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Artistic Gifts with Scientific Purpose

Dean W. Biechler
Iowa State University

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by Dean W. Biechler*

When I'm asked what my occupation is, I'm almost reluctant to reply, because I know my answer will probably require some explanation. My professional title often leaves people wide-eyed, bewildered and curious as to what I actually do. The profession, you ask? I'm a Medical Illustrator.

Medical Illustration is a specialized area within the broad field of scientific art and Iowa State University became involved in this field when a medical illustrator was hired in 1973. In 1975 the College of Sciences and Humanities began to offer training in biological illustration through the Individual Major Program. This program allows a student to design his own program and major. In the past five years 13 students have chosen a major in biological illustration and have been advised by a few faculty members who were willing to venture into this area. In the Fall of 1980 I was asked to design a 400-level course in biological illustration. Since that time the course has been offered one semester during each of the last 3 years. The course is sponsored by three colleges, the College of Sciences and Humanities, College of Design and the College of Veterinary Medicine and draws students[1] from all of these areas.

In the Fall of 1981, the deans of these three colleges appointed an *ad hoc* committee to explore the possibility of establishing a major in biological/pre-medical illustration here at Iowa State University. The committee filed a final report with the deans and they have recommended the report be sent to each college's curriculum committee for review and action.

At first glance, it seems that the artist and the scientist are in pursuit of different goals, or at least motivated by different lines of thinking. The artist, one might think, would be at odds with the stringent disciplines and accountability of the sciences. Surface dissimilarities, however, only obscure the greater regions where the work of artist and scientist are congruent and oftentimes one. In the 400-level biological illustration course that we offer, we try to bring the two together into one unified whole.

Science, in the basic sense, is a creative enterprise. In the words of Henry David Thoreau, "It has come to this—that the lover of art is one, and the lover of nature another, though true art is but the expression of our love of nature." If a person is willing to take a good look at the world around him, he can see a world touched in every facet by scientific illustration. There is hardly a science text or reference book, atlas, or visual aid used in the biological sciences or medicine that has not been touched by an illustrator knowledgeable in science and art. Artists, like scientists, are constantly in search of truth and, as with all responsible investigators, start with a close study of nature. The artist is in the domain of science the instant he proceeds to put down his observation. This observation could be of a leaf, a bird, a mammal, or anatomical and surgical illustrations in medical textbooks. The artist must take into consideration the viewer's level of knowledge and must relate the message in a logical sequence, without confusing the viewer with too much or too little information.

The history of scientific art precedes the 20th century, with medical-type illustrations first appearing in manuscripts during the 12th cen-

*Dean W. Biechler is currently employed as the medical illustrator and art unit supervisor in the Biomedical Communications Section of the College of Veterinary Medicine at Iowa State University. Mr. Biechler is also a wildlife artist and operates a studio, Chichaqua Bend Studio, from his home in rural Ames. He recently placed 2nd in the 1983 trout stamp design contest sponsored by the state of Iowa.

[1]At the present time seven veterinary students have completed the biological illustration course, listed as Veterinary Anatomy 410.

tury. These illustrations were limited merely to surface representations in the plane of a page. The earliest form of scientific art was botanical illustration. These illustrations appeared as early as 512 A.D. Zoological illustration began with the scientific animal drawings done during the great voyages of discovery. The greatest contributions came in the 18th and 19th centuries. The late John James Audubon occupied a special realm of art and research with his great work, *Birds of America,* which is well-known and widely-used today. The most significant advances in scientific illustration happened in the 20th century. Innovations in engraving and printing allowed for a tremendous number of scientific books to be published. This, in turn, promoted the research, production and distribution of illustrated educational material.

The value of illustration, as a tool of science, has long been recognized for its importance in providing a clear and easy understanding for the reader. In the natural sciences, an illustration provides clarity and eliminates the need for much descriptive text. It also makes possible an immediate recognition of the physical characteristics of an organism, a bird for instance. Countless details, such as color, shape and diagnostic features, which are extremely burdensome to explain, are provided at a glance. The eighteenth-century writer Goethe wrote ". . . a flower painter might attain accuracy in depicting nature, but that would be mere imitation, the highest expression requires a profound understanding of the flower, its mode of growth and the effects of the environment, so that its inmost essence can be expressed visually." Although this was written in 1788, it still captures the fundamental aim of today's scientific illustrator.

The biological illustration course being taught at Iowa State University is designed to have the student examine and demonstrate biological, zoological, botanical and medical rendering technqiues, design, printing and display. The knowlege enables the student to

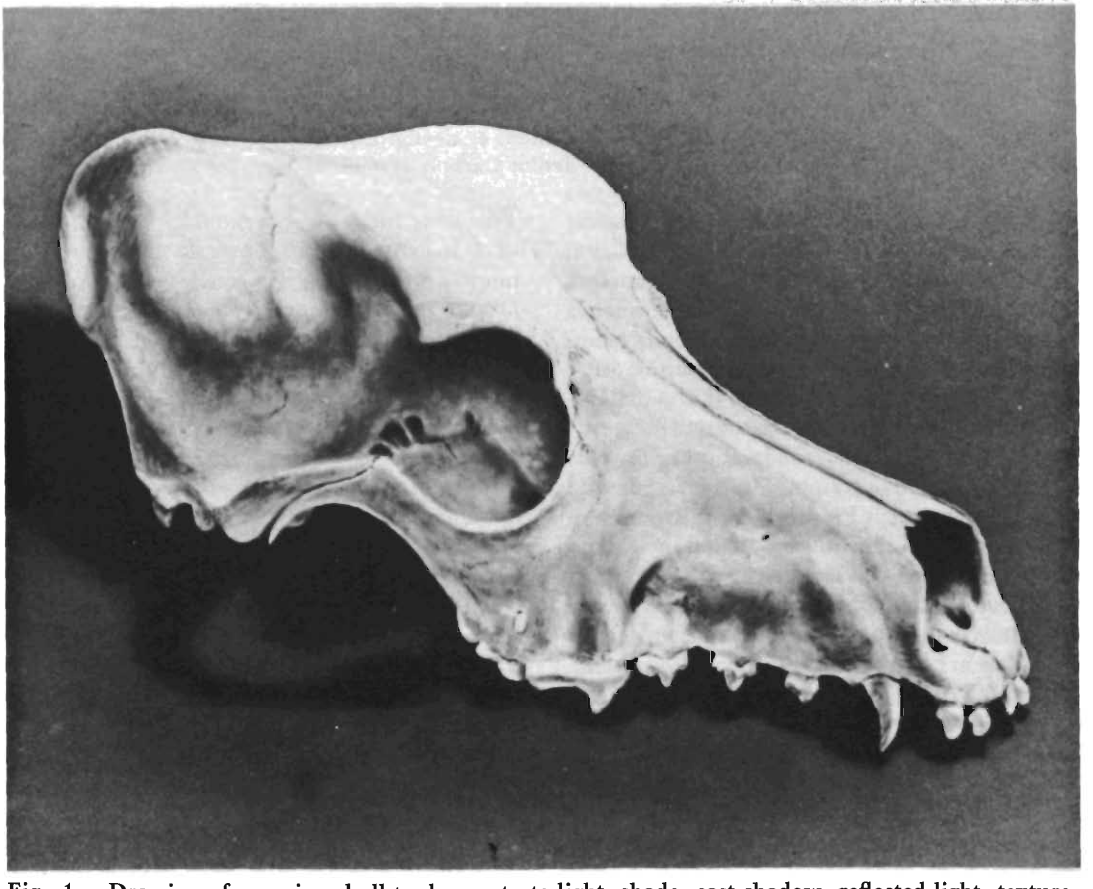

Fig. 1. Drawing of a canine skull to demonstrate light, shade, cast shadow, reflected light, texture, proportion and perspective. Artist: Dick Shook, VM III. Media: Carbon dust on acetate, back painted.

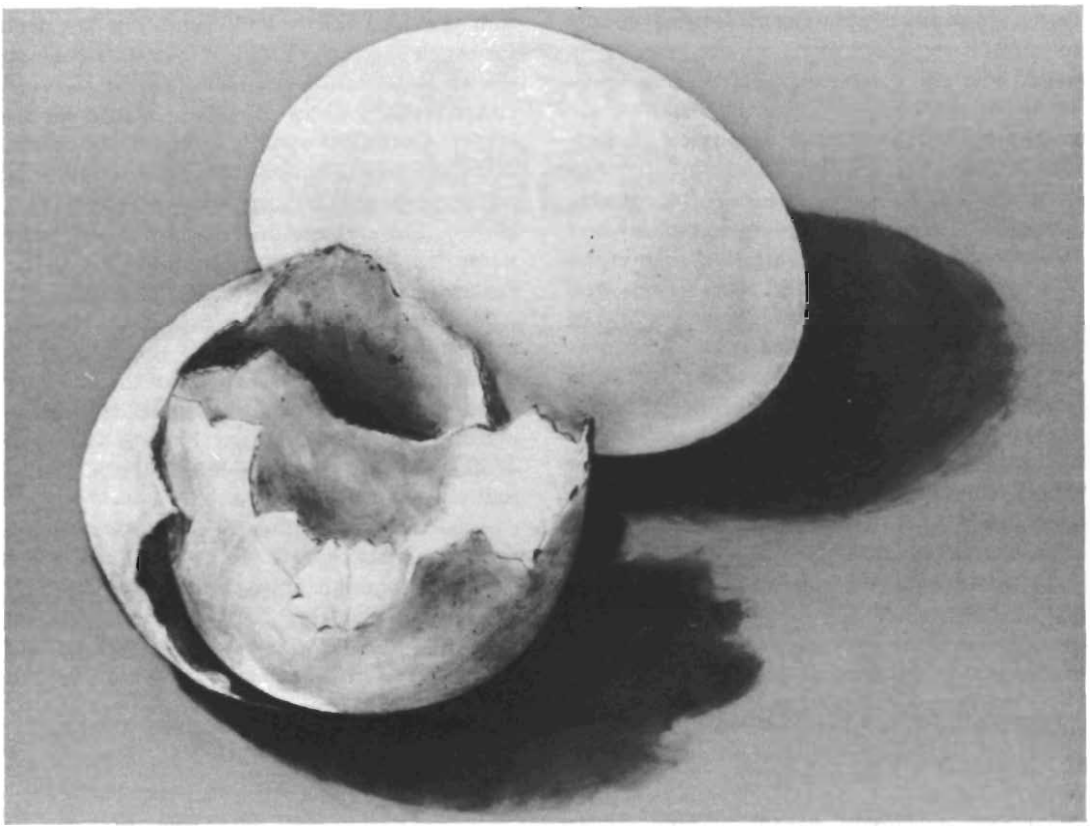

Fig. 2. Drawing of two eggs, unbroken and broken, to demonstrate light, shade, cast shadow and reflected light. Artist: Carol Uphoff, VM IV. Media: Carbon dust on acetate, back painted.

produce illustrations which have both scientific accuracy and artistic integrity. The objective of the course is to have students develop artistic skills and specialized techniques which will aid them in rendering lifelike realism to body structures. Therefore, it is necessary that the artist acquire a thorough background in the biological sciences, particularly anatomy.

Provisions have been made at other universities for this kind of training. In the first decade of the 20th century, Professor Max Brödel, the father of medical illustration, started the School of Art as Applied to Medicine at John Hopkins University. Since that time approximately ten other universities have initiated master degree programs in biological and medical illustration. If Iowa State and the Board of Regents approve the biological/pre-medical illustration major, this undergraduate degree would serve as a solid basic training program for entering one of the masters programs at another university.

Medical illustration is a diverse line of work. Illustrators are often asked to illustrate fragile specimens and exercise care in handling them. The artist must be competent in handling optical instruments and precise in measuring microscopic objects. He is often called upon to prepare pictorial stories, such as life cycles, or render a series of procedures in sequence. Graphs showing scientific data, the planning of page layouts, and cover designs used in publications are also common requests. He is sometimes asked to reconstruct whole objects from incomplete specimens or frequently called upon to make dimensional drawings or conceptualized interpretations, such as a cutaway, which shows internal structures.

An illustrator can simplify comprehension of a specimen better than photography because he eliminates extraneous detail and clarifies relationships of structures. Biological photography has advanced considerably, but it has not replaced illustrators. In many instances, it has enhanced the value of an illustrator's capabilities, but it has also placed new demands upon him. He now adapts his art work to be reproduced in slides, film, television and other audio-visual instructional materials. Often

times, he becomes directly involved in the production of these items.

A successful illustrator is one who is versatile in more than one technique or medium. Therefore, it is my goal to raise the students' level of understanding and have them become skilled in working with acrylic, watercolor, airbrush or oil painting techniques. Their proficiency in the use of mechanical drawing instruments, lettering and transfer sheets, or other commercial or drafting techniques is essential. Since publication limitations confine most work to the traditional black and white line or tone methods, I primarily concentrate on work with pen and ink, brush and ink, graphite and carbon pencil, or carbon dust. Since most illustrations are published, the students are given general knowledge of the printing and photographic processes by which the finished product will be reproduced.

One course is by no means a curriculum, but it is a beginning and an exposure to an old, but rapidly expanding profession. Despite the progress of the camera and other recording devices, it is still the artist, with his talent and intelligence, who can bring the different disciplines of science and art into visual focus. There is a creative and elevating beauty that flows from brain-to-hand-to-image. It allows the artist to conceptualize and visualize what machine does not approach. Medical illustrators are artists in the service of much more than science; they are artists in the service of human understanding.

The Story of the "Gentle Doctor"

Christian Petersen's "Gentle Doctor" statue stood in the Veterinary Medicine Quadrangle of the Iowa State University campus until the College of Veterinary Medicine moved into new facilities on the South Campus in 1976. Time and weather had taken its toll on the terra cotta "Gentle Doctor" and the statue was moved into the Scheman Continuing Education Building to prevent further deterioration. A full size replica was cast in bronze and now stands on the Plaza of the College of Veterinary Medicine.

In an address to the College of Veterinary Medicine Faculty on September 20, 1972, Mrs. Christian Petersen recounted Christian's early days on the Iowa State campus.

"As many of you may know, Christian came to the Iowa State University campus in the Fall of 1934 to finish some sculptures in the Dairy Court Annex. His first appointments were only for three months at a time; however, after two years he was appointed as an instructor and given a studio in the Home Economics Building. Later, about 1936, a magical thing happened. He was moved across the street into the old horse stalls of the veterinary quadrangle which was later to become the area for the Anatomy Department.

At the time, Dr. C. H. Stange was Dean of the Veterinary College, and on a trip to Europe in 1930 he was greatly impressed by