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Modified Maynard's Trichrome Stain for GMA

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Introduction

In 1986 Maynard[1] demonstrated that consistent trichrome staining of Glycol Methacrylate (GMA) embedded sections could be achieved by employing a microwave oven. This technique, however, is not practical for those laboratories that do not have a good microwave oven. The author has modified the original technique to incorporate a trichrome stain for the laboratory not having a microwave oven. This modified procedure has the advantages of producing intense colors and consistency, and better contrast is seen when compared with the other conventional trichrome methods.

Processing and Microtomy

The GMA embedding medium used was obtained from a commercial kit, JB-4 (Polysciences, Warrington, Pennsylvania). For this demonstration, skeletal muscle, cardiac muscle, and liver tissues were embedded in GMA according to the method described by the manufacturer. The tissues were sectioned with a "D" profile carbide knife at 2 microns, mounted on alcohol-cleaned glass slides, dried on a hot plate at 60° C for one hour, and stained by the "modified trichrome staining" technique. The fixative used is not critical.

Solutions

1% Acetic Acid (Stock)

Glacial acetic acid	1.0 ml
Distilled water	99.0 ml

Gill's III Hematoxylin

(May be obtained from several commercial sources)

Scott's Tap Water Substitute

Tap water	1000.0 ml
Magnesium sulfate (anhydrous)	10.0 gm
or	
Magnesium sulfate (hydrated)	20.0 gm
Sodium bicarbonate	2.0 gm

Only use one or the other magnesium sulfates. The Scott's water must be mixed by utilizing heat at a temperature of approximately 60° centigrade on a magnetic stirrer-hot plate until solution is clear.

Biebrich Scarlet/Acid Fuchsin Solution

1.0% Biebrich scarlet	90.0 ml
1.0% acid fuchsin	10.0 ml
Glacial acetic acid	1.0 ml

IN THIS ISSUE

2.5% Aniline Blue Solution (Stock)

Aniline blue ..... 2.5 gm
Distilled water to final volume ..... 100.0 ml
To dissolve aniline blue, heat solution with a magnetic stirrer on a hot plate. Add 2.5 ml glacial acetic acid. Filter.

Aniline Blue Solution (Working)

2.5% Aniline blue (stock) ..... 1.0 ml
1.0% Acetic acid (stock) ..... 20.0 ml

Saturated Picric Acid/Ethanol Solution

Saturated picric acid ..... 50.0 ml
Absolute ethanol ..... 50.0 ml

Phosphomolybdic/Phosphotungstic Acid Solution

Phosphomolybdic acid ..... 5.0 gm
Phosphotungstic acid ..... 5.0 gm
Distilled water ..... 200.0 ml

Staining Procedure

1. Dry mount sections in your usual manner or on a hot plate at 60° C for one hour.
2. Place the slides in a Coplin jar containing saturated picric acid/ethanol for a total of ten minutes in the following manner:
   a. 5 minutes in a 60° C water bath.
   b. 5 minutes on a counter top at room temperature.
3. Wash slides for 2 minutes in running tap water.
4. Stain slides in Gill's III hematoxylin for 2 minutes.
5. Wash slides in running tap water for 2 minutes.
6. Blue slides in Scott's tap water substitute for 2 minutes.
7. Wash slides in running tap water for 2 minutes.
8. Dry slides on a hot plate at 60° C for 2 minutes.
9. Stain in Biebrich scarlet/acid fuchsin for 2 minutes.
10. Dip quickly in distilled water 8 to 10 dips only.
11. Place slides in phosphomolybdic/phosphotungstic acid for 2 minutes (discard solution after use).
12. Go directly into working aniline blue solution for 2 minutes.
13. Wash slides in 1% acetic acid (20 to 30 dips), one slide at a time. Check slides microscopically. If the desired stain is not complete, return to the working aniline blue and check each slide every 30 seconds until the desired stain is achieved.
14. Rinse slides quickly in distilled water.
15. Dehydrate slides in absolute ethanol, two changes.
16. Absolute ethanol xylene mixed 1:1 for 5 dips.
17. Clear in xylene, two changes.
18. Mount coverglass with resinous mounting media.

Results

Cytoplasm, keratin, muscle fibers, and intercellular fibers ..... red
Nuclei ..... purple-blue
Collagen ..... blue

Discussion

Glycol methacrylate is being utilized in many routine histology laboratories because one can obtain thinner sections, better cellular preservation, and less shrinkage from processing. The modified trichrome technique described herein yields consistently good results. In the method described, the brighter red and blue colors produced discriminates muscle fibers from collagen well (Figures 1 and 2).

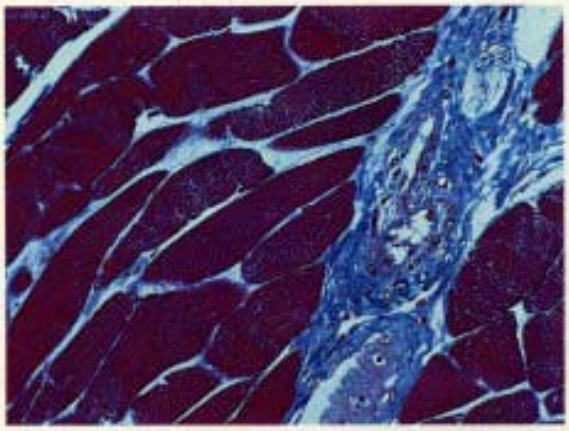

Figure 1: Demonstrates skeletal muscle and collagen in their trichrome characteristic red and blue colors. Maynard's trichrome. X25.

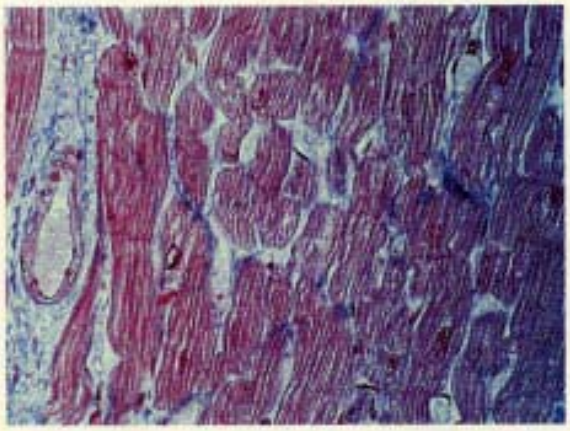

Figure 2: This is a 2-micrometer section of cardiac muscle. Note the delicate staining of muscle fibers. Maynard's trichrome. X25.

This trichrome stain is also useful for other types of tissue (Figure 3).

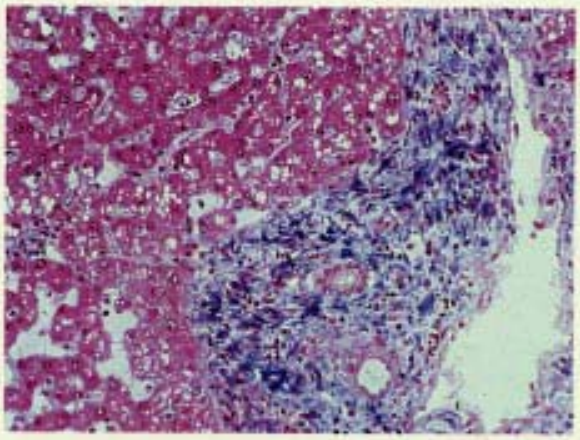

Figure 3: This is a section of liver that shows good staining of cellular entities and collagen. Maynard's trichrome. X25.

Conclusion

This method of trichrome staining was developed for the laboratory that does not have a microwave oven and also for the technologists who may prefer to do their special stains in a routine manner. This modification has been utilized in our laboratory with excellent success.

Acknowledgment

I wish to thank the technologists of University Hospitals, University of Alabama at Birmingham, for their assistance in the development of this article, and also Mrs. Maxine Rice for typing this document.

References

1. Maynard JH: A trichrome stain in glycol methacrylate that works. *Lab Med* 17(8):471-473, 1986.
2. *Manual of Histologic and Special Staining Technics*, 2nd ed. AFIP. McGraw-Hill, p 64, 1960.

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Response to Questions in Search of an Answer

Mark E. Dayman
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Institute of Medical and Veterinary Sciences
Frame Road, Adelaide, South Australia

Editor's Note: The following information was submitted by Mr. Mark E. Dayman in response to a "Questions in Search of an Answer" (Question #3) that appeared in *Histo-Logic*, Vol. XVIII, No. 3, July/August 1988. We are thankful for Mr. Dayman's excellent contribution of additional information in attempts to solve the puzzling problem of uneven staining often seen in tissue sections. For pictures of this problem (artifact) see *Histo-Logic*, Vol. XVIII, No. 3, July/August 1988. *We encourage more responses in the hope that we can find a solution to this long-standing, perplexing problem.* I (L.G.L.) have been aware of this artifact since 1973, after receiving a slide for consultation dealing with the artifact. Since that time I have seen many such slides and have been asked for answers to the same problem by 200 or more individuals. The following information from Mr. Dayman further emphasizes the difficulty connected with solving this problem.

Dear Mr. Luna:
Upon reading your question in *Histo-Logic* (July/August '88), I felt I should write and inform you as to how we have approached an identical problem in our laboratory and the information we have on the subject. I must say, however, that to date I do not have a specific answer to the problem.

The artifact's presence has been noted for approximately three years. It will appear in H&E stained slides for periods of two to three months and then will mysteriously disappear. One of the difficulties we have experienced in studying this artifact is its tendency to stop at intervals. This leaves us unsure whether it has stopped because of a change we have made or simply stopped of its own accord.

We are convinced that this artifact is a result of some change in the block and is not a staining artifact. We have proven this to our own satisfaction by recutting blocks (that were recorded as artifact positive) almost a year later and have found them to still show the artifact.

Introduction
Over a six-week period we recorded the exact handling of every block that went through our main diagnostic laboratory. All pathologists were asked to report any positive cases and these were then correlated to see if any trends were present. I have included a copy of our results and a brief explanation of our handling procedure.

Fixation and Processing
The processing machines we use are Shandon Hypercenters. There are three main types of processing cycles that we utilize:

1. An *overnight cycle*, which takes 12.5 hours (see schedule below).
2. A *short cycle*, which takes just under 3 hours to run, and two or three of these are run as a same-day service (see schedule below).
3. A *biopsy cycle*, which takes 1 hour and 5 minutes to run and is used for small biopsies such as bronchial and gastric specimens (see schedule below).

Specimens arrive in the laboratory in various stages of fixation, from fresh to completely fixed. The routine fixative is 10% buffered neutral formalin.

Specimens for the *overnight cycle* are microwaved in saline after at least 30 minutes in formalin. By using this format we can avoid having formalin on our processing machines.

Material suitable for the *short cycle* is placed in Carnoy's fixative, although this type of specimen is almost always fully fixed in formalin by the time it reaches the laboratory.

The small pieces of tissue that are processed on the *biopsy cycle* either arrive fixed or are fixed for 30 minutes in warm formalin.

In the case of small or friable pieces of tissue, pre-cut foam pads are used to prevent loss from the Tissue-Tek II cassettes during processing.

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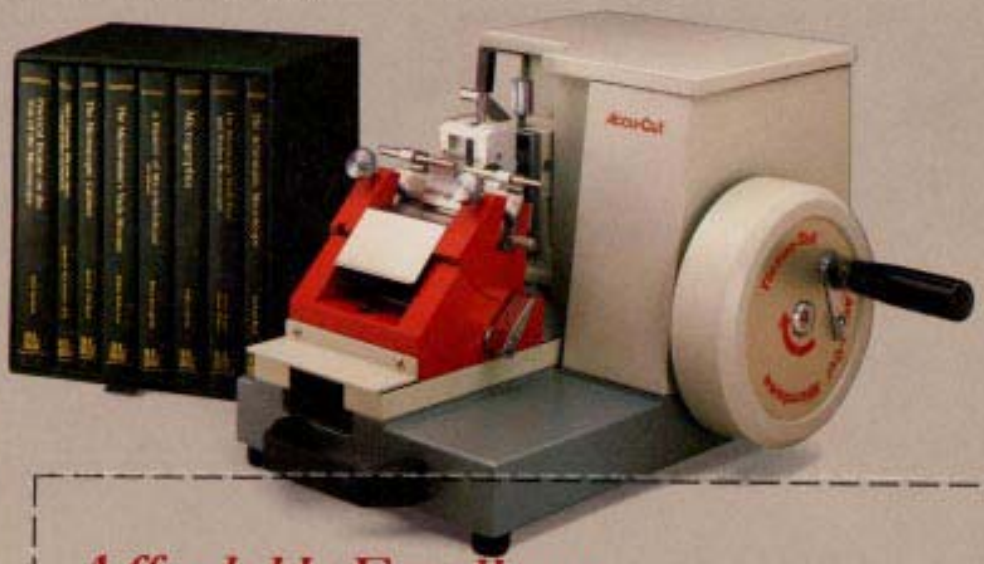

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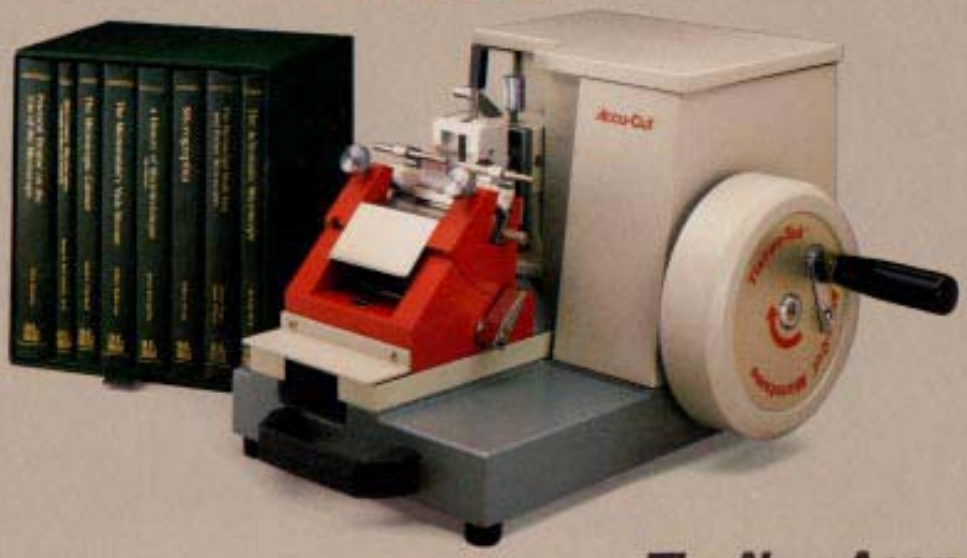

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Overnight Cycle – 12.5 Hours

Stage	*Reagent*	*Temp. °C*	*Vacuum*	*Time*
1	70% Alc.	37	Yes	1½ hrs
2	Abs. Alc.	37	Yes	1.00 hr
3	Abs. Alc.	37	Yes	0.20 min
4	Abs. Alc.	37	Yes	0.20 min
5	Abs. Alc.	37	Yes	0.20 min
6	Abs. Alc.	37	Yes	0.30 min
7	Abs. Alc.	37	Yes	1.00 hr
8	Chloroform	37	No	1.00 hr
9	Chloroform	37	No	1.00 hr
10	Chloroform	37	No	1.00 hr
11	Wax	60	Yes	2½ hrs
12	Wax	60	Yes	1½ hrs
13	Embed			

Short Cycle – 3 Hours

Stage	*Reagent*	*Temp. °C*	*Vacuum*	*Time*
1	—	—	—	0
2	—	—	—	0
3	Abs. Alc.	45	Yes	0.20 min
4	Abs. Alc.	45	Yes	0.10 min
5	Abs. Alc.	45	Yes	0.10 min
6	Abs. Alc.	45	Yes	0.10 min
7	Abs. Alc.	45	Yes	0.25 min
8	Chloroform	37	No	0.20 min
9	Chloroform	37	No	0.10 min
10	Chloroform	37	No	0.20 min
11	Wax	60	Yes	0.20 min
12	Wax	60	Yes	0.30 min

Biopsy Cycle – 1 Hour and 5 Minutes

Stage	*Reagent*	*Temp. °C*	*Vacuum*	*Time*
1	—	—	—	0
2	—	—	—	0
3	—	—	—	0
4	Abs. Alc.	45	Yes	0.10 min
5	Abs. Alc.	45	Yes	0.05 min
6	Abs. Alc.	45	Yes	0.05 min
7	Abs. Alc.	45	Yes	0.05 min
8	Chloroform	37	No	0.10 min
9	Chloroform	37	No	0.05 min
10	Chloroform	37	No	0.05 min
11	Wax	60	Yes	0.10 min
12	Wax	60	Yes	0.10 min
13	Embed			

The following data are provided to show the extent of our study and to illustrate that many variables were considered in attempts to find the cause of this artifact.

Total number of cases examined 1850
Number of positive cases 155

Tissue types

Curetting . . . . . 37 cases
Skin 33
Cervical bx. 24
Gastric bx. 24
Bladder bx. 9
Prostate bx. 9
Gall bladder 7
Appendix 6
Nodes 5
Other 13

Microwaved: . . . . . 85 cases
Not microwaved: . . . . . 70 cases

Processed on overnight cycle 132
Processed on short & bx. cycle 23

Foam used 126
Foam not used 29

Foam + microwaved 66
Foam + not microwaved 65
No foam + microwaved 12
No foam + not microwaved 12

Remarks

This is a widespread problem that other laboratories in Australia suffer from and also at least one laboratory in the United Kingdom (UK) that I am aware of. I am reluctant to offer our thoughts as to the cause of this artifact as we, too, have been unable to definitely prove any theory that fits the situation. We have examined fixation and now are looking at the possibility of batch variation in our processing solvents.

Steps and Standards for Practical Workload Recording* in Anatomical Pathology

Regina H. Hermann, HT/HTL (ASCP)
Huntington Memorial Hospital
Pasadena, California 91105

When Lee Luna invited me to write about my recent workshop topic (California Society Meeting 1988), it was just the encouragement I needed to air my thoughts and findings concerning accurate workload recording methods in the histopathology laboratory. I have talked to many people about the general health and welfare of the workload recording system in this specialty laboratory. From these discussions it appears that there is some laxness in how we as histologists approach the subject. Following are some comments that I hope will help us see the need for this system and help us develop and maintain a good updated workload recording system in our laboratories.

What exactly is a reasonable workload standard in histopathology? A workload that neither kills patients nor technologists and also keeps the budget on target. This is my definition, but I'm sure you are aware that there are many opinions on the subject.

This is not an attempt to explain all there is to know about these fairly complex issues, but an attempt to *encourage the development of more time studies and realistic data gathering* for our field. Most of us are somewhat familiar with various methods of recording daily workloads. I have seen recordings range from the ridiculous to the sublime but we cannot ignore the subject. (Some states now base the laboratory reimbursements on the actual units of services performed—the subject is here to stay.)

Many other hospital laboratory areas have good time studies on file and have a head start in the field of histopathology. It somehow seems much harder to produce good standards for the histopathology laboratory—"the laboratories' stepchild"—and yet, those who know the duties of a histologist do understand that other laboratories' tests are often preliminary to the diagnosis, and therefore, the duties performed well in our laboratory can certainly make a very big difference to the future quality of a patient's life. For example:

> Is a bone marrow handled well enough to be diagnostic?
> Is a melanoma resection demonstrating true margins?

It takes caring, skilled, careful people and a relaxed atmosphere to do the job well. There are few areas in any laboratory that could do more potential harm than a histological misdiagnosis. But where are the realistic standards written? What standards does a pathologist have the right to expect from a well-trained technologist? For that matter, where will our next generation's histologists get their training???

Read the article in the *ASCP Newsletter* June 1988: "Federal Assistance for Schools." If someone gets newly inspired to obtain an education and training in histology, where, for example, would that individual go to school in the state of California?

I felt it would be beneficial to interview some knowledgeable people on the subject so I called the chairman of CAP Workload Recording Dr. Rex Conn at Thomas Jefferson University Hospital of Philadelphia, where he is the Vice Chairman of the Department of Pathology and Director of Clinical Laboratories.

It was a pleasant surprise to hear from Dr. Conn that my thoughts were on target. He indicated that only a few days before my call, on July 11 and 12, there had been a meeting in Chicago of the Workload Recording Committee. So far, they do not have a single histologist on this committee (which consisted of about 30 people). Some of their important comments were: "We need to take a good look at histology. We need to gather more time studies, and we need to study more of the previously assigned values for their validity."

The 1989 *Manual for Laboratory Workload Recording Methods* has been distributed to laboratories. This does not give us much time before the 1990 manual goes to print. In order for us to eliminate "Catch 22," we in histopathology must find the time to contribute time studies to future additions of the Manual for Laboratory Workload Recording Method. The forms and instructions for this purpose can be found in every *CAP Workload Recording Manual.*

Don't allow the manual to be hidden, as some people tell me often happens. Be a concerned, dedicated histologist. Ask your pathologist or administrator to let you duplicate at least the sections that pertain to histopathology. It is up to every histologist to read this manual from cover to cover and to contribute to its revisions wherever needed.

I think it is safe to say that, somewhat peculiar to the field of histotechnology in the United States, there seems to be a tendency toward heroic productivity performances, often triggered by our unhealthy feelings of chronic guilt, possibly because of our "not quite medical technologists" status.

Also, I am sure you have either said it yourself or heard someone say, "Another 10 or 12 hours without a break or lunch!"

Except for occasional emergencies, save me from one of those types of individuals! They are the ones that make time studies unrealistic and therefore invalid. They are also often the ones who are "self-made" and have never been reassured that these are not reasonable working conditions and that there actually is a world out there.

One of the most inexpensive stress reducers available to all of us is the true goodwill and cooperation between pathologist and technologist – *we need each other and our patients need a sane team!*

With proper equipment and procedures, routine work can be pretty well standardized and quality assured, but research-related topics have to be given special blocks of time. Many of us, even in a routine setting, are often involved in some form of research. Also, don't forget the time necessary for Quality Assurance (QA).

Time studies should be done by those who genuinely love histotechnology, people who not only work hard but efficiently, producing quality as well as quantity, and who do not want to wind up as patients themselves before their time.

*Note: References made in this article to "manual" relate to the *College of American Pathologists (CAP) Manual for Laboratory Workload Recording Method.*

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Speaker: Lee G. Luna

Marilyn Gamble Sets Her Goals High as New NSH President

From the very beginning, Marilyn Gamble, HT (ASCP) HTL, has played a significant role in making the National Society for Histotechnology a success. She is a charter member, as well as a member of the Founding Board of Directors. Now, as the newly elected president of the NSH, Gamble has an opportunity to continue her outstanding service to the organization and its members. And that's exactly what she intends to do.

Gamble's career as a histotechnologist began in 1968. She had always wanted to enter a healthcare-related profession. But it wasn't until she went to work for the surgical pathology department at West Virginia University that she realized exactly what she wanted to do. "Once I became involved in histopathology, I loved it," she said. "I think the possibilities are endless in this profession. There are so many different areas you can get into, and there's always something new to learn. It's just a great feeling to be associated with this profession."

Gamble began training with the university's pathology department in October of 1968. By March of 1970, she had passed her HT registry exam. The same year, she transferred to oral pathology, and later also worked in the neuropathology department.

In 1978, Gamble went to work for the National Institute for Occupational Safety and Health, a government institution responsible for conducting research relative to on-the-job hazards. Specifically, she was involved in research on respiratory hazards, including the dangers of asbestos-related and coal-mining occupations. Another of her more interesting projects involved a study of volcanic ash from Mount St. Helens.

Although she enjoyed research, Gamble wanted to get back into patient services, so she moved to Los Angeles in 1985 to become supervisor of the histopathology department at White Memorial Medical Center. While there, she also was responsible for immunotechniques, and was the electron microscopy technologist.

In 1987, Gamble moved to her current position as supervisor of the histopathology department at Southern California Permanente Medical Group's regional laboratory. She supervises a staff of 31, producing more than 1800 routine slides every day.

Gamble's involvement with the NSH has been ongoing for nearly 16 years. During that time she has served on the Nominating Committee, the Budget & Finance Committee, the Legislative Committee, and the Judicial Committee. She has also been corresponding secretary and the representative to the National Commission for Health Certifying Agencies. She received the NSH's outstanding service award in 1976. And before becoming president, Gamble served as the NSH secretary.

When asked what she felt was her most significant professional accomplishment, Gamble didn't hesitate for an instant. "Being elected president of the NSH," she exclaimed. "I've been involved with the NSH from the beginning, so it's a real labor of love."

Gamble is especially proud of the educational contribution made by the NSH. She intends to emphasize education during her term. The society is currently working to develop criteria for a traveling seminar that will be available to states that have no society or that have an inactive society.

She also hopes to see the society offer more services that can be utilized by the general membership. For example, control materials are becoming more difficult to locate and the society may be able to provide a networking system in order to facilitate obtaining these materials. Her plans also include the development of a handbook to guide those who are transferring from technical positions to management. The handbook would outline how to write job descriptions, present justifications, set personnel standards, and perform other key management duties. Another project she hopes to complete is the development of a study guide for people taking the Board of Registry examination.

In summarizing her goals for the society, Gamble wrote, "One of my most important goals is to be able to successfully convey to histology professionals throughout the country the importance of their membership in the NSH. We are the only society that exclusively represents the profession and have achieved recognition as such through involvement and representation to other prestigious national organizations. We want to represent the wishes of all people working in the field and I cannot overemphasize the importance of the general membership to the well-being of the society. When dealing with national issues or with regulatory bodies such as CAP and JCAH, even the total number of members becomes a very important statistic; and only through involvement of the membership can we identify areas where the society can supply services for its members or receive the information necessary to establish goals and policies that will best serve the profession. Additionally, it's our members who are responsible for the success of the society by donating their time to work on committees or serve as society representatives. There are many ideas to explore, but for any idea to become a reality it takes dedicated members who are willing to assist."

Marilyn Gamble's attitude and record leave little doubt about her dedication, especially considering the fact that she devotes about 20 hours a week to the society now. Under her leadership, the society should make great strides.

Forensic Histology A Unique Career Option

Gloria Dorsey, HT, has been a histotechnologist for nearly twenty years. In that time, she has always worked in highly specialized areas. She began her career at Johns Hopkins Hospital where she worked exclusively in the area of eye pathology. For two and one-half years she worked only with ophthalmic tissue. "It was very tedious work," she explained. "Precision is important for any histotechnologist, but working with ophthalmic tissue, it was even more important."

For the past 17 years, Gloria has worked as a forensic histotechnologist at the Office of the Chief Medical Examiner in Baltimore, Maryland. She works with two other histotechnologists and seven pathologists. Working with autopsy material, there are some definite differences between her daily routine and that of the typical histotechnologist. But because the medical examiner's office is also heavily involved in various research projects, Gloria is exposed to a variety of challenges.

In her tenure, she has been involved in lung studies, Sudden Infant Death Syndrome studies, middle ear studies, pituitary studies, liver studies, and heart studies—just to name a few. Her office also has a neuropathology lab, so she prepares an unusual number of brain tissue sections.

Then there are autopsies. And they present their own unique set of challenges. Performing autopsies for a medical examiner's office requires tissue sections from *all* vital organs. The tissue is sometimes badly decomposed and often damaged by traumatic injuries. These tend to make tissue sectioning and staining a bit more difficult because much of the nuclear detail is gone.

"It becomes much more critical that the proper fixative be used," Gloria said. "Usually the tissue must remain in the fixative for a longer period."

On the other hand, there are some aspects of a forensic histologist's job that make it easier to perform. For example, a larger section is usually possible because the pathologist usually has the entire organ available. Deadlines are also not as critical for autopsy material.

Gloria works primarily with the typical H&E stains, but the types of tissue she must work with do not always stain consistently. "It's difficult to maintain consistent stain quality with autolized tissue," she said.

Another thing that is different about Gloria's job is that she is forbidden from discussing any of the specific cases she works on with anyone outside the lab—even with her family. She admits that not being able to discuss her work can be frustrating, but she understands and respects the reasons for confidentiality.

Her workload varies, but Gloria usually handles between 10 and 25 cases each day. She is in the process of earning a degree in Healthcare Administration from Sojourner-Douglas College. She hopes that the degree will help her move into a supervisory position in the medical examiner's office.

A Helpful Hint – To Restore Basophilic Properties

Annamae O'Neal, HTL (ASCP)
West Virginia University Health Sciences Center
Morgantown, West Virginia 26506

In our laboratory we have been asked many times for more slides on tissues that have been stored in formalin for extended periods of time. After processing such tissue and producing slides we find the staining, especially the nuclear staining, to be so pale as to be undesirable. Also many times we have pulled old slides only to find them very faded and unsuitable for diagnostic use.

We recently have found a very quick and easy method to enhance the staining of these basophilic properties. After the slides have been cut and dried, proceed as follows:

1. Deparaffinize and hydrate the slides to water.
2. Mordant in 0.5% Periodic Acid for five minutes.
3. Wash in water for five minutes.
4. Proceed with your routine staining.

We have found this gives us excellent staining, and cellular details are clear and distinct.

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Utilizing Jewelry in the Histology Lab

Marilyn Gamble, HT, HTL (ASCP)
Kaiser Permanente Laboratory
N. Hollywood, CA 91601

At the Kaiser Regional Laboratory in N. Hollywood, California, we provide Histopathology Laboratory service to ten area hospitals. This includes processing an average of 1200 surgical blocks daily. Dealing with ten hospitals, 27 histotechnicians and 10 laboratory assistants, a system was needed to help identify employees who perform a specific task, identify a particular hospital or even flag a block that may require special care or attention.

One problem area for identification was embedding. Our color-coded cassettes are used to identify each hospital and cannot be used to code specific blocks. As an alternative we use colored beads to identify problem or special blocks (i.e., blue for lymph nodes, white for B-5 fixed tissues, and yellow for those blocks that may contain a suture or wire). In addition, each embedder is assigned a color and places one of his/her beads into the top portion of the block, enabling us to identify and correct embedding problems, or, even better, to identify an employee who consistently exhibits excellent embedding skill.

This has been an easy solution to some of our problems that can be adapted to a variety of other needs in the histology laboratory. Beads may be purchased from a jewelry supply house in a wide variety of colors.

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1988 NSH Award Winners

Proper recognition of those who make outstanding contributions to the histotechnology profession is very important. Miles Inc. salutes these exceptional individuals who were recognized for their achievement and dedication in the field of histology at the NSH Symposium/Convention, October 9-14 in Louisville, Kentucky. We wish them continued success in the future.

Histotechnologist of the Year
Kerry Crabb
Grandview, Missouri

J.B. McCormick, M.D. Award
Janet Maass
Fort Collins, Colorado

President's Award
Jules Elias
Sunny Brook, New York

Miles Diamond Cover Award
Lawrence Kass, M.D.
Cleveland, Ohio

Miles Golden Forceps Award
Cheryl Crowder
Baton Rouge, Louisiana

Journal of Histotechnology Editor's Award
Charles Churukian
Rochester, New York

William J. Hacker Award
Cathy Hornbeck
Phoenix, Arizona

Newsletter of the Year Award
"Microtime"
Georgia Society for Histotechnology

Newsletter Merit Award
"On Stage"
New York State Histotechnological Society, Inc.

Convention Scholarship Award
Dawn Allen
Burbank, California

Dezna C. Sheehan Memorial Educational Scholarship Award
Mary Anne Daniels Haynes
Cortez, Colorado

E.M. Diagnostic Systems, Inc. Educational Scholarship Award
James Maynard
Birmingham, Alabama

Fisher Educational Scholarship Award
Catherine Locallo
Arlington Heights, Illinois

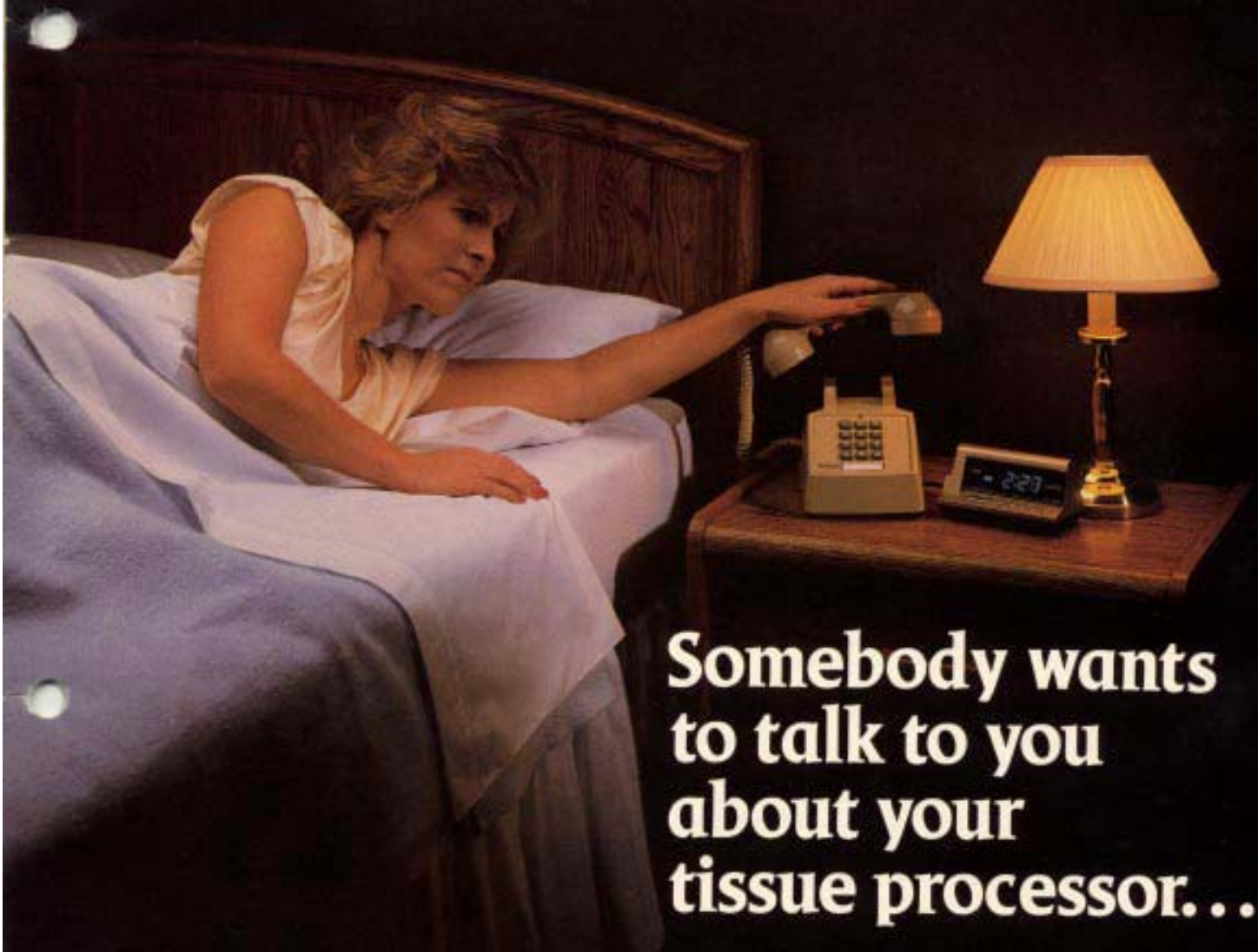
Lipshaw Educational Scholarship Award
Susan Reynolds
Springfield, Illinois

Miles Educational Scholarship Award
Melanie Keyser
Medina, Ohio

Sakura Student Scholarship Award
Lisa O'Connor
Port Jefferson Station, New York

Shandon Student Scholarship Award
Brenda Maitin
Matawan, New Jersey

NSH/Leitz Second Annual Photography Contest
First Place: Roy Bloebaum, Ph.D.
Salt Lake City, Utah
Honorable Mention: Richard Schroeder
Plainview, New York
Criss Meligro
Seattle, Washington



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Regional and State Meetings for 1989

NSH Symposium/Convention September 23-28
Site: Riviera Hotel, Las Vegas, Nev
Contact: Registrar, NSH Office
5900 Princess Garden Pkwy, #805
Lanham, MD 20706

March 9-11 Region III
Site: Raleigh, NC
Contact: Sandra Horton
3911 Memory Lane
Raleigh, NC 27604
919/829-4390 W
919/872-3379 H

May 12 & 13 Region VII
Site: Salt Lake City, Utah
Contact: Susan Wall
2506 E. Cliffswallow
Sandy, Utah 84092
801/581-2560 W
801/942-0124 H

June 9-11 Region V
Site: Omaha, Neb
Contact: Judy Hall
11135 Cottonwood Plaza
Apt. S3
Omaha, NE 68164
402/559-3126 W
402/493-6821 H

May 5-7 Region VIII
Site: Red Lion Inn
Portland, Ore
Contact: Sharon Cheney
1732 N.E. 61st
Portland, OR 97213
503/652-5750
503/288-8529

June 1-3 Region II
Site: Wyndham, Franklin Plaza
Philadelphia, Pa
Contact: Joanne Stanfield
932 Scattergood St.
Philadelphia, PA 19124
215/728-3863 W
215/533-2131 H

Region IV
No meeting for 1989.

Region IX
No meeting for 1989.

May 5-10 Region VI
Site: Sheraton, M. Bird West
Dallas, Tex
Contact: Sandy Hinton
419 Mizell
Duncanville, TX 75116
214/590-8692 W
214/296-9634 H

June 8-11 Region I
Site: Smuggler's Notch at Burlington, Vt
Contact: Judy Carpenter
Histology Lab
Medical Center Hospital
Burlington, VT 05401
802/656-3560 W
802/425-2860 H

March 2-4 Iowa Society of Histotechnology Annual Symposium
Site: Iowa City, Iowa
Contact: Jan Gardner
921 Greene Street
Boone, IA 50036
515/432-3140 X-174
515/432-8741 H

March 3-4 Connecticut Society of Histotechnology
Site: Mystic, Conn
Contact: Bonnie Yanosy
82 Hurd Road
Trunbull, CT 06611
203/384-3020 W

March 12-17 Practical Stain Technology "Wet" Workshop & Seminar
Site: Williamsburg, Va
Contact: Registrar
Center for Histotechnology Training
P.O. Box 736
Olney, MD 20832
301/330-1200

March 23-25 The Walter Reed Bone Symposium
Site: Uniformed Services Univ. Bethesda, Md
Contact: J. O. Hollinger, DDS, Ph.D.
USAIDR
Walter Reed Army Medical Center
Washington, DC 20307-5300

April 13-15 Illinois State Meeting
Site: Springfield, Ill
Contact: Stanley Duknoski
2012 Bruns Lane
Springfield, IL 62702
217/544-6464 X-4160

April 14-15 Louisiana Society for Histotechnology
Site: Tribodaux, La
Contact: Suzanne Lucas
111 E. Garden
Thibodaux, LA 70301
504/447-0747 W
504/448-2012 H

April 19-22 Wisconsin Histology Society
Site: Eau Claire, Wis
Contact: Wayne Kampa
Route #6, Carol Lane
Eau Claire, WI 54701
715/833-6426 W

April 27-28 Tennessee Society for Histotechnology
Site: Nashville, Tenn
Contact: Jeannie O'Saile
1404 Erin Lane
Nashville, TN 37221
615/321-5729 W
615/352-6400 H

April 28-30 New York Histotechnological Society
Site: Syracuse, NY
Contact: Michael Petrilli
554 Tenneyson Ave.
518/476-7461 X-2478
518/488-8011 H

May 6 Oklahoma Society of Histotechnology State Meeting
Contact: Debbie Quackenbush
2813 SW 63rd Street
Oklahoma City, OK 73159
405/737-4448 W
405/682-0223 H

May 6-8 Florida Society for Histotechnology
Site: Ft. Lauderdale, Fla
Contact: Loretta Sayles
#6 Velaire Drive
Boynton Beach, FL 33426
407/395-7100 X-4337
407/737-6216 H

May 11-13 Michigan Society of Histotechnology
Site: Ann Arbor, Mich
Contact: Ethel Pittman
Lab Animal Med.
University of Michigan
Ann Arbor, MI 48105
313/936-1709 W

May 18-21 California Society for Histotechnology
Site: Millbrae, Calif
Contact: Linda McGlothlen
2325 Bridlewood Dr.
Rancho Cordova, CA 95670
916/453-2534 W
916/635-3240 H

May 18-21 Georgia Society for Histotechnology Symposium
Site: Macon, Ga
Contact: Patti Hicks
2119 Nancy Circle
Smyrna, GA 30080
404/350-5577 X-3188
404/432-9417 H

(continued on next page)

May 19-20 Missouri Society for Histotechnology
Site: Kansas City, Mo
Contact: Janet Kliethermes
6213 Claremont
Raytown MO 64133
913/588-2681 W
816/358-3608 H

June 1-3 Ohio Society's 16th Annual Education Seminar
Site: Akron, Ohio
Contact: Melanie Keyser
950 Guiford Blvd.
Medina, OH 44256
216/826-8868 W
216/723-7235 H

October 18-22 AMT/ASMT Northwest Medical Laboratory Symposium
Site: Seattle, Wash
Contact: Yvette Jorgensen
P.O. Box 33605
Seattle, WA 98133

October 26-28 Minnesota Society of Histotechnology
Site: St. Paul, Minn
Contact: Gwen Nelson
2313 Phylis Ct.
Maplewood, MN 55119
612/733-1963 W
612/738-7065 H

November 4 Oklahoma Society of Histotechnology State Meeting
Contact: Debbie Quackenbush
2813 SW 63rd Street
Oklahoma City, OK 73159
405/737-4448 W
405/682-0223 H

November 14-16 Alabama Society of Histotechnology
Site: Birmingham, Ala
Contact: Terrie Staples
1127 Caribbean Circle
Alabaster, AL 35007
205/592-5387 W
205/663-1926 H

To receive your own copy of *Histo-Logic*® or to have someone added to the mailing list, submit home address to: Miles Inc., Diagnostics Division, P.O. Box 70, Elkhart, Indiana 46515.

The editor wishes to solicit information, questions, and articles relating to histotechnology. Submit these to: Lee G. Luna, *Histo-Logic* Editor, P.O. Box 36, Lanham, Maryland 20706. Articles, photographs, etc., will not be returned unless requested in writing when they are submitted.

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