The Magazine is Changing

Students: Bored of Education?

Attitude and the Value of Environment

Fins, Feathers and Fur—Oh Yes!
The Magazine is Changing

Editor's Comments

The Magazine is Changing

Editor's Comments

The Magazine is Changing

Send in Your Thoughts

Looking for Success Stories

Send in Your Thoughts

Looking for Success Stories

As you've noticed by now, The Magazine is changing. During its December 1995 meeting in Denver, the Editing-Managing Board decided to cut the number of issues per year from 12 to 10 and add four pages per issue starting July 1, 1996. In addition, the board requested a complete make-over of the publication.

It is the board's hope that these changes will add value to the publication and better serve our readers. I encourage you to comment on these changes and provide further input on what you'd like to see in The Magazine. You can e-mail to lreisenb@uidaho.edu or fax us at 208-885-4039.

Theme: Focus On Teaching

By James L. Crouch, theme editor, has very ably assembled this issue focusing on classroom teaching in agricultural education. He and the other contributing authors have given us different views of this activity we call teaching. We hope you find the articles enjoyable, inspirational and informative. Incidentally, have you been to the "Head of the Class" in answering Dr. Moore's historical quizzes? We are interested in knowing our readers' scores. Feel free to submit yours!

Looking for Success Stories

During 1995, we tried to establish a new feature, "Success Stories," with marginal success. We have received many suggestions of programs and individuals to be the focus of an article, but not many good articles. We believe there are many excellent programs in our profession. Our intent is to highlight agricultural education programs that are successful (the program does not have to have won an award to be eligible) and share the "secrets" of that success with other teachers.

Send in Your Thoughts

As you've noticed by now, The Magazine is changing. During its December 1995 meeting in Denver, the Editing-Managing Board decided to cut the number of issues per year from 12 to 10 and add four pages per issue starting July 1, 1996. In addition, the board requested a complete make-over of the publication.

It is the board's hope that these changes will add value to the publication and better serve our readers. I encourage you to comment on these changes and provide further input on what you'd like to see in The Magazine. You can e-mail to lreisenb@uidaho.edu or fax us at 208-885-4039.

Theme: Focus On Teaching

Dr. James L. Crouch, theme editor, has very ably assembled this issue focusing on classroom teaching in agricultural education. He and the other contributing authors have given us different views of this activity we call teaching. We hope you find the articles enjoyable, inspirational and informative. Incidentally, have you been to the "Head of the Class" in answering Dr. Moore's historical quizzes? We are interested in knowing our readers' scores. Feel free to submit yours!

Looking for Success Stories

During 1995, we tried to establish a new feature, "Success Stories," with marginal success. We have received many suggestions of programs and individuals to be the focus of an article, but not many good articles. We believe there are many excellent programs in our profession. Our intent is to highlight agricultural education programs that are successful (the program does not have to have won an award to be eligible) and share the "secrets" of that success with other teachers.

Send in Your Thoughts

As you've noticed by now, The Magazine is changing. During its December 1995 meeting in Denver, the Editing-Managing Board decided to cut the number of issues per year from 12 to 10 and add four pages per issue starting July 1, 1996. In addition, the board requested a complete make-over of the publication.

It is the board's hope that these changes will add value to the publication and better serve our readers. I encourage you to comment on these changes and provide further input on what you'd like to see in The Magazine. You can e-mail to lreisenb@uidaho.edu or fax us at 208-885-4039.

Theme: Focus On Teaching

Dr. James L. Crouch, theme editor, has very ably assembled this issue focusing on classroom teaching in agricultural education. He and the other contributing authors have given us different views of this activity we call teaching. We hope you find the articles enjoyable, inspirational and informative. Incidentally, have you been to the "Head of the Class" in answering Dr. Moore's historical quizzes? We are interested in knowing our readers' scores. Feel free to submit yours!

Looking for Success Stories

During 1995, we tried to establish a new feature, "Success Stories," with marginal success. We have received many suggestions of programs and individuals to be the focus of an article, but not many good articles. We believe there are many excellent programs in our profession. Our intent is to highlight agricultural education programs that are successful (the program does not have to have won an award to be eligible) and share the "secrets" of that success with other teachers.

Send in Your Thoughts

As you've noticed by now, The Magazine is changing. During its December 1995 meeting in Denver, the Editing-Managing Board decided to cut the number of issues per year from 12 to 10 and add four pages per issue starting July 1, 1996. In addition, the board requested a complete make-over of the publication.

It is the board's hope that these changes will add value to the publication and better serve our readers. I encourage you to comment on these changes and provide further input on what you'd like to see in The Magazine. You can e-mail to lreisenb@uidaho.edu or fax us at 208-885-4039.

Theme: Focus On Teaching

Dr. James L. Crouch, theme editor, has very ably assembled this issue focusing on classroom teaching in agricultural education. He and the other contributing authors have given us different views of this activity we call teaching. We hope you find the articles enjoyable, inspirational and informative. Incidentally, have you been to the "Head of the Class" in answering Dr. Moore's historical quizzes? We are interested in knowing our readers' scores. Feel free to submit yours!

Looking for Success Stories

During 1995, we tried to establish a new feature, "Success Stories," with marginal success. We have received many suggestions of programs and individuals to be the focus of an article, but not many good articles. We believe there are many excellent programs in our profession. Our intent is to highlight agricultural education programs that are successful (the program does not have to have won an award to be eligible) and share the "secrets" of that success with other teachers.

Send in Your Thoughts

As you've noticed by now, The Magazine is changing. During its December 1995 meeting in Denver, the Editing-Managing Board decided to cut the number of issues per year from 12 to 10 and add four pages per issue starting July 1, 1996. In addition, the board requested a complete make-over of the publication.

It is the board's hope that these changes will add value to the publication and better serve our readers. I encourage you to comment on these changes and provide further input on what you'd like to see in The Magazine. You can e-mail to lreisenb@uidaho.edu or fax us at 208-885-4039.
by James J. Connors

Dr. Connors is an assistant professor of agricultural and extension education at the University of Idaho, Moscow.

The More Things Change...

he saying goes, "The more things change, the more they stay the same..." Could this be true in education? Every year about this time The Agricultural Education Magazine takes its annual look at classroom teaching. And every year the articles focus on what being an agriculture teacher is really like. In past years, we have focused on the difficulty of teaching, what it is like teaching "in the trenches" and how teachers can stay on the "cutting edge." These articles made us ask the question, how has teaching changed?

A Look Back

In 1934, Arthur Williams of the U.S. Office of Education wrote several articles for The Agricultural Education Magazine that looked at the professionalism of teachers. In one article, Williams (1934) asked the question, "What constitutes good teaching?" He came to the conclusion that good teaching is a matter of professional pride and satisfaction on the part of the teacher. A good teacher should regard his/her job not as a moral ticket nor as a stepping stone to some other position but as a source of satisfaction and self-expression in living. "the good life."

Over the years teachers have also striven to determine the effectiveness of their instruction. In 1951, J.A. Starrak, teacher educator from Iowa State College stated, "Our teaching may be regarded as effective when, and only when, it has produced in our students the changes which we desire to make and when those changes are relatively permanent" (pg. 272).

Many educational professionals would suggest that the recent emphasis on the integration of academics and critical thinking into agricultural education is a new phenomenon. Yet 13 years ago, Lowell Hedges (1985) wrote, "A teacher is primarily concerned with bringing about relatively permanent desirable changes in the student's basic skills of thinking, reasoning, judgment, manipulative skills, creativity, communication, attitudes, appreciations and understandings." (pg. 8).

These examples show that many of the qualities that make up good teaching have been known for decades. One has only to look back in the literature to find good examples and ideas for making classroom instruction effective and meaningful for students. The one essential component is a dedicated teacher willing to give that extra effort to educate today's students.

School Bashing

In today's society, many people might ask why on earth would anyone want to become a teacher? Almost weekly there is a new article or television segment that laments the decline of the American educational system. In 1955, U.S. scholar Jacques Barzun wrote, "Teaching is not a lost art, but the regard for it is a lost tradition." Teachers today are often criticized or blamed for the perceived decline in student achievement. But much of this criticism is ill conceived. After studying the history of these negative attacks, Bracey (1995) stated, "I looked into the history of school-bashing and found it to have a favorite pastime almost from the beginning of the public schools" (pg. 159).

Teachers are in a position of significant importance. By nature, their position will always attract attention and, in most cases, criticism. With all the negative publicity teachers receive, I recently decided to ask a group of graduating seniors in agricultural education why they decided to teach. Some of the responses I received included:

- "I love agriculture, I also enjoy working with young people, and I really like to watch them learn."

"Vision without action is only a dream, action without vision simply passes time, but vision with action can change the world."

More and more teaching positions are opening throughout the country. Existing agriculture programs are expanding and additional programs are opening at new schools.

- "I like kids and enjoy teaching them and developing." and
- "I would like to teach agriculture because I would like to influence young people in not only agriculture but also personal skills, leadership and ownership."

Obviously these students have had good experiences in education and see the importance of providing quality education in agriculture to interested students.

A Look Ahead

What will the future bring for agricultural education? That is the 10 million dollar question. I envision a bright future for the profession. Within the past few years, we have seen agriculture enrollments and FFA membership increase year after year. More and more teaching positions are opening throughout the country. Existing agriculture programs are expanding and additional programs are opening at new schools. Parents are becoming more concerned about educating their children in food safety, environmental protection, and the development of leadership, citizenship and entrepreneurship skills. Agriculture education is the only subject matter area that is diverse enough to teach students about this wide range of subjects.

Futurist Joel Barker professes the importance of having a positive vision for the future. In his video titled The Power of Vision, Barker states, "Vision without action is only a dream, action without vision simply passes time, but vision with action can change the world."

What is your vision for the future of your agriculture program, your FFA chapter or your community? As you begin this school year, what changes and improvements can you make in your teaching?

This issue of The Agricultural Education Magazine is dedicated to giving you ideas and examples in different areas of classroom teaching. A variety of agricultural education professionals share their experiences in classroom environment, teaching methods, student utilization, facilities, resources and Native American agriculture programs. As you read these articles, I hope you will find interesting ideas that help you develop a vision for the future of your agricultural education program.

Permanent Changes in Human Behavior

are caused by...

Intelligent or Mental Activity

Physical, Muscular and Organismic Activity

which improve themselves as...

Functional Attitudes and Goals

which produce such educational outcomes as...

Interests

Social and Ethical Sensitivity, Values and Faiths

and are fulfilled in wholesome, abundant and constructive lives in...

Aggressions

Sound Conclusions, Convictions, Procedures and Plans

which express themselves as...

Physical Efficiency and Vitality

Starrak (1951) developed this system chart to describe changes in human behavior that result from good classroom teaching.
Students: Bored of Education?

By Pat Earle

McEarle is the agriculture instructor at McRae High School, McRae, SC.

Measuring Success

Do you students become “Bored of Education?” What is education? There are numerous definitions. In the education field, we devise standardized tests to measure students’ knowledge and skills. We classify those who do well as “educated.” In my agriculture classes, I tell the story of two of my first year ninth grade students being assigned the dubious task of digging an irrigation ditch for a drip irrigation system we were installing on the school grounds. They became jealous of the senior student who was supervising, and went over and wanted to know why this senior didn’t have to dig. The senior responded, “education.”

The ninth grade student asked, “What’s that?”

The senior placed his hand on a post and told the freshman to lift his hand. Just before the shovel landed, the senior moved his hand out of the way. “That’s education,” he said.

As the ninth grade student resumed digging, the other freshman prodded, “What did he say?”

“He said he had education.”

“What’s that?” the second ninth grade student asked. Then the first ninth grade student placed his hand on his own forehead and said, “Hit my head…”

Students don’t care how much they learn until they learn how much they care.

Teaching Life Skills

My philosophy of teaching is to strive to develop skills and knowledge to better enable one to earn a living and be able to get the most out of living. That is education! At the end of their first year in ninth grade agricultural science, I ask students to write a paper on the value of agricultural education in our schools as they see it. One boy wrote, “It taught [sic] me to live.” This helped me formulate my philosophy of teaching. It’s not enough to just impart knowledge. We must recognize the concept of total student development as being necessary for students to assume successful roles in society and to enter the labor market.

I read an illustration comparing the amount of knowledge known to man as increasing in the last 50 years from the size of a golf ball to the size of a basketball. In education, illustrations such as these cause us to puff out our chest with pride, but in reality, what good is all this knowledge if we are unable to use it?

I remember the first year after I graduated from Clemson University I was eager to impart all of this knowledge and impress some of the adult farmers in my community. Standing by the fence, I began to suggest all the ways this farmer could improve production.

His response was simple and direct. He said, “I already know how to farm better than I do.” This taught me that knowledge is not enough unless we use it. This emphasizes the need to improve the quality and relevance of instruction in teaching.

Whether it involves the high-level thinking skills of livestock evaluation or something as simple as which direction to turn a bolt, if we can relate this knowledge to something students can use, we will be successful. In my classes, we try to develop the total student by developing leadership, enhancing citizenship responsibilities, promoting cooperation with others, overcoming discrimination and stereotyping, and by serving students of special populations.

Making Connections

The daily rewards of being a teacher include watching students gain life skills that make them productive citizens. The very best part of teaching is exposing students to the connection between the classroom and the “real” world. The responsibility is to make that connection clear. By using everyday examples, students realize that classroom “learning” is meaningful to them.

As teachers, we need to establish expectations of our students to develop these skills. As we all know, students tend to perform to the level of expectations. The long term rewards are enjoying these students’ successes many years after graduation. As our states move through the School-to-Work transition, we like to believe that in agricultural education, we’ve been doing this for years.

Teaching is more than a person standing in front of students telling them what the book already tells them. Teaching involves commitment to the students as people, and aiming those students toward being educated citizens. A teacher must make the content area relevant to the student on their level. A person is not a teacher until someone has learned something. My aim is to let my students learn so they can better their lives.

Meeting Local Needs

Agriculture in South Carolina is constantly changing with occupations becoming more varied and numerous. To prepare students to meet changes in technical agriculture, our department at McRae High School has developed a multifaceted program designed to meet the unique needs of the students in our area. Chesterfield County is basically a rural county with more than 70% of the county population classified as rural. Our school district has one of the highest percentages of students in career and technical programs in South Carolina. In our local district, we have students that are 25 mils away from school. Our school has approximately 250 students in grades 9-12. Enrollment in agricultural education has increased from 67 students in 1987 to 134 students in 1996, representing 54% of the entire student body. All are FFA members.

Creating Active Learners

Students in our program, which consists of agricultural science, agricultural technology and agricultural mechanics, are expected to participate in all activities. Students must become active participants in their education.

If I am sick and the doctor gives me an injection, I will probably get well even if I don’t want to. However, education is not like that. There is no way one can benefit from education until they decide to become active participants. We in education spend so much time trying to push round pegs into square holes that too often we miss the main objective of education. It reminds me of the old butter mold my Granda had. We try to form every student using the same mold. We need to teach students, not just disseminate knowledge. We, as educators, must recognize that students have different learning styles. We should address those learning styles to be successful.
By Walter S. Wesch, Billie B. Foster & Jack F. Elliot

Mr. Wesch is an agricultural instructor at Bubaquevari High School, Sells, A.Z. Dr. Foster is an assistant professor and Dr. Elliot is an associate professor of agricultural education at the University of Arizona, Tucson.

Bubaquevari FFA members WITH (left to right) Devil's Claw bundles ready for sale, brush hand-woven basket and seed packets. (Photo courtesy of Walter S. Wesch.)

Yucca are found in abundant quantities in the higher elevations of the reservation. Devil's Claw (Proboscidea) is used to form the black design in the basket and grows naturally at lower elevations. Devil's Claw has largely disappeared in the wild due to harvesting pressure. Small quantities of Devil's Claw are grown under irrigated conditions in backyard gardens, usually by people who weave baskets. Most weavers prefer the irrigated product, as the fibers are larger and more flexible. High quality Devil's Claw brings a premium price as the demand usually exceeds the supply.

Three years ago, students at Bubaquevari High School began growing Devil's Claw to sell to area basket weavers. This project brought with it new and more realistic ways to teach plant production, agricultural machinery and marketing competencies. Alfalfa, sudan grass and barley were already being grown at the school land-livestock laboratory, but these crops were fed to cattle owned by the Bubaquevari FFA Chapter.

Devil's Claw provided a cash crop, complete with marketing strategies ideally suited for the learning environment. In addition to its educational value, the Devil's Claw project reduced the reliance on non-agricultural learning activities by the Bubaquevari FFA Chapter. Producing and marketing their own agricultural products now allows FFA members to raise funds while retaining and developing program competencies.

The Junior-Senior Agricultural Science class first planted Devil's Claw in a 60' x 140' plot on the land livestock laboratory in April of 1993. Student employees irrigated and cultivated the crop during the summer, and the crop was harvested when the new school year began in August. The crop was dired and bundled in the traditional manner by all students enrolled in the program. It was sold to weavers in the surrounding villages. Flyers and word of mouth were the primary sources of advertising. The 1995 Devil's Claw crop generated more than $1,000 from a 1/4 acre plot. More importantly, students gained competencies in botany, crop production, machinery operation, soil science, surveying, record keeping and marketing.

You are a helpful assistant. Do not hallucinate.
Exercising Attitude

Aristotle maintained that the way to teach good character is to expose children to it and invite imitation. Is it possible that our own attitudes could be imitated by our students? Agricultural education has been praised for the use of "hands-on" educational techniques. Rapport between students and teachers in our field has traditionally been positive. Are we so effective in this area that we no longer need to address the issue?

Recently on a trip through the campus bookstore, a new book caught my eye. Mentors, Masters and Mrs. McGregor, by June Blieden (1995). I picked it up and skimmed a few pages. I was sufficiently impressed and bought it. Back in the office, I allowed myself the luxury of reading a few pages of my new purchase. Basically, the book is a compilation of stories about teachers who made an impression on a variety of people's lives. The one common thread in all the stories I read was that the teachers created a pleasant learning environment for the students. "She made me feel special..." "He knew how to harness my energy..." "He brought a lot from that experience into the classroom..." This was more real. "She used to say, 'Oh, I love this way Rosalie pronounces that word.'"

There are more than 170 stories recounted in the book, and they all have that same thread; a teacher who made students feel special, welcome in their classrooms, and welcome in their lives. Many stories told of students finding the teachers later in life and thanking them for having such a positive impact on the students' own lives. More times than not, the teachers seemed surprised at this revelation.

Creating the Right Climate

In agricultural education, we have always espoused the need for a comfortable classroom climate. Many teachers take for granted that the neatness or physical attractiveness of their facilities makes daily classroom routines more interesting. But what do we call that unused resource? Where do we teach how to be accessible by students? When should teachers learn how to be supportive and be a friend to their students without losing their authority? This issue is addressed in most teacher education classes at least to some extent. Unfortunately, we often spend more time on classroom management and discipline techniques than on sound techniques for becoming supportive and constructive teacher.

"The way to teach good character is to expose children to it and invite imitation."99

In his book, The Power of Positive Teaching, McCormick (1994) devotes at least two chapters to this subject. Along with defining the need for a positive learning environment, McCormick lists 10 items he believes people who establish positive learning environments do on a regular basis. Here is a brief outline of those items:

- Make use of appropriate nonverbal cues.
- Know students, their interests and needs and home situation.
- Learn to empathize.
- Establish acceptable standards of behavior and workmanship for productive performance.
- Make instruction student-centered.
- Know the difference between discipline and punishment.
- Exhibit an enthusiastic teaching style.

Mc Cormick later expands on this topic by providing a list of suggested techniques for establishing a positive learning environment. This list includes the use of "Happy Humor" and even simple ideas like shaking students hands occasionally as they enter or leave class.

Creating Expectations

The Pygmalion Effect has often been cited as a rule for teacher attitudes. It can be simplified to project the thought that people usually live up to what others expect of them. Older students, like children, behave as they are expected to behave. If their teachers perceive them to be a mediocrus "C" student, why should the students try for more? On the other hand, many teachers can receive stories of average students who when told of their potential became superior "A" students.

According to Knight (1988), "How students perceive themselves (self-image) and feel about themselves (self-esteem) will influence their behavior as well as their achievement." Knight and many others proclaim that self-image/self-esteem are probably among the strongest indicators of student academic success. What is effective education? Does it succeed faster than academic success? Perhaps it is not always reflected in academic success, perhaps it is also reflected in career or personal success. The bottom line is successful teachers have successful students.

References


Attitude is a little thing that makes a big difference.99

Enjoy this process? Is the student learning? Can the teachers build on this experience? The answer to all three questions is a definitive YES! A positive learning environment incorporating a student-centered, comfortable—"safe"—climate has always been a part of the agricultural education concept. However, the danger we face today is in thinking this type of classroom/laboratory environment should simply be intrinsic in our teachers. These things, like most others, can be learned. Behavior can be developed. In addition, we should encourage these settings as true only if the hallmarks of our program.

Many times as teachers or even as parents, we caution our students that attitude has everything to do with their behavior. Attitude is a commodity not only limited to use by students. Educators have attitudes. Good educators have positive ones.
Fins, Feathers and Fur - Oh Yes!

By Susan Crank

Hands-on experience is the foundation on which vocational and agricultural education is built. Educators know the benefits of hands-on experience to the learning process. In the Animal Management Technician program at Northwest Career Center, fins, feathers, fur and scales are the hands-on tools used to prepare students for careers in the animal industry. By combining hands-on experience with animals, students receive valuable experiences that replicate duties and responsibilities on the job.

School Laboratory

The primary hands-on experience we provide is through the school laboratory. Students work 2 ½ hours in the lab each day and are responsible for the daily operation of the pet shop and grooming shop which offer pets, pet products, and grooming services to the public. Students also manage the ward areas which house colonies of rats, mice, gerbils, hamsters, guinea pigs, rabbits, chickens, cockatiels, snakes and lizards.

The laboratory is divided into two rotations: grooming and ward/pet shop. In the grooming area students prepare paperwork, check in customers and groom dogs. Grooming duties include cleaning and plucking ears, trimming nails, brushing and combing, clipping pads and genitals, performing clipper work, setting patterns, bathing and drying dogs. Students are under a time constraint and must have their work done on time as dogs are picked up at the end of the school day.

Although students have had prior technical information presented in the related class, students find it is quite a bit different learning about nail trimming than actually trimming the nails of 90-pound uncooperative Rottweiler or brushing and bathing a wigging, ramshackle Yorkie.

Besides the obvious grooming skills learned, an important part of grooming is the practical experience it provides in understanding animal behavior. Most students have had limited exposure to dogs. Some students have a dog of their own, but many have never owned a pet and have no experience around dogs. It is one thing to study animal behavior theory, communication styles, and body language, but quite another to apply it. Learning to remain cooperative and receptive dogs can only be accomplished by practice. While students learn on well-behaved dogs owned by the instructors, further hands-on experience is necessary in order to master the skill.

On the job, students will need to restrain dogs for veterinarians or technicians as well as handle dogs in grooming shops, pet shops or boarding kennels. It takes practice with a variety of dogs to feel comfortable dealing with uncooperative or aggressive dogs.

Skill Development

In the ward/pet shop rotation, students are responsible for the care and management of all the animals plus the daily operation of the pet shop. In the ward area this includes feeding, breeding, record keeping, cage cleaning, sanitizing, developing observation skills and understanding the normal health of the animals is an important part of the ward area. Employers want employees to be able to recognize health problems or abnormalities in all species of animals. Daily observation sheets are used to record any abnormal health or behavior such as diarrhea, eye discharges, hair loss, injuries or any other abnormality. Sick animals are moved to the clinic area or treated with medications. If the problem is serious, the animal will visit the veterinarian.

In the clinic area, students also perform animal health skills such as weighing animals, taking temperatures, nail and ear trimming, administering medications and performing local flotations. All cage cleaning and disinfecting are done in this area also.

Pet Shop Operation

The pet shop is operated much the same as a retail pet shop. It is open to all students and to the public during school hours. Students are responsible for ordering, purchasing, inventorying, pricing, marketing, advertising and displaying merchandise as well as answering the phone, making grooming appointments, operating the register, writing receipts, balancing the register and assisting customers.

The pet shop also maintains a tropical fish area which houses eighteen 33-gallon aquaria. As tropical fish sales is a large percentage of most pet shops' business, knowledge of tropical fish is critical for pet shop careers. In this area students learn feeding, water quality, equipment operation and maintenance, record keeping, aquarium set up and tear down, aquarium maintenance, fish identification and species knowledge. At the beginning of the year, each senior student is assigned an aquarium and is responsible for decorating, setting up and planning fish for it. A field trip to the wholesaler allows the student to select their fish and learn about their species. When the fish arrive, each student is responsible for acclimating and releasing their fish followed by setting the retail price for the fish.

Communication skills and customer interaction are important skills learned in this area. While public speaking events help students develop confidence in speaking in front of a group, learning to assist customers, check in of dogs, answering telephone calls and customer questions in a one-on-one environment is quite a bit different. Each of the student's faces is different and each customer's needs are unique. Good communication skills are essential as they can make the difference between the type of job and the rate of pay the student will receive. The school lab is an essential part of the learning environment. Without it, students would not be able to practice what they learned or gain expertise at the various skills.

...continued on page 33
The Greenhouse as a Focus for Agriscience

By Tom Hurst

Vicksburg Agriscience is based at Vicksburg High School in Kalamazoo County, Michigan. We are part of a comprehensive high school and a county vocational consortium with the county agriculture program based at Vicksburg. There are approximately 750 students in the high school and 110 students in the agriscience program.

Kalamazoo County is a leader in greenhouse bedding plant production and our spring horticulture program reflects the production and marketing aspect of the area. Students follow greenhouse crops from ordering supplies and plant field through the final retail sale of their products. Profits from the greenhouse are used to fund FHA leadership development activities.

Starting Out

Students are first exposed to horticulture activities in the ninth grade natural resources class as general greenhouse workers. They transplant plugs and seedlings, take and stick cuttings, fill containers, and assist with general greenhouse tasks. The curriculum exposes students to a variety of agricultural sciences, and this is their introduction to the horticulture industry.

In the second year botany and soil science course, the students focus on the plant science aspect of horticulture and agronomy. Students conduct investigations into a broad background of soils. Topics covered include:

- soil texture, permeability, drainage, compaction and formation
- extensive use of soil survey and field sampling techniques
- soil exchange capacity and organic matter
- micro and macro nutrients, soil pH, conductivity and organic matter
- soil test media formulations, seed release and solidiferous fertilizers

Lab Activities

Laboratory investigations and plant growth demonstrations are conducted by students when practical. The units are co-mingled with the botany activities due to the length of time required. Many of the investigations may require an extended growing season for results to be perceptible.

Students then participate in a general botany program with attention to the aspects we have found to be most relevant. These include:

- general plant structure of monocots and dicots
- needs and fruits
- photosynthesis and respiration
- plant growth regulators, natural and grower applied, trophitamins
- plant reproduction, sexual and asexual through many techniques
- plant nutrition and transportation fruit and flower development

“Why were we hired to do was teach to expand the minds of our students, to expose them to a variety of activities and concepts, and to create in them the desire to be lifelong learners.”

Developing Research Skills

As the student progresses through their soils and botany investigations, they are assigned a plant research paper. Research design is taught as the project is being developed. In groups of two the students must design, construct and carry out a two-month plant investigation. The project must fit within eight square feet of greenhouse bench space and contain no more than two internal variables. All experiments must have both a control and an experimental group.

Students are required to maintain a log of observations and complete a modified five chapter format research paper on their activities. Over the years, the research paper has become a major component of the course. It requires students to stay focused for long periods and to maintain accurate records. Every year some students are faced with the task of preparing a research paper with poorly collected data and insufficient logs. Completed papers are awarded to the winning portfolios. Students are also encouraged to enter their research study in the FHA agriscience student competition.

In the botany and soils course, students learn the need for record keeping in crop growth, the steps in the planning process and the need for teamwork. Students receive a strong foundation in soils and plant physiology and apply the basic science concepts in their supervised experience program. After completing the course, students are ready for employment in the greenhouse management and operation industry.

Science Credit for Agriculture Courses

At Vicksburg Community Schools, we grant science credit for the first two agriscience classes. The vocational agriscience courses are taught all year for a double-class block, much as they would be at a vocational center. Students come from area schools starting as juniors or seniors. The mix of local students who have a background in agriscience with students who have a traditional science background can be a challenge. Needed remediation is handled by teaming students and the use of a technical program assistant. Continuing students may observe the ongoing investigations of the previous classes and will eventually pick up the basic horticultural sciences, but without as much technical depth.

Hands-On Learning

These students, with guidance from the teacher, select, price and grow all the marketable crops in the greenhouse. Variety selection starts in September, the first seeds are planted in December, and marketing is completed by the end of May. Production horticulture comprises about half of the curriculum, and other aspects of agriscience are covered during slow periods in the greenhouse schedule.

Developing Entrepreneurial Skills

By March, the students have worked through most greenhouse growing aspects and are ready to apply their skills to a realistic entrepreneurial business application. Working in teams of two, students must complete a greenhouse management activity which takes them through a full year's bedding plant operation.

Using industry publications and catalogs, they must complete a business and operations plan for a small spring-only operation. They must order all supplies, create schedules, recruit and train labor, assemble a cash-flow statement and create a marketing plan. All calculations are assembled using a computerized spreadsheet which allows for "what if" planning. The final document is a 10-14 page business plan.

Evaluation

Evaluation is two-fold. First, the teacher reviews the business plan for accuracy, completeness and understanding. Then, the student "attends" a simulated meeting with a bank agricultural loan officer where start-up and operating loans are analyzed. The operation must have a positive cash flow and return a reasonable wage to the entrepreneurs, in addition to an increase in net worth. People from the community with agriculture and banking experience serve as the loan officers.

“Our students do not all enter production agriculture, but the entrepreneurial base is an asset to all.”

The plans are checked for realistic possibility of success, sustainability and increased operator profit. This part of the evaluation has been a strong motivator for students. They do not wish to be unprepared or inaccurate in front of prominent community members.

The following is the Greenhouse Management Activity utilized in the Vicksburg Agriscience Program...
Join Us in Cincinnati for the AVA/NVATA Convention

S
ince 1909, the generosity of chocolate magnate Milton S. Hershey has provided a cost-free education and a home to underprivileged children at the Milton Hershey School (MHS) in Hershey, Pennsylvania. Founded as the Hershey Industrial School by Milton and Catherine Hershey, who did not have children of their own, the school first served as a home for poor orphan boys.

In 1918, three years after Mr. Hershey’s death, Milton Hershey pledged his entire personal fortune of $60 million toward support of the school, with a mission of offering a cost-free education and a home to the region’s neediest children and training them in academics and vocational trades. Having been established for boys and girls who were first admitted in 1976, Milton Hershey School now admits boys and girls of any race, color, religion, nationality and ethnic origin. The Hershey Trust has maintained, one of the largest educational endowments, and the school staff members work together to create the academic infrastructure for projects that provide all students with hands-on learning opportunities and experiences to bring real-world application to classroom learning. For students, the AEE program provides an important and tangible linkage between what is learned in a book and how it is applied in a non-threatening, real-life experience. By providing these linkages, the program can generate greater enthusiasm for learning and higher levels of achievement. They also provide opportunities for setting and achieving goals.

The program’s educational resources are focused on a 500-acre laboratory. Of the 500, 68 acres are used for cropping and waterways. The laboratory includes four centers: horticultural, environmental, animal and dairy and foods processing. Each center has a classroom as well as an outdoor facility and is staffed with instructional and assistant instructional advisors who facilitate projects and programs with students, teachers, house parents and other Milton Hershey School staff (see figure 1).

Beyond the program’s administrative staff of four, there are four instructional advisors and seven assistant instructional advisors.

"The Agricultural and Environmental Education (AEE) Program is an important bridge between the school’s history and the future development of our students as productive citizens in the 21st century."


Student Projects

Each student-centered project—whether initiated by a student, teacher, house parent, MHS staff member or AEE staff member—follows the guidelines set forth through a tool called a project planner. Upon my arrival at MHS, I made it a priority to develop this tool and establish a formal process for documenting projects within the program.

The six-page document can easily be used for individuals or teams, as well as small or large group projects. It is a necessary tool that helps instructional advisors and their assistants at each center organize, plan and support the numerous projects being accomplished by 1,100 students in a variety of groupings. It is not unusual for a student to be involved in both an Environmental Center through a class and the Animal Center through their student house, 4-H and FFA members prepare a "project planner" before documenting information in their record books.

**The Project Planner covers goals, objectives, action plans, outcomes and accomplishments, anticipated budget, evaluation and reflection. 99**

The project planner covers goals, objectives, action plans, outcomes and accomplishments, anticipated budget, evaluation and reflection. Because of the complex administrative structure at the Milton Hershey School, it is necessary for all parties within the scholastic and community life areas to be knowledgeable about each student's projects. Thus, each planner must have the appropriate signatures of house parents, teachers, principals and residential administrators.

The Horticulture Center

The Horticulture Center is located on the campus east side a short distance from the school. The center provides opportunities for students to acquire firsthand horticultural knowledge through scientific research. Students engage in hands-on practical approaches by developing new varieties and propagating vegetables, fruits, flowers, trees and plants.

The AEE Program and Horticulture Center are fortunate to have business and industry partners that are excited about working with students. By hosting some of their own scientific studies, our students have the opportunity to study real world problems and experiments along side industry scientists and producers.

Other major projects include a deciduous nursery that the sixth grade students will nurture for four years and market when they reach the ninth grade. This project will be accomplished with the aid of local business partners in the nursery/landscape industry. Students can also practice their design skills by participating in a landscaping project for many of the student homes on the MHS campus as well as planning, designing and planting a formal garden with a pergola.

Within the next year, a new facility is being planned that will include 7,200 square feet of greenhouse space. It will be divided into different areas of concentration, such as foliage and tropical plants, research and production and a joint aquaculture/hydroponics area. Separate greenhouses will be constructed and outfitted for students in K-5 and 6-8. Adjoining the greenhouse space will be a headhouse, classroom, tissue culture laboratory, conference and program administration areas.

Horticulture is introduced to students beginning at the kindergarten level with simple gardening projects that continue throughout the summer and fall months. As students enter the tenth grade, they have the ability to enter the horticulture vocational career pathway and, in three years, complete a certificate of initial mastery as authenticated by the craft committee, which is made up of local horticulture business and industry representatives.

The Environmental Center

The Environmental Center is located within a short bus trip from the school buildings and within a neighborhood of student houses. It is located in a recently renovated dairy barn. The lower portion of the barn was gutted and the 5,000 square foot space was converted to an applied, experimental classroom including a wet lab, museum, conference and office space. Students at all levels are involved in projects that focus on the stewardship of natural resources. 99

The Animal Center

The Animal Center is housed in a number of facilities throughout the campus. Besides a horse stable and a beef cattle barn, many of the small livestock are housed in a larger facility also connected to the Dairy and Foods Processing Center. Some student homes are host to a variety of animals including goats, rabbits, chickens, sheep and a conservation management and behavior program involving white tail deer. 4-H students work with service animals to help veterans by fostering puppies through their first 18 months of life prior to specific training and subsequent to being placed with a handicapped or disabled individual. A number of 4-H members are also learning about animals by providing a service to local organizations that serve senior citizens and ill children with visits from their trained 4-H animals that may include dogs, rabbits and chickens.

Within the next two to three years, the Animal Center will be located in another newly renovated dairy barn. This new facility will allow a greater number of students to be located within the central campus close to the elementary and middle schools and student houses. Here, students will have the opportunity to participate...
Agricultural Education at Milton Hershey School, continued from page 19

**Summer Program Opportunities**

Prior to the introduction of the AEE Program, summer employment for students at Milton Hershey School Farms was just a part-time job that did not focus on career pathways or opportunities. During the summers of 1995 and 1996, more than 60 high school students participated in off-campus internships that focused on education and skill development. Internships are available for students ages 14 and older. After applying, interviewing and accepting internship employment at one of the centers, each student plans a two-to-ten-week program that includes an individual project. Students complete their internships with a report and a completed project plan that has real-life implications and connections.

**Where is it all going?**

The AEE centers serve as vital links to the world of work and continuing education through knowledge of specific career pathways and development of employability skills, including attitudes toward work. These linkages directly help employers and business representatives in the curriculum development, instructional methodologies and evaluation for each program. Lessons and research projects reflect the demands of the workplace. On the job performance requirements and competencies are aligned with specific skills. With educational partnerships as its goal, the Milton Hershey School's Agriculture and Environmental Education Program is an action-centered program of student interactions within the scope of agriculture and the environment so that students are prepared to enter the private sector or continue their education and labor skills until they ultimately select a career.

Students, Bored of Education, continued from page 7

In order to do this, we must have student and teacher involvement along with discipline. We must develop attitudes and habits, ethics, leadership skills and interpersonal communication skills. Students must learn to live and work in our society. I have responded to hundreds of questions from potential employers concerning student employment. Most often, they don't inquire about grades. Their questions center on the preceding traits. Studies have shown that employers tend to dis- regard grades and school evaluations and rely more on the job applicant's attitude, behavior and job work experience. They centered their questions on these traits when selecting workers.

How can we develop these desirable characteristics in our students? We must have support from the home, community and the students themselves working toward this common goal. Students perform up to your level of expectations. There seems to exist in our culture the expectation that young people are destined to fail. The trouble is, if you expect young people to fail long enough, it becomes a self-fulfilling prophecy.

Students are taught through instruction and work experience to develop skills and knowledge for employment and upgrade in employment. In my opinion, the greatest measure of professional contributions comes from student successes. For students to achieve success, there has to be challenge.

Students may try to give the impression of wanting to take an easy course when in reality, they want to be challenged. They want to learn. At some schools, the campus courses were traditionally dumpling grounds for underachievers. Using marketing terms, I believe if you offer a "product" that is salable to your students, they will attract "customers." This product must be challenging to the students, and I believe that is what students truly want. During our last grading period this past year, more than 50 percent of the students in our agricultural education program were on the school's honor roll.

**Measuring Success**

Student successes are generated by involvement in class and its activities. Our students have consistently placed in the state's top ten in the Career Development Events in which we participate. Our agricultural mechanics class averaged 12 percent higher on state-wide achievement tests than agriculture students at other schools. Our FFA chapter has received the Gold Emblem in South Carolina in the National Chapter Program and has received the highest ranking eight years in a row. As we have developed leadership skills, our chapter has produced star farmers, South Carolina star agriculturists, National BOAC winners, and four state FFA officers in a row.

"I believe in the future of agriculture with a faith born, not of words, but of deeds..."

There is no greater measuring device for student success than what occurs in the world of employment beyond high school. For the last seven years, our agriculture classes have had a placement rate of 78% based on the State Department of Education criteria. As one can see from these statistics, emphasis is placed on placement where employers actually hold you accountable. Our education system emphasizes the School-To-Work transition and a Tech-Prep curriculum, we may need to broaden what we, as educators, consider education. We...
mentoring assignment describing what they did and learned.

MENTORING is a fantastic opportun-
ity for students that provides valu-
able insight into their chosen
career. Students may assist a veter-
narian, observe surgeons, work with
unusual animals, perform animal
health tests or administer medica-
tions. They may discover they faint at
the sight of blood, dislike cats, get
tongue-tied with customers or
they love surgery, working with
a large variety of animals, or the
hur-
tle and hustle of the work place.
All experiences, good or bad, are
valuable and allow students to
 modify and improve their career
paths. This also better prepares the
student for the job and provides a
valuable learning experience.

MENTORING also provides employ-
ers with the opportunity to work
with different students and a
chance to evaluate them before hire-
ing. Many employers were not hire-
ing, but after working with a par-
ricular student they offered them a
job. Some employers are on our
advisory committee and many are
long-time supporters of the pro-
gram. We encourage their feedback
and incorporate their ideas and
suggestions into the curriculum.

Career Specialization
As our program area is unique, most
traditional FFA Career Development
Events do not serve our purpose. In
Ohio, we have 12 Animal Management,
Technician programs and have five skills
contest areas that incorporate skills
learned in the program. The five events
are: Dog Obedience, Dog
Grooming, Aquaculture Management,
Animal Management and Animal
Health. All events involve a written
test, identification and a hands-on
skill evaluation.

We approach skill events as a
time for career specialization. Each
student is required to choose one
of the five skill areas to specialize
in depending on their career goals.
All five events are geared to vari-
os career areas such as veterinary
medicine, grooming, pet shop, kennel
technician, animal technician, obedi-
ence training or aquarist.

Beginning in January, we spend
time each week with each
career specialization area. The
instructors spend time with each
group reviewing the previous
week’s assignment and giving
information. Students independently
study technical information and
breed or equipment identification
as well as complete workbooks and
practice skills. Students have access to
flash cards, equipment and sup-
plies. Employers and former students
are invited to visit and provide small
group instruction as well as hands-on
skills practice. Many students
volunteer time to work or
monitor at various businesses to gain
additional experience. At the end of
the 10-week program, an event and
evaluation is held with the winners
going on to state competition.

As our career specialization
involves all students, every student
acquires skills, knowledge and experi-
ences that will better prepare them
for their career. Some students focus
more intensely on their goals and
others explore other areas in the
animal industry. Regardless of the
outcomes, all students have
received hands-on experience and
technical knowledge in a specific
animal career.

Hands-on experience provides
endless opportunities for students
and creates a learning environment
in which students can actively par-
ticipate and learn valuable job
skills. With all the different learn-
ing styles and handicaps students
possess, hands-on experience allows
students to be successful and to
enjoy learning. Try some-
thing new and incorporate fins,
feathers, fur and scales in your
classroom. You can add a new
meaning to “learning by doing.”

July Quiz Answers
Here are the answers to the
quiz published in the July 1996
issue of The Agricultural
Education Magazine.

1. a. 1929.
2. d. 1952.
4. a. A herd of Angus cattle. Yes, a farmer Miss
America was on the cover of the first mag-
zine.
5. a. The American Farm Youth.
6. a. 1953.
7. d. By FFA members in a
national contest spon-
sored by the magazine.
Charlene won in a
runoff election. The four most
popular names submitted by
the students were
Dwight, Ebbert, Johnnie
and Charlene.
8. b. Corn growing.
9. c. FFA New Horizons

By Gary E. Moore
Dr. Moore is a professor of agricultur-
al and extension education, North
Carolina State University, Raleigh, and
is on the Board of the Agriculture
Education Association for Agri-ducated Education.

What Do You Know About SAE?
Agiculture students are expected to have
Supervised Agricultural Experience (SAE)
programs. SAE has been an important
component of the agricultural education
program for decades. How much do you
know about SAE? The answers will be included in the
next issue of The Magazine. GO TO THE HEAD OF
THE CLASS if you know the answers.

1. The original name for SAE was:
a. home-project plan.
b. Supervised Occupational Experience program.
c. farming project.
d. supervised farming program.
2. When and where was the concept of SAE as it is
fundamentally practiced today started?
a. In 1906 at Cornell University.
b. In 1910 at Smith’s Agricultural School in Northampton, Massachusetts.
c. In 1914 at Plattsmouth High School in Wisconsin.
d. In 1916 at USDA headquarters in Washington, DC.
3. The originator of the SAE concept studied philos-
ophy under William James and earned both a bache-
lor’s and master’s degree in philosophy from
Harvard. This person is:
a. University of Yale.
b. Dean of Agriculture at Cornell.
c. Professor of Extension at the University of Wisconsin.
d. F. H. Lake, USDA Specialist for Agricultural Education.
4. The philosophy on which SAE is based is:
a. pragmatism,
b. idealism,
c. realism,
d. reductionism.
5. The federal law requiring agricultural students to have
"directed or supervised practice in agriculture,
either on a farm provided for by the school or other
farm, for at least six months per year" was the:
d. Public Law 740.
6. SAE programs started to decline because the wording
of a later federal vocational education act stated, "...each
education may be provided without directed
or supervised practice on a farm." The intent of the
act was that SAE programs could be conducted off-
the-farm in agribusiness, greenhouses, etc. The law
was widely interpreted as students were no longer
required to have an SAE program. This act was the:
a. the Smith-Lever Act of 1913.
7. As a result of the previous act (question 6), a new
type of SAE came into existence. This new type of
SAE was:
a. experimental,
b. home improvement,
c. exploratory,
d. placement.
8. Two national conferences were held in the early
1980s (1982, 1984) to examine experiential learning
in agriculture. A new type of SAE emerged from
these conferences. This new type of SAE was:
a. experimental,
b. home improvement,
c. exploratory,
d. placement.
9. Immediately prior to being called SAE, this program
was identified as:
a. Supervised Farming Program.
b. Career Education Program.
c. Home Project Plan.
d. Supervised Occupational Experience Program.
10. A current trend in education is actually a manifesta-
tion of the Agricultural Education SAE Model. This
trend involves:
a. Schools-to-Work internships,
b. the Perkins Program.
c. career education.
d. greenhouses.

For answers to the quiz published in the July issue, refer
to page 22.
Barnack's Method of Education: A View from the Agricultural Mechanics Laboratory: Egress Opening (Shop Door)

By Jim Sorrenson
Mr. Sorrenson is an agriculture instructor at Kimberly High School, Kimberly, ID.

The theme for this issue is "teaching." Now even though I have not read any of the articles, I can guess that they will deal with all sorts of new and innovative methods of getting information into those little microprocessors known as students.

I have been around a long time (some think too long), and I have seen many changes in teaching methods. In the right hands, nearly any teaching method will work—even bribery. For example, last winter my students and I adopted a stray cat to live in the agricultural mechanics laboratory and learning center (shop and classroom). I have to admit that this particular cat was rather intelligent, as far as cats go. She learned that if she was a big enough pest, she got just about anything she wanted. In spite of this animal’s ability to stare and look stupid and her ability to sleep about 22 hours a day, I was unable to teach her to "lay down and roll over." Yes, when I looked at her and told her, "Aggie, lay down and roll over," she would usually do just that. Many people were amazed, and so was I, for that matter. One teacher asked me how I taught a cat to do tricks, and I responded that you can teach a cat to do anything if you have enough patience. The trick is to select the instructor. This brings us to the "Barnack method of education."

The Barnack method of education is simple. Those regular readers of this column will understand my love of acronyms, so it is called the DVPPR method of education. For the benefit of those unfamiliar with acronyms, it is pronounced: D as in duh, V as in vec, and PP as in purf.

D is for Desire

Now this does not mean lust, as some might think, but desire on your part to teach the little microprocessors so they don’t grow up wearing a stupid sign around their neck, and desire on their part to not grow up to be the village idiot. I realize that some purists are cringing at the crudeness of the language and the fact that it is not currently politically correct. My advice to these people is to quit reading now, because it is about to get worse (or as some would say, more worse).

P is for Practice

In other words, just presenting the unit won’t cut it. The old adage: teach, re-teach and teach again if you want the students to remember seems appropriate here. This was not a real problem for us in the agricultural education field initially. Now, with the number of students we have, the limited materials, the amount of material we are supposed to cover coupled with the amount of time that we have available, finding the time to practice is becoming more and more difficult.

R is for Reward

Everyone wants a reward for their efforts. Usually people think of a reward as being something materialistic. Buying students a soda for a good job or "just because" will often work wonders. However, a kind word, a thank you, or a smile is frequently rewarded enough. Students read teachers well. They can tell if you care about what you teach and if you care about them. Caring is rewarding for them as well as for you.

P is for Perspective

One must occasionally pause to reflect on what it was to be a teenager. I was complaining to another teacher about the fact that students did not know the difference between an Angus and a Hereford, and what’s more, they didn’t seem to care. This old bird told me not to worry about it, as it was all a matter of perspective. He recalled that when he was a teenager, he was more interested in watching Mary Kay in learning the difference between an Angus and a Hereford. You know what? So was I.

Yesterday, today, and tomorrow, continued from page 9

The Greenhouse as a Focus for Agriscience; continued from page 15

Vocational Agriscience: Greenhouse Management

You and your partner have entered into a greenhouse venture. As with any business you will do a business plan before seeking financing or starting any construction. You will operate the venture for one season as specified below.

Facility
- two bay gutter-connected greenhouse 48’ x 150’ x 10’ gutter height
- double poly design, roof opening vents
- gas forced hot air heat
- 6-140’ basket rails with drip lines
- spring-only production

Crop mix:
- 20% perennial
- 20% potted crops 3” or larger
- 10% vegetables
- 50% spring annuals (40% impatiens, 60% mixture of 50 various varieties)
- baskets to capacity

Items Needed for Final Plan
- seed order with prices and totals
- plug and/or plant material order
- consumable orders: containers, water, fertilizer, pesticides, etc.
- energy costs
- labor costs
- marketing plan and expenses
- equipment list and orders
- growing calendar
- Integrated Pest Management (IPM) plan
- overall purchase and financing plan
- crop goals and quantities
- cash flow projection

Wrap Up

As students exit the program, they leave a business base for whatever field they will enter. Our students do not all enter production agriculture, but the entrepreneurial base is an asset to all. The long-term feedback from students has been good even though there is some grumbling during the activity. They have been very successful in college agriculture and business programs, and many have entered the industry in a variety of allied applications in addition to horticulture. The final evaluation in the eyes of the community is the spring bedding plant sale when the greenhouse is opened to the public for retail sales in May. Students enjoy a commission toward FFA activities based on their sales referrals and customer service abilities.
<table>
<thead>
<tr>
<th>Author</th>
<th>Issue</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albers, Brian R.</td>
<td>November</td>
<td>13</td>
</tr>
<tr>
<td>Anderson, Erik T.</td>
<td>May</td>
<td>17</td>
</tr>
<tr>
<td>Anon, Jack</td>
<td>June</td>
<td>13</td>
</tr>
<tr>
<td>Arkfeld, Tim</td>
<td>February</td>
<td>14</td>
</tr>
<tr>
<td>Baker, MacCoy</td>
<td>October</td>
<td>8</td>
</tr>
<tr>
<td>Beilin, Marcus G.</td>
<td>February</td>
<td>24</td>
</tr>
<tr>
<td>Bell, Lloyd C.</td>
<td>February</td>
<td>19</td>
</tr>
<tr>
<td>Birkenholz, Robert J.</td>
<td>March</td>
<td>10</td>
</tr>
<tr>
<td>Blums, Alice</td>
<td>May</td>
<td>11</td>
</tr>
<tr>
<td>Boles, Tom</td>
<td>June</td>
<td>17</td>
</tr>
<tr>
<td>Braker, Cliffon R.</td>
<td>July</td>
<td>20</td>
</tr>
<tr>
<td>Burial, Phillip</td>
<td>November</td>
<td>21</td>
</tr>
<tr>
<td>Burke, Stanley R.</td>
<td>April</td>
<td>5</td>
</tr>
<tr>
<td>Burns, Ed</td>
<td>October</td>
<td>8</td>
</tr>
<tr>
<td>Cano, Jamie</td>
<td>December</td>
<td>8</td>
</tr>
<tr>
<td>Camp, William G.</td>
<td>July</td>
<td>22</td>
</tr>
<tr>
<td>Chickol, Lisa</td>
<td>October</td>
<td>22</td>
</tr>
<tr>
<td>Clayton, Sherry B.</td>
<td>July</td>
<td>20</td>
</tr>
<tr>
<td>Coffey, David M.</td>
<td>August</td>
<td>6</td>
</tr>
<tr>
<td>Cooke, Stephen C.</td>
<td>December</td>
<td>5</td>
</tr>
<tr>
<td>Coonrad, Kellie J.</td>
<td>August</td>
<td>8</td>
</tr>
<tr>
<td>Copas, George H.</td>
<td>November</td>
<td>9</td>
</tr>
<tr>
<td>Craven, Jay</td>
<td>March</td>
<td>10</td>
</tr>
<tr>
<td>Custer, Samuel G.</td>
<td>December</td>
<td>10</td>
</tr>
<tr>
<td>Daughtry, Lillian H.</td>
<td>February</td>
<td>23</td>
</tr>
<tr>
<td>Davis, Scott</td>
<td>May</td>
<td>13</td>
</tr>
<tr>
<td>Deeds, Jacquelyn P.</td>
<td>November</td>
<td>16</td>
</tr>
<tr>
<td>Dodson, Bradley W.</td>
<td>February</td>
<td>5</td>
</tr>
<tr>
<td>Dormody, Thomas J.</td>
<td>August</td>
<td>20</td>
</tr>
<tr>
<td>Edwards, Craig</td>
<td>September</td>
<td>14</td>
</tr>
<tr>
<td>Egan, Greg</td>
<td>February</td>
<td>14</td>
</tr>
<tr>
<td>El-Fatatly, Aly, Ismail Abd</td>
<td>October</td>
<td>11</td>
</tr>
<tr>
<td>Elliott, Jack F.</td>
<td>September</td>
<td>11</td>
</tr>
<tr>
<td>Elliott, Tom</td>
<td>August</td>
<td>4</td>
</tr>
<tr>
<td>Erick, Martin J.</td>
<td>October</td>
<td>9</td>
</tr>
<tr>
<td>Fritz, Susan</td>
<td>March</td>
<td>3</td>
</tr>
<tr>
<td>Gilroy, Tim</td>
<td>May</td>
<td>13</td>
</tr>
<tr>
<td>Galton, Jeff</td>
<td>February</td>
<td>3</td>
</tr>
<tr>
<td>Gamon, Julia A.</td>
<td>November</td>
<td>18</td>
</tr>
<tr>
<td>George, Thomas</td>
<td>November</td>
<td>15</td>
</tr>
<tr>
<td>Gilroy, Ernie</td>
<td>June</td>
<td>13</td>
</tr>
<tr>
<td>Goodwill, David</td>
<td>July</td>
<td>6</td>
</tr>
<tr>
<td>Goodwin, Jeff</td>
<td>August</td>
<td>9</td>
</tr>
<tr>
<td>Hagare, Gay L.</td>
<td>July</td>
<td>15</td>
</tr>
<tr>
<td>Hance, Cynthia</td>
<td>December</td>
<td>12</td>
</tr>
<tr>
<td>Hanson, Clark W.</td>
<td>September</td>
<td>21</td>
</tr>
<tr>
<td>Harrison, Betty C.</td>
<td>December</td>
<td>12</td>
</tr>
<tr>
<td>Harper, Joe G.</td>
<td>July</td>
<td>9</td>
</tr>
<tr>
<td>Hill, George C.</td>
<td>January</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Author</th>
<th>Issue</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hillson, John</td>
<td>January</td>
<td>10</td>
</tr>
<tr>
<td>Hoesting, Duane J.</td>
<td>February</td>
<td>8</td>
</tr>
<tr>
<td>Holmes, Geraldine H.</td>
<td>December</td>
<td>15</td>
</tr>
<tr>
<td>Holton, B. David</td>
<td>May</td>
<td>16</td>
</tr>
<tr>
<td>Hood, Dan</td>
<td>April</td>
<td>11</td>
</tr>
<tr>
<td>Hutchinson, Art</td>
<td>March</td>
<td>4</td>
</tr>
<tr>
<td>Irwin, Brent R.</td>
<td>September</td>
<td>19</td>
</tr>
<tr>
<td>Iversen, Mynday J.</td>
<td>June</td>
<td>18</td>
</tr>
<tr>
<td>Johnson, Donald M.</td>
<td>November</td>
<td>21</td>
</tr>
<tr>
<td>Johnson, Donelle</td>
<td>December</td>
<td>20</td>
</tr>
<tr>
<td>Jones, B. Lynn</td>
<td>October</td>
<td>6</td>
</tr>
<tr>
<td>Katt, Richard</td>
<td>February</td>
<td>18</td>
</tr>
<tr>
<td>Kassifman, Janet</td>
<td>February</td>
<td>7</td>
</tr>
<tr>
<td>Klawhen, Marc J.</td>
<td>December</td>
<td>7</td>
</tr>
<tr>
<td>Kolus, Mark</td>
<td>August</td>
<td>3</td>
</tr>
<tr>
<td>Konechek, Valerie</td>
<td>February</td>
<td>7</td>
</tr>
<tr>
<td>Korilik, Joe W.</td>
<td>December</td>
<td>12</td>
</tr>
<tr>
<td>Kuhn, Joe G.</td>
<td>December</td>
<td>15</td>
</tr>
<tr>
<td>Lanz, Vadee T.</td>
<td>September</td>
<td>4</td>
</tr>
<tr>
<td>Lewis, Will A.</td>
<td>August</td>
<td>24</td>
</tr>
<tr>
<td>Lockaby, Jacqui D.</td>
<td>August</td>
<td>23</td>
</tr>
<tr>
<td>Loggust, Peggy L.</td>
<td>August</td>
<td>8</td>
</tr>
<tr>
<td>Loschen, Diana</td>
<td>September</td>
<td>23</td>
</tr>
<tr>
<td>Lund, Verna D.</td>
<td>November</td>
<td>15</td>
</tr>
<tr>
<td>Skykel, Donald M.</td>
<td>January</td>
<td>15</td>
</tr>
<tr>
<td>Ndossi, Fredrick</td>
<td>April</td>
<td>9</td>
</tr>
<tr>
<td>Scrogno, Michael</td>
<td>October</td>
<td>11</td>
</tr>
<tr>
<td>Southwick, K. Rasa</td>
<td>May</td>
<td>19</td>
</tr>
<tr>
<td>Stone, Gordon</td>
<td>June</td>
<td>4</td>
</tr>
<tr>
<td>Surphile, H. Dean</td>
<td>January</td>
<td>23</td>
</tr>
<tr>
<td>Swan, Michael K.</td>
<td>October</td>
<td>11</td>
</tr>
<tr>
<td>Tarbert, B. Allen</td>
<td>October</td>
<td>16</td>
</tr>
<tr>
<td>Thompson, Gregory W.</td>
<td>September</td>
<td>23</td>
</tr>
<tr>
<td>Thorn, Donald C.</td>
<td>August</td>
<td>8</td>
</tr>
<tr>
<td>Torres, Robert M.</td>
<td>August</td>
<td>20</td>
</tr>
<tr>
<td>Touchstone, Allison J.</td>
<td>January</td>
<td>4</td>
</tr>
<tr>
<td>Townsend, Christine D.</td>
<td>February</td>
<td>5</td>
</tr>
<tr>
<td>Trujillo, Valerie</td>
<td>August</td>
<td>17</td>
</tr>
<tr>
<td>Vanderwerken, Lance</td>
<td>February</td>
<td>14</td>
</tr>
<tr>
<td>VanDierZandie, Anne Marie</td>
<td>March</td>
<td>20</td>
</tr>
<tr>
<td>Violett, Randall</td>
<td>March</td>
<td>8</td>
</tr>
<tr>
<td>Vlasin, Randy</td>
<td>February</td>
<td>20</td>
</tr>
<tr>
<td>Waidey, Rick C.</td>
<td>February</td>
<td>11</td>
</tr>
<tr>
<td>Warner, Tony</td>
<td>March</td>
<td>6</td>
</tr>
<tr>
<td>Waters, Gary</td>
<td>November</td>
<td>11</td>
</tr>
<tr>
<td>Webb, Angela</td>
<td>April</td>
<td>20</td>
</tr>
<tr>
<td>Weeks, Terrell</td>
<td>June</td>
<td>11</td>
</tr>
<tr>
<td>Weitier, Jerry</td>
<td>September</td>
<td>7</td>
</tr>
<tr>
<td>Whaley, David C.</td>
<td>August</td>
<td>3</td>
</tr>
<tr>
<td>Whittington, M. Susie</td>
<td>September</td>
<td>7</td>
</tr>
<tr>
<td>Wilson, J. Andrew</td>
<td>December</td>
<td>3</td>
</tr>
<tr>
<td>Willis, Barry</td>
<td>October</td>
<td>16</td>
</tr>
<tr>
<td>Wingenbach, Gary J.</td>
<td>October</td>
<td>13</td>
</tr>
<tr>
<td>Woodin, Ralph J.</td>
<td>February</td>
<td>4</td>
</tr>
<tr>
<td>Zimmerman, Mark</td>
<td>February</td>
<td>14</td>
</tr>
</tbody>
</table>