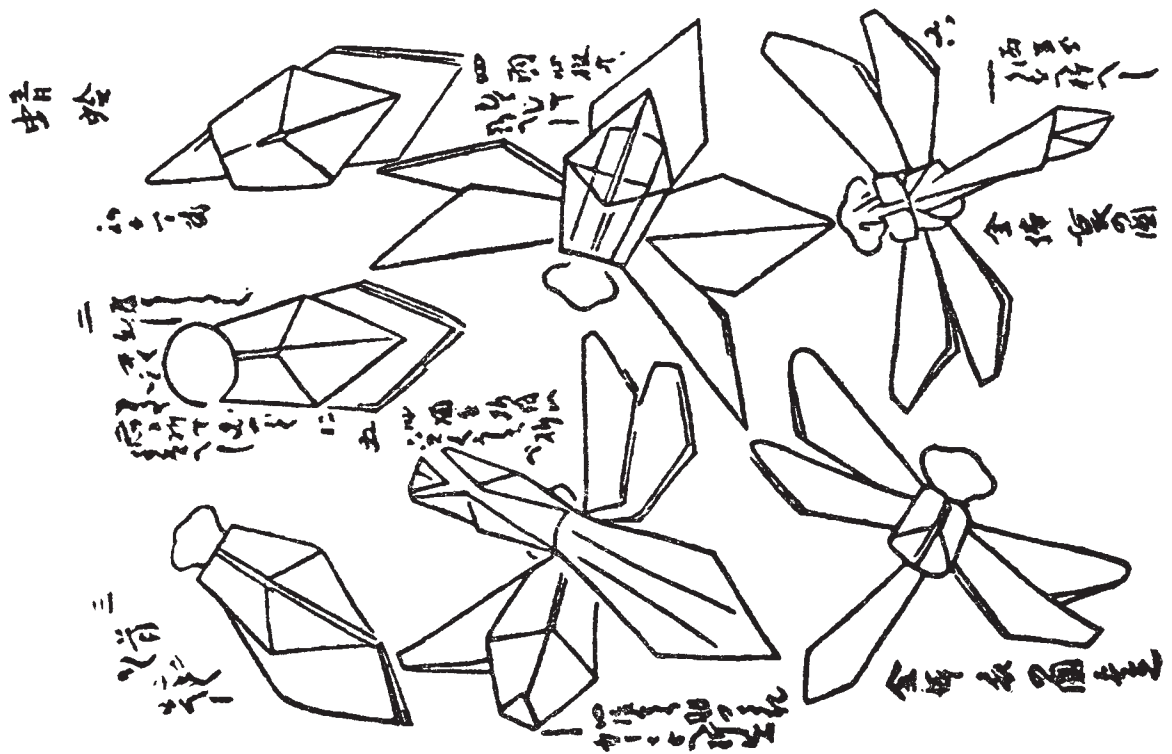


# Introduction

## Creating Origami: The Origin

It started with a dragonfly, created many years ago by an unknown Japanese artist. The model came to me through a book from my childhood which I'd lost track of over the years. After a fifteen year hiatus I found myself folding again, and having followed the directions for the dragonfly, was quite dissatisfied with the result. Not only was the model not particularly crisp, but it required numerous cuts and was folded from a hexagon rather than a square. It didn't do much for me aesthetically either.<sup>1</sup>

When I was in my teens, I was interested in learning to program in a computer language called "Assembly", but was told by all my computer buddies, "No one can write in Assembly. You have to be a genius to do that." So, for awhile, I sort of lived in fear of Assembly, afraid to even try. Luckily I'm stubborn, and eventually I decided to teach it to myself, regardless of whether I was smart enough to learn it. I discovered that it wasn't hard at all, just very different from other languages. Later when I was in college, I learned that Assembly was a required course for graduation. Obviously, if everybody was expected to take the course, it couldn't have been that hard. In fact, there was never any reason to be afraid, it was only my attitude toward it which made it intimidating.



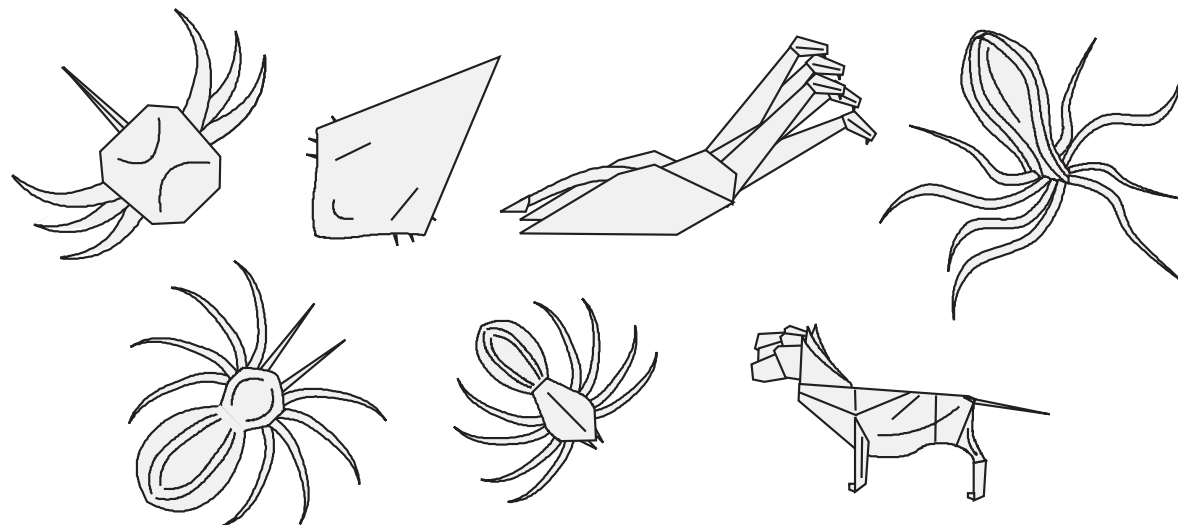
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<sup>1</sup> That is not to say that I do not appreciate the model. Historically it is a significant piece as are all the earliest origami creations, regardless of whether or not they adhere to the more modern rule of "one square, no cuts". Their designs in terms of effectiveness and stylized beauty are exceptional considering their simplicity. The fact that such intriguing beauty could be produced from a few folds and cuts is truly a feat to be applauded. But in truth they are Model T's in today's age of high performance, electronically controlled automobiles. The technologies that are now available to creators, such as an accepted and standardized form of notation and several decades of recorded models from which to derive inspiration, give an enormous advantage to designers which has resulted in designs of such sophistication that would never had been dreamed possible by early creators.

And so it was with origami. It always seemed to me that the creation of original models was akin to magic, invoked by mysterious and hyper-intelligent magicians who gathered in exclusive covens and shared their secrets only among themselves while effortlessly producing diagrams and books to be disseminated to the rest of us. I felt that designing was a task far beyond my capabilities, so I never even considered trying. But somehow, the dragonfly inspired me, perhaps because I was so displeased with the original, or perhaps it was because I was older and more confident. In any case I found myself thinking I could find a way to fold it without cutting. And off I went.

I wish I could say that creating a dragonfly was a simple task. It was, in fact, a process that took several months in which I encountered many stumbling blocks. But from my design attempts I inadvertently created a multitude of other models including: a horseshoe crab, a spider, a tarantula, an octopus, a strange leaf-like insect and an eight sided birdbase.<sup>1</sup> These other models were discovered partly by accident and partly through experimentation while trying to overcome problems I encountered in designing the dragonfly. The horseshoe crab was folded first, while doodling around with a piece of paper in attempting to create a base for the dragonfly. The wolf spider and eight sided birdbase were created while experimenting with the dragonfly's wings. The tarantula and octopus were discovered while trying to adjust some of the proportions of the wolf spider, and the leaf bug is actually a practice model which I folded to test an idea that I had for the dragonfly's legs. Each of the models was created in one form or another from the dragonfly, though I came upon most of them by accident.

This period of discovery was an enormous growing experience for me, and I was extremely excited by the process. I wanted to learn everything there was to know about designing that I could. I wanted to know how creators kept track of their models as they folded without instructions and how they solved the problems they encountered in their designs. I wanted to know where their inspiration came from and what strategies they utilized. I wanted to know how people *create*. But after interviewing several designers of original models including Michael Shall of the Friends of the Origami Center of America and John Montroll, what I learned was that little had been written on the subject.<sup>2</sup> I decided that if there were no books available then I would write my own, and thus started a three year project of obsession, frustration and jubilation. Creating "Creating Origami."



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1 Which I later used in another model of Cerberus, a mythological, three headed dog.

2 I think that this lack of published information is responsible for my previous sense of mysticism regarding the creation process. It is also worth mentioning that origami has been growing greatly in popularity in the past several years, and as interest in the art form spreads, books on the topic will become more common. I have since discovered several excellent books which include sections on creation, though in some cases they are for me somewhat technical and difficult to approach. They are: "Origami Omnibus", by the great Japanese master Kunihiko Kasahara; "Folding the Universe", by Peter Engel and "Origami Zoo", by Robert Lang and Stephen Weiss.

## Creating Origami: Philosophy

Over the past decades origami has grown in acceptance and popularity. While historically it has been viewed as an enjoyable and intriguing activity to be shared by both the young and the young at heart, it is in fact a fledgling art form that is just now beginning to reach recognition. A similar sort of transformation has been seen recently in the realm of comic books. Traditionally, comics have been viewed as “pulp fiction” consisting of mindless stories with shallow characterizations and thematically empty plot lines. But over the last decade there has been a movement by artists such as Frank Miller, Alan Moore & Dave Simm to create comics of literary and artistic merit. This led to early significant works such as “Ronin”, “Dark Knight”, “The Watchmen” and “Cerebus. Each of these works is literally a novel presented in graphic form. The success of these initial efforts led to an increase in the production of comics of greater substance which led to more and more artists jumping on the comics bandwagon. This change in perspective is the primary cause of the enormous proliferation of comic book-related material that can be seen in the television and cinematic media in the past several years, not to mention a maturation of thematic content of the story lines found in mainstream comic books such as “Spiderman” and “Superman”.

And so it is with paper folding. While previously it was considered by most to be a hobby, like needlepoint or model rocketry, where following the directions and completing the project was half the triumph, there is a growing perception of origami as a form of sculpture, where the objective is to create beautiful forms under extreme limitations - produced by simply folding a square piece of paper.

Historically, there have been many forms of art where such severe limitations are imposed. The Shakespearean sonnet, for example, is a poem with exactly fourteen lines of text which are broken up into three sets of four lines and are followed by one set of two. It must have a specific rhythmic form, meaning that all accents on words must fall in a specific pattern. Additionally, the first line must be rhymed with the third, the second with the fourth and so on. In Classical Western music similar forms can also be found. One example is the “Canon” where a line of music is played on the piano by one hand, while the other hand plays the same line out of synchronization with the first.<sup>1</sup> The “Crab Canon” is another example wherein a line of music is played with one hand while the same line is simultaneously played in reverse by the other.<sup>2</sup> As difficult as these canonical forms are to play, they are significantly harder to construct, for not only must each note in each line work well with the others surrounding it, they must also sound pleasing with the same line being played backwards or out of synchronization with the first. Avoiding dissonance under these circumstances is a formidable task.

Origami is a form of sculptural sonata in paper. It is a puzzle and engineering achievement as well as an aesthetic form. It is an intriguing juxtaposition of science and art, of right-brain and left, for much of the artistic process is hidden inside the model, within the techniques and solutions which were utilized by the designer to produce the actual folding sequence. For the artist whose objective is to create an object of beauty, a great deal of variability in the final result can be derived through choice of media and folding technique, but only by designing original models can they gain complete control over their work. Fortunately, the process of solving problems, overcoming pitfalls, and finally producing a successful result is one of the most satisfying experiences that can be had. Also in this way, the artist has an opportunity to experience every aspect of the creative process: not only the choice of media and folding technique, but the joy of creation, the ability to control every minute aspect of the final product.

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1 The song “Row, Row, Row Your Boat” is a well known example of a common canon.

2 Fascinating descriptions of these as well as other canonical forms can be found in the book “Godel, Escher, Bach” by Douglas R. Hofstadter.

## Creating Origami: The Structure

This book has three major sections: “Experimentations”, “Inspirations”, & “Creations”. The last two contain directions for folding actual models and a short description of the origins of each model. “Inspirations” contains models which I found the most intriguing in my youth. Some were my favorites to fold and others were models which I dreamed of folding but could never decipher. Many of these models, particularly those by Patricia Crawford, are no longer available in print. Others, like the “gum wrapper chain”, I have never seen published. The next section, “Creations”, includes instructions for folding the models I designed while producing this book. Some of the models are crude and others more refined. Some are simple and others extremely complex. I believe that it is important to show all of my work, not only my best but also those which are perhaps not as polished or satisfying to me, because the creation of each model, regardless of how successful the result, was an important learning experience.

“Experimentations” is dedicated to discussing the process of designing origami, and relating what I learned while creating the models in this book. It is broken up into several subsections. The first is devoted to discussing the tools and materials which are so important to the creation process. The second gives an historic representation of how each of my models was created. I discuss the approach that I used in creating the model, where the original idea came from, as well as what problems I had to overcome during the design process. The last subsection of “Experimentations” addresses on a theoretical level, the process of creation, and includes various essays on other topics pertinent to the subject.

I hope you enjoy “Creating Origami”. Producing it has been an enormous growing experience for me. In developing it I have gained a great respect for the designers that came before me and for those who are still designing today. Sir Issac Newton said “If I have seen further it is because I have stood on the shoulders of giants,” and that is very much how I feel with regard to my own work. Developing original models is in many ways, as with other art forms, a process where discoveries are made by studying the work of others and gaining inspiration from them, of taking the inventions of others and applying them in new ways, and of taking the work of another and modifying it until it becomes something different and uniquely your own. I hope that this book inspires you to do just that, with my work and with the work of others, and that you will share in the excitement and satisfaction that comes with designing your own original origami creations.

# *Creating Origami*

by J.C. Nolan

An exploration into the process of designing paper sculpture