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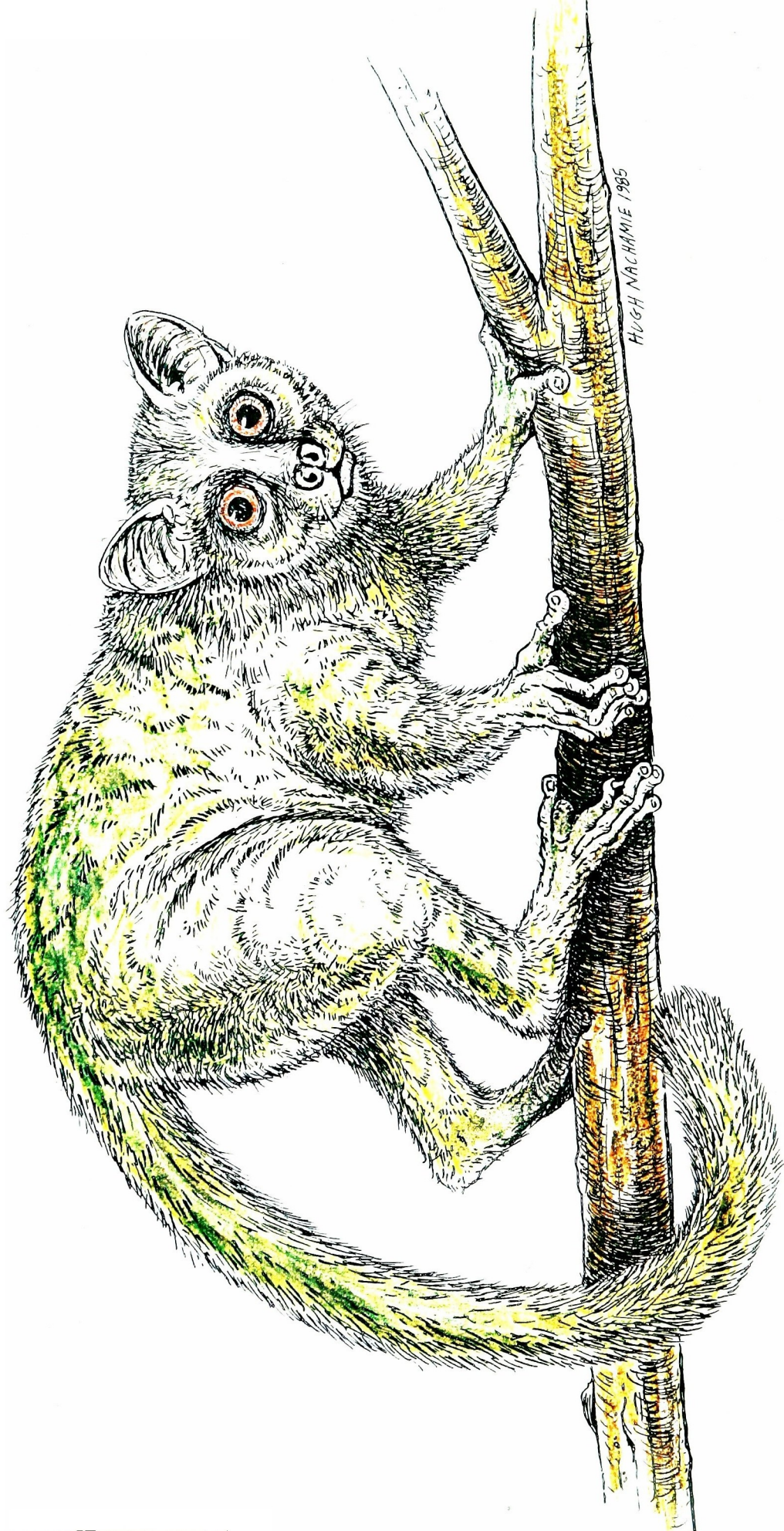
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Galago demidovii — shown actual size

ROCHESTER INSTITUTE OF TECHNOLOGY

A Thesis Submitted to the Faculty of
The College of Fine and Applied Arts
in Candidacy for the Degree of

MASTER OF FINE ARTS

Anatomical Study and Illustrative Plates of the Dwarf Galago Primate

By

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May 14, 1985

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PROPOSAL

I intend to dissect and illustrate various anatomical features of the Dwarf Galago (Bush Baby) primate. I will research the best techniques available for anatomical book illustrations, and I will complete a series of plates which are both scientifically and artistically valuable.

In order to create my drawings, it will be necessary to spend a significant amount of time on a delicate and involved dissection of the small animal. I will be directing this work towards possible inclusion in a new series of books on Primatology. An editor of these books is a former teacher of mine and the source of the specimens I will work from.

ACKNOWLEDGMENTS

I'd like to take time to thank those people to whom I owe a great deal to for their helping hands of assistance. Without their valuable advice, criticisms and their thoughtful donation of time, materials and guidance I would never have achieved the thesis goals I strove for.

Mrs. D'Ambruso of the College of Science at RIT was a great help in getting my dissections off the ground. She secured me a work space, loaned me supplies, advised me on dissection problems and was there to help me investigate some of the mysteries of the Galago demidovii.

Without the hours spent learning photography from Mr. William DuBois of the School of Photography at RIT both in class and out, my research would have suffered greatly. Bill taught me techniques and was even kind enough to let me use his equipment.

Glen Hintz, one of my medical illustration instructors at RIT has been a great help to my thesis illustrations in both technical advising and artistic critiquing. My thanks go to Glen for his artistic skills and his patience in trying to communicate them to me.

Without Professor Randall Susman of the Anatomy Department at the SUNY Stony Brook Medical School, my Galago demidovii thesis would have never existed. It was Randy who helped keep me interested in medical illustration in my undergraduate days, and it was he who so graciously loaned me the five galago specimens he had captured on safari. Dr. Susman was also an important help on matters concerning my dissections and where to seek reference materials.

I would like to thank Mr. Robert Wabnitz, head of the Medical Illustration Program at RIT. Mr. Wabnitz has always been there to look over a piece in progress or comment on an idea for one. His input and teaching was of great help to me as I worked my way through a challenging and rewarding thesis project.

I would also like to thank my peers, fellow students, friends, girlfriend and family for their encouragement, advice and generous giving of time, energy and material. Their help was invaluable.

INTRODUCTION

"Hey what's that? That's gross looking!" Heads turned to see, then quickly recoiled from the dissecting pans cluttered with my "dead monkeys".¹ By this time my thesis research was nearing completion and the specimens I was working with were not the cute, furry creatures they once were. They weren't a pleasant sight it's true, but to me, that tray held not something which turned the stomach, but a reminder of one of the most challenging and educationally rewarding experiences I've known, my thesis project for my Master of Fine Arts in Medical Illustration.

In September of 1984 I ended my quest for a topic; my decision spurred on by what I saw as a lack of quality illustrations of non-human primate anatomy. Some months earlier, a former professor of mine had offered me some small prosimian primates he had captured in Africa, and preserved as possible subjects for my thesis research. I now chose to accept his offer. This task of researching, dissecting and illustrating the anatomy of the Galago demidovii seemed more valid with each dissapointed glance I took through atlases and comparative anatomy texts. There seemed to be a real need for more carefully considered quality illustrations. This thesis could aim for that, while being a culmination of my interests and skills in both science and art. I knew the task I had chosen to undertake would be a demanding one, and that is what I prepared myself for.

During my seven months of research, people often stopped to watch as I probed, cut and drew the small galago. Many times they questioned why I began such a "gruesome" and unusual project. I would just look up, smile and say, "I enjoy the challenge." After responding I could feel the smile linger, fueled by the rewards of scientific and artistic discovery.

PURPOSE

Why would I chose to study and illustrate a Galago demidovii, or any other non-human primate? What is there to be gained from this work? It seems important to begin my report with an explanation of what I saw as the purposes behind my thesis research. Like medical illustration itself, my motivations were two-fold: one artistic and one scientific. Artistically speaking, I hoped to develop accurate, clear and skillfully rendered anatomical plates describing features of a species of animal which seemed to all but lack an illustrative record. I hoped to make these drawings precise and fit for reduction and reproduction. I aimed to create art work which could be appreciated by both one who knew nothing about science and another who understood little of art.

In writing about the scientific purpose behind my thesis, I encounter few reservations when it comes to justifying my dissection of five preserved animals. Without becoming involved in a moral discussion over the use of animals for research, I'd like to point out the value of such study.

Concerning non-human primates in general, their close ties to humans both physiologically and evolutionary make them a source of interest for scientists in many fields. Comparative anatomists, anthropologists, taxonomists, muscular physiologists and kinesiologists all value the study of non-human primates.

In order to carry out research on man and his needs, the availability of an animal model is imperative. Non-human primates are often chosen for this testing since they are our closest relatives. According to Geoffrey H. Bourne, author of The Primate Odyssey,

The increased knowledge of primates in recent years and growing awaren-

ness of their physiological as well as anatomical closeness to man have led to their increased use in biomedical research. The results are impressive: already among many advances the use of monkeys has provided us with vaccines for poliomyelitis and measles and ensures the safety of other vaccines and medical products as well. Much more spectacular breakthroughs will occur in the future.²

The study of galagos, such as the Lesser Bushbaby, Galago senegalensis, has recently become popular as a research model in neuroanatomy, behavior and skeletal anatomy, according to Stevens, Mitton and Edgerton.

I noted on one previously published study of the Lesser Bushbaby that the grant for the research was supplied by Easter Seals Research Foundation of the National Society for Crippled Children and Adults Inc. It would seem that this organization, dedicated to helping humans, has put some faith into galago research to help its cause.

Lodged someplace between and beyond the scientific and artistic purposes of this thesis lies what could be labelled as my selfish, human curiosity - a desire to investigate the unusual and the hidden. The dwarf galago dissection surely supplied enough anatomical oddities to quench my curiosity.

The dwarf (Demidoff's) Galago is a very small prosimian primate, measuring about eleven inches long with half of that being tail. They contain many interesting adaptations useful in their nocturnal and arboreal life in the jungles of Central Africa. The tiny size of the galago is a curiosity in itself - not the image one thinks of when the usual monkey/ape primate comes to mind. This galago has anatomical peculiarities such as a cartilagenous second tongue under the ordinary one used as a grooming aid, and a long tarsus(ankle) bone which is actually larger than its forearm - an adaptation for jumping. They have a long curved claw on the second digit of their feet, also for grooming. Their eyes and ears are very large and they possess very interesting padded toe and finger tips.

I admit that in my decision to study and draw the dwarf galago my concern centered not so much around any particular medical or scientific goal, as much as a more general aim. My purpose in exploring the anatomy of the Galago demidovii was to document, investigate and portray an animal about which little work has been recorded. I believe my notes, measurements and drawings will lead to new insights which can only aid man and his primate kin. I am optimistic that my work was accurate enough to warrant not another capture of the same wild animals for the same study.

RESEARCH

Far too often students and professionals alike will undertake the task of producing detailed illustrative material without having spent enough time researching subject or technique. It seems that more often than not, the artist's ignorance of his subject will show through even the finest technique. On the other hand, weak or inappropriate execution will do an injustice to data. I was determined to cover these pitfalls by being extra-dedicated to compiling a solid base of honest research for each sketch before I even considered the final piece.

The need for accuracy in any scientific artwork is a priority, and in creating plates of original and often minute anatomy the research became a critical concern. I shudder to think of the difficulties these galago drawings would have posed me had I not been judicious enough to prepare myself in both my general education over the past years and in my recent intensive studying of any and all Galago demidovii data I could find.

I consider the benefits of my biological and artistic study, observation and interests which not only power my career goals, but which have also given me an indispensable foundation without which this galago project would have been impossible. All the previous dissections I've done, from frog to cat, pig to human now seem important. All the hours spent sketching with a crow quill pen and pencil now appear invaluable. Without the long list of biology courses, and without the cadaver sketching, my galago artwork would have suffered a lot if it had ever begun. I am confident when I say that without a strong background in science, art and dissection, a thesis project such as mine would not have been worth the effort.

Just generalized and prerequisite knowledge was far from sufficient in creating my thesis pieces. I took a deep breath and began a roundup of all the galago information I could find. I needed to acquaint myself with as many specific facts, data and writings as possible. I scanned everything from general mammalogy texts and scientific journals to encyclopedias and magazines. Though the Galago demidovii was my interest, the lack of material on it often sent me to more general resources.

While expanding my knowledge of my prosimian subject matter, I was sure to leave myself plenty of time to read up on, decide on and experiment with the illustrative approach that would best suit my thesis needs. I searched through illustrated texts, surgical atlases, and anatomy journals. I spent many hours picking through examples of scientific illustration, until I decided to center my work around a black and white technique - pen and ink on scratchboard. When I knew scratchboard would be my medium, I studied printed examples and experimented with my own styles. There was much to consider when choosing an appropriate medium and method. The art must be clean, sharp, easily reducible, printable and cost efficient.

Let me note that more than just looking through books went into my research. Many hours were spent discussing, questioning and prodding both peers and professors for advice. The time I feel was well spent.

THE DISSECTION

Weeks before my work began I stated in my thesis proposal that "it will be necessary to spend a significant amount of time on a delicate and involved dissection of the small animal." In retrospect the phrase "significant amount of time..." strikes me as being quite an understatement. Despite the adequate preparation I thought I had, my hours spent on the dissections of the tiny Galago demidovii were many, and each one was crammed with new challenges.

The challenges in the dissection usually centered around the size of the dwarf galago and the accuracy I strove for. Another difficult aspect of this dissection involved the attempt to save each muscle, gland and organ as they were removed. These saved pieces were placed in airtight labelled containers so that they might be studied, weighed and analyzed in future research, by myself and others. As you can imagine the difficulty in severing a small scalene neck muscle clean enough so that it was worth saving was quite frustrating. The leg muscles for example might one day be weighed, analyzed, and compared to other species. Stomach contents were saved in an attempt to one day better understand the dwarf galago's eating habits. In labelling and saving the pieces of my dissections, I was recycling the subject and hoping for the most possible discoveries from a single animal.

My dissections demanded an efficiency grown out of a time limit to my work and the lack of availability of reference material or additional subjects. Unlike a cat dissection there weren't any laboratory manuals to pace me, and I just couldn't place a call and order more as if they were earthworms or frogs. I was generously given five Galago demidovii specimens from a friend and former teacher

of mine, Randall Susman PhD. at SUNY Stony Brook. These preserved animals were loaned to me for research, and I wanted my dissections to be as meaningful and efficient as possible.

I dealt with the problem of the Bushbabies small size by squinting and using a magnifying lamp (2x) and a much more powerful dissecting microscope. Without the magnification I would have been lost when trying to follow a spermatic artery or trace a pterygoid muscle's fibers. They were just too small. Following veins and arteries of this size was difficult since they weren't prepared or injected with colored dyes.

After spending months dissecting and drawing the same specimens, my work became much like a daily ritual with a pleasing familiarity. I would head right for the box of surgical gloves marked "Medium" and don a pair. Pulling them onto my fingers I'd flip on the light switch in the large lab where I usually worked alone, and head for my corner of the room. From my cabinet would come a fluorescent lamp with a magnifying lens, a box of instruments, and a tray with my galagos.

My dissection tools included a waxed bottom dissecting pan I rigged up with plastic-coated wire, pins and staples to keep my subjects stretched out and accessible while keeping my two hands free (for the later deep head and neck dissections the best I could do was to grasp the galago in my palm so I could turn and examine his head freely), and a selection of scissors, forceps and scalpels.

Usually I would sit down to dissect with a plan of action I'd mapped out the night before. I quickly found that without specific goals and questions to be answered, a day's looking would be just that - too much looking and not enough of the discovering my thesis demanded. With specific tasks outlined, such as "locate lateral pterygoid", or "clarify duodenal region", I would sit and probe,

stopping to note and sketch what I saw whenever it seemed worthwhile. It seemed worthwhile many times an hour. Often I would refer to a lab manual of a rabbit, or a text on dog or human anatomy just to see what to call some muscle or vessel. The dissecting microscope I used became very important to me when the direction of a muscle fiber or the branch of a nerve was to be deciphered.

Before I began my dissection of the galago, I sat down and tried to map out which areas I would be dissecting, and on which of the five specimens would it be most appropriate. After I had a basic idea what I was to approach first, I slowed down and spent some time examining each galago's external features. Their external landmarks, skin, position and sex were very important beginnings, and I drew and noted the animals very carefully before making even the first cut. In fact, determining the sex of the galagos was not as easy as one might guess. They look an awful lot alike. The female clitoris is about as long as the male penis and... well, deeper inspection was necessary to make an accurate decision. It might be interesting to note that the animals came to me labelled as they were when they were captured in Africa. The local natives who tagged the Galagos after shooting them out of trees with arrows at night automatically assumed that any pair of animals seen together included one male and one female. This was far from an accurate method of judging sexes. In fact most of the tags on my galagos were wrong. For some, it wasn't until I cut open their abdomen that I noticed the mistake. I devoted a good deal of time towards learning about the animal from the skin outward. I drew hands, feet, ears, eyes and fur, and as it turned out, these external orientation sketches were a great general learning device and a valuable aid to my later deep dissections. It helped to understand the whole before its parts.

My dissections were often stimulating and amazing to me. I recall probing

and cutting one female's uterus, and all of a sudden I realized I'd discovered two fetuses of different stages of development within the double-womb. This was quite exciting to me, as I was told that I was given no pregnant females. I was happy to find my former professor, Dr. Susman wrong. Discoveries like this often sent me off on a sketching and studying tangent which afforded me hours of new learning enjoyment. This kind of time "wasting" made the whole thesis worth remembering.

During my thesis dissections, it often became necessary for me to dissect two or more of the same areas in different subjects in order to fully understand what I was studying. The wide range of size variation, shape and locale throughout all areas of an animal so small became something to strongly consider before settling on a final drawing. It was important to weed out such things as overly distended stomachs or a gland whose features looked altered by physical damage or inadequate preservation methods. A 4% formalin, a weak formaldehyde was the preservative.

Preparing skeletal portions on one of the animals became useful in my study of the others, since I had no other reliable picture reference or skeleton to study. In one instance, difficulty in deciphering where various neck and chewing muscles inserted drove me to clean one head entirely of soft tissue until I had an accurate skull reference. Skeletal preparations involved cleaning off as much tissue as possible and then carefully immersing the bone in weak (3%) Hydrogen Peroxide for short periods of time.

"Anatomy is more meaningful when coupled with physiology."³ This quote from a book on dissection is worth noting. On several occasions I found myself returning to the library to thumb through old physiology text books in an effort to bolster my familiarity and understanding of a specific organ system or what-

have-you. These study sessions were very useful when I began to lay out my final renderings for the male urogenital system and the digestive system in particular.

Though I became very involved in my thesis' scientific aspects and dissections I never lost sight of my artistic aims. The objective of my thesis was to use the dissections to complete a series of illustrative anatomical plates. Note-taking, sketching and photography are excellent learning aids and record keepers for any researcher, but for me and my illustrating they were more than indispensable. They were my work.

During the dissecting hours my hands were constantly alternating grasps of scalpel and pencil. I would cut and probe an area, then I would draw what was important. The sketches ranged from hieroglyphic-like images and notes, to fully rendered pencil drawings with actual labels. Other than my art, the date, a sex indication and the time, my pages would often be interrupted by diary-like paragraphs of anything I thought valuable to record. "I found a long round worm in the stomach of No. 2", "These animals have really long cecums", and "Holy smokes! I wouldn't want to be bitten by those teeth" are examples. My sketches were usually made with an ordinary No.2 pencil on a bond paper, but occasionally a magic marker scrawl on a paper towel would have to suffice temporarily. Long hours of research can quickly deplete a pad full of paper.

Every couple of weeks or so I would conclude that it was time to move on to new dissections and I wanted to save some views of the present ones with a camera. Using just enough camera-handling knowledge to get by, some patience and some trial and error, I would load a 35-millimeter camera with black and white Plus-X print film and shoot a roll of various galago features and references. After processing the rolls of negatives, I would create a contact sheet of all of

my images and then proceeded to print shots which I thought would be the most helpful to me in the future. These photographs turned out to be valuable guides for me during both my pen and ink plates and my watercolor portraits of the galago which accompanied them. The photographs I took made their strongest impression on me as an aid to notetaking - a way of recording a stage of my dissection before I would go on to the next.

Struggling through many months of challenging dissections, sketching enough to fill a hundred pages, and clicking off dozens of photographs is what I owe the scientific accuracy and detail of my thesis illustrations to. I could not and would not have abridged any of those tasks and still remain content and confident with my final illustrations.

ARTWORK

It wasn't until about 3/4 of the way into my thesis project that I finally sat down at my drawing board and touched my inked pen nib to a future finished galago plate. The wait seemed worthwhile, for as I inked in my muscles, glands and vessels, I never faltered, slipped or slowed down. Except for the time spent double-checking the accuracy of specific anatomical features, the speed, smoothness and constancy of my pen was more than I had hoped for. Good preparation, planning and training really paid off with reduced time spent on the final plates. Let me back up here, and describe step by step how I went about creating my final Galago demidovii illustrations.

All throughout my dissections I was compiling sketches and photographs on each area I wished to focus on for a finished plate. I would then wade through this multitude of rough sketches in an attempt to determine which views of the same area seemed most informative. Which view will show the most? I needed to eliminate all the superfluous and include all the pertinent. There is often a fine line between the two, and personal judgment was my final determinant. With my sketches in hand, and an optimum view of a particular area I wanted to show in mind, I would return to the laboratory. Positioning my galago specimens so that the view, angle and components were as I wanted them to be on my scratch-board plates, I would start probing and sketching all over again. These final dissection sketches were developed with enough pencil detail, and accompanied by sufficient notes, measurements and labelling so that I could cover up my specimens and head to my drawing table, ready to tackle the finished piece.

At this point in my artwork, my two "best friends" were a pad of tracing

paper and a "lazy Lucy" enlarging and reducing projection device. By tracing over my finished sketches, and by enlarging and reducing these separate images until they were arranged into a layout I would be pleased with, I created the final design or look I wanted. Being careful to keep in mind the size, number, and position of the labels I would be adding later, I then traced all the elements onto the same piece of vellum. I now had an outlined image of what the final drawing would be. This laying out and composing was a crucial element in some of my pieces with more than one inset, such as "Chewing Musculature" or "Male Urogenital System".

The medium and technique I had chosen for my final illustrations was scratchboard, or more specifically "British Scraper Board" by EssDee of England. This professional grade paper was coated with a layer of fragile white clay, which would require mounting on a stiff illustration or chip board to keep it from cracking, chipping or bending. After cutting the scratchboard to the 11x14½ inch dimensions I desired, I affixed each of them to a board with dry mount tissue and a dry mount press. The press heats up and "sandwiches" the mounting board and the scratchboard around the waxy dry mount tissue. After about thirty seconds the pressure is released, and the melted waxy tissue has joined the two boards, giving the scratchboard a rigid backing.

What purpose is served using paper coated with clay, and why is it worth the hassle to mount it, or the significant expense (approximately 10 times the cost of a good illustration board of the same size)? According Phyllis Wood, author of Scientific Illustration, "Drawing with ink on scratchboard is a different and marvelous experience."⁴ In Meritt Cutler's book Scratchboard Drawing, he writes "Scratchboard permits the meticulous delineation of detail, the convincing development of texture, and the achievement of values ranging all the way from pure white to jet black."⁵ I, Hugh Nachamie, Master of Fine Arts thesis candidate

echo the above sentiments. I have been very pleased with each drawing (thesis and other) I've done on this clay coated surface, and thanks to their somewhat alkaline chemistry the drawings will last to be enjoyed in years to come. The scratchboard's white clay surface allows you to create lines in two ways: you can apply a positive black ink line to the board or remove line by scraping away black ink and producing a negative, or white line. This revealing approach towards creating a pen and ink drawing on scratchboard offers a richness of tone and a crispness of line available in no other black and white medium.

Having gotten as far along as describing how I came to have a finished outline on tracing vellum and a sturdily mounted clean scratchboard, I will now consider the final artwork. To ensure clean erasures of pencil lines, I sprayed the board with a workable matte fixative before I began transferring my image. My tracing paper composition was transferred to the scratchboard by a transfer method. On the flip side of the tracing paper I proceeded to trace the lines with a carbon pencil. When the lines were drawn I taped the vellum right side up to the board in the position I wanted. Using any smooth surface, I used the bottom of an ink bottle and a plastic burnishing tool to rub over the pencil lines. This transferred the underside carbon line to the scratchboard surface. Removing the tracing paper left a rough carbon outline on the scratchboard. There are other transfer methods, but for me this was simplest. The carbon pencil lines could then be straightened, detailed or sharpened as I needed, with any pencil.

The fixative I sprayed before transferring my image turned the board's slick chalk surface to a lightly toothed one which allowed my ink to flow smoothly without picking up pen-clogging dust.

I did a great deal less filling in of areas with black ink, and therefore swayed

a bit from the prescribed book methods. I did what might be called pen and ink drawing with added scratchboard technique. I drew all my lines in with a Hunt 104 crow quill point, or an occasional sweep with a No. 1 sable watercolor brush, with Higgins waterproof black ink. I scraped away my negative or white areas/lines with a scraper point mounted to an old paintbrush handle. Anything can scrape away the ink from the board, but a sharp tool is what is needed for that all important crisp, clean cut. The joy of using scratchboard is in the ranges of grays useable for shaded areas, and the ease in which highlighted areas can be scratched away. "The effect of grey is achieved by cutting white⁶ in the black; the eye blends the blacks and whites to obtain an illusion of grey." The results can be rewarding, but successful pieces as in any medium, come only after considerable practice, for there are many common pitfalls in technique to be avoided. An example might be that your ink must be dry before you scrape or you'll make an uneven ragged line. Crosshatching at any angle approaching 90° will result in a miserable "screen door" look. In other words it's a medium which can afford you great control in creating forms, textures and shadings, but without a good deal of prerequisite competency you'll just make a more varied mess.

If you take time to examine my finished pen and ink on scratchboard Galago illustrations, you can see that there are many areas complex with tone and texture and also dense with important information.

By using the aforementioned scratchboard drawing methods I was able to successfully overcome many difficult illustrative predicaments. For example, in many of my plates you can see the galago's fur rendered with both black ink lines and white lines scratched into black ink. The black and white lines and their interfacing allowed me to successfully render an area whose texture

resembled fur while holding on to its solid form in both dark and light areas. When I was representing a group of vessels, as in "Superficial Dissection" or "Deep Dissection", the usual arrangement exhibited an artery directly next to a vein next to a nerve. The problem of differentiating these similarly formed tiny "strips" was remedied by leaving the nerve board white, rendering the artery with positive black ink, and scraping away negative white lines into a solid black vein. This easy formula for clearly distinguishing nearly identical-looking vessels was a result of the variability in tone allowed with a scratchable surface.

An important consideration when doing any illustrations directed towards publication is what size to create the original artwork in relation to the final printed page size. It is generally considered advantageous to render your pen and ink drawings one third or so larger than the size you expect them to be published in. First, this allows you to draw at a size which is usually more comfortable for both your hands and your eyes, and secondly, the final reduction of the drawing will help to "tighten it up", and improve your line work. It was important to keep in mind however, especially when inking my deep neck muscles and fur, that too much reduction might cause a "blackening" or filling-in of lines. Such a misjudgment could have done damage to a finely detailed drawing.

Illustrative plates such as the ones I drew required a lot of labelling with lead lines, and serious thought had to be given to them. Good labelling technique can improve and complete a nice drawing, but poor labelling will destroy even a fine piece of work.

After considering many labelling possibilities, including rub-on, typesetting and freehand, I settled on the template-aided "Leroy" mechanical lettering system. For someone who has withstood the significant initial investment in a Leroy lettering set, or has one available for his/her use as I did, this method of producing inked lettering is cheaper in the long run than any other lettering except

freehand. My decision to use the most economically efficient form of lettering was inspired not only by my need to conserve money, but also by a belief that cost-conscious future employers might be swayed by quality portfolio pieces completed as economically as professionally possible.

After carefully laying out the positions of the letters on tracing vellum, I lettered with a variety of different sized Leroy templates and was able to create neat and clean inked labels directly on my scratchboard drawing. With a good deal of prior practice, I efficiently "Leroy-ed" on the scratchboard all the time secure in knowing a simple slip or error could be scratched clean. I also knew all too well that a more serious mistake could cause me much agony. When I finished my illustrations it took some courage to ink worded labels directly on the board, and the first long black and white lead line I drew/scratched through my galago "Superficial Dissection" head and neck plate also made me nervous. The pressure of the time-pressured thesis caused me to realize my drawings were too precious to ruin. Come to think of it, that makes sense. As it turned out I had no problems lettering the labels, the centimeter scales or the titles. I would opt to use the Leroy system and draw lead lines directly through my illustrations again without hesitation.

CONCLUSION

My thesis proposal stated that I aimed to "complete a series of plates which are both scientifically and artistically valuable." Now that my thesis work, both researching and illustrating, is complete I can sit back, push my scalpels and crow quills aside and evaluate my performance.

In retrospect, I think that I could have reworded my original proposal, and in the place of "both scientifically and artistically valuable", I might have written "successfully medically illustrated". Whenever I think of good medical illustration I automatically envision work which is, as I proposed, scientifically and artistically valuable. I believe that scientific and artistic worth are fused as one in a good biomedical/scientific illustration. In an effort to isolate specific criticisms of my thesis however, I will begin by picking out what I feel is scientifically successful about my thesis work. For the vague stamp of success to be awarded to scientific illustrations such as my Galago demidovii plates certain criteria I feel must be met. The drawings must communicate complex scientific concepts, facts or data, in a readily understandable manner. The artwork must highlight all that's important and leave out the superfluous details. The art must cater to a particular audience, whether it be the scientific community or the general public or both, and this audience must be attracted to and informed by it.

The Galago demidovii's anatomy presented a complicated collection of scientific facts which needed clarifying and highlighting. As I viewed my own work and heard the early responses of others, I am optimistic that I have fulfilled my

own requirements for a scientifically successful illustration.

The galago plates contained dozens of muscular, vascular, glandular and visceral intricacies which in the animal itself are basically unrecognizable on a glance to even a trained eye. I put many hours of thought, research and technique into enlarging, clarifying and making obvious these indiscernible anatomical details.

It didn't take long for me to realize that for each area of the galago's anatomy my dissections shed some light upon, there was another interesting facet which was passed by. It seems that the more I examined my specimens, the more I became curious about them, and the more aspects of its anatomy and physiology I felt deserved future attention. When I dissected the animals' oral region I became fascinated by their 'second cartilagenous tongue". Why do galagos have one whereas other primates don't? When studying female's urogenital system, I wondered why I encountered such a wide variation in uterine form. Why did one female seem bicornuate and another not? These and many other aspects of the dwarf galago's anatomy left me puzzled and frustrated. I was frustrated because I could uncover little previous research to help answer my queries, and I hadn't sufficient time to devote towards researching these various anatomical areas. I hope one day that I will be able to continue my study of these primates and begin to find answers to some of the many questions my limited thesis dissection raised.

As for my goal of creating work with artistic value, it is harder for me, as it is for mankind in general, to assign criteria to evaluating this aspect. Artistic value is a term so relative and ambiguous so as to make it nearly useless. Let me avoid an issue worthy of its own document and state how I define

"Artistic value" in this context. For a scientific illustration to be artistically valuable in my mind, it must be technically proficient, informative and visually pleasing enough to attract and hold an interested viewer's attention long enough for him/her to begin to absorb the information that is shown.

Leaving the definition writing to others, let me suffice to say I'll leave any artistic criticisms beyond a simple "I myself like them" to others. The rest of my speaking must be done by the finished illustrative plates themselves. Let's hope the "dead monkeys" can talk.

Notes

¹ The specimens I dissected were not monkeys. They were prosimians.

The term "dead monkeys" refers to the popular but uneducated label other students gave to my research subjects.

² Geoffrey H. Bourne, Primate Odyssey (New York: Putnam, 1974), p. 10

³ William Berman, How To Dissect (New York: Arco Publishing, 1978), p. 119

⁴ Phyllis Wood, Scientific Illustration (New York: Van Nostrand Reinhold 1979), p. 48

⁵ Merritt Cutler, Scratchboard Drawing (New York: Watson Guptil, 1949), p. 8

⁶ Ibid., p. 31.

Galago demidovii
UROGENITAL SYSTEM ♂

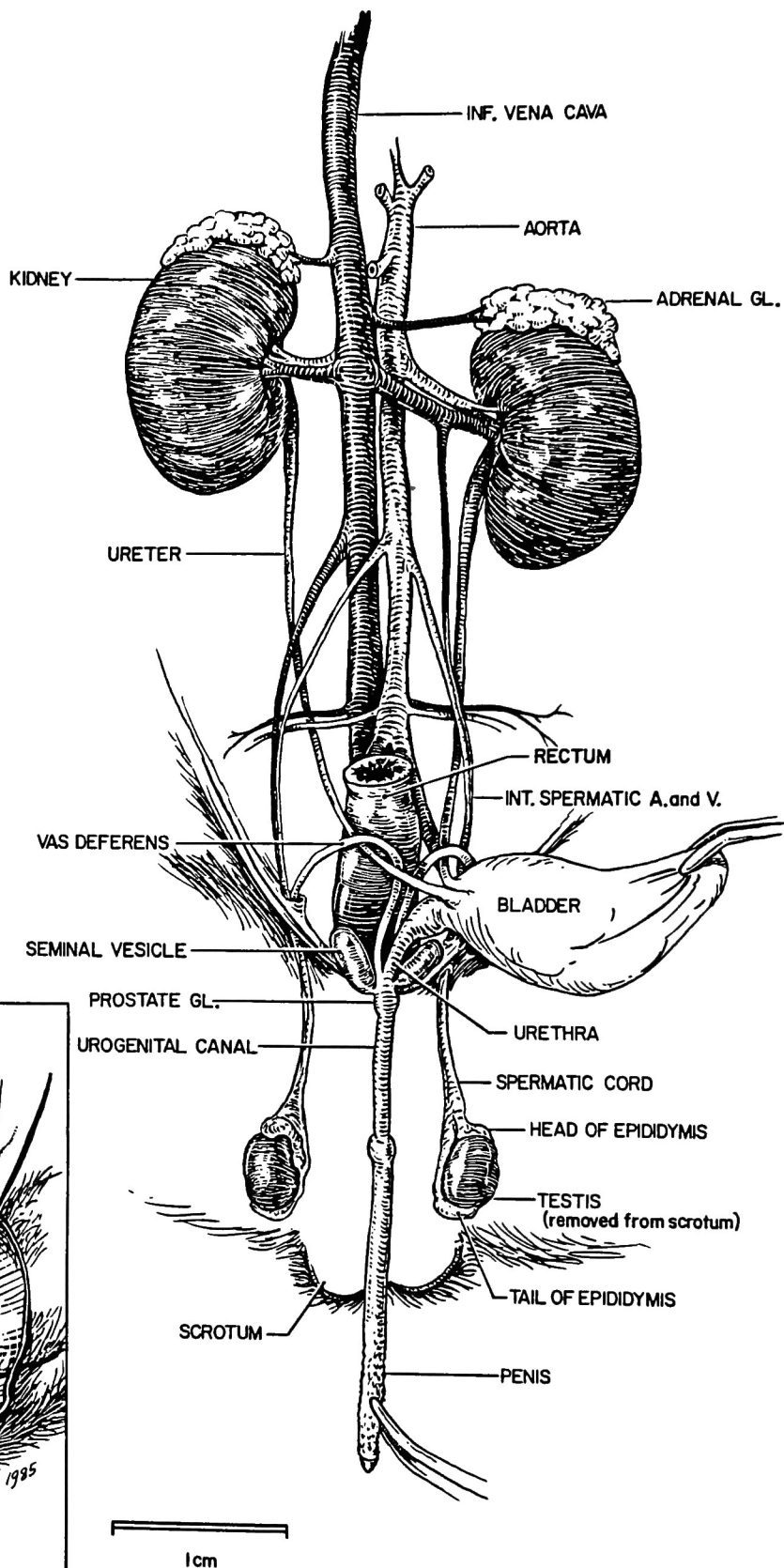
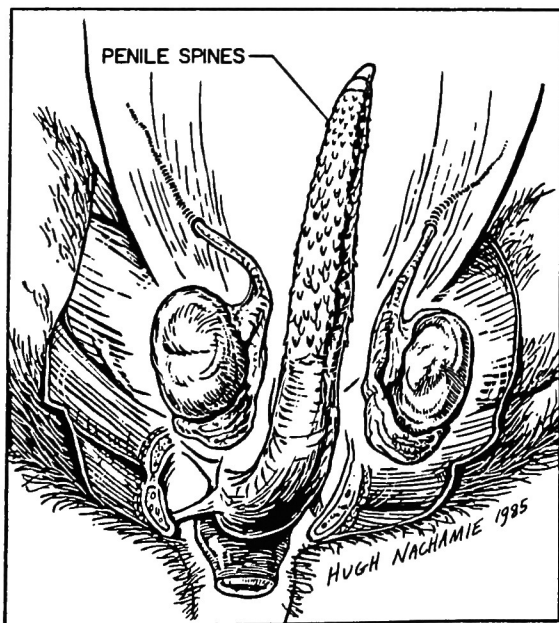
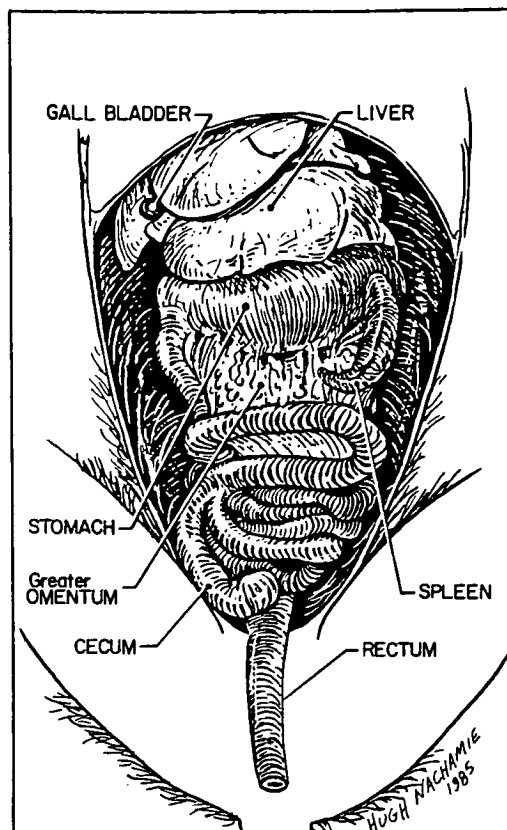
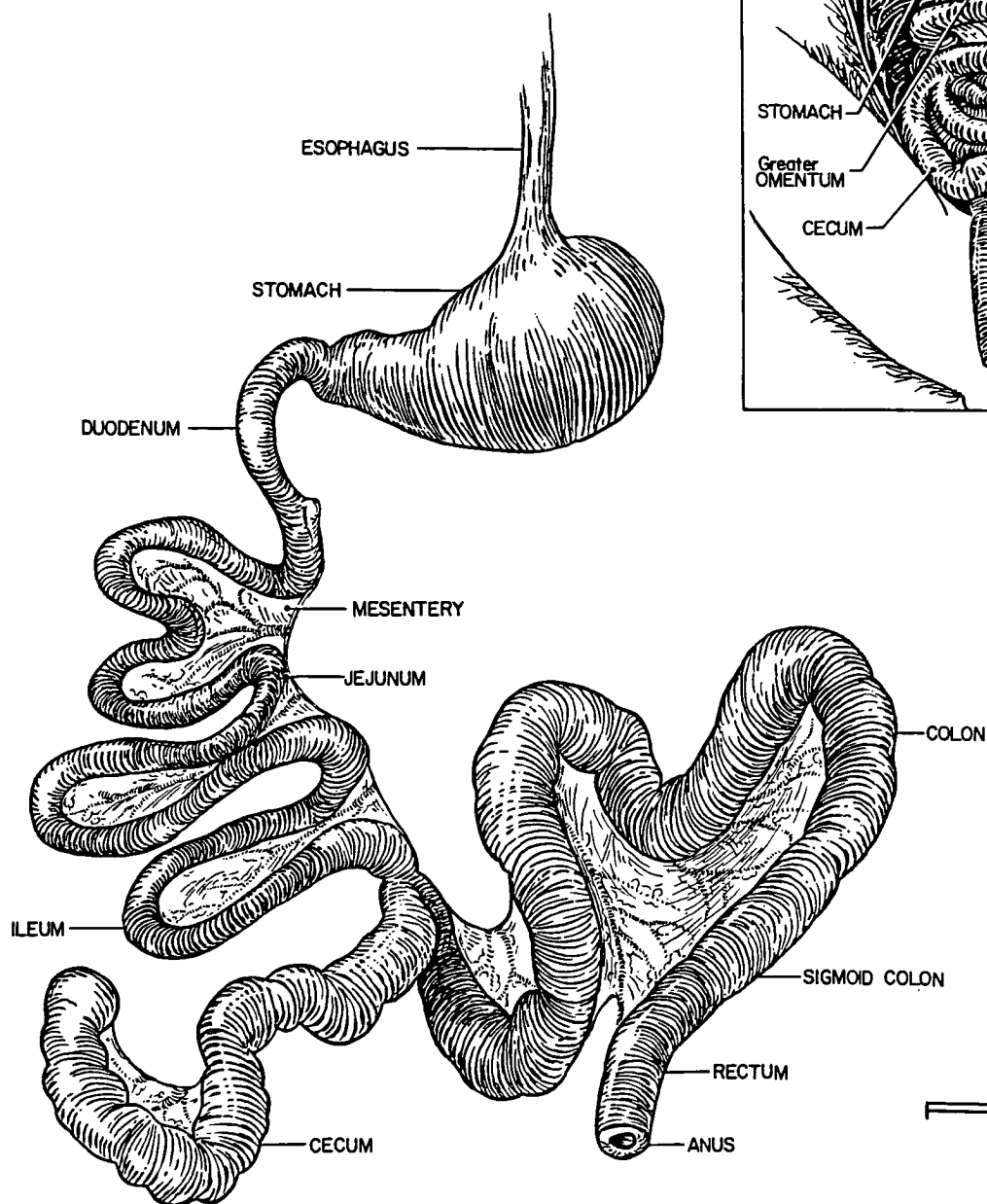


Plate 1. The Male Urogenital System (reduced 26% from original)

Galago demidovii

DIGESTIVE SYSTEM
ABDOMINAL PORTION



1 cm

Plate 2. The Digestive System (reduced 26% from original)

Galago demidovii
SUPERFICIAL DISSECTION

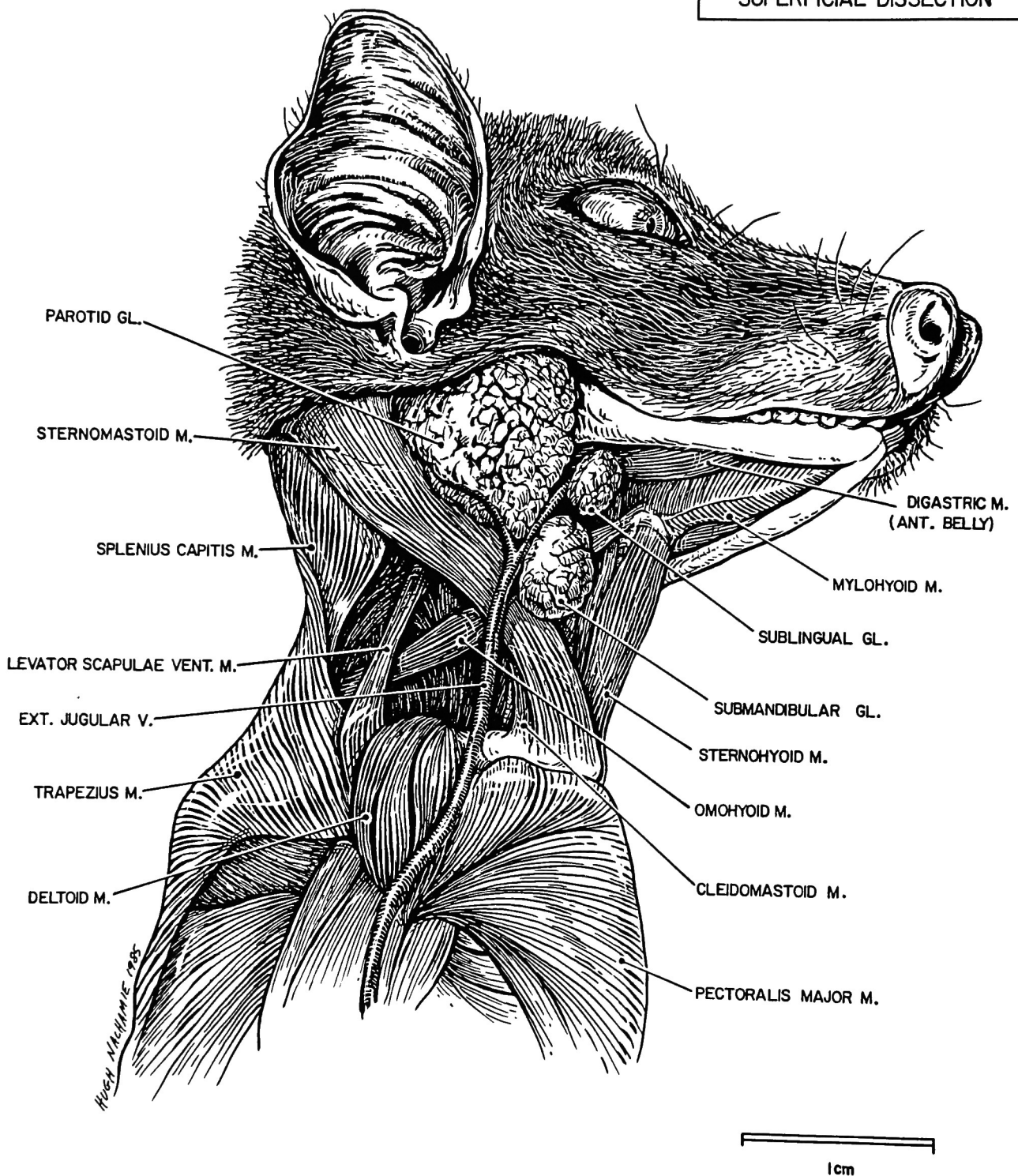
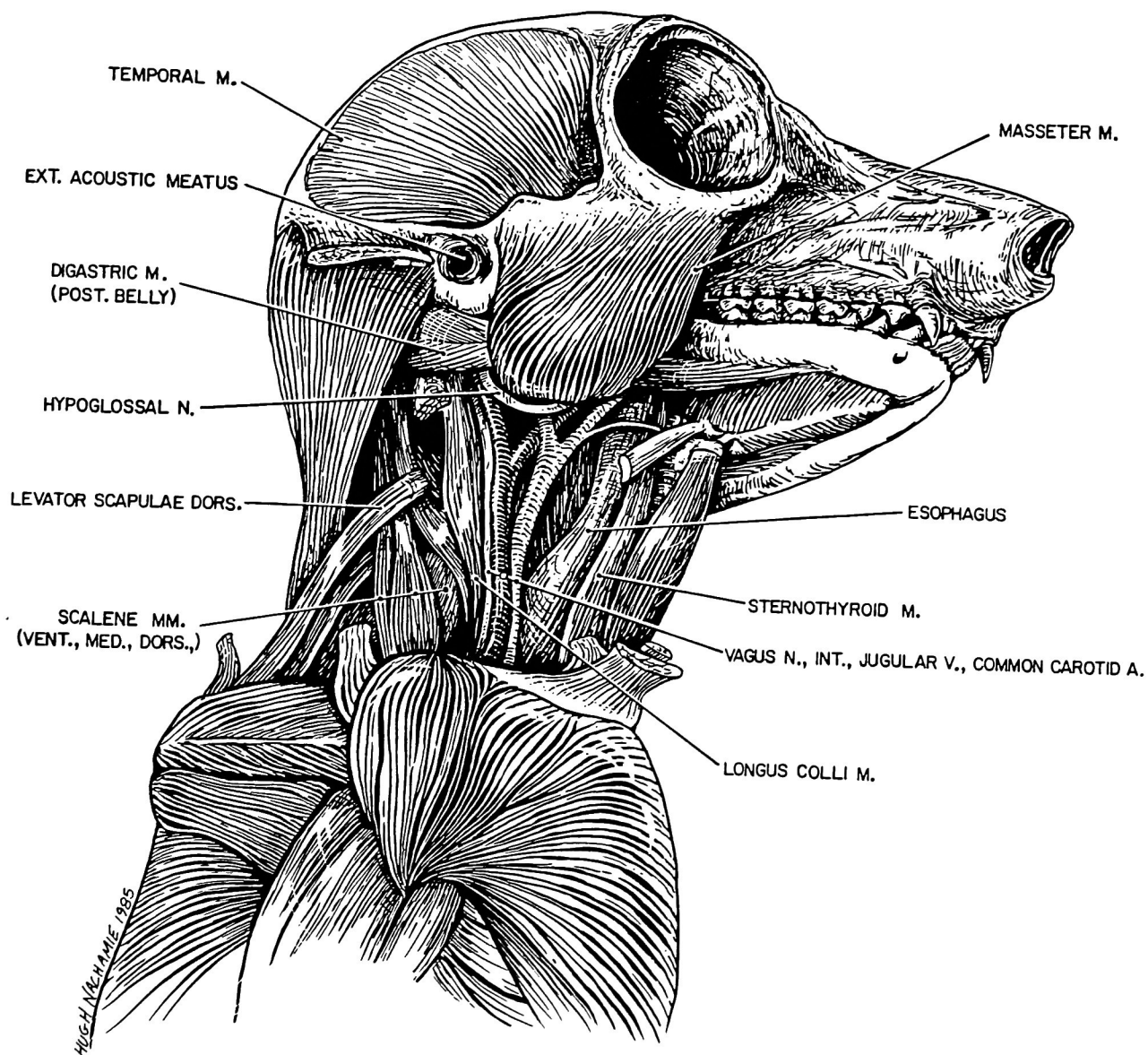


Plate 3. Superficial Dissection (reduced 26% from original)

Galago demidovii
DEEP DISSECTION



1cm

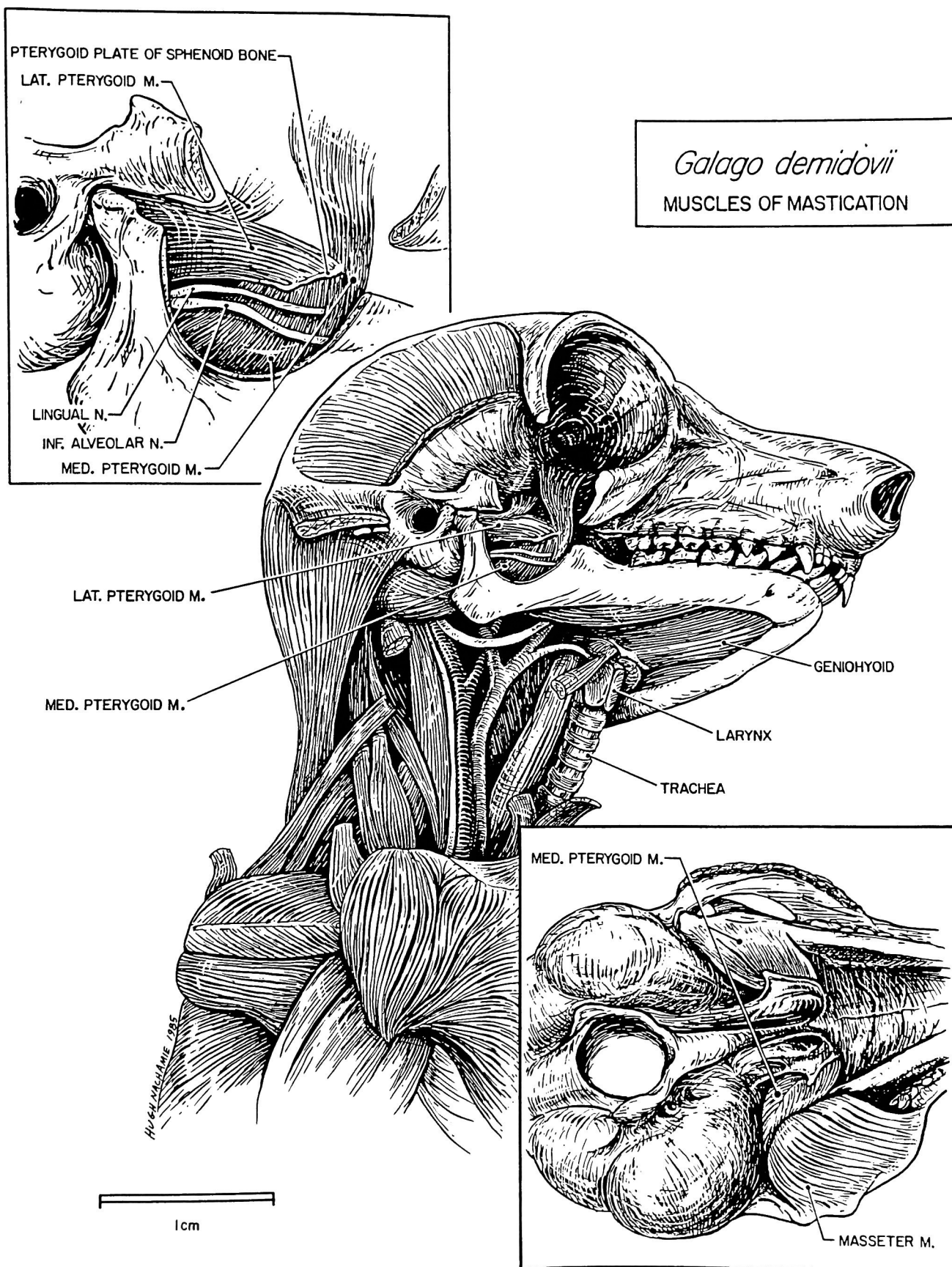


Plate 5. Muscles of Mastication (reduced 26% from original)

SKULL BONES OF *Galago demidovii*

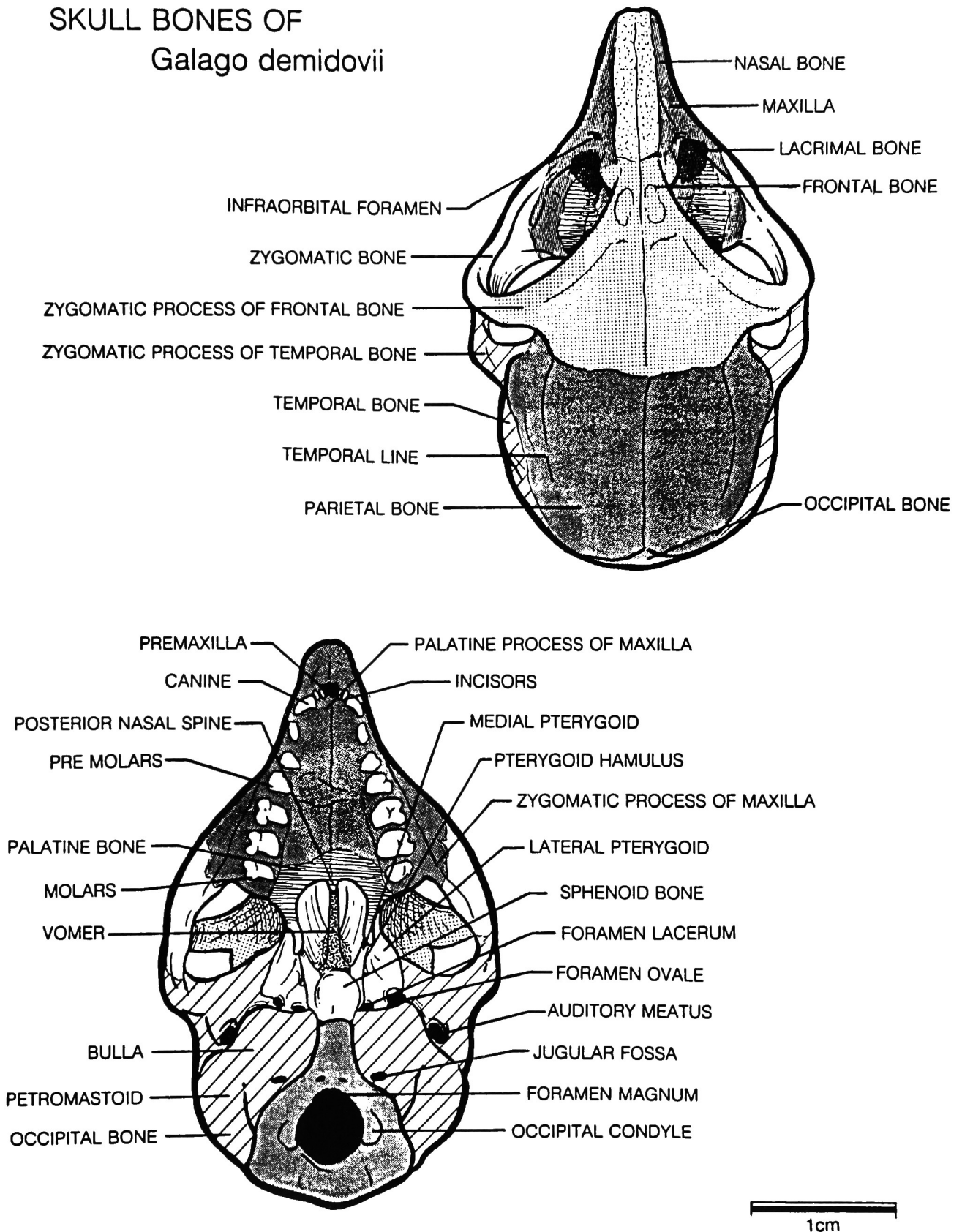
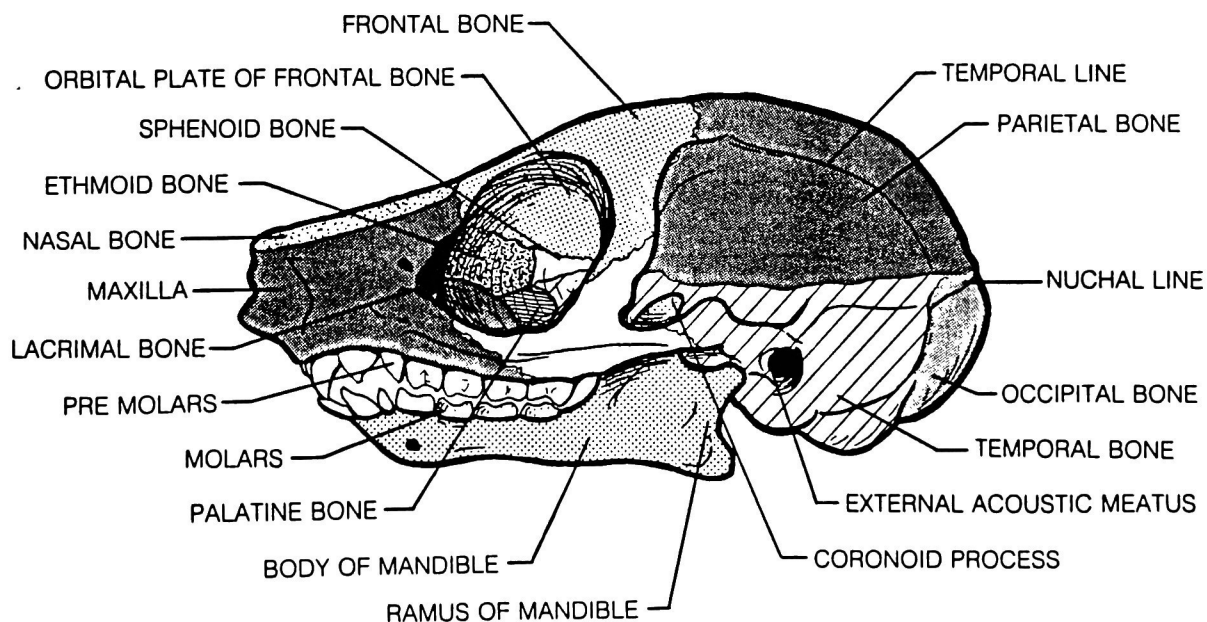
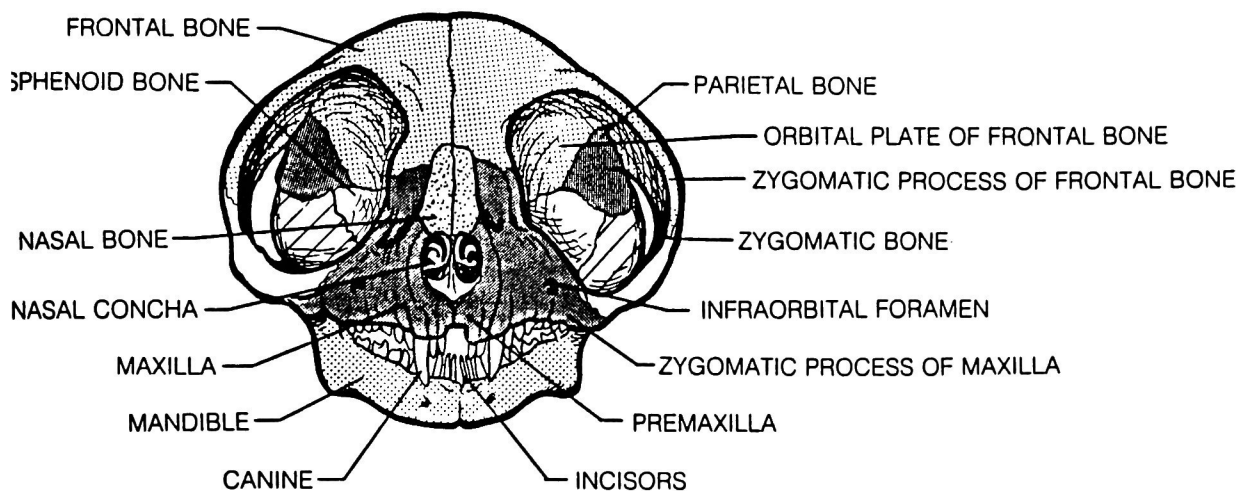


Plate 6. Skull Bones (reduced 26% from original)

SKULL BONES OF *Galago demidovii*



1cm

DEC 46 HAN:
♀ Dorsal



Figure 1. Dissection sketch page of Dec. 4

DEC 10
HEAD FACE
+ NECK



$\frac{3}{4}$ VIEW



UNDERSIDE

Figure 2. Dissection sketch page of Dec. 10

Ugit NACHAME

N/1

Digestive system ♀

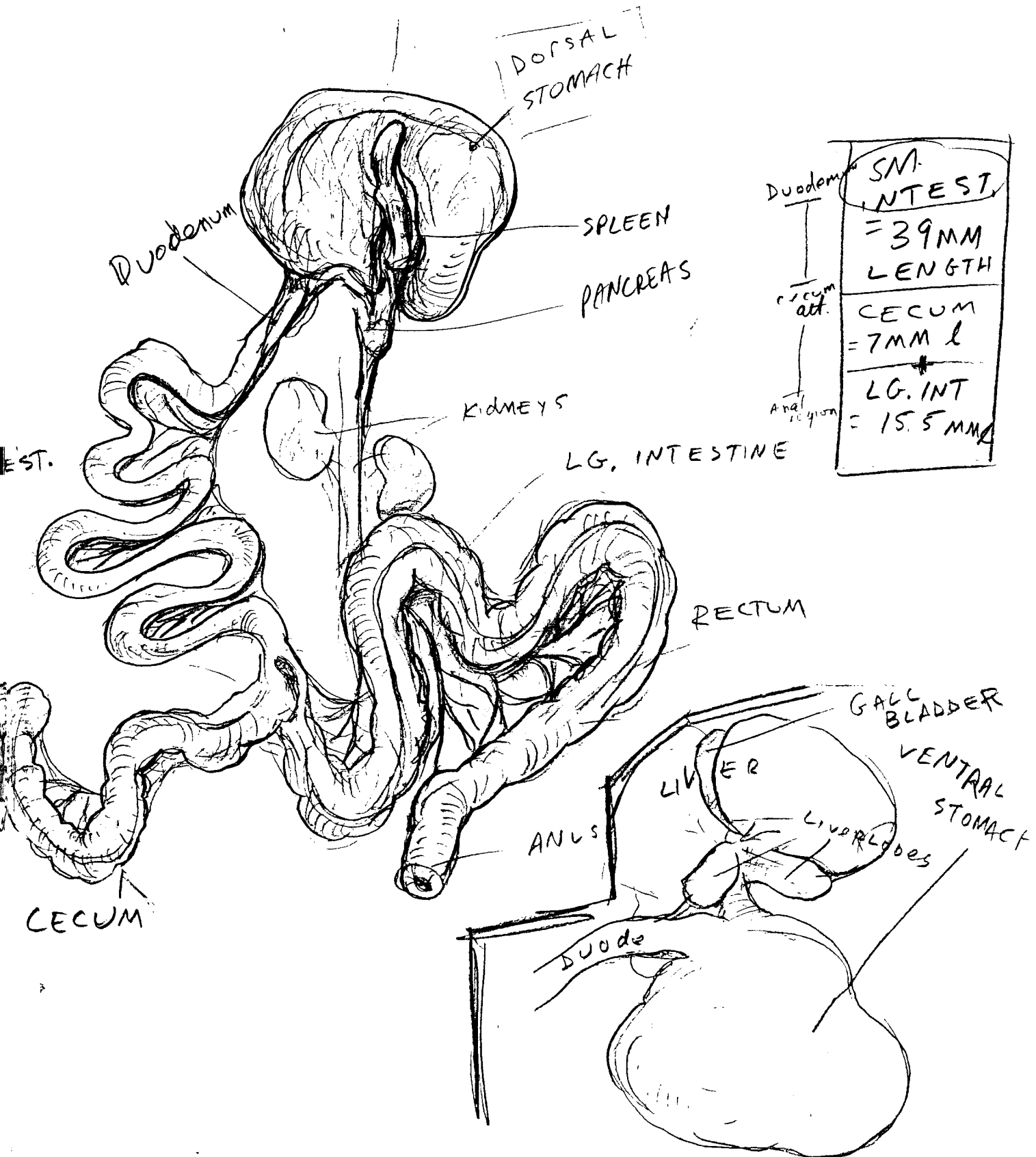


Figure 3. Dissection sketch page of Jan. 8

anatomy of Legs
 left Leg

JAN 17

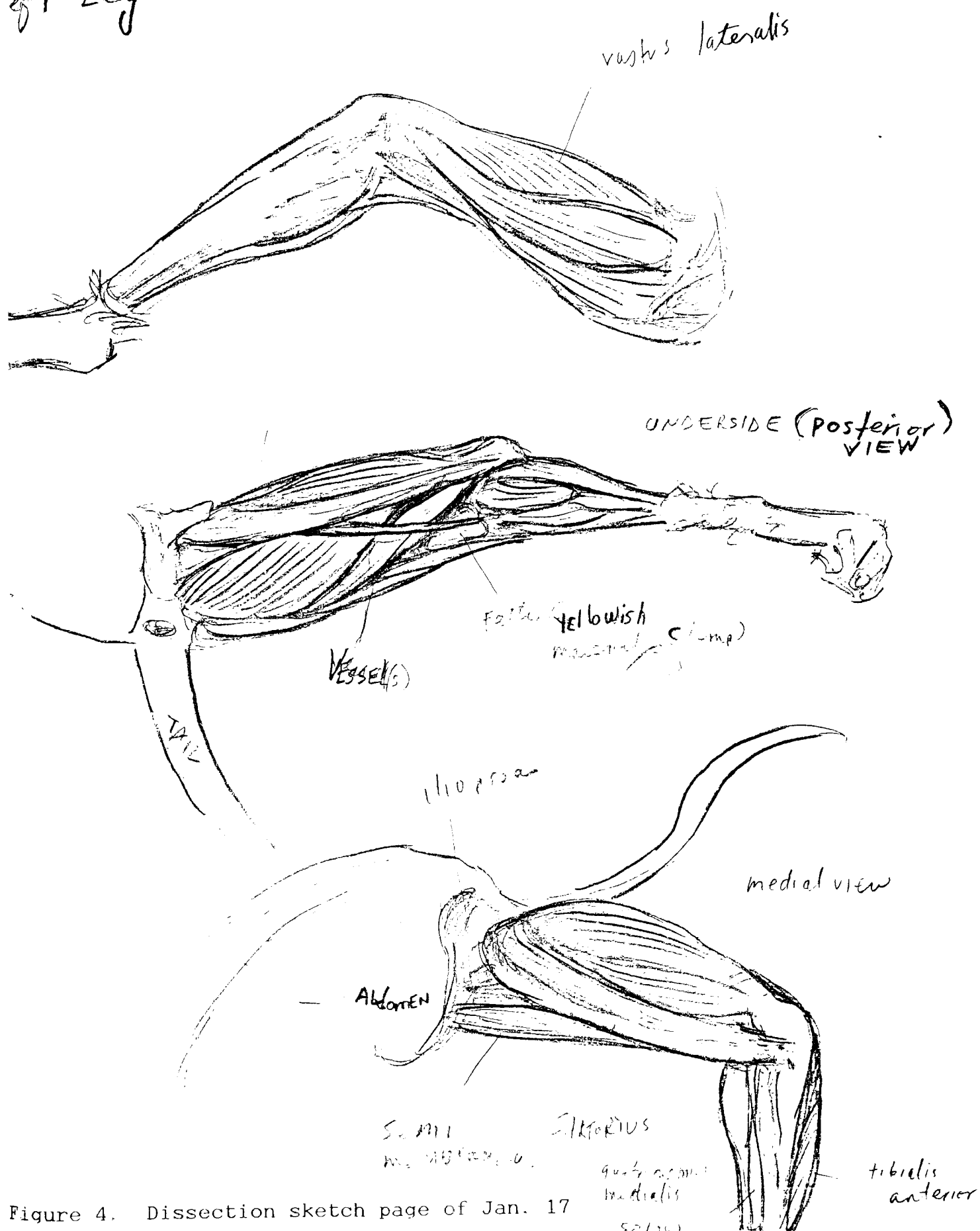


Figure 4. Dissection sketch page of Jan. 17

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