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ARTISTS APPLY HERE!

You probably have noticed the unique look of the cover for the Spring edition of the HAPS-EDucator. The wonderful art work was done by an anatomy and physiology student! This is the second HAPS-EDucator to feature original art done by a student.

The HAPS Editorial Board would like to make this an annual tradition for the Spring edition of the HAPS-ED. Thus if you have a student who has some artistic talent and would like to see his/her art published, please submit the finished art to the HAPS-ED editor. The art work must be original and can be submitted throughout the year. The HAPS-ED Advisory Panel will determine which art will be featured. In order to be eligible for the Spring edition, art work must be received by February 1, 2004.
HAPS-EDucator is the official publication of the Human Anatomy and Physiology Society (HAPS) and is published four times per year. Major goals of the Human Anatomy and Physiology Society are: to promote communication among teachers of human anatomy and physiology in colleges, universities, and related institutions; to present workshops and conferences, both regional and national, where members can obtain information about the latest developments in the health and science fields; and to encourage educational research and publication by HAPS members. HAPS was established in 1989.

Annual membership dues are $50 for full time faculty, and $35 for part-time and retired faculty. Annual membership renewals shall be due on January 1, April 1, July 1, or October 1. New members shall renew on whichever date most closely follows the date of their initial membership. **HAPS Hotline: (800) 448-HAPS (4277). Information on membership, meetings, and more! Send correspondence to:** HAPS, 8000 Bonhomme, Suite 412, St. Louis, MO 63105. Check out our new webpage at: [http://www.hapsweb.org/](http://www.hapsweb.org/)

**SUBMISSIONS TO HAPS-EDucator**

Papers for publication, requests for information, positions available and wanted, and letters to the editor are welcome. Articles may be submitted to the editor by e-mail attachment as Microsoft Word or Word Perfect file or on 3.5” double density disks—please include a hard copy as a backup. If references are included, please follow the methods suggested in *Scientific Style and Format: The CBE Manual for Authors, Editors, and Publishers*. 6th Edition, Style Manual Committee (Council of Biology Editors) Cambridge, Cambridge University Press. 1994.

It is the policy of the Human Anatomy and Physiology Society (HAPS) that any advertising appearing in its publication(s) must be related to the teaching of anatomy and physiology. The **HAPS-EDucator** Editor and Advisory Panel jointly determine whether an advertisement meets the criteria of HAPS. Any advertisement that is deemed not to meet the needs of the organization will not be printed, and the advertisement plus any monies collected from the advertiser will be returned. The opinions reflected in advertising that appear in this publication do not necessarily represent the opinions of HAPS. Advertisement of a product in the **HAPS-EDucator** does not represent endorsement of that product by HAPS. Contact the Editor for information on advertising rates, advertisement size, and the procedure for submitting an advertisement to **HAPS-EDucator** for publication.

**DEADLINES FOR SUBMITTING MATERIAL TO HAPS-EDucator:** April 15 (Summer issue); August 1 (Fall issue); November 1 (Winter issue); February 1 (Spring issue).

**CONTACT THE HAPS-EDucator Editor:** Susan Baxley, Troy State University Montgomery, College of Arts & Sciences, P.O. Drawer 4419, Montgomery, AL 36103-4419, (334) 241-5473, (334) 241-8665 fax. sbaxley@tsum.edu
This is my fourth and final contribution to this column. In each of the previous letters, my effort was to look forward in the life of HAPS and to give the readers of HAPS-EDucator a preview of new things on the horizon for the organization. Frankly, I found that an enjoyable goal, but I never felt capable of keeping pace with all of the new developments, even though some still are in progress. In this letter, I will attempt to look back on the year from a perspective that has had the experience of “A Time To Chime” in Philadelphia. (If you promise not to tell anyone, I will reveal that today’s date is March 25.)

The year was not an easy one for the Board of Directors and Steering Committee. It began, shortly after the Annual Conference in Phoenix, with the group needing to confront predictable financial difficulties that would remain our nemeses throughout the year. I hope each member can appreciate the efforts put forth by every member of the Steering Committee to help conserve funds as plans for a large and expensive Annual Conference 2003 took form in Philadelphia and elsewhere. The Winter Board Meeting was held in Ft. Myers, Florida, with only those committee chairs able to procure support from their colleges in attendance. Others contributed via proxy reports presented by the Regional Directors and/or via conference telephone calls. We think the approach was successful, and its cost was $4056.00 less than that of the previous year’s winter meeting (a 42% savings!).

I hope each member will appreciate the efforts of those who (will have) made the Philadelphia conference a great success. Conference Coordinator Lakshmi Atchison worked more than two years to arrange for the conference and, in an unprecedented fashion, incorporated the input of HAPS members from all regions of our existence. We are extremely grateful to Lakshmi, her family (husband Michael and sons Alan and Steven), and her colleagues at the beautiful Chestnut Hill College for their graciousness and hard work on behalf of our Society and our Annual Conference. Henry Ruschin, President Emeritus and Chair of the Annual Conference Committee, was a great help to Lakshmi in coordinating these efforts, and Phil Tate performed Herculean tasks acting as President-Elect, Chair of the Nominating Committee, Conference Financial Manager, professor, and text book author. Carl Shuster, from his office in Wisconsin, doubled as the Editor of HAPSWEB.org and coordinator of the conference poster sessions, and Elizabeth Harper, Director of the Eastern Region, coordinated the workshops from her office in New Jersey.

I wonder how this could have been accomplished without email and must conclude simply that it could not have! Yet, even as the early fall found us becoming quite proficient at completing HAPS business via electronic means, it was pointed out by Western Region Director Jim Pendley that this may, in fact, be inconsistent with the corporate statutes of the State of Idaho where HAPS is incorporated. By golly, Jim was correct! Fortunately, consultation with an attorney in Idaho enabled us to exercise a relatively simple and inexpensive legal procedure that has now cleared the way for HAPS to legally conduct its business by any convenient means, electronic or otherwise, that is available at the time.

That process may prove to be a linchpin for other work that has been underway during this year. No doubt by now almost everyone has visited HAPSWEB.org. One should visit the site frequently in order to stay abreast of Editor Carl Shuster’s “Top New Stories,” to maintain your own member information, and to keep in touch with HAPS colleagues. If you choose, you also can produce and post your own webpage using the site’s real-time web editing feature. As Carl says about that process, “No muss, no fuss...and no knowledge of HTML or strange programs necessary.” Soon members also will be using the website to submit proposals for workshops or posters, and even to register online for Regional and Annual Conferences using a credit card just as they might make any other electronic purchase. But remember...I am writing this early in order to make the publication deadline, so some of this paragraph is based upon faith in what we can accomplish through perseverance and “HAPS grit.” No doubt some reading this already will have had some difficulty, for example, getting into the “Members’ Area” at HAPSWEB.org. “HAPS grit” means that we can expect that problem to be resolved by the time this issue is published, and that all of the features we anticipate will be debugged and functioning well in the very near future! Note: If you are reading this in July and that is not true, remember that your President’s name is Phil Tate!

Now, in my final paragraph for this column, I want to thank a number of specific individuals who have made my year as President one of personal growth, general success and, indeed, no small pleasure. The list includes the President (Dr. Martha Smith), the Vice-President for Learning (Dr. Andrew Meyer), and the Dean for Learning Advancement (Trish Casey-Whiteman) of Anne Arundel Community College for their gracious support of our faculty’s involvement in HAPS. May their actions serve as examples to college administrators everywhere! The list also includes my close friends and colleagues (Rich Faircloth, Javni Mody and Carol Veil) whose understanding and support have been available to me this entire year. And, last but not least, and at no surprise to anyone active in HAPS management during the year, the list includes Phil Tate and Gail Jenkins for being such valuable team members. The year began with me expecting that their anal retentiveness would drive me crazy, but as it comes to a close it is clear that their tireless work and devotion to HAPS saved me and our organization more than once and in many ways. My sincere thanks to each of these people, and to each loyal member of HAPS, for a year of jobs well done!

Peace,
Mike

HAPS-EDucator - Summer 2003 - page 3
Picturesque Prairies, Majestic Mountains! Those are what await you surrounding the city of Calgary, site of the 18th Annual HAPS Conference in Calgary, Alberta, Canada from June 12th to 17th, 2004. Moreover, the vibrant city of Calgary itself has much to offer you. In this second in a series of four articles about the 2004 HAPS Conference, I will describe Calgary and introduce some of its major attractions.

The white cowboy hat, pictured in our HAPS 2004 logo above, is a well-known symbol of Calgary hospitality frequently presented to visiting dignitaries. Historically rooted in ranching, Calgary was once known as “Cowtown.” However, with a population rapidly approaching one million, Calgary has grown from its original ranching roots to become a cosmopolitan city with an economy fueled largely by the oil and gas industry, but also boasting the second largest number of head offices of any city in Canada. Nevertheless, every year the city returns to its ranching roots for a week in July for the Calgary Stampede.

During the HAPS Conference, you can learn more about the history of Calgary and western Canada by visiting Fort Calgary (site of the original RCMP detachment), the Glenbow Museum and Heritage Park. You can find out about today’s Calgary by exploring Calgary’s downtown core, taking in the view from the top of the 190 m tall Calgary Tower, ambling down the Stephen Avenue Pedestrian Mall, and visiting Olympic Plaza. During your stay, you may also wish to visit Calgary Olympic Park (site of the 1988 Winter Olympics), the Calgary Zoo, and the Calgary Science Centre. In addition to these attractions, you can enjoy dining at a large variety of restaurants featuring cuisines from all over the world. Or, you can enjoy nature in one of Calgary’s many parks and pathways. Below is an introduction to some of Calgary’s attractions.

**Calgary Tower:** Located in the heart of downtown Calgary, this tower offers a panoramic view of the city and the Canadian Rockies from its Observation Terrace. It also features a “Towers of the World” display and a revolving restaurant.

**Glenbow Museum:** The Glenbow Museum, the largest museum in Western Canada, offers a lively journey into the heritage of the Canadian west. On permanent display is “Nitsitapiisini—Our Way of Life,” describing the history and culture of the native Blackfoot people. Their story is told through interactive displays, artifacts, large photomurals and video screens. The Glenbow’s art collection displays contemporary Alberta art and historical works by many of Canada’s noted early artists.

**Heritage Park Historical Village:** Canada’s largest living historical village, Heritage Park recreates all the sights and sounds of pre-1915 life in Western Canada. Stroll down Main Street circa 1910; ride the rails behind a real steam locomotive; board the S.S. Moyie for a relaxing paddlewheeler cruise in Glenmore Reservoir or enjoy the thrills of an antique midway.

**Fort Calgary:** Located on the side of the Bow river just minutes from downtown, Fort Calgary brings history to life by telling the stories of this site, the early settlement of Calgary, and its people.

**Calgary Olympic Park:** The site of the 1988 Olympic Winter Games, Canada Olympic Park attracts visitors year-round. If you wish, you can race down the bobsleigh track at 95 km/hour (almost 60 mph) on the Bobsliegh Bullet/Road Rocket even in June! (Reservations fill quickly, so book early!) Alternately, visit the Olympic Hall of Fame Museum.

**Calgary Zoo, Botanical Garden & Prehistoric Park:** The Calgary Zoo, with over 1,100 animals from around the world, is one of the top zoos in North America. Its focus is on preservation of the natural environment and endangered species. Its prehistoric park allows you to step back to the time that the dinosaurs roamed the Earth. The combination of zoo, prehistoric park, and botanical garden make this a unique facility that is worth a visit.

**Spruce Meadows:** This internationally renowned equestrian facility is located in the south of Calgary. It hosts four major show jumping championships annually, one of which, the Masters, is the richest show jumping championship in the world.

**Calgary Parks and Pathways:** Calgary has an enormous amount of green space compared to other cities its size. This includes Fish Creek Provincial Park in Calgary’s south, the largest urban park in Canada, with more than 10 kilometers (6 miles) of river valley providing habitat for animals and birds. In northwest Calgary, Nose Hill Park features natural prairie grassland and breathtaking views of Calgary and the mountains. In total, Calgary boasts of more than 8,000 hectares of parkland and natural areas and 475 km of pathways winding through parks and along the riverbanks of the Bow and Elbow rivers.

Watch for these articles in the next two issues of HAPS-ED about the HAPS 2004 Conference in Calgary:

- **HAPS-EDucator Fall 2003 Edition**—Attractions Outside Calgary Including the Rockies and Badlands;

Thanks to Tourism Calgary for information for this article. More information is available at the Tourism Calgary website (http://www.visitor.calgary.ab.ca), 1-800-661-1678.
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The concept of a national organization to serve teachers of human anatomy and physiology arose at an Anatomy and Physiology Workshop held June 1-5, 1987, at Triton College (located just west of Chicago, Illinois). The 1987 workshop was sponsored by the Illinois Association of Community College Biologists (IACCB), the National Association of Biology Teachers (NABT), and the Triton College Conference Center. Members of IACCB presented the workshop in response to a need for professional growth activities evidenced by a very successful one-day human anatomy and physiology conference conducted during the spring of 1985.

The agenda for the 1987 workshop included two days of update seminars followed by two days of hands-on workshops. A fifth day was used for field trips to area institutions involved with some aspect of medicine. During the workshop, participants expressed an interest in having further conferences and perhaps looking into the possibility of either forming a new organization for teachers of human anatomy and physiology or affiliating with an established teaching organization. In response to this interest, a second A & P Workshop was planned. One of the 1987 participants promoted this second Anatomy and Physiology Workshop in the newsletter The Anatomist/Physiologist.

It was during this second human anatomy and physiology conference, also held at Triton College, that a meeting of the participants was conducted to examine the various options. The consensus of the group was to form a new organization so an advisory committee was established. The first organizational meeting of the advisory committee was held in August of 1988. The name Human Anatomy and Physiology Society (HAPS) was proposed for the organization during this meeting and a rough draft of a constitution was developed.

The tenure of HAPS officially began during the third Anatomy and Physiology Workshop hosted by Truckee Meadows Community College. The proposed constitution was approved, the first officers were elected, and the initial committees were established during the business meeting at this 1989 Conference held in Reno, Nevada.

The original officer positions for the first Executive Committee were President, President-Elect, and Secretary-Treasurer. Two Representatives-at-Large were also elected at the 1989 Conference. A Membership Committee Chair, an Archivist, an Editor for the newsletter, and an Editorial Board were appointed by the President in 1989. During the 1990 Conference, the Past-President was added to the Executive Board, and three, rather than two, Members-at-Large were elected. A new appointed officer, Editorial Board Chair, was added in 1990. The three Members-at-Large positions were expanded to four in 1992. In 1996, the four Members-at-Large positions (termed Directors in 1997) were elected from specific regions throughout the United States and Canada. The term Executive Board was changed to Board of Directors in 1996 with the Publication Editor of the HAPS-EDucator included that year as a none voting Director. The Secretary/Treasurer position was divided into two separate positions in 1997. In September of 1997, the Organization Services Group (OSG) began to assume many of the administrative functions previously performed by members of the board. In 1999, the designation OSG was replaced with the term “HAPS headquarters.”

After the 1989 Reno Conference, Annual HAPS Conferences have been conducted in the following locations: 1990 Anatomy & Physiology Workshop in Madison, Wisconsin hosted by Madison Area Technical College; 1991 HAPS Conference in Greenville, South Carolina hosted by Greenville Technical College, Clemson University, and Furman University; 1992 HAPS Conference in San Diego, California hosted by San Diego Mesa College; 1993 HAPS Conference in Beaumont, Texas hosted by Lamar University; 1994 HAPS Conference in Portsmouth, New Hampshire hosted by the New Hampshire Technical Institute; HAPS 1995 Conference in St. Louis, Missouri sponsored by St. Charles County Community College and St. Louis University Medical School; HAPS 1996 Conference in Portland, Oregon and Vancouver, Washington hosted by Clark College; HAPS 1997 Conference in Toronto, Canada (this conference was incorporated with the Colleges Biosciences Association of Canada) hosted by Humber College; HAPS 1998 Conference in Fort Worth, Texas.
HAPS in Review - continued from page 6

hosted by Texas Woman’s University, Tarrant County Junior College, Grayson County College, and Navarro College; the 13th Annual HAPS Conference in 1999 was sponsored by Towson University and held near Baltimore, Maryland; HAPS 2000 in Charlotte, North Carolina hosted by UNC-Charlotte University; HAPS 2001 in Maui, Hawaii hosted by Maui Community College; and HAPS 2002 in Phoenix, Arizona hosted by Phoenix College. The seventeenth Annual HAPS Conference will be held in Philadelphia, Pennsylvania during the last day of May and the first week of June, 2003.

In addition to the annual conferences, regional conferences have also been held to provide additional professional growth opportunities for teachers of human anatomy and physiology. The first regional conference was held at the University of Southern Indiana, Evansville, Indiana, in October of 1991 followed by a second regional conference in Joliet, Illinois at Joliet Junior College in February of 1992. Since the first two conferences, other Regional HAPS Conferences have been held at Southeast Missouri State University (Cape Girardeau, Missouri) in February of 1993, at St. Louis Community College at Meramec (St. Louis, Missouri) in February of 1994, at Elon College (Elon, North Carolina) in March of 1994, at Frederick Community College (Frederick, Maryland) in February of 1995, at the University of North Carolina at Charlotte in March of 1995, at the University of Alabama Birmingham (Birmingham, Alabama) in April of 1995, at Kishwaukee College in Malta, Illinois in November of 1995, at Community College of Allegheny County—North Campus (Pittsburgh, Pennsylvania) in March of 1996, at Collin County Community College, Plano Texas in March of 1996, at Hawkeye Community College (Waterloo, Iowa) in April of 1996, at Stark Technical College (Canton, Ohio) in February of 1997, at New Orleans, Louisiana in April of 1997 in conjunction with the American Physiological Society Meeting, at Baker College of Flint (Flint, Michigan) in March of 1998, at Montgomery College (Takoma Park, Maryland) in October of 1998, at Clark College (Vancouver, Washington) and Triton College (River Grove, Illinois) in February of 2001, at Delaware Technical and Community College (Newark, Delaware) in March of 2001, at Collin County Community College (Plano, Texas) in March of 2001, at New York University (New York, New York) in May of 2001, at Northern Illinois University (DeKalb, Illinois) in April of 2002, at Anne Arundel Community College (Arnold, Maryland) in October of 2002, and at the University of Illinois at Chicago in March of 2003.

The first publication promoting the founding of a new organization for instructors of human anatomy and physiology, The Anatomist/Physiologist—A National Newsletter for Instructors of Human Anatomy and Physiology, was sent out in October of 1987. The initial mailing of the official newsletter of HAPS, the HAPS News, occurred in December of 1989. The title of this newsletter was changed to the HAPS-EDucator in August of 1996.

Other publications of HAPS have included the Course Guidelines of Introductory Level Anatomy & Physiology prepared by the Core Curriculum Committee in 1991/1992. A second edition of these guidelines was published in September of 1994. A position paper on the use of animals in anatomy and physiology education, HAPS Position Statement on Animal Use, was adopted in July of 1995. A Position Statement on Distance Education was published in the HAPS-EDucator in spring of 2002.

Other forms of communication used by the organization to share ideas and teaching approaches have included a HAPS Electronic Bulletin Board System in 1992 and the development of a HAPS Homepage in 1996. This webpage (currently at http:/www.hapsweb.org/) has been continually modified and updated since its implementation more than seven years ago.


Over the years, HAPS has developed associations with several other professional organizations to collaborate on the topics of anatomy, physiology, teaching, and learning. These organizations include the American Anatomical Association (AAA), the Associations of Biology Laboratory Educators (ABLE), the American Institute of Biological Sciences (AIBS), the American Physiological Society (APS), and the National Association of Biology Teachers (NABT).

The success of HAPS has been based on a commitment to provide opportunities for a dialogue on our mission statement, Promoting Excellence in the Teaching of Anatomy and Physiology. An atmosphere of mutual respect for one another as teaching colleagues has been a significant attribute of our many conferences and workshops.

In this “Brief History of HAPS”, we have chosen to leave out individual names involved in various phases of the organization. We will include names in a more extensive history of HAPS currently under development.

Please let us know if there are any inaccuracies in this article or if significant events have been omitted.
Teaching Anatomy and Physiology In the Pacific Northwest

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Introduction

We wrote an article for the Spring 2001 issue of the HAPS-EDucator titled, “A Case for Discipline Based Anatomy and Physiology Programs.” In that article, we argued that teaching anatomy separately, and as a prerequisite to physiology provides students with a better background in these subjects. We believe that students who take anatomy prior to physiology matriculate to a physiology course with a mental picture of the whole body as well as an overview of its basic functions. This background enables students to pursue a more in-depth course in physiology as well as to better develop a paradigm shift in their thinking from the anatomical domain of “what is it” to the physiological domain of “how does it work?”

We decided to follow up that article by determining the relative number of colleges that offered anatomy and physiology as a combined course versus those colleges that taught them as separate sequential courses. Our initial effort was focused on colleges in the Pacific Northwest, specifically Oregon, Washington, and Idaho.

Methods and Data

We hired several work-study students to search college and university websites in three states in the Pacific Northwest. We identified the number of schools in each state that offered anatomy and physiology and whether the courses were taught as a combined course or as separate sequential courses. Our initial effort was focused on colleges in the Pacific Northwest, specifically Oregon, Washington, and Idaho.

We found that 95% of the 42 community colleges in Oregon, Washington, and Idaho offer anatomy and physiology as separate sequential courses. Tables I and II show the data separated by states.

Table I
Schools offering Anatomy and Physiology as Combined Courses

<table>
<thead>
<tr>
<th>State</th>
<th>Two-Year Colleges (N = 42 total)</th>
<th>Four-Year Institutions (N = 43 total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oregon</td>
<td>13 (100%)</td>
<td>9 (53%)</td>
</tr>
<tr>
<td>Washington</td>
<td>25 (93%)</td>
<td>16 (84%)</td>
</tr>
<tr>
<td>Idaho</td>
<td>2 (100%)</td>
<td>6 (86%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>40 (95%)</td>
<td>31 (72%)</td>
</tr>
</tbody>
</table>

Table II
Schools offering Separate Anatomy and Physiology Courses

<table>
<thead>
<tr>
<th>State</th>
<th>Two-Year Colleges (N = 42 total)</th>
<th>Four-Year Institutions (N = 43 total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oregon</td>
<td>0</td>
<td>8 (47%)</td>
</tr>
<tr>
<td>Washington</td>
<td>2 (7%)</td>
<td>3 (16%)</td>
</tr>
<tr>
<td>Idaho</td>
<td>0</td>
<td>1 (14%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>2 (5%)</td>
<td>12 (28%)</td>
</tr>
</tbody>
</table>

Discussion

Out of the 85 schools examined 71 (84%) offer anatomy and physiology as combined courses. Community colleges were more likely than four-year institutions to offer combined anatomy and physiology courses, clearly the majority of all colleges use this method. Another interesting point in the data we collected is that 28% of four-year colleges offer separate
Educational Issues - continued from page 8

anatomy and physiology courses whereas only 5% of community colleges did so. We also noticed that four-year institutions that offer a lower division combined anatomy and physiology course (typically a two hundred number year long sequence) will frequently offer upper division separated courses (three or four hundred number), such as human or comparative anatomy and/or mammalian or comparative physiology.

As we stated in our previous article we think teaching anatomy separately and as a prerequisite to physiology prepares students with a better background in these subjects than teaching them as a combined course. Our question is why do so many colleges offer combined courses in anatomy and physiology? Possible answers to this question that we have thought of include:

1. Most students taking anatomy and physiology are in allied health, especially nursing. Traditionally nursing schools taught anatomy and physiology as combined courses.
2. The belief among faculty that teaching a combined course facilitates learning. Students are first exposed to the structure of a system and then immediately learn about how it works.
3. The belief that teaching the course as a combined sequence saves money for the institution.
4. No one has questioned the method, thus it is taught in a fashion similar to that of other institutions in the region.
5. When taught separately, students can focus on each course as a separate discipline.
6. Students can progress to greater depth and breadth in each course. After completing anatomy their vocabulary includes terminology for every system in the body. When students matriculate to a physiology course, they use this vocabulary as a tool to help learn physiology. The students then are more capable of thinking with the vocabulary they learned in anatomy and not just about the vocabulary.
7. After completing a course in anatomy, a separate course in physiology guides students through a study of the human body a second time from a different disciplinary approach, thereby reinforcing concepts.
8. Separating the courses serially permits students to complete a single course that covers the entire human body. If the student then decides to change majors or wait for a period before continuing, they will have at least finished a complete course on a subject.

With these ideas as a starting point, we hope to stimulate discussion of this issue among HAPS members.

We have not reviewed data from colleges outside of the Northwest, but we currently have two students collecting data from colleges and universities in California. We are interested in seeing if the majority of colleges in the United States teach anatomy and physiology as combined courses. We are also curious how these subjects are taught in other countries.

As an organization HAPS has done a wonderful job bringing human anatomy and physiology instructors together from across the country. While not every instructor can attend national meetings, our national publication, the HAPS-EDucator, allows members to learn and benefit from each other. We suggest that HAPS, either through discussion in the HAPS-EDucator, or more formally through the Core Curriculum and Assessment Committee, look into the advantages and disadvantages of both combined and sequentially taught anatomy and physiology courses. We have stated our viewpoint, and are interested in hearing views from others on this topic. We would like to know how the system of combining anatomy and physiology evolved. Are there other reasons for teaching combined courses? We invite comments and new ideas to the discussion so that we can engage in careful educational planning and development of our courses.

We appreciate the excellent help provided by our students, Erin Callahan, Summer Ives, Jessica Walker, and Scotty Walker in searching and reviewing college and university websites.
EDU-Snippets is a column designed to let you, the HAPSters, share your personal or institutional educational experiences. So, here are this edition’s contributions!

For the sake of column continuity, we have done a bit of editing. We have also avoided quotation marks (except in-text). However, we think everyone will be able to tell where our introductions and commentaries leave off and where our contributors’ words begin. (In this issue we have used a modified outline format to help with the organization.)

I. MANAGING THOSE MICRO-MONSTROUS MUSCLES AND NERVES
Augustine DiGiovanna (Salisbury University, agdigiovanna@salisbury.edu) sent us several terrific ideas for working with skeletal muscle concepts.

A. “All-or-None”—Are You Sure???
I define the All-or-None principle for my students for skeletal muscle cells as follows: “Either a muscle cell contracts with all the force it has under given conditions or there is no contraction.”
(And for action potentials as: “Either a neuron carries an action potential with all the force it has under given conditions or it does not carry any action potential at all.”)

To demonstrate all-or-none under given conditions, I use gravity. I stand on a short step stool and step off, falling a short distance and landing on my feet on the floor. I point out that either I step off and fall to the floor, or I do not step off therefore I do not fall to the floor. I cannot hover or slow my descent as cartoon characters can. Then I change the conditions—the height from the floor—and this is where I get student attention. I stand on a chair or stool and step off. Then I stand on the instructor’s desk or a table at the front of the room. Now they are REALLY watching, cheering, warning me, etc. And I step off. I am famous for this one, and years later students still say they remember me for it.

B. THOSE FLIPPING CROSS-BRIDGES!
After explaining the process of muscle cell contraction, particularly the part about the results of flipping cross-bridges, I extend a long rope (20 feet) on the floor across the front of the classroom. Then I select approximately eight students to be volunteers. I line them up in two rows of four. Each row stands beside the rope with the rows facing each other—as for a tug ‘o’ war. I explain that the rope on the floor is a thin myofilament (actin). Each student is a myosin molecule, and their arms and hands are myosin heads with binding regions (i.e., hands). I have them raise their myosin heads so all the class can see them. I play sarcoplasmic reticulum with a calcium-loaded hose. Then we proceed step-by-step in slow motion.
I act out spraying the students with calcium by motioning with my hands. Their myosin heads grasp the actin myofilament. Their myosin heads pull the actin as their feet allow them to move toward each other (N.B. They must be told clearly that they must let their feet move when they pull on the rope). Their myosin heads release, swing forward, bind to the actin again, pull again, and their feet move so each row moves toward the other. Voila—sliding filaments producing contraction. Then I vacuum up the calcium and they drop the actin rope. I pull the rows apart back to the ends of the actin rope, and we repeat the process. After two or three tries, the students can do the action smoothly without coaching. Both the awkward initial tries and the later smooth tries delight the volunteers and the class.
If time permits, I have another group of volunteers do the process with little coaching.

C. CHANGING PARAMETERS
After explaining the effect of various strengths, durations, and frequencies of stimuli on initiating an action potential and the interaction of neurons at synapses (e.g., subthreshold, threshold, convergence, facilitation, hyperpolarization, antagonistic transmitters, anesthetics), I use two candles in stands and positioned vertically, some wooden coffee stirrers, (if gas is available, a Bunsen burner; and, if there are no overhead sprinklers, a piece of newspaper and a bucket of water for extinguishing it), and a plastic spray bottle containing water (e.g., hair spray bottle, cleaning detergent bottle). I light one candle and set it aside as a source of ignition. The centrally located candle represents a neuron, and the wick represents the end of a sensory dendrite. Before a stirrer is used, it is first ignited in the flame. The burning stirrer serves as the stimulus. The following is the procedure I suggest following.

a. Stimulate the neuron once by briefly bringing the stirrer flame into contact with the wick. The wick does not ignite (no action potential). I ask the class what this represents (subthreshold stimulus).
b. Stimulate the neuron very slowly several times. No action potential (ignition of the wick) occurs. Ask the class what this represents. (Subthreshold stimuli with low frequency.)
The neuron repolarizes (wick cools) after each stimulus.
c. Stimulate the neuron quickly several times. An action potential (ignition of the wick) begins. Ask the class what this represents. (Summation of subthreshold stimuli with high amplitude.)

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frequency.) The neuron does not have enough time to repolarize after each stimulus, and the effects add up (heating of the wick until ignition).

d. Observe the candle burn (action potential of a certain height burning at a certain rate [self-propagating all-or-none law of action potential]).

e. Blow out the candle and quickly stimulate it again once. Ignition. Ask the class what this represents. (The warm candle is facilitated, so a previously subthreshold stimulus can initiate an action potential.)

f. Blow out the candle and let it cool. Feel the wick to be sure it is cool. Use several stirrers simultaneously (or a large Bunsen burner flame or a newspaper flame) to stimulate the neuron. Ignition occurs quickly. Ask the class what this represents. (One large quick stimulus can initiate an action potential.)

g. Observe the candle burn. The flame is the same as the previous flame (action potential of a certain height burning at a certain rate [self-propagating all-or-none law of action potential]). Strength of stimulus does not alter the action potential. (I have never added candles or other combustible materials to simulate neurons of different diameters, though this could be done here.)

h. Repeat part f using LARGE flame. Students REALLY pay attention here.

i. Spray water on the wick to extinguish it (provide non-homeostatic conditions for the neuron or anesthetize the neuron).

j. Stimulate the neuron as in part c above (i.e., summation of subthreshold stimuli). Ignition occurs with great difficulty. Ask the class. (Hyperpolarization of the neuron by antagonistic transmitters or non-homeostatic conditions for the neuron.) (N.B. Often the candle will burn erratically because of residual water remaining on the wick or in the upper pool of wax [altered action potential due to altered conditions].)

k. Spray water on the wick to extinguish it and to simulate non-homeostatic conditions for the neuron or an anesthetic on the neuron. Stimulate the neuron as in part f above (i.e., stimulus greater than threshold). Ignition occurs with great difficulty. Ask the class. (Inhibitory effect of hyperpolarization [cooling] of the neuron by antagonistic transmitters [water] or non-homeostatic conditions for the neuron.) If anyone expands on this demonstration or alters it to fit other changing parameters, Augustine would be very interested in hearing about it.

II. FROM THE GROCERY STORE

Augustine DiGiovanna (Salisbury University, agdigiovanna@salisbury.edu) also sent us on a trip to the grocery store for a few more practical educational experiences.

A. Bones and Joints

Since large beef bones are now nearly impossible to obtain from our local supermarkets, I obtain fresh pigs feet and have the meat cutter saw them longitudinally down one toe—a parasagittal section. This section makes a longitudinal section through a metatarsal and all the joints in the pig’s foot. The metatarsal is just like a beef long bone (or a human long bone), though smaller. By using pigs’ feet, I can get as many fresh specimens as I want for our many lab sections. The sectioned pig’s feet are also wonderful to show diarthrotic joint components and action including real synovial fluid. Pulling on the tendons shows how muscle contraction can cause the foot to flex or extend. To emphasize the bone structure, which may be partially obscured by meat saw remnants, I wash the foot under warm water. This brings out the bone features.

B. Spinal Cords and Vertebræ

I obtain fresh pork neck bones (any part of the pig vertebral column is called pork neck bones in the supermarket) and have the meat cutter saw them longitudinally slightly off the midline—a parasagittal section. This section makes a longitudinal section through the vertebra and leaves the spinal cord intact but accessible. A clean cross section of the cord shows the normal appearance and arrangement of white matter and gray matter and the natural colors, textures, and consistencies of the nerve tissue. This clarifies the need for the support and protection provided by the spinal column, fat, muscle, etc. around the spinal cord. By removing a length of the cord, trying to hold it upright, and then cutting it longitudinally (a messy job), one can demonstrate the actual weakness of the spinal cord and CNS tissue. The specimen can also reveal the dura mater, the pia mater, and the spinal nerves.

The specimen also shows the parts of the vertebra, trabecular bone and red marrow, the intervertebral discs, and the nucleus pulposus (which looks like a herniating disc when the specimen is manipulated). Of course, an unsectioned “pork neck bone” shows the fresh natural appearance and position of the cord completely surrounded by the meninges, vertebra, muscle, etc. (Note: I used to be able to get fresh pork brains or frozen pork brains from the supermarket for additional nervous system demonstrations, but they are no longer available in the markets here because of the fear of spreading disease [e.g., mad cow disease]).

C. Fresh from the Meat Case

The supermarket meat case can be a veritable gold mine for providing anatomists with other fresh human analogous treasures (e.g. liver, kidneys, pork or beef stomachs and intestines [i.e., tripe, chitterlings]). The seafood section can provide fresh eyes from large fish heads. I work up to using them! HAPS-EDucator - Summer 2003 - page 11

III. HANDS-ON IDEAS

We have a number of other simple and practical uses for every day materials. Pat Bowne (Alverno College, pat.bowne@alverno.edu) sent us two ideas.

A. Mapping those Retinal Cones

First, Pat sent us a plan for mapping the distribution of cones in the retina.

I give each group of students a sheet of newsprint and masking tape and I have them draw a set of crosshairs on the center of the newsprint with a dot at their intersection. They then tape the newsprint to the wall.

The subject covers one eye, stands close enough to the wall so that the newsprint fills the field of vision. The subject stares at the dot. The experimenters take pens of different colors—one at a time to fill in the retina. The subject counts the number of dots they can see in a specified time period.

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time—and begin moving them along the crosshairs from the edge of the paper toward the dot. When the subject can tell what color the pen is, the experimenters make a dot on the newsprint.

When the dots are connected, the result is a map of the patch of cones in the retina. By using red, blue, and green pens, each type of cone can be mapped. This experiment is modified from Reeves’ Disorders of the Nervous System.

B. Circling Willis

In addition, Pat finds balloons especially handy for brain work! To teach the cerebral arteries and circle of Willis, I give each group of students a white balloon with red cord attached, two narrow red Post-its, and a red Sharpie. The balloon is the brain and the red cord represents the basilar artery. Each group draws and labels the posterior cerebral arteries extending dorsally from the basilar artery.

We discuss the carotids, the carotid sinus, and the internal and external carotids. Using themselves for references for positioning, the students label the red Post-its “internal carotid” and affix them where the internal carotids would enter the brain. They then draw and label the anterior cerebral arteries proceeding anteriorly from the internal carotids, and the middle cerebral arteries proceeding dorsally from the internal carotids.

We then discuss what might happen if the internal carotid on one side were blocked. Each group draws the communicating branches of the Circle of Willis. They can look at their “brains from the ventral surface and see how blood could flow all the way around the loop.

This demonstration can be made more elaborate by creating a model of the meninges over the balloon brain. I use a plastic bag for the arachnoid and a double layer of paper sack for the dura. I push little pouches of the arachnoid out through holes punched in the dura to demonstrate the arachnoid granulations.

C. And Which Route Did That Blood Take????

Richard Connett (Monroe Community College, rconnett@monroecc.edu) sent us an idea to help students understand the routes involved in blood flow. This follows very nicely on Pat’s idea, we think!

I discovered something in my class that helped me and (I hope) helped my students deal with the issues of blood vessel location and flow routing. I had lab exercises without a lecture to deal with vessel anatomy. So, I set up a series of exercises that including putting colored yarn on the skeleton and labeling vessels in routes from the heart to the foot and back.

I asked the students to write out the routes a blood cell takes from the heart to the hand. They were then asked to use both a deep and a superficial route back to the heart. I had a similar requirement for a route from the heart to the foot, a route to right cheek and back, a route to the small intestine and back, and finally a route from the placenta and back in the fetus.

I did these exercises on Monday & Tuesday. I then collected the results and used the papers for a small grade. Most errors were the result of inattention to issues such as direction of flow at the branches and return flow problems of the “you cannot get there from here” variety. I also found some very real misunderstandings about fetal circulation and the hepatic portal connections. Many students missed the brachiocephalic veins.

After returning the papers, I then used these errors (or misunderstandings) as points to make in the lecture given on Thursday. The students were personally involved, and I caught the misunderstandings early on. I also avoided a boring an “A is connected to B” lecture!

D. Clones and Expansions

Nina Zanetti (Siena College, zanetti@sienna.edu) presented us with a very interesting clonal analogy. The students should really be able to relate to this!

When I am teaching about the immune system and the concept of clonal selection and expansion, I like to use the analogy of the handouts that I give to my students to go along with our lectures. At the start of the semester, I make or collect a set of master copies, one master copy for each different handout (master copy = naive lymphocytes, which are few in number, but have all necessary information for their function of fighting specific antigen). As the semester progresses, when the need arises (= when antigen is encountered), the appropriate master copy gets removed from the file cabinet (= selection) and photocopied to create a large set of copies of the same handout (= clonal expansion of lymphocyte with correct specificity for the task at hand).

IV. Mnemonic Acrostics

A. Anonymously Ours

A.H. (Anonymous HAPSter) sent us these mnemonics and told us we could use them provided we kept the inclusion anonymous. We thought these were too good to refuse such a request!

When it is hard to remember which valve names belong where, I tell the students to remember the Lamb. That is: LAMB = Left A-V valve, Mitral, Bicuspid

And when they are confused about the supination and pronation of the forearm they can think about how “You hold soup in your hand to supinate and you pour it out to pronate.”

In the beginning, when talking about the nervous system, the students often confuse afferent and efferent, so I tell them it is all the same. That is: SAME = sensory afferent motor efferent

B. Cryptically from a Student

Juville Dario-Becker (Central Virginia Community College, DARIO-BECKERJ@vcvc.vccs.edu) has a student, Patrice Owens, who seems to be on the ball with these teaching tips. Here is what Patrice says.

I was studying about the skin and was truly tired of studying but I needed to figure out a way to remember or describe the functions of the skin. This is what I came up with: Please Ask For Extra Sun Screen. It is an acrostic.

P-protection
A-absorption
F-filtration
E-excretion
S-secretion
S-sensory reception

V. Kitchen Table Anatomy

A. Fruits and Vegetables

Ken Saladin (Georgia College & State University, ksaladin@mc.edu) sent us an idea to help students understand the functions of the skin. This is what I came up with: Please Ask For Extra Sun Screen. It is an acrostic.
information about Gator Ade® can try http://www.gatorade.com/ to show some glucose differences. (Anyone interested in more Gator Ade®. (Different flavors work quite well.) drink 1 liter of bottled water and another group drink 1 liter of pre-test urine screening to obtain baseline values. I have one group the subject is OK), a chemist, and a recorder. The students do a test subject, a subject monitor (who keeps time and assures that a test subject, a subject monitor (who keeps time and assures that the Jello® cell. This demonstration works well for all levels; but, for those who may think it is a bit childish, I suggest introducing it as something for them to help their Junior High friends and relatives. Put a nice layer of lettuce on the bottom of a flat cake pan. This is the cell membrane. Pour in the Jello® (preferably yellow) for the cytoplasm. Add ingredients to represent cell parts. A nice plum with a section missing to reveal the pit makes a wonderful nucleus. The pit is, of course, the nucleolus. Lasagna is good for the endoplasmic reticulum and spaghetti resembles the microfilaments. Grapes are great lysosomes and raisins make delightful ribosomes. Use other fruits and vegetables for other cell parts.

B. The Gel-Cell

This made Roberta Meehan (Aims Community College, biology@ctos.com) hungry enough to remember the Jello® cell. This demonstration works well for all levels; but, for those who may think it is a bit childish, I suggest introducing it as something for them to help their Junior High friends and relatives.

Put a nice layer of lettuce on the bottom of a flat cake pan. This is the cell membrane. Pour in the Jello® (preferably yellow) for the cytoplasm. Add ingredients to represent cell parts. A nice plum with a section missing to reveal the pit makes a wonderful nucleus. The pit is, of course, the nucleolus. Lasagna is good for the endoplasmic reticulum and spaghetti resembles the microfilaments. Grapes are great lysosomes and raisins make delightful ribosomes. Use other fruits and vegetables for other cell parts.

VI. It’s All Urine.

Robert S. Rawding (Gannon University, rawding001@gannon.edu) has been involved in the urine discussions for some time now. Here is how he handles urine tests in his lab.

The students are divided into groups with each group having a test subject, a subject monitor (who keeps time and assures that the subject is OK), a chemist, and a recorder. The students do a pre-test urine screening to obtain baseline values. I have one group drink 1 liter of bottled water and another group drink 1 liter of Gator Ade®. (Different flavors work quite well.)

Each subject in each group must consume his or her respective fluid within 3 minutes. The chemist in each group also tests the Gator Ade® and distilled water for pH, specific gravity, glucose, protein, etc. We use Chem-Stix for the miscellaneous tests and pHydrion papers (narrow ranges) for pH and we do a titration for Na+. (An osmometer can also be used.) The Gator Ade® flavors show some glucose differences. (Anyone interested in more information about Gator Ade® can try http://www.gatorade.com/ footer/faq.html.)

The subjects urinate every 20 minutes for about 140 minutes. We then analyze urine volume, flow rate, clearance, pH, and whatever other factors we may be interested in.

One down side of this experiment is the inactive time from the other persons in the group. During this idle time the students are instructed to work with Benjamin Cummings’ PhysioEx kidney function simulation. (Of course, other activities could be substituted.)

We record all of the data in real time in an Excel spreadsheet that is being projected on the screen throughout the lab. The recorder enters the data into the spreadsheet and the calculations are made automatically. This part of the exercise can be adjusted according to how much math I want them doing. When we are finished, I save the Excel data as both a spreadsheet and as an HTML file. The files can be sent directly to Blackboard or WebCT, or to a disk, or to other “saving systems” as needs and equipment would dictate.

In analyzing the data, we have found that the urine volumes follow the path we would expect, as does the salt output / conservation, and specific gravity. There are just enough other goodies in Gator Ade® to inhibit the urine output to give us responses that parallel water conservation in a salt-loaded subject. The only complaint I get is that the Gator Ade® is too cold! I put all of the fluids on ice in the morning about 8:00 A.M., then they drink the fluids in the afternoon.

VII. Dissecting the Exam

HAPS-EDucator Editor, Susan Baxley (Troy State University Montgomery, sbaxley@tsum.edu) sent us a piece about lab practicals.

I did something different on a lab practical exam recently that I really liked. The students took the exam individually. When all had finished, I let them get into their dissection groups to take the exam again. I graded the individual exams and compared the average grade of the individuals to the group exam grades. (One group had an individual average of 37/45; their group exam was 42/45. Another group had an individual average of 38/45 while their group exam was 42/45; the third group had an individual average of 30/45 and their group exam was 36/45.) For each 2 points difference in group score and individual score, I gave one bonus point (up to 5 points; one group got 2 bonus points, one group got 2.5 bonus points, one group got 3 bonus points.) The groups did much better than the individuals, and I heard them discussing the answers. I think they really learned something from the group exam that they might not have learned from a simple test review.

We thank you all for your EDU-Snippet contributions. Keep those cards and letters coming! The next deadline is August 1, 2003. Plan ahead—in case you will be gone for the summer! Submit your ideas now and maybe you too will see your EDU-Snippet in print!
The Central Regional Human Anatomy and Physiology Society (HAPS) meeting was held at the University of Illinois at Chicago (UIC) on Saturday March 1, 2003. This year’s theme was “Improving and Assessing Teaching and Learning in Anatomy and Physiology”. The School of Kinesiology and two of its faculty members, Mary Lou Bareither and Jane Marone, hosted this meeting. The meeting was attended by members of HAPS, the National Association of Biology Teachers (NABT), and graduate students from UIC. The conference was partially funded by an AAA Outreach Grant.

This was the first year NABT members, many of whom are high school instructors, were invited. We hope that the information these high school instructors take back to their students will spark an interest in the study of structure and function, and will set up lines of communication between the high school and colleges. These lines of communication should also improve the what and how students should learn, and should sufficiently prepare them for entry into a college science curriculum.

One of our keynote speakers, HAPS Past-President Bill Perrotti from Mohawk Valley Community College, focused on the issue: “Anatomy: Dead or Alive.” Bill provided great insight into the active teaching and learning that can go on in the anatomy lab. His students investigate their way through structures in order to understand similarities, differences, and functions of these structures. Don Wink, chairman of the Department of Chemistry at UIC, addressed assessing the outcomes of our teaching endeavors through student portfolios. Having students provide examples to their instructors of how they work through problems will help instructors to understand where more focus is needed, how the students are learning, and how to reach the students intellectually.

Several workshops that focused on our theme creatively involved the participants and helped them integrate ideas of conceptual learning and assessing outcomes. The UIC graduate students presented a workshop on Systemic Anatomy that involved an approach to learning structures by understanding their interrelated functions. A workshop comparing everyday structures to otherwise complex structures and functions provided an opportunity to exchange ideas and experiences in teaching basic concepts of anatomy and physiology. Ideas on learning to develop course evaluations that addressed various methods of teaching, using web-based course management systems, and incorporating assessment into anatomy and physiology courses were also presented in the conference workshops.

In our quest to become better teachers, all who attended had great opportunities to learn and share ideas on providing to our students meaningful teaching and learning in anatomy and physiology.
$ HAPS Grants and Scholarships $  
The HAPS' Board of Directors has awarded the following grants and scholarships for 2003.

Faculty Grant Recipient 2003

**Dr. Amy Way** of Lock Haven University of Pennsylvania, Clearfield Campus for her proposal entitled “Adrenergic Stimulation of Oviduct Epithelial Cells in Culture: An Exercise in Cell Biology and Reproductive Function.”

Robert Anthony Scholarship Recipients for 2003

**Dr. Victor Alvarez** of Delaware Technical and Community College, Georgetown, Delaware

**Dr. Georgia Purdom** of Mount Vernon Nazarene College, Mount Vernon, Ohio

$ Call for Proposals 2004 $  
*Any questions regarding grants and scholarships contact the 2004 HAPS Grants and Scholarship Committee Chair:*

*Richard Faircloth at 410-777-2272*

*or*

*e-mail at Rfaircloth@aacc.edu*

The 2004 Call for Proposals and applications will be available on the web site [www.hapsweb.org](http://www.hapsweb.org) after July 1, 2003
HAPS COMMITTEES AND BOARDS

The following committee chairs invite input from HAPS members and willingly provide information on the activities of their committees.

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The primary responsibilities of this committee are development of a standardized fee structure for the annual conference, formulation of guidelines and assistance for the conference coordinator, and generation of a calendar of conference sites.

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This committee has developed a second, revised edition of the HAPS “Human Anatomy and Physiology Course Guidelines.” The second edition includes new guidelines relating specifically to the laboratory component of the course.

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The committee provides mentoring assistance to coordinators of regional conferences. Anyone interested in hosting a regional conference should contact the Chair.

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A three-year plan includes widely distributing the HAPS policy statement, developing animal use internet links on the HAPS Home Page, monitoring relevant legislation, and creating a resource packet for HAPS members. Suggestions and questions from members are welcome.

CADAVER USE COMMITTEE
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The goal of this committee is to develop guidelines for use of cadavers in anatomy and physiology instruction.

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The Safety Committee is developing standards for safety in the laboratory.

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This committee recently completed, tested, and approved the HAPS Standardized Test for Human Anatomy and Physiology. Any HAPS member may obtain a copy of the test by writing to the Chair.

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