No one can definitely say when the era of modern research began at the College. One year, 1964, stands out though as a turning point in the College's research efforts. In that year, Dr. Leslie Murphy became Director of Research Development.

As of the first of this year, Dr. Murphy has left the position of Associate Dean for Research and Graduate Studies, and Dr. Lloyd Faulkner is stepping into that position.

What is the position of Associate Dean for Research and Graduate Studies? What has happened in the past to make that office what it is today? How will that office cope with the future? See p. 2.

A sampling of researchers and their projects (clockwise, from upper left): Dr. Gary Osweiler, Toxicologic Studies, Department of Veterinary Anatomy-Physiology; Dr. Ronnie Elmore, MMA Studies, Department of Veterinary Medicine and Surgery; Dr. Donald Blenden, Early Diagnosis of Rabies, Department of Veterinary Microbiology; Dr. Robert Green, Coagulation Factors, Department of Veterinary Pathology.
Dr. Murphy described the office of Associate Dean for Research and Graduate Studies as a "service office for faculty and staff in all matters of research." He also said: "The function of this office is to establish a climate in which faculty and staff can perform excellent research. This office should additionally exert influence to maintain a balance in the three College missions—research, teaching, and service."

Dr. Faulkner agrees with that basic philosophy. In this interview, he elaborates on his new position.

How do you perceive your role in relation to a faculty member seeking funds for a research project?

"This office is a College resource that acts as a bridge between the researcher and funding sources. My role will be to know the research capability of the College, and to know where funds can be obtained—and then match researchers with resources. The Associate Dean's responsibility is to be a 'facilitator', that is, to make it easier for the researcher to do his work."

What role will you take in a researcher's work aside from identifying funding sources?

"All an administrator can do is to encourage and facilitate to the extent possible the role of faculty."

Are you planning to recommend any immediate procedural changes in your office?

"Before any changes are suggested, I plan to become acquainted with the faculty and all functions of this office."

Will you attempt to enlarge the graduate degree program?

"This must be carefully explored in terms of what is the optimal size of the graduate program. As research efforts expand, the graduate program will expand too—the educational enterprise ought to grow with research. Research only for the sake of research should be confined to government laboratories and industry. Research here involves graduate training because the instructional component should be there in academic research."

Do you foresee a change in the College's research capability with regard to other disciplines on campus?

"Science has become so compounded in the last twenty years that all scientific researchers, including veterinarians, have been forced into specialization. Because no one is adequate unto himself to answer all questions, a researcher has to interact with scientists in other disciplines. The product of science is knowledge; knowledge is used to advance technology, and technology serves society."

Does this relate to your role as Assistant Director of the Missouri Agricultural Experiment Station?

"Yes. Although animal husbandry is separate from veterinary medicine in the U.S., it behooves veterinary researchers to cooperate with researchers in animal husbandry because the public research dollar is best used when these allied groups work together. Animal husbandry is an intrinsic part of animal health and disease. For everyone, however, there is an easy tendency to focus on curing disease rather than maintaining health. Cures may be more glamorous, but our primary mission ought to be maintaining health."

So far, this interview has inferred research involving income-producing animals. What will be the future of companion animal research here?

"We need to establish a good base in funding companion animal research. In terms of funding resources, this area has been badly neglected. We should have a visible pet research capacity at UMC to attract funding sources."

Should this College broaden its research outlook?
Changing Trends in Research Funding

Base of Continuous Support Coming for College

On October 10, 1978, President Carter signed the first bill to appropriate more than $15 million to fund the Food and Agriculture Act of 1977. Subtitle E of that Act is significant to College researchers in that Congress included this provision to promote improved health and productivity of income-producing animals by providing research funding.

Dr. Leslie Murphy, who had been Associate Dean for Research and Graduate Studies, and Assistant Director of the Missouri Agricultural Experiment Station, was responsible for initiating and coordinating efforts at the College so that researchers here can receive maximum possible funds available from the Act.

Although this is a new funding source, Dr. Murphy feels that once funding has begun, it will probably be continual. He went on to say that to date the College has met all federal and state deadlines and requirements with regard to obtaining these dollars. He anticipates funding to start by spring, 1979.

Dr. Murphy spoke about the significance of this Act: “Prior to this, there had not been at the College a core of base support. Now for the first time in this College’s history we have the potential for a solid core of support, and this means we will be able to begin building a program of continuous research. Before this, the College’s research support was fluctuating since grants have been awarded with time limits. This limitation has created many problems, among which have been the difficulty in recruiting quality technical help and researchers sacrificing weeks to prepare grant proposals.”

Interview, cont.

“Research has been done at UMC in problems relating to companion animals, income-producing animals, and comparative medicine—but much more needs to be done. This brings us back to the importance of veterinary researchers interacting with people in other disciplines—including those disciplines outside of the biological sciences. For example, we should consider education, social science, ethics, and communications. There is a need to broaden veterinary research and medicine.”

Research Support in the Past

After fourteen years of service, Dr. Murphy has resigned as Associate Dean. Dr. Lloyd Faulkner replaced him (see story, p. 2). His establishing a core of continuing base support for the College’s research activities was a fitting culmination for Dr. Murphy in his career as Associate Dean.

When he came to the College in August, 1964, Dr. Murphy found that funding sources for research were almost non-existent except for some support from the Missouri Agricultural Experiment Station. At once, he started to turn around a trend that had begun shortly after World War II.

Before 1918, veterinary researchers at the University of Missouri could maintain a reasonable balance of time and effort spent on research, teaching, and service. Research accomplishments of that period included finding means of controlling such diseases as Texas fever and blackleg. After World War I, service and teaching loads gradually increased. This meant less and less attention was paid to research by University veterinarians. Consequently, without the effort going into research, funding gradually dried up to the point that by the end of World War II only a few Experiment Station projects were maintained on some diseases of poultry and swine, and on parasites of cattle and sheep.

Until 1949, this College was a department in the College of Agriculture. This situation exacerbated the research funding problem because veterinary researchers had to compete with fellow researchers in the Agriculture College for limited funds from a few sources.

When the Department of Veterinary Science became the School of Veterinary Medicine in 1949, the faculty numbered less than 22. These few faculty members were by necessity almost fully occupied with teaching and service activities. Due to the effort and responsibility required to build the new four-year professional program, research efforts continued to decline.
A Review of Canine Conjunctival Allergy

History Is of the Utmost Importance in Arriving at an Accurate Diagnosis.

L. J. Klenofsky, VMIV
H. E. Jensen, D.V.M., Ph.D.
Dept. Veterinary Medicine and Surgery

One type of patient often seen by the veterinary practitioner is the dog exhibiting conjunctivitis, the most common eye disease in all species of domestic mammals. This condition can be acute, or if left untreated, may become chronic.

There are many different etiologies of conjunctivitis, and the list of differential diagnoses should include: 1) infections caused by pathogenic bacteria and viral agents; 2) parasitic organisms such as Thelazia californiensis (reported in all domestic animals and seen primarily in the Sierra Nevada Mountain region in the western U.S.) and Demodectic mange mites; 3) physical irritation from wind, dust, weed seeds, some medications, or eye lash problems; 4) keratoconjunctivitis sicca; and 5) allergic conjunctivitis which is most common during the pollen season but may occur year-round from any allergen. Allergic conjunctivitis is also more apt to be pruritic than the other forms.

Thorough examination should first be performed to rule out possible physical or parasitic causes. Culturing for bacteria is not routinely recommended, but it should be considered if the lesion is causing severe changes or has been chronic. A bacterial culture free of significant growth is reason to re-evaluate the patient for a viral or non-infectious etiology.

Conjunctival scrapings stained with Gram's stain are an excellent means of rapidly evaluating whether or not bacterial organisms are present. Using Wright's stain or modified Wright-Giesma stain (Diff-Quik), a scraping can also be evaluated for the presence of inflammatory cells.

To perform a conjunctival scraping, instill a few drops of topical anesthesia (alcaine) onto the eye. Then evert the lid and, using a Bard Parker #15 blade, lightly scrape the palpebral conjunctiva. Smear the scraping onto a slide, air dry, and appropriately stain.

Because little material has been available in the past, the following discussion will specifically focus on allergic conjunctivitis, its symptoms, etiology, and treatment.

An allergy is a hypersensitive state acquired through an animal's exposure to a particular allergen, with re-exposure resulting in an altered capacity of the animal to react to the allergen. The allergen may be any substance capable of inducing the immune response in the animal. The triggered immune response can have several reactions, two of which include the production of humoral antibodies to result in an immediate hypersensitivity or the development of sensitized lymphocytes to result in delayed hypersensitivity (cell-mediated immunity).

In the immediate hypersensitivity reaction, tissues which have been previously sensitized to a foreign substance produce an allergic reaction of the anaphylactic type that immediately follows a second exposure to the same allergen. Another term for immediate hypersensitivity is "atopy", a carry-over from human medicine. However, in veterinary medicine the more specific term, Allergic Inhalant Dermatitis (AID), has been assigned to describe the dermatologic and conjunctival manifestations of immediate hypersensitivity.

The AID dog may be characterized by one or all of the following generalized manifestations: pruritis, urticaria (welts or hives), and angioedema. Conjunctival responses include hyperemia and edema characterized by chemosis, itching, burning, photophobia, and watery discharge with vasodilation and eosinophilic exudation. Some of the allergens producing AID include house dust, smoke, pollens, spores, feathers, dander, vegetable proteins, and ingestants.

After the first exposure to the allergen, the animal's immune system develops immunoglobulin IgE (known also as reagin or skin sensitizing antibody). Upon subsequent exposure, the IgE affixes to mast cells. This results in an antigen-antibody reaction that causes degranulation of mast cells to release the vasoactive substances, serotonin, histamine, and prostaglandins. The release of these substances results in the allergic manifestations mentioned above.

There appears to be some evidence for a familial predisposition in the AID dog. History is of utmost importance in arriving at an accurate diagnosis. The first allergic episode can occur as early as one to three years of age with an average age of eighteen months. Clinical signs are first noticed as a seasonal problem characterized primarily by pruritis and erythema of the conjunctiva. The AID dog quite often exhibits superficial dermatitis of the feet, ears, axilla, perineal or inguinal region due to the same allergen.

It should be emphasized that there may be a fine line between an animal exhibiting a true AID conjunctivitis and one with a contact conjunctivitis due strictly to a toxic reaction to a particular agent. The latter condition is characterized by small follicles and no eosinophilia.

Allergy testing may be necessary to determine the causative agent(s).

Clinical management of the allergic disease consists of avoidance of the allergen, medical treatment, or biological treatment. Medical treatment should include administration of bland astringent washes and topical corticosteroids instilled into the conjunctival sac to reduce inflammation. In more aggravated cases, systemic corticosteroids should be used for relief from pruritis and to "cool" the patient. The type and dosage selected must suit the needs of the individual patient.

An alternate-day dose of prednisone, prednisolone, or methylprednisolone may be used. Give a single oral dose every other morning between 8 and 10 a.m. Gradually reduce the dosage to the minimum to control the condition. This regimen allows long-term seasonal control of the pruritis and inflammation with little or no suppression of the animal's hypothalamic-pituitary-adrenal axis. The value of antihistamines is considered to be much less than that of corticosteroids. To be efficacious, the dosage of antihistamine must be so high that the animal approaches somnolence. Therefore, these drugs are rarely used.

Biological treatment consists of hyposensitization following allergy testing. Some clinicians may wish to try hyposensitization before resorting to long-term corticosteroid therapy.
St. Louis Dog Breeders Donate to College

Mr. Ralph Beahmberger (L) and Mr. Emil Klinkhardt (R) presented a $3,000 check from the St. Louis Dog Breeders Association to the College to help fund future canine research activities. Dr. E. A. Corley (C), Associate Dean for Academic Affairs, accepted the check on behalf of the College.

The check was presented during a break in the tour of the College on October 14 for more than 25 people from the St. Louis area who breed and show dogs. Several members of the College’s faculty showed the group the Veterinary Teaching Hospital and the Middlebush Farm south of Columbia.

Last year, the St. Louis Dog Breeders Association donated funds to help remodel the examination rooms in the Teaching Hospital.

Canine Conjunctival Allergy, cont.

The second major type of reaction responsible for allergic conjunctivitis is that of delayed hypersensitivity, mediated by antigen-sensitized lymphocytes. Another name for the delayed type allergic entity is Contact Allergic Dermatitis (CAD).3,4 Delayed hypersensitivity of the conjunctiva is characterized by mononuclear cell infiltration, and perivascular aggregates of macrophages and lymphocytes produce the local swelling seen.3,4

Some of the most common causes of CAD are ophthalmic drugs, sprays, and chemicals including local anesthetics, antibiotics, sulphonamides, atropine, pilocarpine, and ophthalmic bases such as mercury, benzalkonium chloride and lanolin.1,2,4,5 Treatment of delayed hypersensitive conjunctivitis consists of removal of the causative agent followed by bland washes and use of topical steroids.4

REFERENCES
Zinc and Cadmium Interference With Lead Test

Zinc and cadmium interference with a commonly-used lead exposure test is a problem that is currently being investigated by Dr. David Thawley, Assistant Professor of Veterinary Microbiology. For this research the National Institute of Environmental Health Sciences has recently awarded Dr. Thawley a two-year grant of $32,432 per annum.

Lead exposure tests are commonly given to people such as smelter workers, who have become exposed to lead and therefore may suffer from lead poisoning. Symptoms of lead poisoning include nervous disorders and a hypochromic, microcytic anemia. One diagnostic sign of the presence of lead in the body is the increased excretion of δ-amino-levulinic acid in the urine (ALAU).

δ-amino-levulinic acid (ALU) is an early intermediary in porphyrin biosynthesis. Lead blocks the enzyme, ALA dehydrase (ALAD), that causes ALA to accumulate in developing erythrocytes. Much of the ALA then diffuses into the serum, and thence into the urine. The ALAU test measures the concentration of ALA in the urine.

Researchers such as Dr. Thawley have recently noticed that, when a human or animal is exposed to zinc or cadmium and simultaneously exposed to lead, the amount of ALA in the urine drops—sometimes to levels that are the same as those levels in subjects who have not been exposed to lead at all. Therefore, the validity of this commonly used test is in doubt. Many people who have become exposed to lead have also come into contact with zinc or cadmium because these heavy metals are often found together in the environment.

Dr. Thawley's research will concentrate on these factors of the interaction in the body of zinc or cadmium with lead: ALAU excretion, ALAD activity, and free erythrocyte porphyrin. This research will provide an in-depth evaluation of the influence of zinc and cadmium on the toxicity of lead, and the validity of the ALAU lead exposure test.

Dr. Robert B. Miller has been awarded a grant of more than $4,900 from the Upjohn Company for the study "Comparative Testing of Lincomycin and Tylosin in the Treatment of Mycoplasmal Infections (Pneumonia/Arthritis) in Neonatal and Growing Swine".

Research Funding, cont.

until they were almost non-existent. Even research laboratory space was converted into teaching space.

The situation began to change with the partial completion of the Veterinary Teaching Hospital in 1961 and the subsequent renovation of Connaway Hall. This made some space available for research.

Dr. Burnell Kingrey was appointed Dean in 1963, and almost immediately he took action to stimulate research. Among his first appointments to the faculty was Dr. Leslie Murphy who left the National Institutes of Health to become Director of Research Development.

Dr. Kingrey also established the Veterinary Medicine Research Council with Dr. Murphy as its Chairman. Among its duties, this Council organized administration procedures for obtaining research funds, recommended allocation of undesigned research monies, and organized procedures for finding research space.

Because Class size increased in 1965 from 30 to 60 students, the state made available more funds to recruit additional faculty. By 1965, the faculty numbered more than 30. This meant that some of the faculty could devote a portion of their time to research. As a result administrators such as Dr. Murphy could pursue heretofore unavailable research dollars. In addition Dr. Murphy worked closely with and counseled the research-oriented faculty.

Numbers of grants for research began to increase, especially from federal sources. Soon the Veterinary School became eligible for a General Research Support Grant from the National Institutes of Health (NIH). To be eligible, the School must have had a minimum of $100,000 in other NIH grants awarded within a fiscal year and have presented a varied research program. Reflecting upon his early efforts, Dr. Murphy remarked, "This office could not have gotten a nickel if we didn't have faculty capable of doing research."

Securing adequate facilities for research did not make significant progress until nine years after Dr. Murphy took his job.

Shortly after Dr. Kenneth Weide became Dean in 1973, the General Assembly of the Missouri Legislature appropriated

$400,000 to prepare plans for two new buildings for the recently renamed College of Veterinary Medicine. In 1974, the Legislature approved the expenditure of $6 million for construction of the Veterinary Medicine Building and the Veterinary Medical Diagnostic Laboratory. The addition of more than 58,000 square feet of space to the College meant new and expanded laboratories for research.

With the fiscal year that ended June 30, 1978, 39 separate projects for research were awarded and funded by non-university sources for a total of $584,501. The Missouri Agricultural Experiment station funded an additional three projects for $97,245. Research efforts now being undertaken at the College include investigations of bovine respiratory disease, pseudorabies, lamingitis, turkey infertility, rables, foot rot in cattle, and anaerobic infections of small animals.

The Graduate Program and Research

In the College environment, research is indispensable to teaching—and vice versa. Faculty researchers train graduate students. Thus, the students are extensions of their sponsors' research efforts. Outside of the resident program, many graduate students are supported by grants and contracts.

Currently at the College, eighteen veterinarians are seeking the M.S. degree and

Dr. Robert B. Miller has been awarded a grant of more than $4,900 from the Upjohn Company for the study "Comparative Testing of Lincomycin and Tylosin in the Treatment of Mycoplasmal Infections (Pneumonia/Arthritis) in Neonatal and Growing Swine".

Researchers such as Dr. Foley must take weeks, even months, from their research every year to prepare all of the paper work necessary to obtain grant funds. The burden of this work would be much greater for each researcher without the aid of the office of Associate Dean for Research.
Small Animal Examination Rooms and Reception Area Improved

In fall, 1977, the College's Development Committee selected for a special fund-raising drive improvements for the public areas of the Small Animal Teaching Hospital. The St. Louis Dog Breeder's Association kicked off the drive with a $5,000 donation.

To date, more than $15,500 has been raised for this project. With this money, the College has refurbished four examination rooms and the reception area. The area still occupied by Medical Records remains to be converted into more examination rooms. The College's Development Committee hopes that the few extra dollars needed to complete the project will be raised in the next few months.

In the completed examination rooms, new cabinets, fixtures, drapes and paint have greatly improved the appearance, and have made the rooms easier to clean. For the reception area, a vestibule has been added to the entrance (pictured above) for energy conservation as well as new furnishings, drapes and paint for the room.

Two Classrooms Renovated in Connaway Hall

Work is nearly complete on two classrooms in Connaway Hall that have been renovated and furnished by means of a $12,500 grant given in November, 1977, by the Merck Company Foundation.

This grant from the Merck Company Foundation is one of a series of grants given under its Animal Health Education Series.

Research Funding, cont.

three are seeking the Ph.D. degree. Of the graduate students without the D.V.M. degree, nineteen are seeking the M.S. degree and five the Ph.D. degree.

Research Funding Problems

Dr. Murphy stressed that in spite of recent successes problems still remain with research funding. Inflation erodes these dollars. Furthermore, federal financing of research has regressed. Dr. Murphy feels that research backing was easier to obtain ten years ago than now.

On the other hand, several producer and commodity groups have become increasingly aware of the need for research in those particular fields that are related to improved productivity of food and fiber animals. When their resources have permitted, groups such as the Missouri Pork Producers Association have granted funds to College researchers.

Dr. Murphy noted that the private producer and commodity groups, and recently the federal government have shown more interest in backing applied research rather than basic research. He went on to say: "Based on limited funds and the immediate needs of producers and consumers, College researchers have had to work on those problems usually related to applied research. Nevertheless, we must still stress the importance of basic research. Without answers gained from basic research, everyone is at a loss to further develop applied research."
Pharmacy Moves

The College's pharmacy has moved to more spacious and efficient quarters. Its new home is the former necropys area in the Teaching Hospital. A new floor was laid, some walls were removed, and new paint was applied. The area underneath the Teaching Hospital Auditorium vacated by pharmacy's move will be converted into a seminar and auto-tutorial room for theriogenology and large animal medicine and surgery classes.

Referring to the new area, Mr. Charles Newsome, who is in charge of the College's pharmacy, said, "For the first time, all supplies and drugs are in one location."

Connaway Annex Gone

TD-7 or Connaway Annex, the converted P.O.W. barracks that had been in use at the College since 1946, has come down! Contrary to what you may be thinking, it has not spontaneously collapsed. Instead, campus administration has contracted with a St. Louis firm to remove the building. A parking lot will be built in its place.

The building has stood vacant since spring, 1977, when its last occupant, the Department of Veterinary Microbiology, moved its offices to Connaway Hall. This move was made possible by the completion of two new buildings for the College.

Funds for New Radiology Instrumentation

Funds totalling nearly $325,000 from several sources have been identified so that the College may begin to replace its aging radiology instrumentation. Dean Kenneth Weide said that College administrators and faculty have tried for four years to find the needed dollars. An additional $275,000 will be required to finish upgrading the entire area, including purchase of new instrumentation for the Equine Center.

What is planned for the $325,000 is the remodeling and equipping of one diagnostic room in the radiology area. A new X-ray machine would be purchased along with new imaging devices which would include spot film camera, television monitors, videocassette recorders, and capability for fluoroscopy and cinematography. The new instrumentation would come with ceiling tubemount and 1000 watt generator, three phase, with grid control, high speed rotor drive, automatic radiation control, and anode heat calculator. The room that will house this instrumentation will require some remodeling.

The instrumentation presently in that one room will be turned over to the company installing the new equipment. The old instrumentation, some of which was surplus from the UMC Medical School, has been plagued with repair costs of as much as $15,000 a year. In addition, film costs have been higher than normal due to an excessive number of retakes required on the old.

Remodeling and installation of new instrumentation will take place later this winter.

Faculty Publish


Veterinary Medical Review
College of Veterinary Medicine
and Cooperative Extension Service

Editor: Barry L. Siler, W-205 Veterinary Medicine Bldg.,
College of Veterinary Medicine, University of Missouri, Columbia, MO 65211

Return Requested

- Supported in part by the UMC Extension Division. - University of Missouri is an equal opportunity institution.