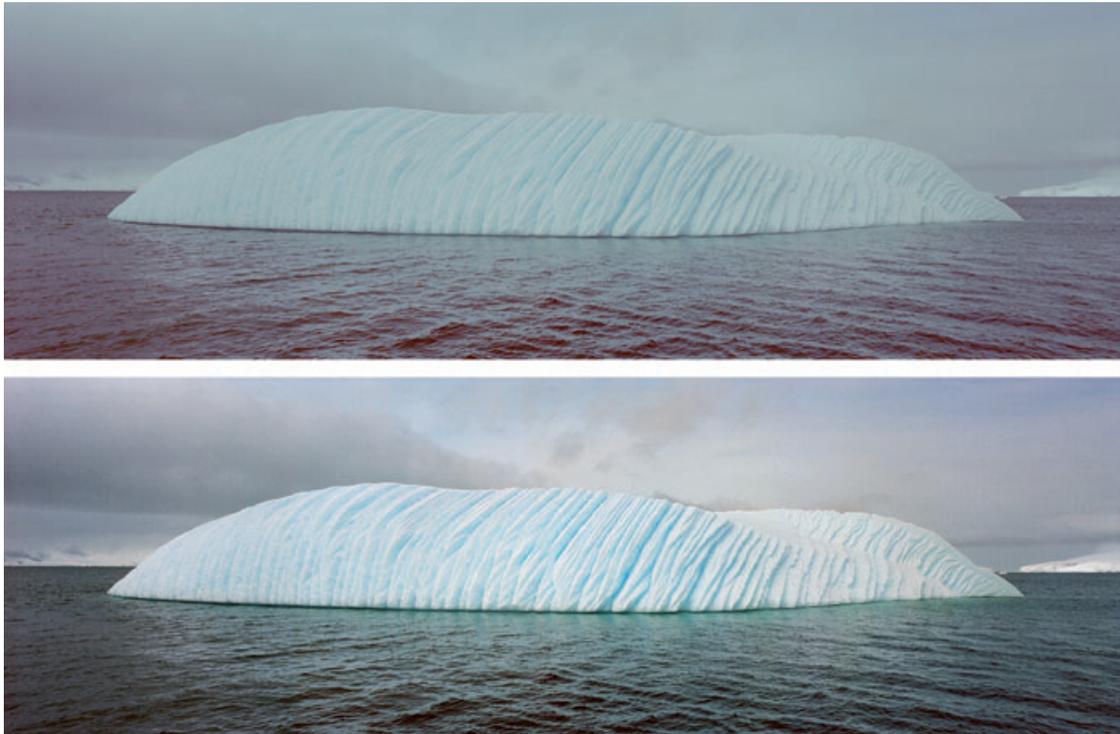


Fig. 9-25 The top figure shows the three merged scans after color matching and alignment. This appears to have been a single, seamless scan. The bottom figure shows the fully restored photograph after color and tone correction with a Curves adjustment layer. (Photograph copyright by Stuart D. Klipper.)

The two scans now blended perfectly; as long as scans don't differ too much to begin with, this four-point adjustment scheme can produce a perfect color match. I repeated this procedure for the middle and right-hand scan layers. That gave me a seamless blend between all three sections of the photo, as you can see in Figure 9-25, upper. All the file needed was overall color correction to produce a lovely, finished photograph (Figure 9-25, lower).

**HOW TO COMBINE
SCANS TO MAKE
ONE LARGE
PHOTOGRAPH
(continued)**

Improving the Original

Just what do I mean by "improving the original"? A recurring theme throughout this book has been my admittedly perfectionist quest to create the best possible print of a photograph. What do I think makes for a better print?

- Rich and more accurate color
- More accurate tonal rendition