Academic/Education Portfolio

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JOHNS HOPKINS
MEDICINE

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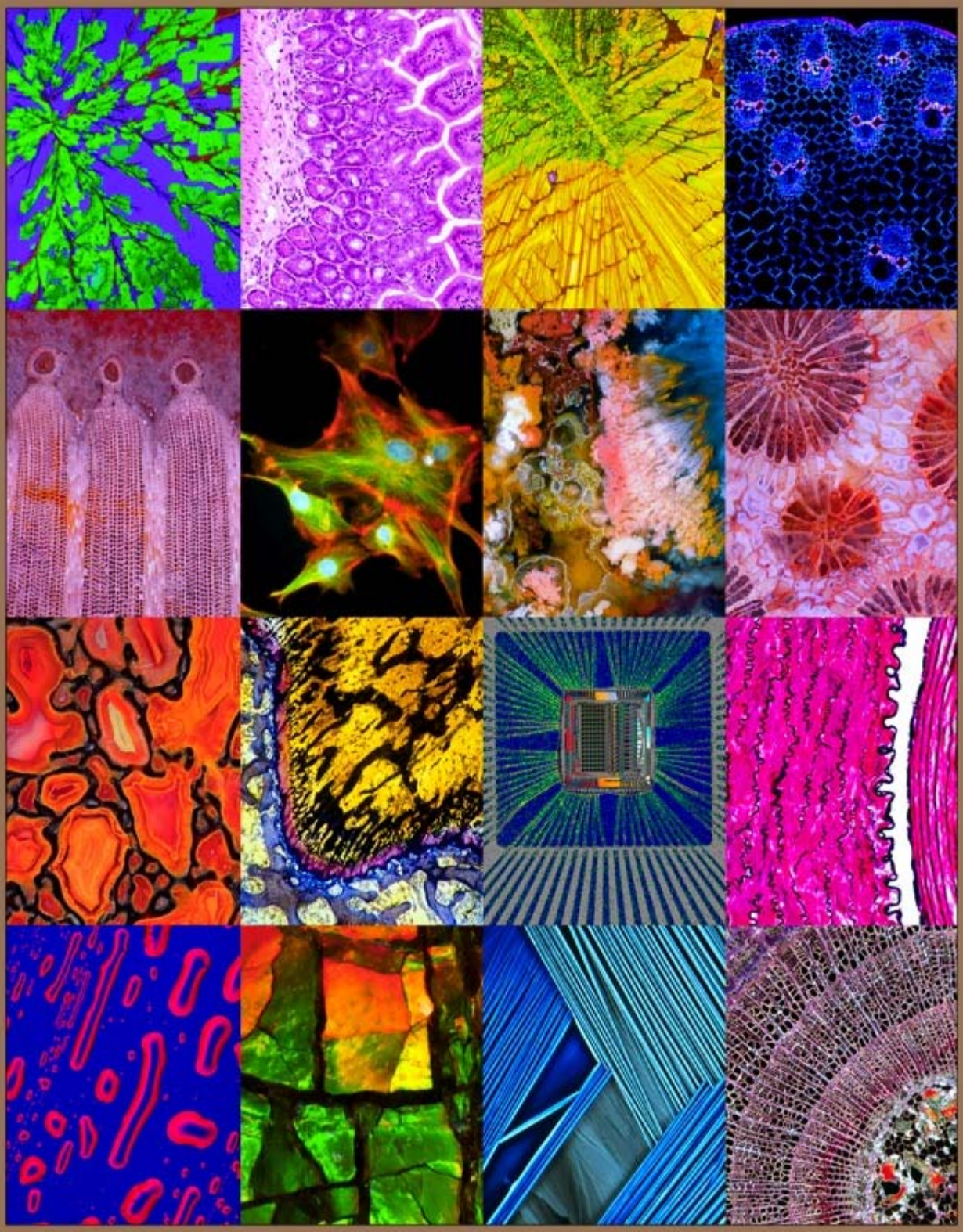
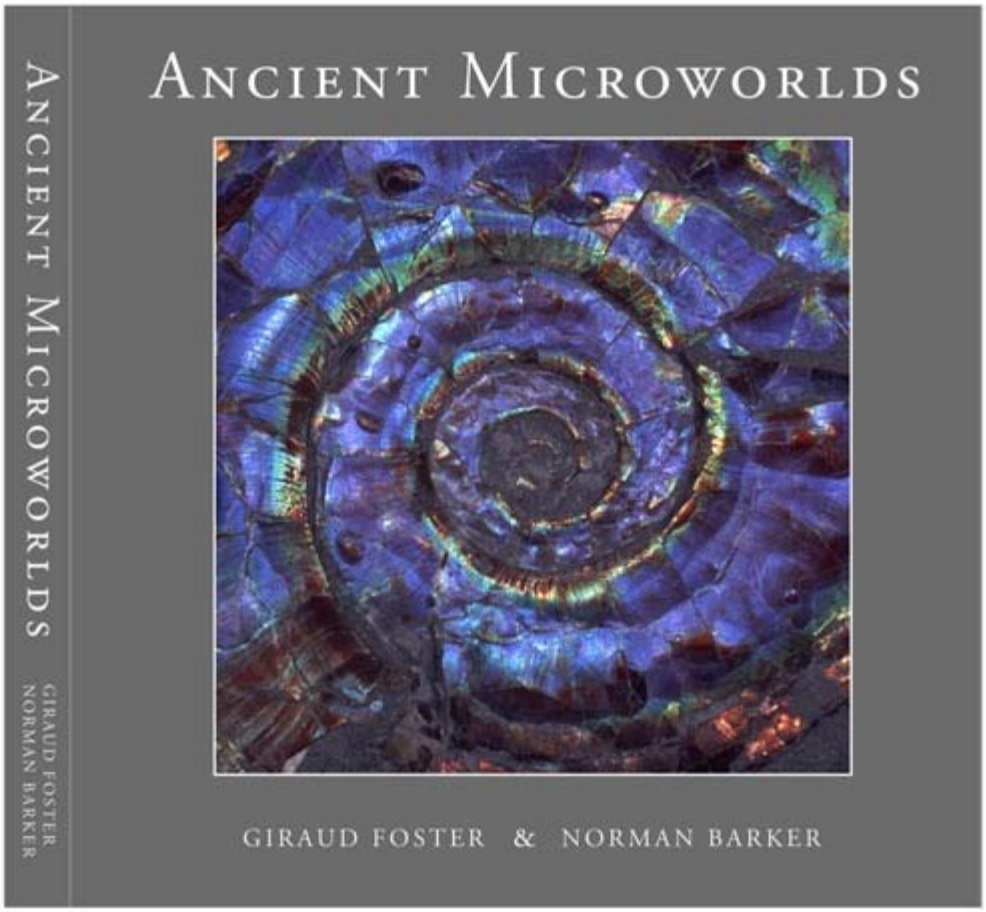
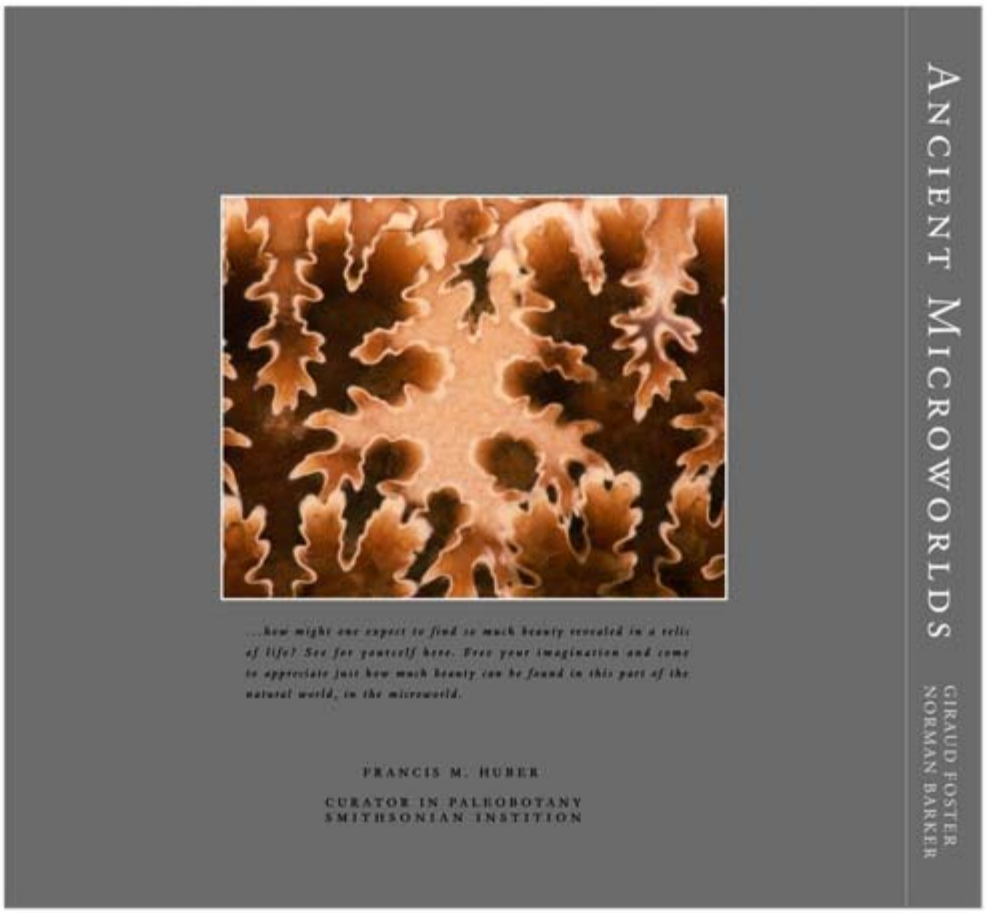
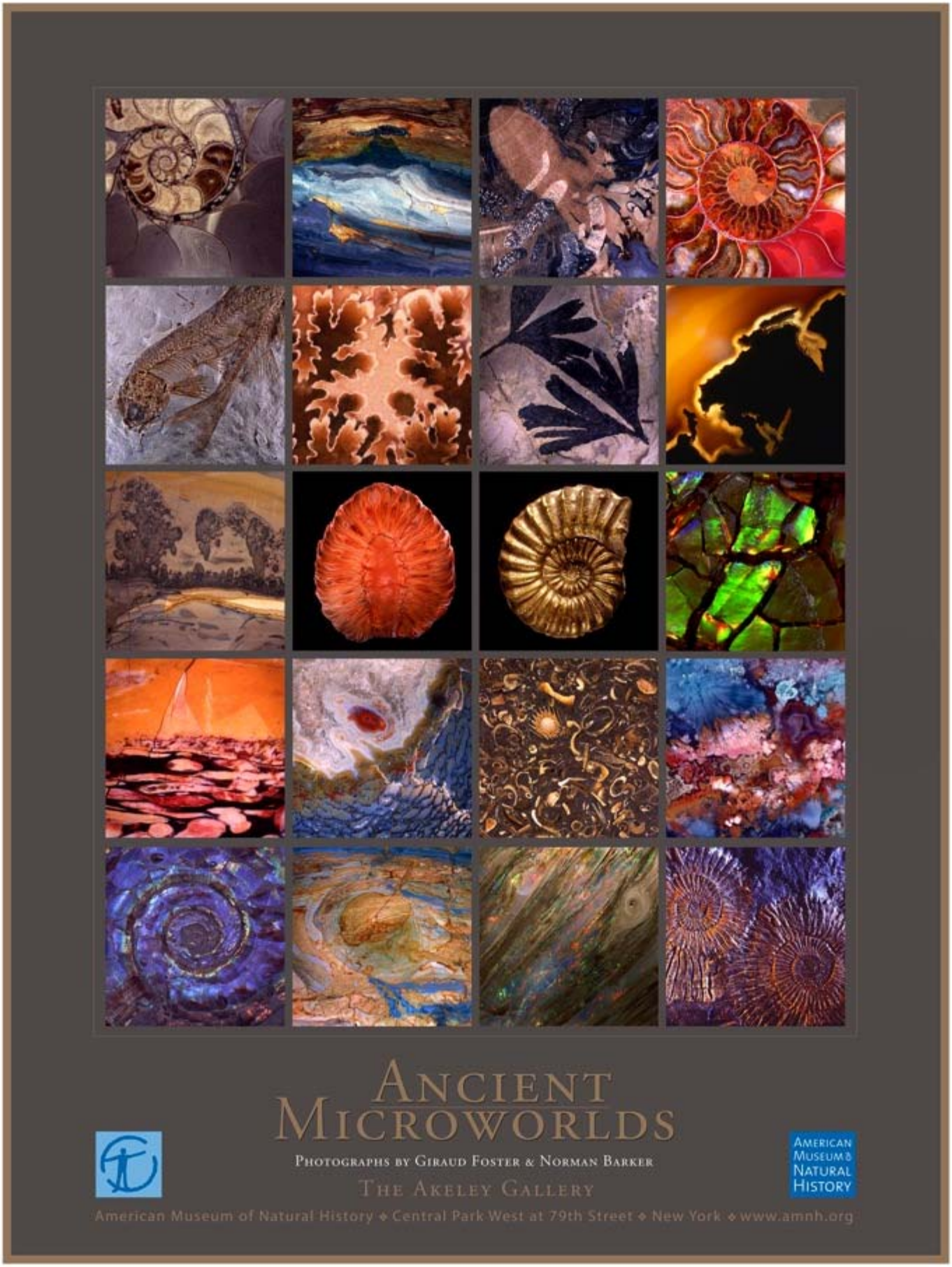
The foregoing pages are samples from books, exhibits and teaching projects created and published by Norman Barker. This work illustrates the scientific image as an intersection between art and science. These images are examples from projects where the scientific image has been taken a step further. The additional steps include identification and publication of the image, communicating information to both the scientist and the student in a way that is both visually interesting and meaningful is critical. In this way, photography and design provide an important bridge between the worlds of art and science and it is to this work that I have dedicated my career as a biomedical photographer, designer and teacher.





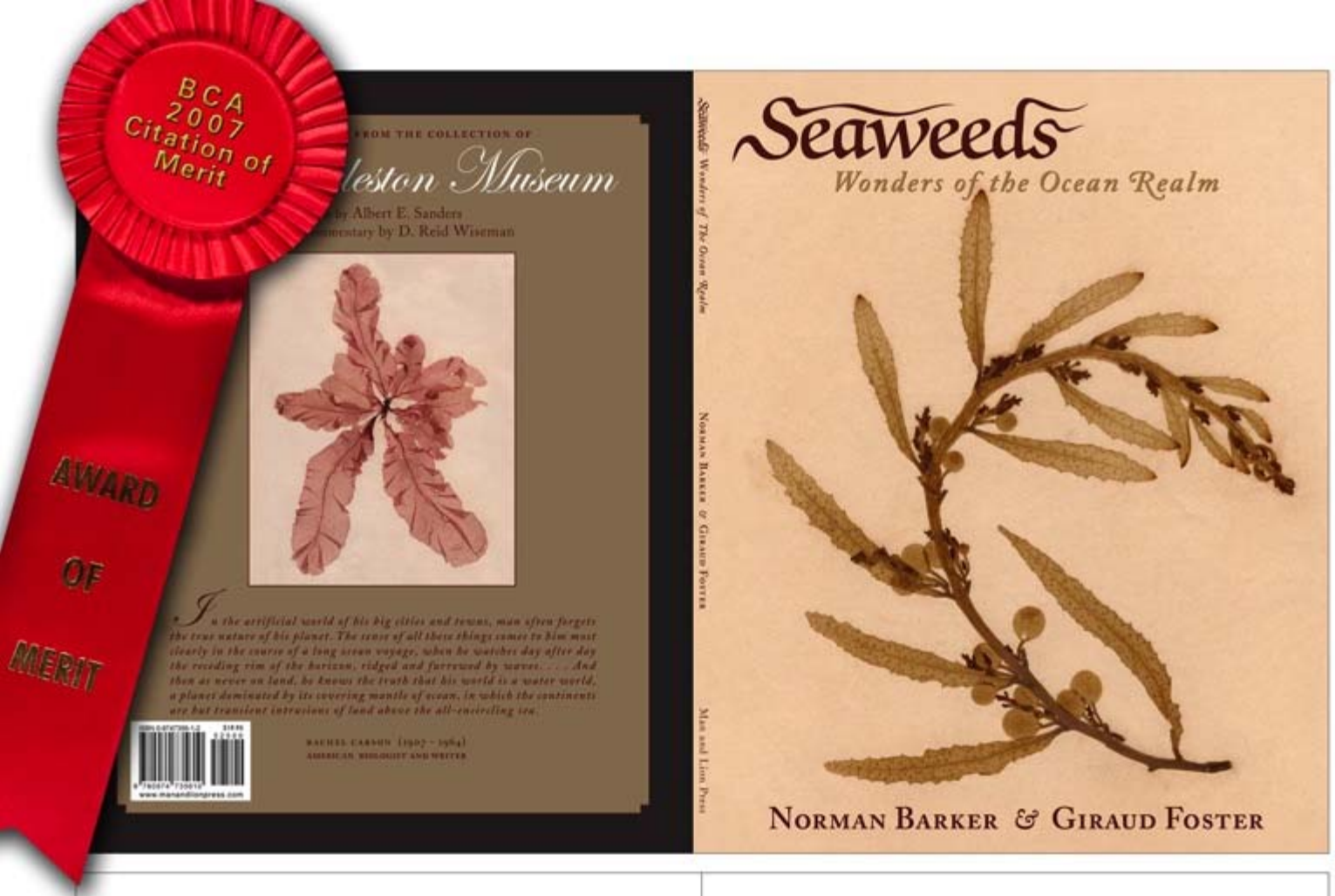


ANCIENT MICROWORLDS, THE BOOK: Coauthored with Giraud Foster this body of work lies at the interface of science and fine art, photographing beautiful fossils from around the world in color with varying degrees of magnification. In the book there are seventy-eight images included with complete scientific names and explanation of morphology. Custom & Limited Editions Publisher, 2000



ANCIENT MICROWORLDS, THE EXHIBIT: Ancient Microworlds was shown at more than 40 natural history museums and science centers in the United States, Europe and Asia over a period of ten years. It has been seen by more than one-million museum visitors. I designed the this poster for the exhibition at the American Museum of Natural History. www.ancientmicroworld.com

Seaweeds: Wonders of the Ocean Realm: I designed this poster for The Charleston Museum. It was awarded with "Best of Show" at the the national salon at the BioCommunications Asscociation meeting in Portland, Oregon, 2005. www.bca.org/gallery/bioimages2005.html



Polysiphonia sp.

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Seaweeds

Wonders of the Ocean Realm

Norman Barker & Giraud Foster

Essay by Albert E. Sanders
Notes & Commentary by D. Reid Wiseman

in association with
The Charleston Museum

Man and Lion Press / Baltimore, Maryland

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Seaweeds: Wonders of the Ocean Realm: This collaborative book and museum exhibit trace the historical connection of pressed plant specimens and the first book to be published using photographs by Anna Atkins in 1842. The catalog also describes seaweed morphology and specimen geographic location. Man & Lion Press 2007, The book was awarded a Citation of Merit in the graphics media periodicals division at the BCA meeting in Tuscon AZ. www.bca.org/gallery/bioimages2013awards.html

Hypoglossum hypoglossoides

Ceramium sp. & *Euthora cristata*

In South Carolina, this is mainly a winter-spring species and has been reported from the Canadian Arctic to southern Florida in the Gulf of Mexico, Bermuda, Brazil, Russia, Portugal, South Africa, Australia, Japan, western South America, and from Alaska to California. It is truly one of the most cosmopolitan species in this book.

Heterosiphonia gibbesii (Harvey) Falkenberg

This is one of the most historically significant specimens in the Charleston Museum's algal collections. This specimen was collected by Harvey from Key West as "Harvey (8)" and cited as such in *Nereis*. Harvey's Key West collections of this species and a specimen sent to Professor Gibbes by Dr. Wurdemann from Key West formed the basis for Harvey's describing them as a new species, "*Dasya gibbesii*"; again another triad of scientists, Wurdemann, Gibbes, and Harvey.

From *Nereis*: "The name is given in honor of Prof. Lewis R. Gibbes of Charleston, from whom I received the first specimen of this and several other interesting Algae of Florida." Imagine Harvey's delight when he found this species growing abundantly in Key West.

Dr. Wurdemann, a Charleston physician, had retired to Key West for health reasons and died from tuberculosis in 1849, thereby missing the opportunity to meet Harvey a year later. Harvey erected a new genus in *Nereis*, *Wurdemannia*, to honor "a meritorious naturalist." Harvey stated that he was not totally convinced that the Key West specimens merited being assigned to a new genus because this "cannot be fully substantiated until cystocarpic shall be discovered." Oddly, these reproductive structures that develop on the female alga have not been observed but the genus has stood the test of time and now is placed in its own family, the *Wurdemanniaceae*. So "pimples" are not absolutely determinative for taxonomic recognition. Harvey in *Nereis* also described a new species, *Dasya wurdemanni*, previously placed in the genus *Rhodomela* as "*R. wurdemanni*" by Professor Bailey of West Point. In 1901, Falkenberg also transferred this species to the genus *Heterosiphonia* as *H. wurdemanni*.

H. gibbesii has been reported in Bermuda, Bahamas, Cuba, Jamaica, Grenada, and Venezuela.

Hallmeda incrassata (Ellis) Lamouroux **& *Laurencia* sp.**

There are two different species on this sheet from Edmund Ravenel's herbarium. Three of the specimens are the calcified green alga, *H. incrassata* and a single specimen of the red algal genus, *Laurencia*. In tropical ecosystems, the various species of *Halimeda* play a dominant role. Borings from coral reef lagoons reveal that the first twenty meters of sediment are up to 95% *Halimeda* segments. These sediments are eventually turned into limestone formations.

Like species of *Caulerpa*, the *Halimeda* are siphonaceous, broadcast spawners. Nearly all of the contents of the cells are turned into sex cells or gametes. The gametes are released in puffs followed by the death and disarticulation of the segments making up the alga.

During Harvey's 1850, one-month stay in Key West, he collected ten species of rhodosporeae, eighty-two rhodosporeae and thirty chorosporeae. Since there is no collection data on the sheet, the chlorosporeae, *Halimeda*, and the rhodosporeae, *Laurencia*, may have been collected by Harvey in Key West. Edmund Ravenel owned a home on Sullivan's Island and these specimens may have appeared in a post-hurricane wrack line on the beach. Harvey commented in *Nereis* that " 'A perhaps of the seasons of seaweed cast ashore at Key West" are species of *Laurencia*.

Callithamnion corymbosum (J. E. Smith) Lyngbye

This specimen from a Smythe album has a penciled identification on the sheet, *Callithamnion corymbosum*, but the identifier's name is absent as is the collector and locality. In the British Isles this red algal species grows on *Zostera marina*, "eel grass". This rhodosporeous species has been reported throughout the world's oceans from Norway, Canary Islands, the Mediterranean, and the Canadian Maritimes to New Jersey, the West Indies, Australia, and Japan. Although it has not been found in South Carolina, it is very similar to *Callithamnion pseudofaroides* P. Crouan et H. Crouan which have been reported in South Carolina.

Bangia fuscopurpurea (Dillwyn) Lyngbye

This Smythe specimen is loosely inserted into one of his albums. These unbranched red algal filaments are heterophasitic, that is, they produce male and female sex cells on the same filament. After fertilization occurs, cystocarpous are released and settle down on a rock or shell and germinate into minute, pink threads, during this, the "conchocelis" stage. The conchospores that are produced will, when released, settle down on a rock or shell and give rise to these macro-algal filaments. *Bangia* and its close relative, *Porphyra*, are the only two red algae illustrated here that do not form "pimples" after fertilization, and do not produce tetrasporangial plants; all of the other reds have a tetrasporangial phase that is indistinguishable from the male and female stages and they do not have a "conchocelis" stage.

Bangia fuscopurpurea was one of the eight first-issued cyanotypes of Anna Atkins. This is a cosmopolitan species and is commonly found growing intertidally on jetties, groins, and seawalls in South Carolina.

Dasya baillouviana (Gmelin) Montagne

Identified as *Dasya elegans* this specimen is now recognized as *Dasya baillouviana*. Abundant in the winter and spring in South Carolina, it seemingly disappears during the warmer months but persists through the summer and fall by forming microscopic germlings and discs. Harvey in *Nereis* commented that he and Gibbes collected specimens from Sullivan's Island and Harvey from Key West as *D. elegans*. This intricately beautiful red alga has been reported from Massachusetts to southern Florida, the Gulf of Mexico, Caribbean, and Brazil. It has been introduced into Holland and Sweden but has not been reported from the British Isles.

Delesseria sanguinea (Hudson) Lamouroux

This is one of the five specimens in the Smythe albums identified as to species with locality data. This red algal specimen, *D. sanguinea*, was collected from Roundstone Bay, Ireland by an unknown collector on an unknown date. Originally described by Hudson in 1762 as *Fucus sanguineus*, the male and female plants have thirty-one chromosomes in their nuclei (see comments about chromosome number under *Polysiphonia denudata*). It has been reported from Iceland, Arctic Norway, Spain and the British Isles. Cyanotypes of this species were made by Anna Atkins.

Champia parvula (C. Agardh) Harvey

No other red algal specimen in this book has such prominent Harveyan "pimples", or "cystocarpidia-like" fruits. Each of these cystocarps represents a single fertilization and that, within each, the first cell (the zygote) formed by the sexual union of spermatium and egg, is cloned many times producing a "bushel" of carpospores. Each carpospore when released will develop into a tetrasporophyte that will produce spores that will give rise to male and female plants. Before the multiple fertilizations take place on the female plant, "she" is indistinguishable from the "male" plant and the tetrasporophytic plant. In the field, the protuberant pulchritude of the alga leaves little doubt that you have a female in hand.

This alga has been reported from the Canadian Maritimes to South Florida, the Gulf of Mexico, from the Caribbean to Brazil, the British Isles, France and Portugal.

Chrysymenia enteromorpha Harvey

This red algal specimen from the Gibbes collection was collected by Harvey in 1850 from Key West. This was one of the eighty-three red algal species he reported from there, and this species was numbered "(65)." Harvey initially identified it as *Halymenia ligulata* with a question mark. Gibbes has penciled in *Chrysymenia enteromorpha*. Harvey in his original description of *C. enteromorpha*, admitted that he had mistaken it for one of the "sporiferous" forms of *H. ligulata* but under the microscope, found the structure of the two plants different.

Historically, this specimen may be of great value, if Harvey based his original description *does not* a specimen or specimens numbered "65." Harvey said this was a "rare" species in Key West and more than likely it was "thrown up from deep water."

This deep-water species has been reported from the Carolinas, Georgia, Bermuda, southern Florida, the Gulf of Mexico, Caribbean, Brazil and West Africa.

Gracilaria tikvahiae McLachlan

This is a Gibbes specimen collected from Charleston Harbor on May 27, 1854, and identified by him as *G. multipartita* J. Agardh, though now recognized as *G. tikvahiae*. Gibbes and Harvey previously collected specimens from the harbor in 1850. It is one of the most abundant intertidal reds especially on the jetties in South Carolina of Charleston Harbor, Winyah Bay and Murrells Inlet. The subtidal cell-wall polysaccharide agar may be extracted from this species.

It has been reported from the Canadian Maritimes to northeastern Florida, in the Gulf of Mexico and Caribbean to Brazil.

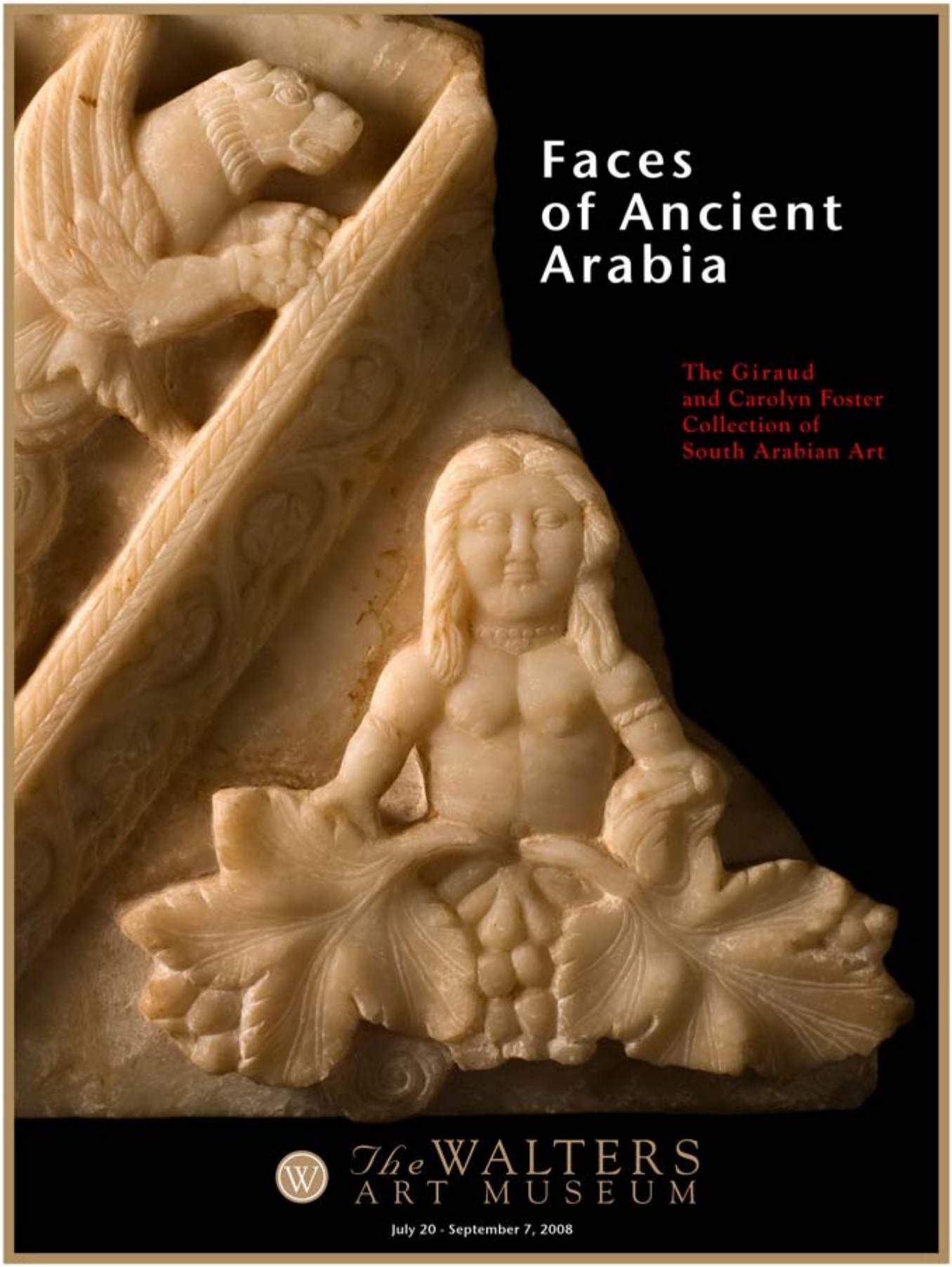
Odonthalia dentata (Linnaeus) Lyngbye

Harvey sent this specimen to Henry Ravenel without data about location and date of collection. Harvey in *Nereis*, reported that he secured specimens of this species while dredging in Halifax Harbor, Nova Scotia, in 1849. However, this specimens may have been collected by Harvey from the British Isles, probably from Antrim County in Ireland.

The "shadow" of Anna Atkins' cyanotype is almost identical to this specimen. The great Swedish taxonomist, Linnaeus, originally described this red algal species and gave it the binomial epithet, *Fucus dentatus* in 1767 which survived in the scientific literature until 1819, when Lyngbye placed it in a new genus, *Odonthalia* as *O. dentata*. It has been reported from the Spitzbergen to the British Isles, the Canadian Arctic to Nova Scotia.

Hypoglossum hypoglossoides (Stackhouse) Collins & Harvey

This lovely red algal specimen is one of the first species of seaweeds reported from South Carolina by the West Point professor, Jacob W. Bailey in 1851. In *Nereis*, Harvey commented on the passing of Bailey: "He was, so far as Algae are concerned, my chief American referee, to whom I could apply when seeking information on local matters, connected with this branch of study." Also "With him I constantly associated my work, and to his approbation I looked forward as the most grateful reward of my labours, and now that he is removed, my interest in the work has sensibly flagged, and I am not sorry that it is brought to a conclusion." Harvey wrote these comments in the 1858 introduction to the Chlorosporeae, the last of the three "sub-classes" in *Nereis*, the others, the Melanosporeae and the Rhodosporeae.



Faces of Ancient Arabia: This book and museum exhibit documents the largest collection of Ancient Southern Arabian Sculpture in private hands. The sculptures were donated to the Walters Art Museum, my role as picture editor and photographer included all of the studio photography for the exhibition catalog and work with the designer to produce the book.
The Walters Art Museum, 2008

Fragment of a Stela with Ibex and Oryx Antelopes
5th–4th century BC, Calcite-Alabaster

Head of a Ram
1st century BC–2nd century AD, Calcite-Alabaster

Frieze with Animals and Trees
5th–3rd century BC, Calcite-Alabaster

Stela with Representation of a Seated Woman, 2nd-1st century BC
Calcite-Alabaster

Stela with the Head of a Bull
3rd century BC, Calcite-Alabaster

Head of a Women with Oval Face
1st century BC, Calcite-Alabaster

Stela with Female Bust
1st century BC, Calcite-Alabaster

Relief with Vine Tendrils
2nd century AD, Calcite-Alabaster

Head of a Man with with Moustache and Grumpy Face
2nd–1st century BC, Calcite-Alabaster

Inscribed Stone Block
Middle 1st century AD, Calcite-Alabaster

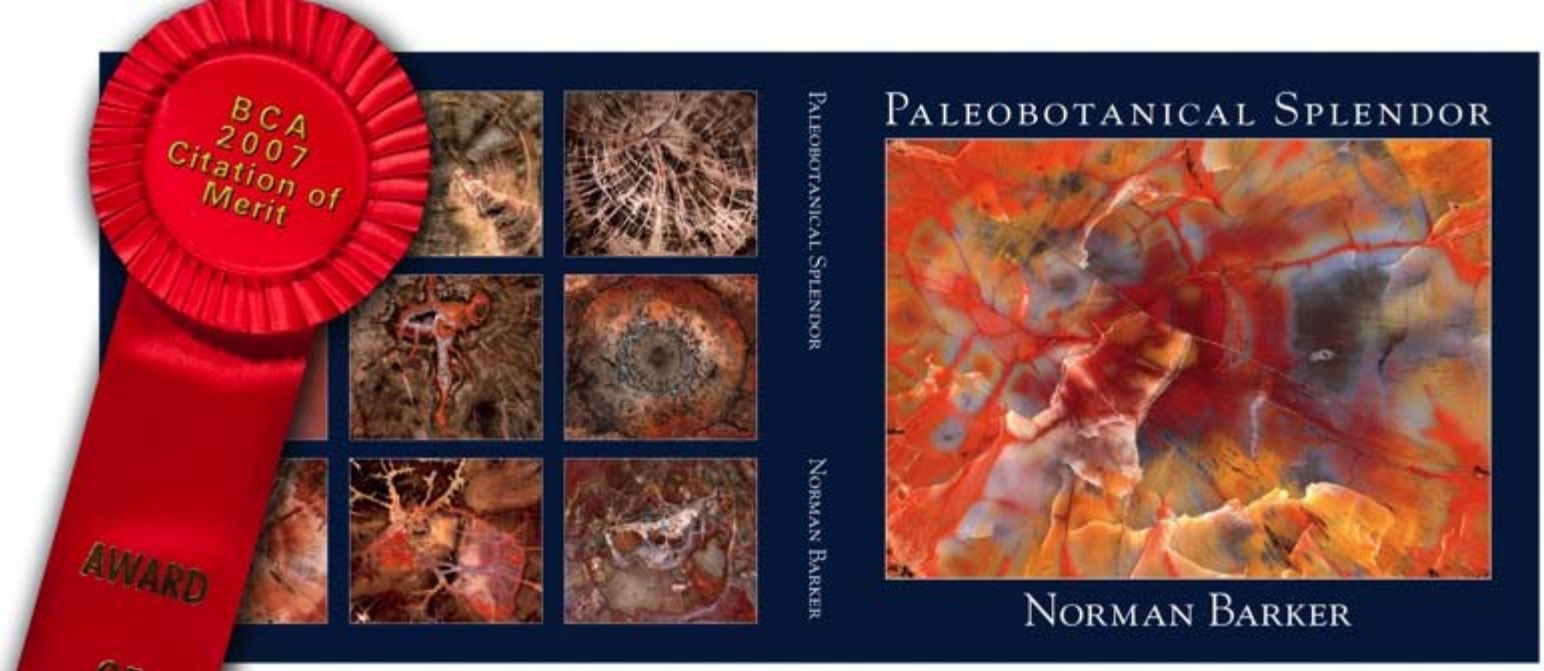
Head of a Women with Long neck on a Base,1st century AD, Calcite-Alabaster

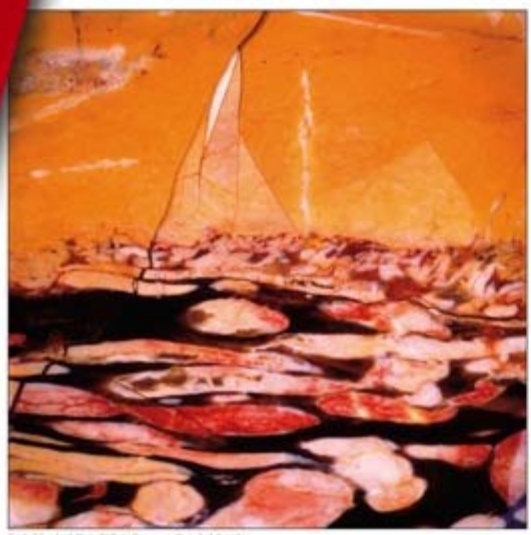
Head of a Large Bull Figure
1st–2nd century AD, Calcite-Alabaster

Fragment of a Stela with Ibexes
8th–7th century BC, Calcite-Alabaster

U-shaped Juvenile Face
1st century AD, Calcite-Alabaster

Faces of Ancient Arabia: The Giraud and Carolyn Foster Collection of South Arabian Art, A sample of some of my studio photographs from the book. Walters Art Museum 2008





PALEOBOTANICAL SPLENDOR

NORMAN BARKER, MS, MA, RBP
Associate Professor of Pathology
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The Johns Hopkins University
School of Medicine

Man and Lion Press / Baltimore, Maryland

"There are worlds of expression beyond the world of the oppressive man, beyond history, and beyond sorrow. The moods and qualities of nature and the realizations of great art are equally difficult to define: we can grasp them only in the depths of our perceptive spirit."

Ansel Adams

Neuropteris
Carbonifera
Freiberg Dreibrunn, Germany

PALEOBOTANICAL SPLENDOR: This book is a celebration of the beautiful ancient plant life that has been preserved in stone. Macro and micro photographic techniques were used to highlight the functioning of the plant structure. Simply stated, paleobotany is the study of fossil plants. One of the extraordinary aspects of this scientific discipline is that it can provide a historic perspective on how plants function, from the earliest stages to full maturity. Man & Lion Press 2011, www.bca.org/gallery/bioimages2008.html

"The dignity of the artist lies in his duty of keeping awake the sense of wonder in the world. In this long vigil he often has to vary his methods of stimulation; but in this long vigil he is also himself striving against a continual tendency to sleep."

G.K. Chesterton

Tietea brasiliensis

Permian

Araguaina, Brazil

"It is not so much for its beauty that the forest makes a claim upon men's hearts, as for that subtle something, that quality of air that emanation from old trees, that so wonderfully changes and renews a weary spirit."

Robert Louis Stevenson

Araucarioxylon

Cretaceous

Madagascar

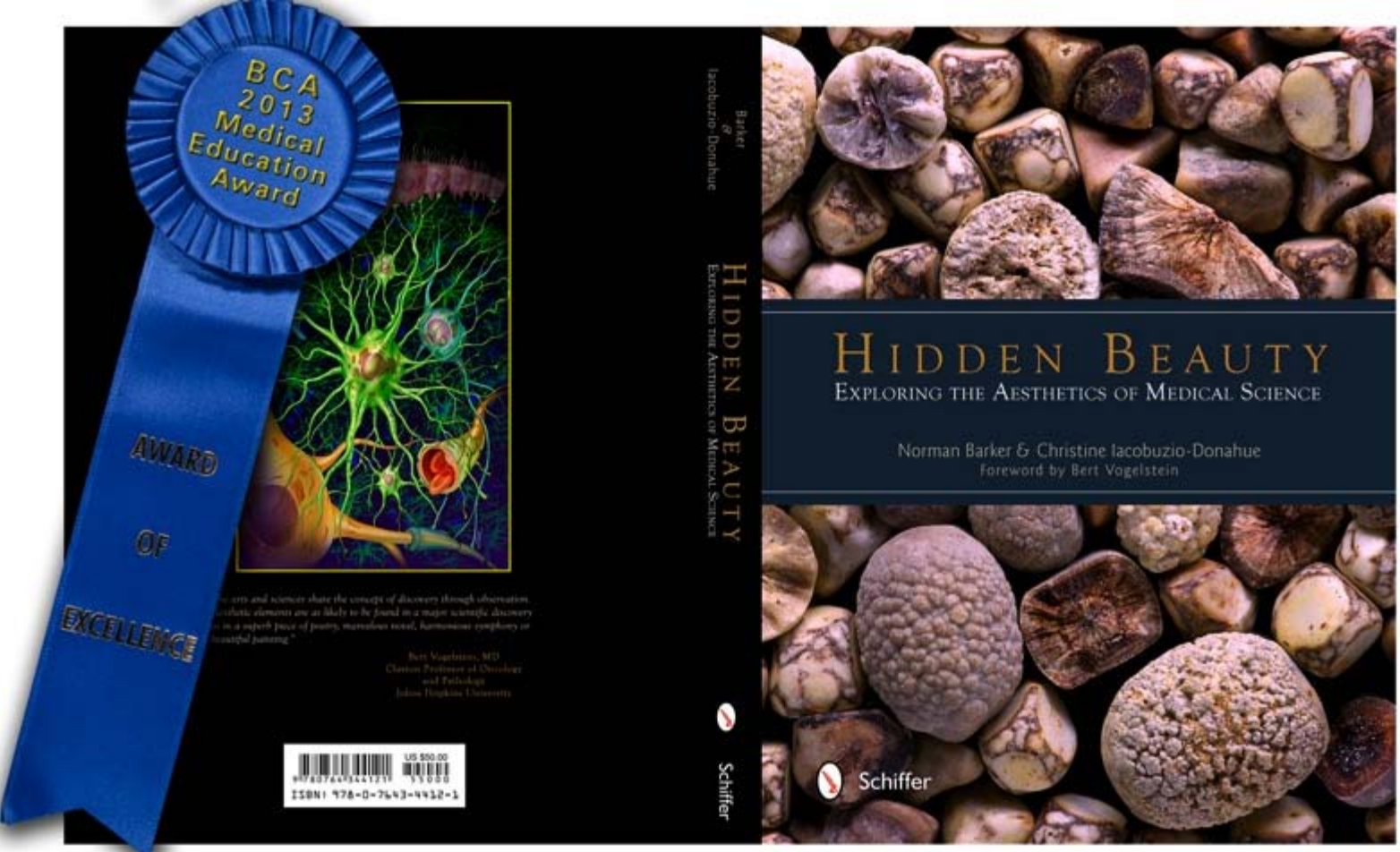
"One does not think during creative work, any more than one thinks when driving a car. But one has a background of years—learning, unlearning, success, failure, dreaming, thinking, experience, all this, then the moment of creation, the focusing of all into the moment. So I can make 'without thought,' fifteen carefully considered negatives, one every fifteen minutes, given material with as many possibilities. But then, is all the eyes have seen in this life to influence me."

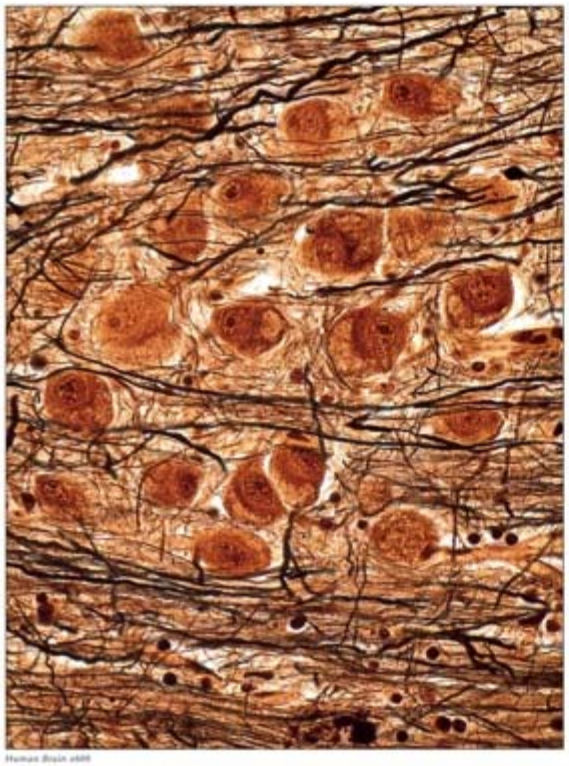
Edward Weston

Tarcihapteris Spec.

Permian

Villamora, Paraguay





Human Brain x600

HIDDEN BEAUTY

EXPLORING THE AESTHETICS OF MEDICAL SCIENCE

EDITORS

NORMAN BARKER

CHRISTINE IACOBUZIO-DONAHUE

FOREWORD BY

BERT VOGELSTEIN

HIDDEN BEAUTY: EXPLORING THE AESTHETICS OF MEDICAL SCIENCE: This award winning book is a collaborative project by a scientist and artist asks the reader to consider the aesthetics of human disease, a dynamically powerful force of nature that acts without regard to race, religion, or culture. Here more than sixty medical science professionals present visually stunning patterns of different diseases affecting various areas of the human anatomy. Captured with a variety of imaging technology ranging from spectral karyotyping to scanning electron microscopy. Schiffer Books, April 2013. The book was awarded the BioCommunications Associations *2013 Medical Education Award.* www.bca.org/gallery/bioimages2013awards.html www.hiddenbeautyinmedicine.com

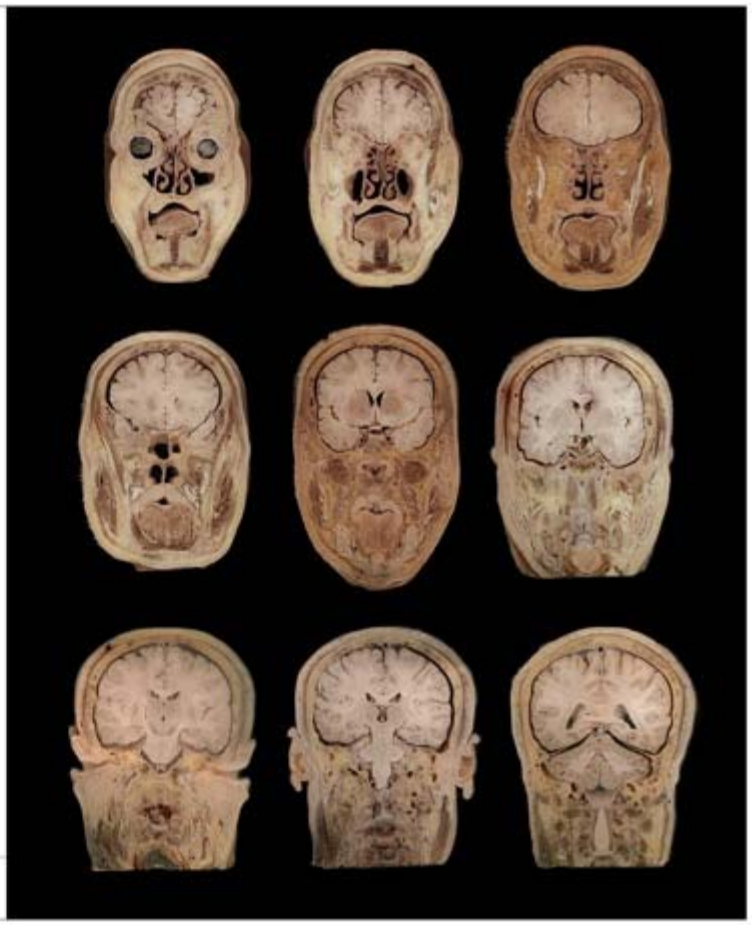
Coronal section through the head

Through the ages, art and anatomy have always had a close relationship. For example, during the Renaissance artists and anatomists were often the same person. From their own dissections and drawings came huge contributions to our understanding of medical science and the human body. One of the most famous drawings illustrating this point is that of the great anatomist/physician Andreas Vesalius on the title page of his classic book, *De Humani Corporis Fabrica*, published in 1543. One of the most influential books on human anatomy for several hundred years, the book plate shows Vesalius performing a dissection with a crowd of interested spectators observing the great anatomist as he points out the salient features from the open belly of a female corpse.

There has always been a fascination in looking to see what's inside the human body. The first Dutch anatomy theatre was at the University at Lieden. For a nominal charge the public could view the dissection of a human corpse. The Latin text *Nosce te Ipsum* ("Know Thyself") established and legitimized the religious context for dissection of the human body and the advancement of anatomical knowledge. In modern times, people are fascinated to watch a live operation in high-definition on The Discovery Channel from the comfort of their couch.

The controversial modern German anatomist Gunther Von Hagens patented the process of plastination that enables museum visitors to view the human body in unprecedented detail. His exhibition entitled "*Body Worlds*" has been exhibited at science and natural history museums around the world. Literally millions of museum patrons have been awestruck to get close-up views of the inner workings of the human body. The Visible Human Project by The National Library of Medicine is another marvel of modern anatomy. The initial aim of the project was to create a complete digital image dataset of male and female cadavers using high-resolution photography as well as MRI and CT. The whole catalog of data is available on the Internet. Regardless of these hi-tech approaches to anatomy, the requirement for a medical degree remains the one-on-one dissection of a cadaver to learn human anatomy.

The image at right illustrates the anatomy of the human head in nine equally thick serial sections.



The modern microscope

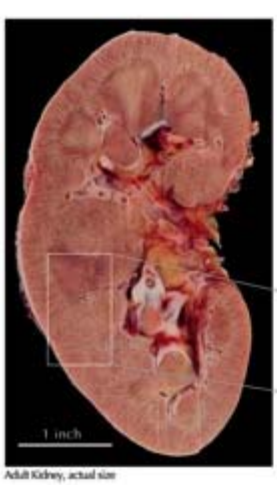
In 1683, Dutchman Antoni van Leeuwenhoek made a startling discovery that changed the world. His observations through his simple microscope started the discipline of microbiology. Despite all the changes in more than three hundred years of microscopy, the pleasure is still being able to view and show others the invisible world beyond the human eye. The universe beyond what can be comprehended by the unaided eye is unbelievably rich and complex. Early microscopes were used more for entertainment than as a tool for scientific discovery. The beauty and subtlety of nature's work fascinated early microscopists, just as it does the curious viewer in the 21st century.

The microscope plays a central role in so many disciplines of science especially medicine and biology. In the majority of biomedical research there are three types of microscopes in use today. The light microscope, the transmission electron microscope (TEM), and the scanning electron microscope (SEM), all help to extend our inspection inside the human body. The two units of measurement shown at the right, the inch and the millimeter are shown at actual or life size. Unfortunately these measurements are of little use in microscopy, for practical applications two smaller units are used. The micrometer is one-thousandth of a millimeter, or one-millionth of a meter. The other unit of measure is even smaller and that is the nanometer. It measures one-millionth of a millimeter or one-thousandth of a micrometer. Just to give an idea of size, twenty atoms side by side would cover the distance of one nanometer, which is about the resolution maximum for a high quality TEM scope. In the modern light microscope, magnification is the result of light passing through a very thin specimen and then up to the objective lens and then the eyepiece, where the virtual image is examined. Magnification occurs in two stages, hence the name, compound microscope. The light that passes through that thin specimen is referred to as transmitted light or bright field illumination.

Incident light (reflected off the surface) is used to view opaque subjects like computer chips or fragments of metal. But, the light microscope has its limitations for the very simple reason of the aberrations of light. In practice, the light microscope has a resolution limitation of approximately one-thousandth of a millimeter (0.001mm). At the highest of magnifications around x1000 we can see structures such as bacteria but they are so small their structure cannot be seen in any detail.

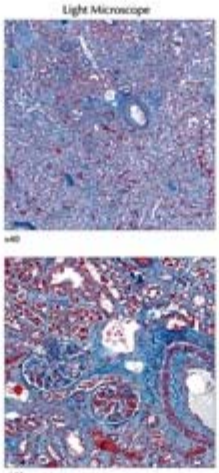
The transmission electron microscope has a resolution limit of (0.000005 mm). This is more than one hundred thousand times smaller than the human eye can see. This instrument can be used to look at the DNA stands inside bacterium with great clarity. This very complicated microscope does not use light to form an image but electrons in a vacuum chamber that bombard the specimen that is usually coated with a very fine layer of platinum or gold to make the specimen electron conductive. Much higher magnifications can be achieved so that we can actually study the basic way in which life functions down to the molecular level.

The scanning electron microscope doesn't have the high resolving power of the TEM. Instead of looking into cells and atomic structures, the SEM is used to see surfaces, such as a kidney glomeruli (right) or metal fatigue. A fine beam of electrons projected in a vacuum scans the surface of the subject. As these secondary electrons radiate off the specimen a detector collects them and they can be viewed on a television screen. Since no light is used to form the image, great depth of focus can be achieved, that can resolve a parasite on top of a flea's head. Images produced with the electron microscope are always monochromatic or B&W, but they are usually artificially colored by a computer. Known as "false color", the color added has no relation to the real color of a particular specimen but the color is added generally for aesthetic effect and can help distinguish regions of interest in the specimen.

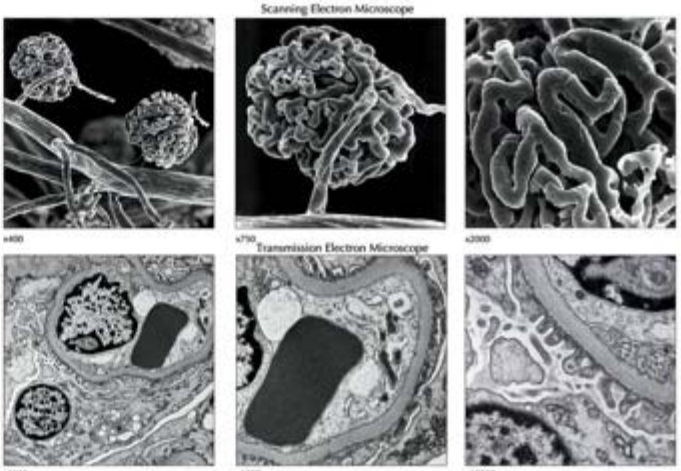


Adult Kidney, actual size

Light Microscope



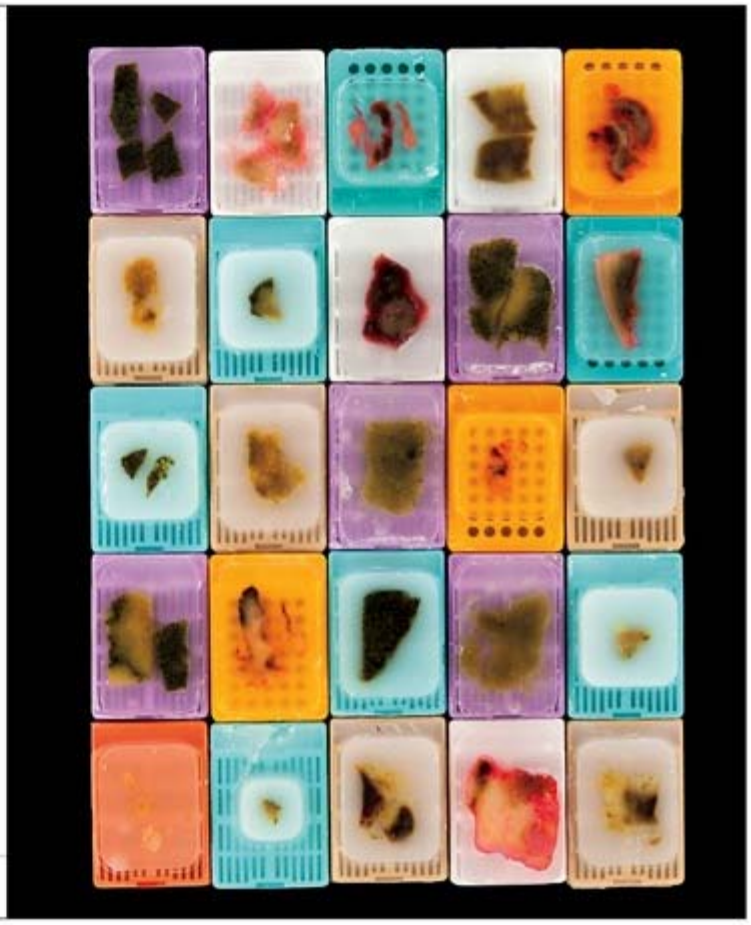
Scanning Electron Microscope



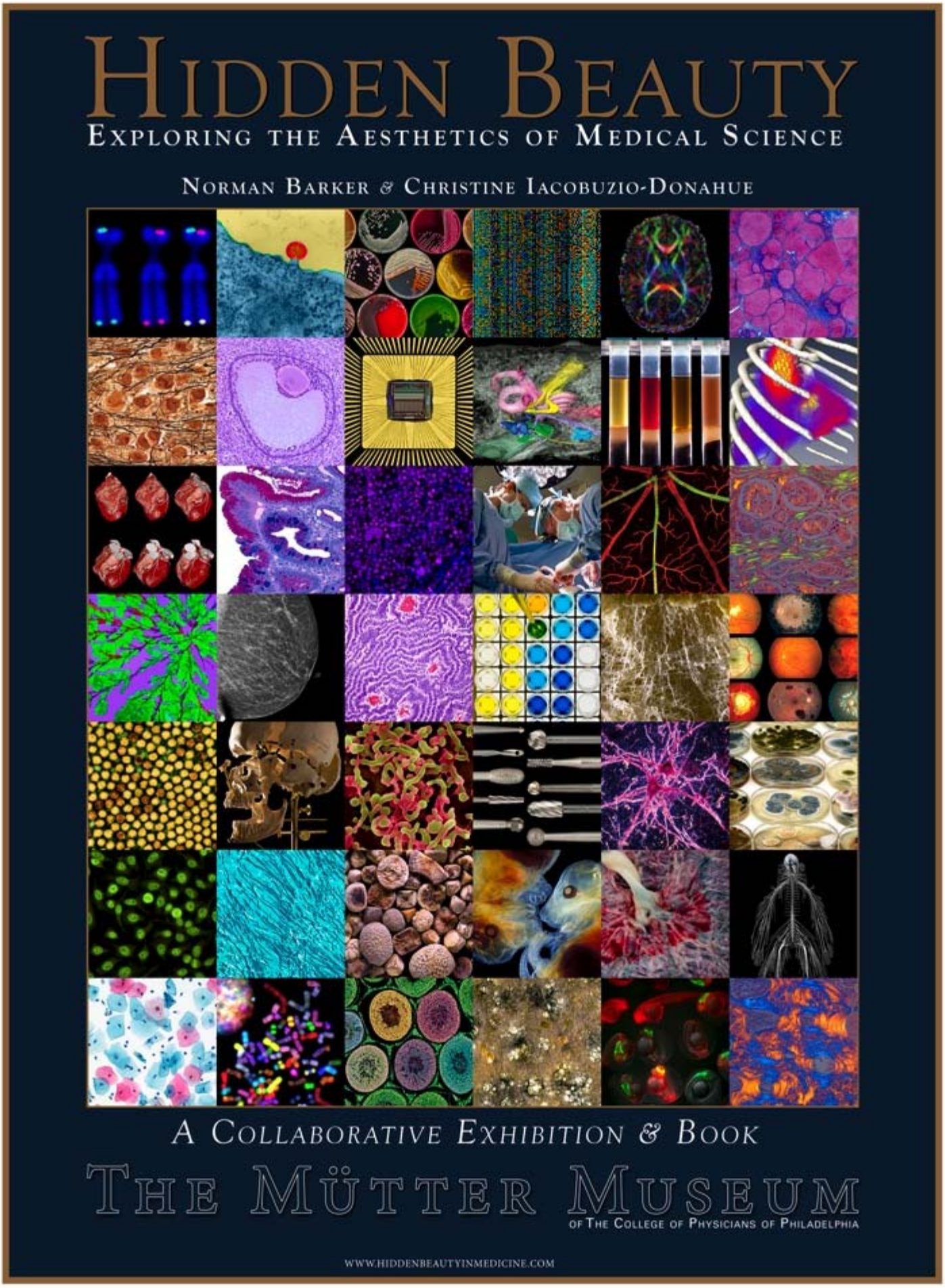
Hidden Beauty: Exploring the Aesthetics of Medical Science: Norman Barker & Christine Iacobuzio-Donahue, book page spreads, Shiffer Books, April 2012, hiddenbeautyinmedicine.com

Paraffin blocks

"Let's see what the pathology shows!"
Many a patient has heard this phrase after a biopsy or surgical procedure, but what exactly does it mean? Anatomic Pathology is a specialty within the medical field that deals with the study of disease in tissues, cells or fluids. Pathologists are medical doctors, and are often referred to as the "doctor's doctor" because they play a consultant role by interpreting the findings in biopsies, tissue specimens or body fluids that help a clinician understand his/her patient's disease and how to treat it. But how does an anatomic pathologist do this exactly? When a piece of tissue is taken from a patient, the pathologist fixes the specimen using a chemical called formalin, and then dehydrates the tissue by incubating it in solvents and alcohol. Once this occurs, the dehydrated tissue can be permeated with hot wax creating a paraffinized version of the tissue. This is important to do because the paraffin acts as a support that allows histotechnologists to cut very thin sections of the tissue. These thin sections (*the width of a human hair*) are mounted on glass slides and then stained so that the pathologist can examine the tissue sections under a microscope (for example, see *Histological Stains* in the Chapter: Abdomen). The image at right is an example of several different paraffin blocks created from different tissue specimens from different patients. Depending on the pathologist working in the lab that day, this particularly busy histology lab has used different colored plastic holders (known as "cassettes") to keep track of each pathologist's specimens while they are being fixed and paraffin embedded.



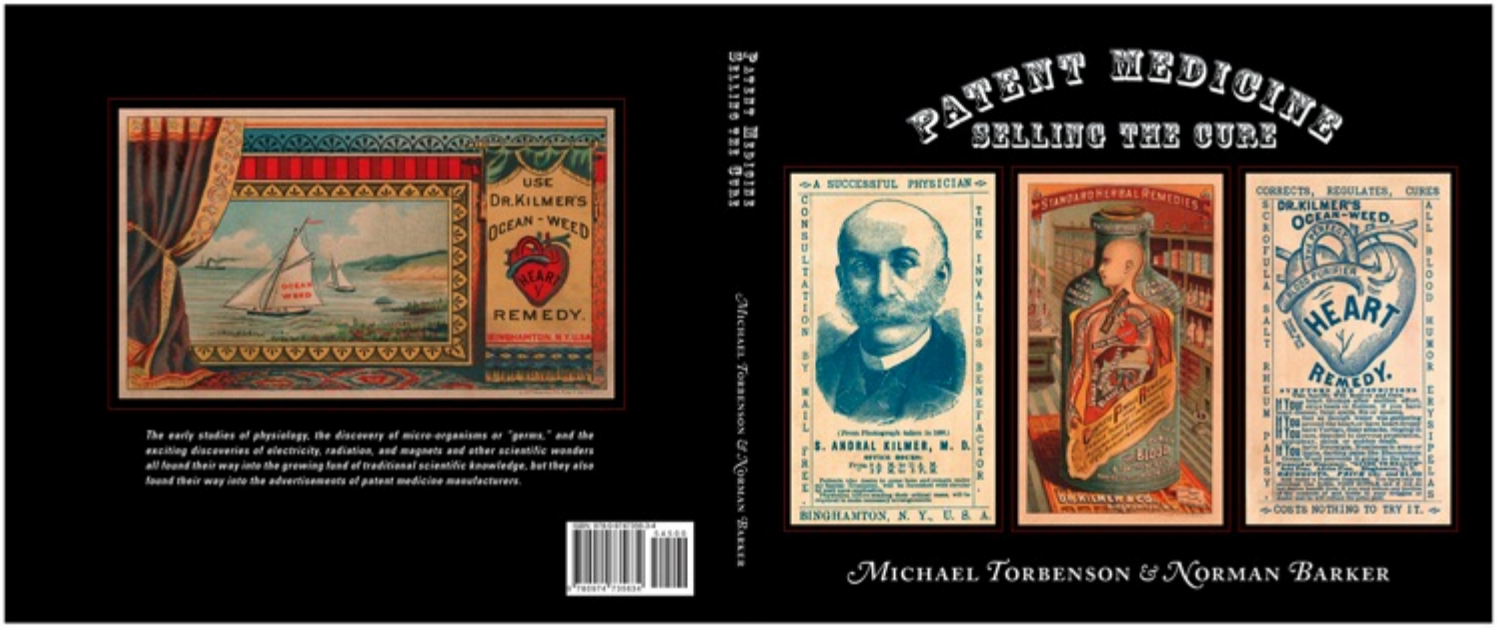
Hidden Beauty: Exploring the Aesthetics of Medical Science: Norman Barker & Christine Iacobuzio-Donahue, book pagespreads, Shiffer Books, April 2012, hiddenbeautyinmedicine.com

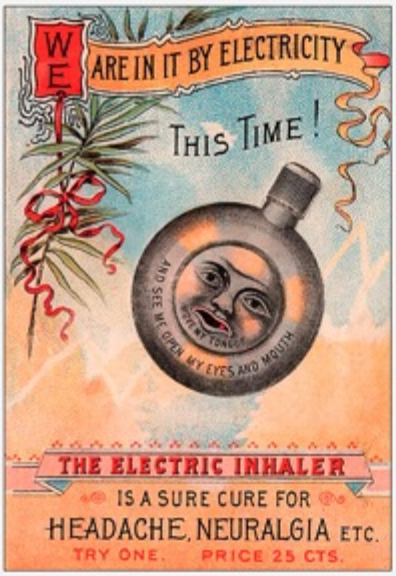


HIDDEN BEAUTY: THE EXHIBIT: Sixty large images from the book will be going on a museum tour, 1st stop, The Mütter Museum.
www.hiddenbeautyinmedicine.com

This paper ***Photographing the osprey in the Chesapeake Bay Region***, documents nesting behavior with remote controlled cameras in the nest, it was recognized with the gold award for the best paper published in The Journal of Biological Photography, Vol 60 No.2 April 1992

Images from the project, ***Photographing the osprey in the Chesapeake Bay Region***. The Journal of Biological Photography, Vol 60 No.2 April 1992





PATENT MEDICINE SELLING THE CURE

MICHAEL TORBENSON
&
NORMAN BARKER

MAN & LION PRESS • BALTIMORE, MARYLAND

Lydia Pinkham's Vegetable Compound

(card circa 1900)

Lydia Pinkham is probably the best known female manufacturer of patent medicines. She grew up in a Quaker family and taught school after marriage. Lydia Pinkham was very active in a number of social and political causes including abolition, women's rights, and temperance, as well as movements such as phrenology and Swedenborgianism. She made herbal remedies for personal and family use for many years, principally a concoction thought to have been derived from modifying a herbal recipe contained in the King's American Dispensary. The original Vegetable Compound contained about 18% ethanol and the following herbs: Unicorn Root, Life Root, Black Cohosh, Pleurisy Root and Fenugreek Seed.

In 1873, a financial panic left her husband bankrupt and in 1875 she began to sell her Vegetable Compound for a $1 a bottle. She advertised her product as a woman's medicine with slogans such as "only a woman can understand a woman's problems". She encouraged women to write in for medical advice and usually recommended Lydia Pinkham's Vegetable Compound along with exercise, good diet, and cleanliness. Her medicine also was recommended for infertility with the advertising promise of "*a baby in every bottle*." Lydia Pinkham realized that many women of the time had little understanding of "*the facts of life*" and published a free booklet on the female reproductive system from puberty through child birth and menopause.

Overall, a small but significant proportion of patent medicines were produced by women. In Baltimore, 44/671 (7%) of patent medicine companies from 1860 to 1930 were owned by women.

LYDIA E. PINKHAM'S
VEGETABLE COMPOUND
IS A POSITIVE CURE

For all those painful Complaints and Weaknesses so common to our best female population.

It will cure entirely the worst forms of Female Complaints, all Ovarian troubles, Inflammation, Ulceration, Falling and Displacements of the Womb, and the consequent Spinal Weakness, and is particularly adapted to the Change of Life.

It will dissolve and expel Tumors from the uterus in an early stage of development. The tendency to cancerous humors there is checked very speedily by its use. It removes faintness, flatulency, destroys all craving for stimulants, and relieves weakness of the stomach. It cures Bloating, Headaches, Nervous Prostration, General Debility, Sleeplessness, Depression and Indigestion.

That feeling of bearing down, causing pain, weight and backache, is always permanently cured by its use.

It will at all times and under all circumstances act in harmony with the laws that govern the female system. For the cure of Kidney Complaints of either sex, this Compound is unsurpassed.

Lydia E. Pinkham's Vegetable Compound is prepared at Lynn, Mass. Price, $1.00; six bottles for $5.00. Sent by mail in the form of Pills, also in the form of Lozenges, on receipt of price, $1.00 per box, for either. Send for pamphlet. All letters of inquiry promptly answered. Address as above.

No family should be without LYDIA E. PINKHAM'S LIVER PILLS. They cure Constipation, Biliousness, and torpidity of the Liver. 25 cents per box.

Lydia E. Pinkham's Blood Purifier.

This preparation will eradicate every vestige of Humors from the blood, and at the same time will give tone and strength to the system.

It is far superior to any other known remedy for the cure of all diseases arising from impurities of the blood, such as Scrofula, Rheumatism, Cancerous Humors, Erysipelas, Canker, Salt Rheum and Skin Diseases.

SOLD BY ALL DRUGGISTS.

Complimente of

PATENT MEDICINE: SELLING THE CURE: I coauthored this book that explores the history of the medical trade card at the turn of the century. Patent Medicines play an important role in the history of medicine and were extensively used in the late 1800's and early 1900's. We show how patent medicine manufactures used images to communicate notions of health and disease and how these images demonstrate several recurrent motifs: slaying the beast of disease, the docterine of signatures, the sick patient, literal illustrations of medicinal effect, gender appeals and utilization of new scientific wonders. Each motif conveyed ideas on health and disease to the public, and their examination provides insight into the history of medicine. Man & Lion Press, October, 2013

Friedrichshaller Bitterwasser

(card since 1880)

During most of the 1800's, the prevailing medical explanation for disease was based on the notion that each person had four humors (*blood, black bile, yellow bile, and phlegm*) and disease was caused by an imbalance in these *humors*. Treatment was designed to restore humors and relied heavily on bleeding, blistering, causing vomiting, and causing diarrhea.

Often, the treatments were literally worse than the disease. George Washington, for example, is felt to have been helped to an untimely grave by excessive bleeding. Patent medicines promised to cure without having to resort to such heroic methods. Some patent medicines were dangerous and a few contained poisonous substances such as mercury, but most were either mild stimulants or laxatives. You don't have to understand German to understand the therapeutic effect offered by this medicine.

No-To-Bac

(Sterling Remedy Co., date unknown)

This patent medicine offered a cure for tobacco addiction. Addiction to tobacco, alcohol, and narcotics are not unique to our times but were recognized by many as causing poor health for several centuries. If you look carefully, you can see on the medicine packaging that "*No-To-Bac eradicates the poisonous nicotine from the system.*" Instead of emphasizing the health benefits of not smoking, the back of the trade card illustrates the potential social benefits.

This understanding that excess use of tobacco, alcohol, and narcotics was unhealthy was often counterbalanced by wide-spread beliefs that the same tobacco, alcohol, and narcotics in modest amounts could cure diseases and they were common ingredients in patent and traditional medicines. Unfortunately, their levels were often not very moderate at all and addiction to patent medicines was not uncommon. Some enterprising medicine manufacturers even made remedies to "cure" individuals of their addictions to other patent medicines.

In the image on this trade card, we again find the familiar motif of an individual defeating an enemy being used to symbolize the patent medicine defeating a disease.

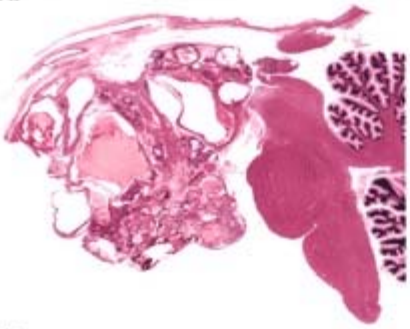
Rex Bitters

(date circa 1900)

Bitters originated in England to avoid a tax levied on alcohol by the addition of bitter flavoring to alcohol and selling it as a tax-free medicine having healing and curing properties. Its curative powers claim to "*cure biliousness, malaria, chills and fever, neuralgia, constipation, pain in back, dyspepsia, sick headache, indigestion, sour stomach, and all "afflictions" of the kidneys and liver*". By the end of the 19th century claims for bitters became more focused on disorders of the stomach and bowels. With the passage of the Pure Food and Drug Act in 1906, the "snake-oil" aspect was curtailed. The law required the manufacturer to list on the label the quantity of alcohol, opium, cocaine and any other major ingredient.

This card was used as an optical illusion, if you put the two cards together the top card appears bigger but both are exactly the same size. It was thought at the time that lobsters were considered a luxury food and hard on the digestive system. So the message of the card translates to "*Why take the lobster to bed with you*"!

9–93



9–94

FIGURES 9–93 AND 9–94 ADAMANTINOMATOUS CRANIOPHARYNGIOMA

This multilobate, multicystic craniopharyngioma filled the third ventricle and produced hydrocephalus in an 11-year-old boy whose 3-year course included headaches and decreased visual acuity (Fig. 9–93). Suprasellar calcification was noted (see Fig. 9–98). The histologic section emphasizes nodular areas of cellularity interspersed among cysts, necrotic debris, and fibrous tissue (Fig. 9–94).

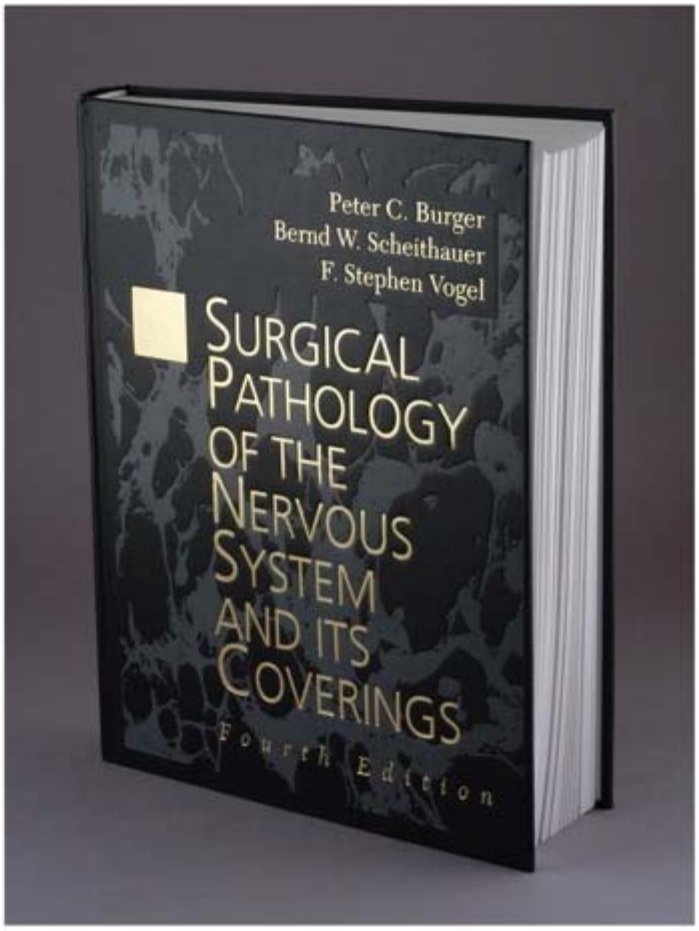


FIGURE 6–10 HIPPOCAMPAL ("MESIAL") SCLEROSIS

In some cases, gliosis is more "active" or "gemistocytic" in appearance, featuring hypertrophic astrocytes with glassy cytoplasm and coarse processes. The molecular layer, at the right of the illustration, is somewhat depopulated and disorganized.

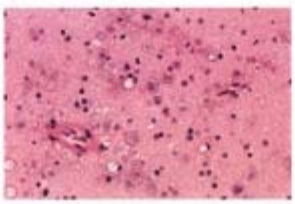


FIGURE 6–11 HIPPOCAMPAL ("MESIAL") SCLEROSIS

Corpora amylacea may be abundant in sclerotic areas.

Cytologically, focal cortical dysplasia is characterized by extremely large cells, some clearly neuronal and others obviously astrocytic, intermingled with neuroglia that cannot be assigned readily to either category (Figs. 6–14 and 6–15).[2,5,11,18,19,20,25] Prominent among the latter are especially large cells with "ballooned" glassy cytoplasm.[9] GFAP-positive astrocytes may be prominent in the first or most superficial, cortical lamina, whereas others are unpredictably and unevenly distributed throughout the remaining cortex and subcortical white matter. The white matter is characteristically hypomyelinated, may contain the large cells (Fig. 6–16), appears pale in myelin-stained sections, and is correspondingly bright in T2-weighted or FLAIR MR images.[9] A linear, often perivascular, tracking of these large cells from white to gray matter suggests that the process is, at least in part, a disorder of cellular migration.

Identifying the large cells is elementary when they are numerous but requires exacting microscopic review when they are not. Abnormal clustering of cells and lack of polarization of apical dendrites to the cortical surface are helpful index features of abnormality. Size per se can

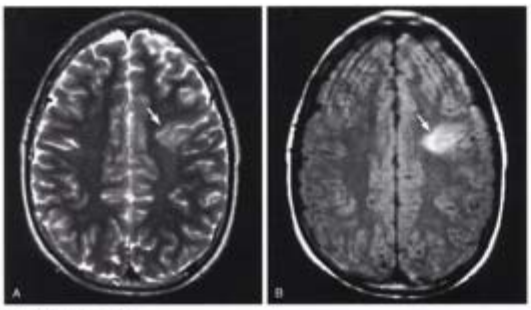


FIGURE 6–12 CORTICAL DYSPLASIA

Radiologically, focal cortical dysplasia may appear as an abnormal sector of the cerebral cortex, as seen in A in a T2-weighted image (arrow). As seen in a FLAIR image, abnormal signal in the hyperintense white matter (arrow) may be present in some cases (B). The patient was an 11-year-old boy with focal right-sided seizures. (Courtesy of Dr. Tom Milligan, Corpus Christi, TX.)

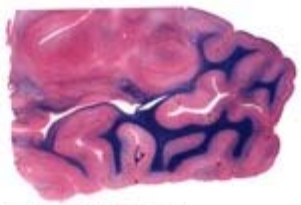


FIGURE 6–13 CORTICAL DYSPLASIA

As is evident in a section stained for myelin (H&E–Luxol fast blue), focal cortical dysplasia thickens the cortex and effaces the normally sharp gray-white junction.

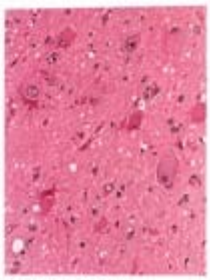


FIGURE 6–15 CORTICAL DYSPLASIA

Abnormally large, sometimes "giant" neurons as well as large glassy astrocytes are the principal components of this process.

be diagnostic because neurons comparable in size to giant motor neurons of Betz would be abnormal in the temporal lobe.

As neuronal-astrocytic hybrids, these large glassy cells and the lesions themselves resemble cortical tubers. Nonetheless, one study found contrasting features. The balloon cells in hemimegalencephaly were negative immunohistochemically for tubers, the tuberous sclerosis 2 gene product, and were always negative for GFAP.[1] Efforts to find molecular abnormalities of the two tuberous sclerosis genes in the sporadic cortical dysplasia have been unrewarding.[21]

Microscopic Malformative Lesions (Microdysgenesis)

The term *microdysgenesis* has been applied to a diverse group of radiologically subthreshold findings. Their significance is difficult to determine in a given case because the same "lesions" are occasionally found in patients without seizures, and more than one variant may be found in a single specimen from a patient with seizures. Although their presence may satisfy the

FIGURE 6–14 CORTICAL DYSPLASIA

The process in this case spans the cortical ribbon. Note the large cells.

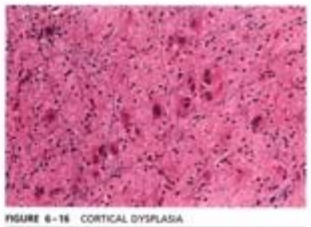
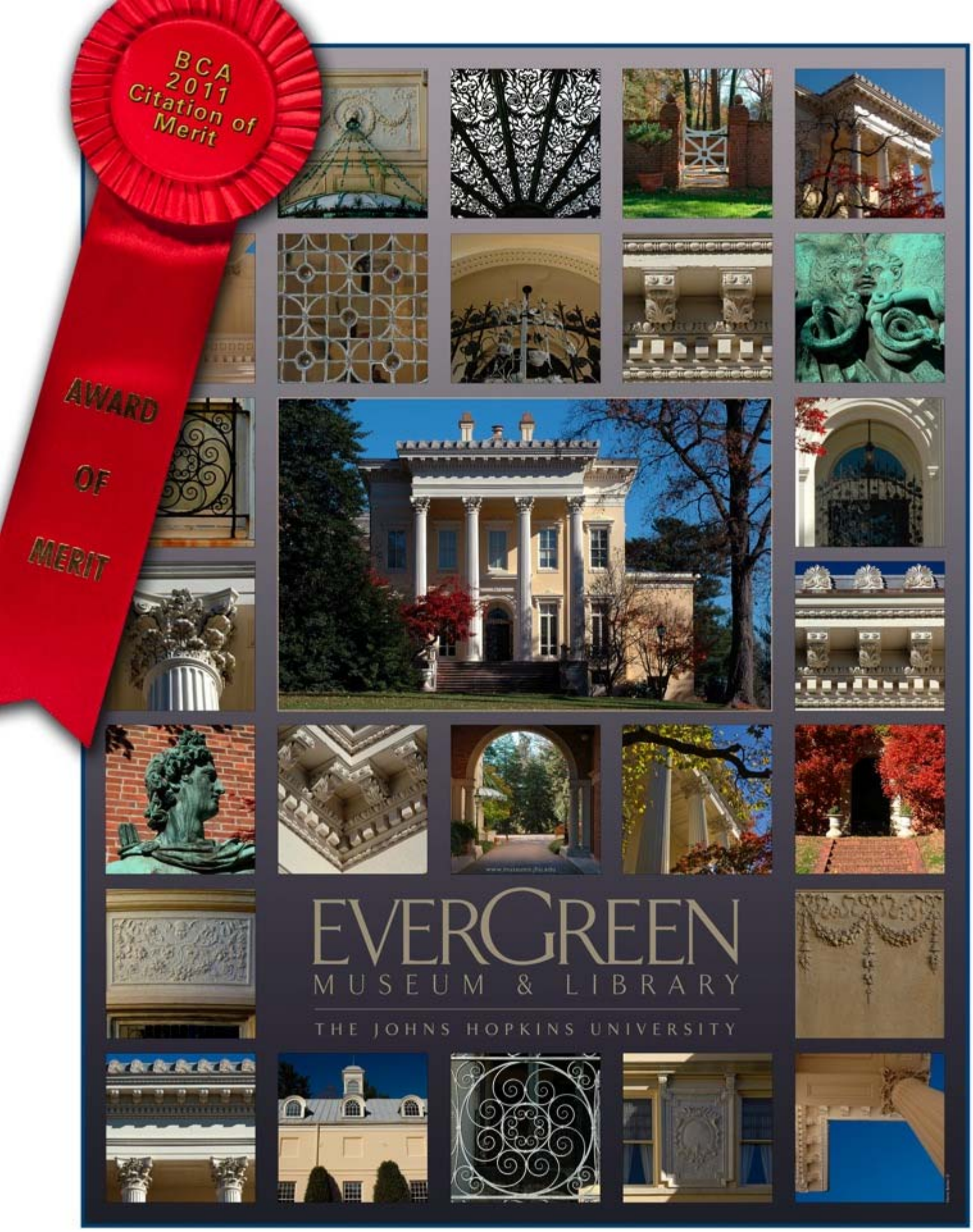


FIGURE 6–16 CORTICAL DYSPLASIA

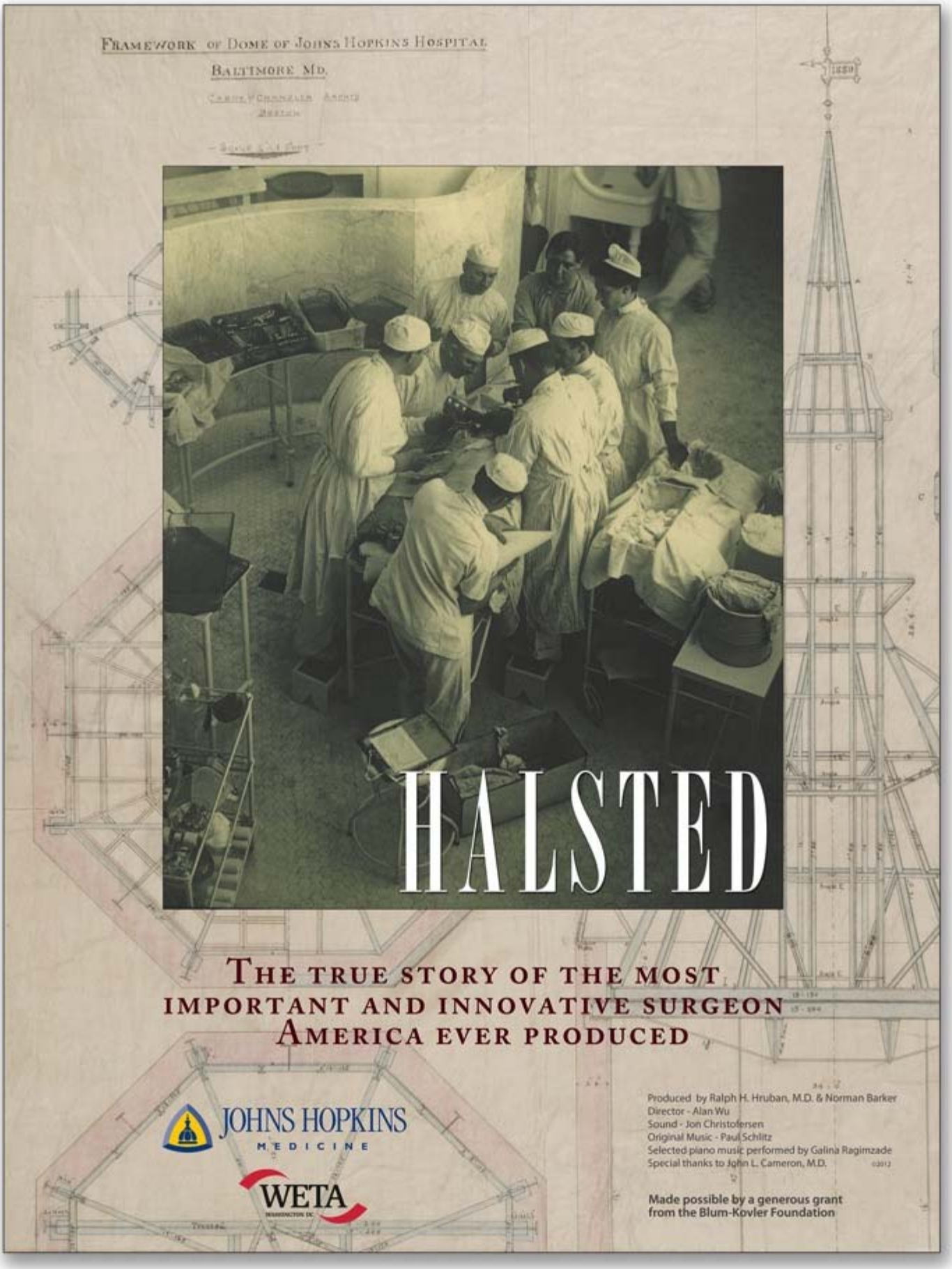
In the specimen illustrated in Figure 6–13, large, cytologically abnormal cells lie ectopically within subcortical white matter.

Surgical Pathology of the Nervous System and its Coverings: Peter Burger MD, This is one of more than twenty atlas projects that I have provided images for. I was the contributing photographer for this project that contains more than 1,500 photomicrographs and gross specimens. This book is a seminal work in neuropathology and in the 4th edition.

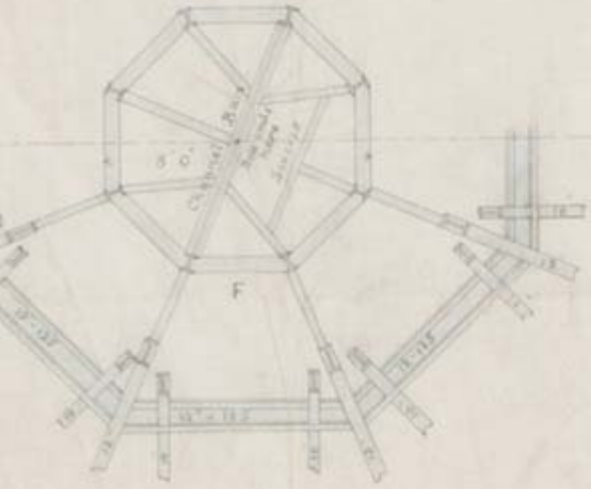
George Peabody Library: I photographed and designed this poster that won an award of excellence from the national salon at the BioCommunications Association. It also won the Royal Society of Chemistry, RSC Science in the Library Competition. The image appeared on the cover of the 2012 RSC catalog. This was done as a personal project and along with the poster I made a special limited edition portfolio of 50,16x20 archival prints in a clamshell box that were presented to and are in the permanent collection of The Sheridan Libraries of Johns Hopkins University. Photographs from the project have been published in several magazines including, Travel and Leisure. September, 2009
www.bca.org/gallery/bioimages2009.html

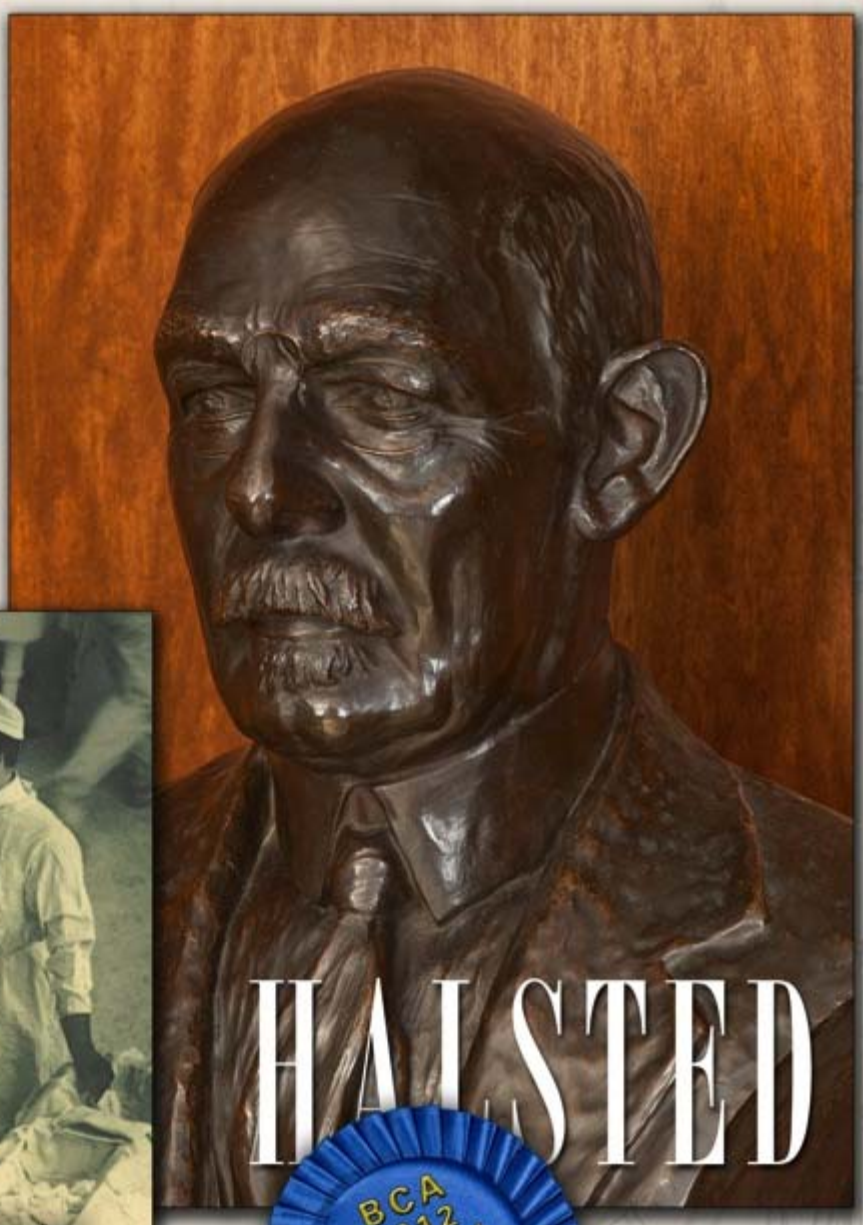


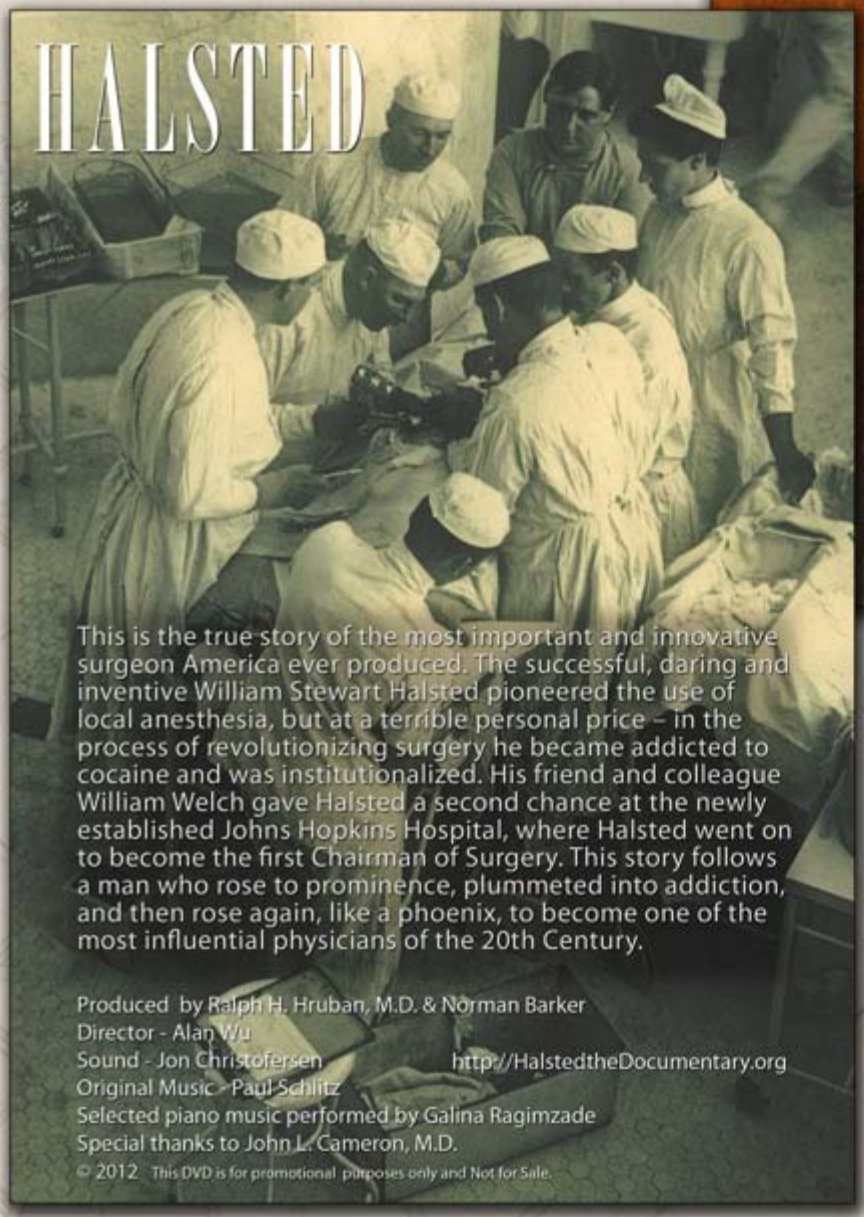
Evergreen Museum & Library: I photgraphed and designed this poster which was given to the board of trustees members and sold in the museum gift shop.The poster was awarded a Citation of Merit in the graphics media poster division at the BCA meeting in Phoenix AZ. www.bca.org/gallery/bioimages2011awards.html



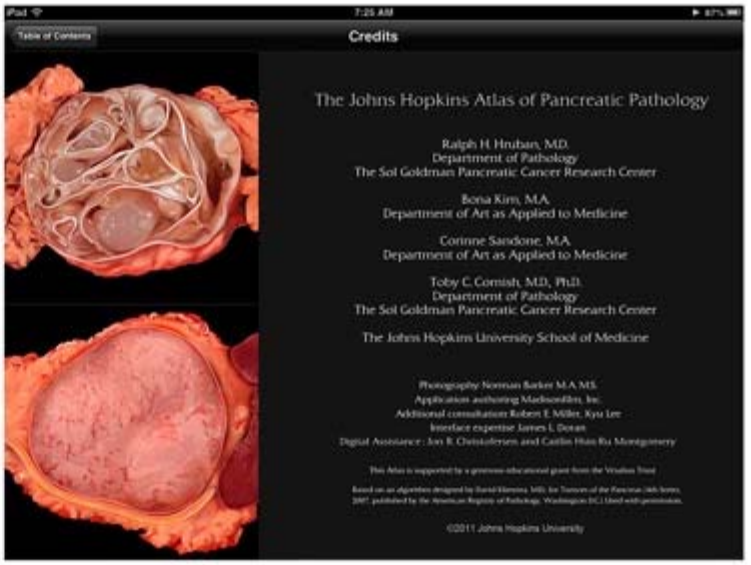
HALSTED: I co-produced this award winning 55 min PBS documentary with Dr. Ralph Hruban. The documentary was aired on more than 50 Public Broadcasting Stations around the country. This documentary tells the facinating story of the first Chief of Surgery at Johns Hopkins and the remarkable contributions he made to surgery and medical education. April 2012 website:halstedthedocumentary.org

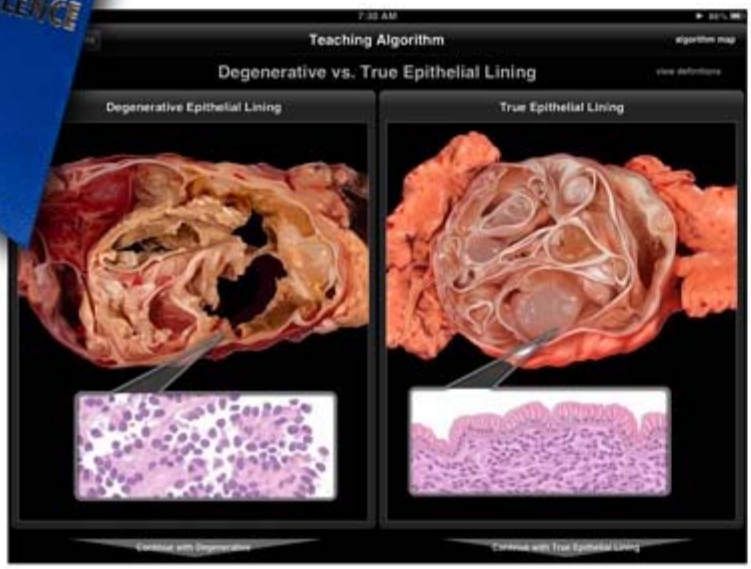




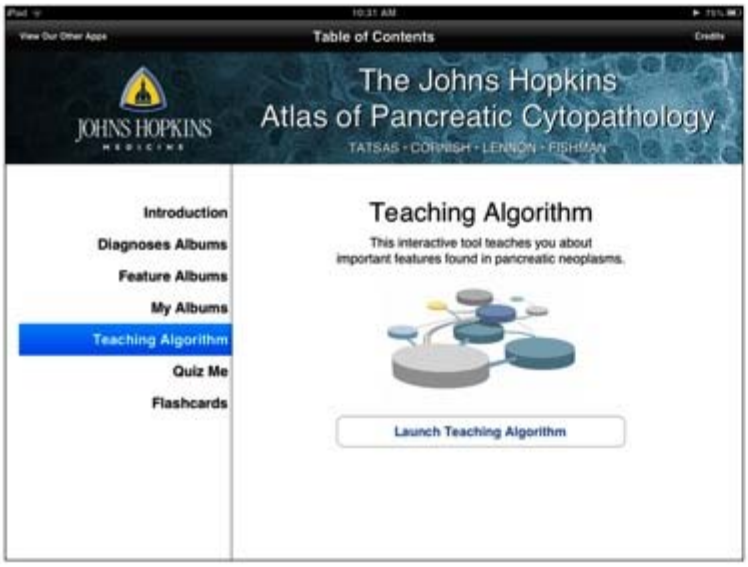


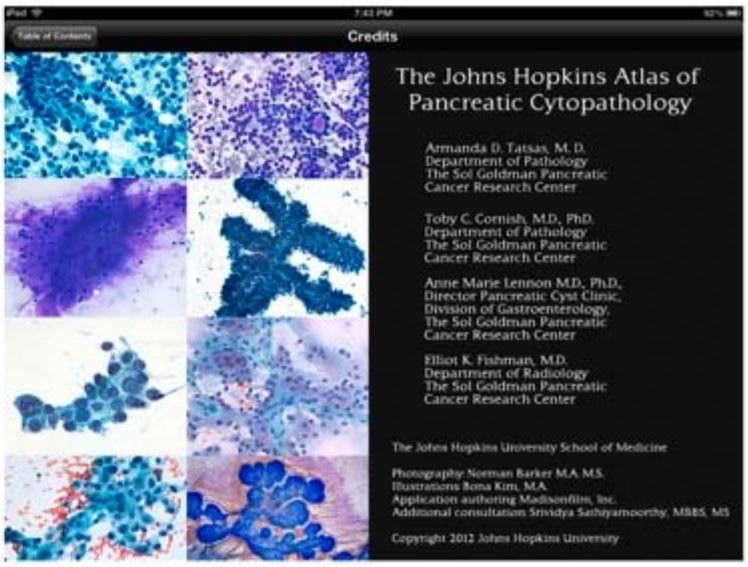
Halsted: Produced by Ralph Hruban & Norman Barker, 55 min High-Definition PBS Documentary, DVD & Blueray
It won the Biocommunications Associations 2012 Medical Education Award. It was also recognized with a Bronze Award from the Media Festival at the 2012 national meeting of the Health & Science Communication Assoc.
www.bca.org/gallery/bioimages2012awards.html



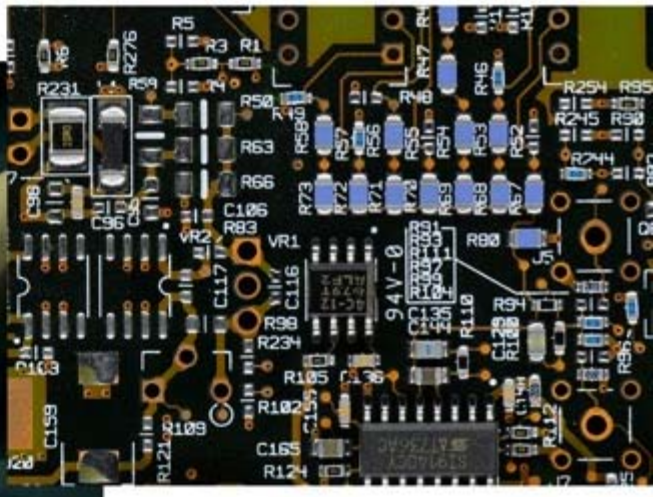


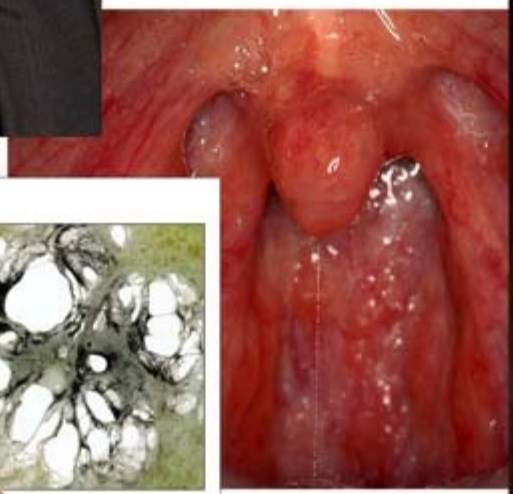
The Johns Hopkins Atlas of Pancreatic Pathology: I was the photographer for this iPad application, the first of its kind. The application contains 1,400 photographs and 26 medical illustrations. The app won the Dr. Frank Netter Award for the advancement of education and research in visual communication for the health sciences. In the last year it has been downloaded more than 14,000 times.
iTune Store, 2012

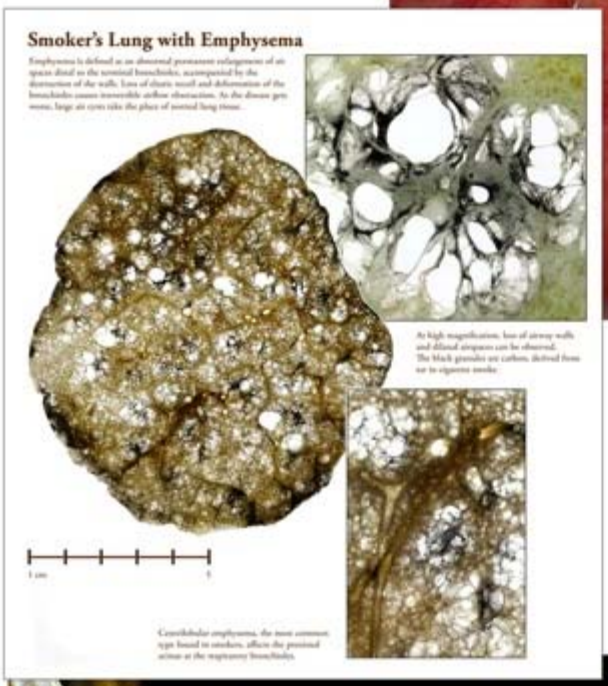




The Johns Hopkins Atlas of Pancreatic Cytopathology: Based on the sucess of our first iPad application we made a second educational app.I was again the photographer for this app and provided more than 700 high resolution images. iTune Store, 2013





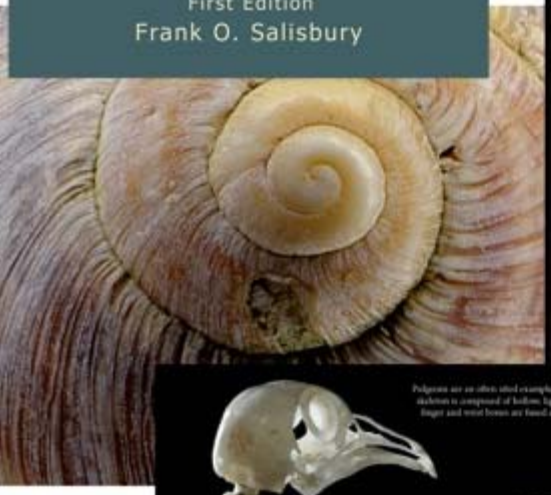


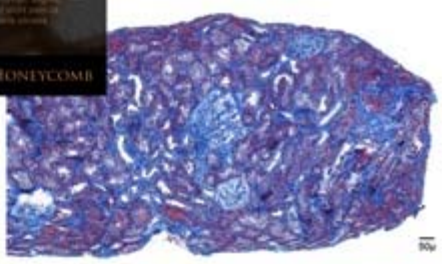
Graduate Student Work: I love to teach and these are some examples of my student's work from the first year course in BioMedical Photography and Digital Imaging in the Department of Art as Applied to Medicine. Over the last 20 years I have taught more than 100 graduate studets and haved always used several different assignments so the students get hands-on practice for many of the situations they will come across when out in the real world. Many specialty areas are practiced, such as macro to portraiture to making a photographic scientific illustration. Lighting and creating high quality photographs for publication is stressed.

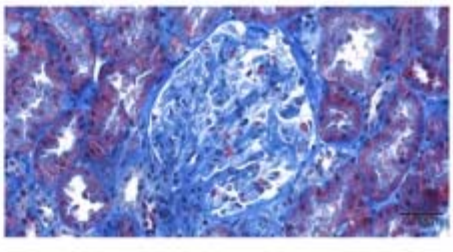
Advanced Scientific Computing

First Edition

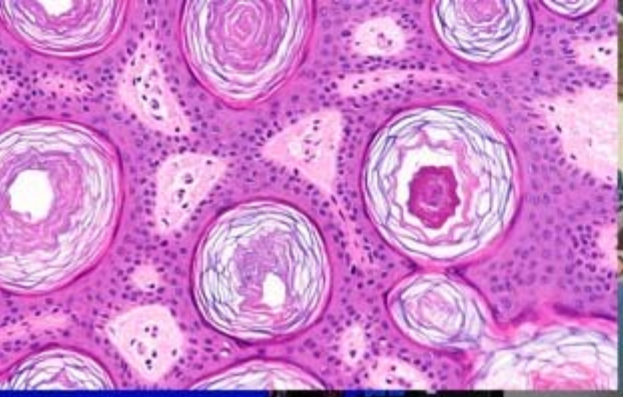
Frank O. Salisbury

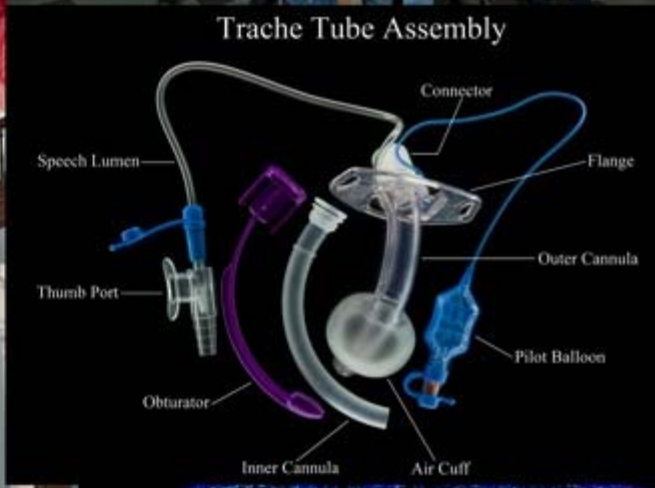


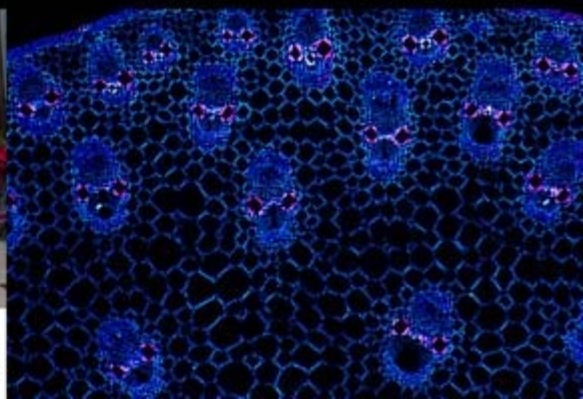




Pathology Photography Training Program: These examples of work from photographers who have trained under me. Their photography is used for many different purposes in the institution. All of the photography we do meets the mission of Johns Hopkins Medicine... Teaching, Research and Patient Care. Over my 32 year career at Hopkins I have trained more than 75 Biomedical photographers and a few have gone on to run biomedical communications departments at other institutions, Mark Teske, Univ of MD, Jay VanRennselear, JHU Homewood, Rick Dewitt, Memorial Sloan-Kettering, Ben Ehrman, Sinai Hospital.







Pathology Photography Training Program: These examples of work are from my photographers who cover a wide variety of assignments for the institution.