One of the year's Philotherian Prize winners, Jeri L. Cheraskin '87, caught this polar bear in mid-stroke.
For other winners at the 1987 Honor Day, see page two.
CORRECTION:
In the last issue of Veterinary Viewpoints, it was stated in the article "Fleas in the Lab" that fleas move freely from host to host. This is incorrect. According to Dr. Wade, fleas are natural "homebodies", preferring to stay on one host.

ALUMNI NEWS
If you're an alumna or alumnus and you've noticed that ALUMNI NEWS is missing from your issue, don't worry! ALUMNI NEWS plans a big, double issue for the next VETERINARY VIEWPOINTS with all the news on summertime reunions and class happenings.

VETERINARY VIEWPOINTS
Veterinary Viewpoints is published four times a year for friends and alumni of the New York State College of Veterinary Medicine, a Statutory College of the State University of New York. Correspondence may be addressed to Karen Redmond, Editor, Schurman Hall, New York State College of Veterinary Medicine, Cornell University, Ithaca, New York 14853. Telephone: 607/253-3740.
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TRAVERS FUNDS TO SUPPORT EQUINE RESEARCH

FOR THE SECOND consecutive year, the fund-raising activities of the Travers Committee have generated $60,000 in support of the Saratoga Performing Arts Center and equine research at the New York State College of Veterinary Medicine, Cornell University. Committee members drawn from the Thoroughbred and local Saratoga, New York, community devote considerable time and energy each year to the festivities surrounding the annual running of the Travers Stakes. Fund-raising and celebration are well mixed as demonstrated by a gala party in 1986 at which the auction of a lapis species of nematode parasites of the Thoroughbred and local Saratoga, New York, community devote considerable time and energy each year to the festivities surrounding the annual running of the Travers Stakes. Fund-raising and celebration are well mixed as demonstrated by a gala party in 1986 at which the auction of a lapis egg. An electromagnetic digitizing tablet is used to convert the perimeter of each egg studied into a set of X and Y coordinates. These X and Y coordinates are relayed to a computer and converted into 8 geometrical measurements (length, width, area, perimeter, and area and arc length of each pole). The geometrical measurements, in turn, are subjected to Stepwise Discriminant Analysis, a sophisticated statistical technique capable of classifying objects into defined categories by objective mathematical analysis.

During the first year of study, the computer program that transforms coordinate point data into geometrical measurements was developed, preliminary data for 20 species of nematode parasites were collected, and these data analyzed. The objectives of the second year of effort will be to apply statistical criteria to reject "undetectable" eggs, to expand the base of data for all species of equine nematode parasites and to determine the best way of grouping species to obtain efficient differential diagnosis.

- Dr. Jay Georgi and Dr. Maire O’Connor for the study “Differential Diagnosis of Equine Parasite Infections by Computerized Morphometry of Strongylid Eggs.”

- Dr. Richard Hackett and Normand Ducharme for the “Evaluation of Reliability of Endoscopic Examination in Diagnosis of Laryngeal Function in Racehorses.”

- Dr. Robin Gleed and Dr. Alan Dobson for the study of “Pulmonary Function and Performance in Anesthetized Thoroughbred Horses.”

One of the major problems connected with equine anesthesia is a shortage of oxygen in the patient’s blood, even though the patient breathes an oxygen-rich mixture through a breathing circuit. Drs. Gleed and Dobson have identified ways in which to minimize this problem through changes in the horse’s posture. They are now looking for drugs that will reverse low oxygen.

- Dr. Harold Hintz for his continuation of work on the “Effect of Training and Diet on Energy Utilization in Racehorses.”

Originally funded in 1986, this research is looking at the energy needs of racehorses, an area of equine research at Cornell that has previously focused on polo ponies and equitation school horses. This study seeks to determine some of the energy demands of race training by determining the post-exercise energy demands. Energy expenditure will be determined by measuring oxygen consumption. Since there is increased interest in the use of fats as an energy source in horses and fats have been shown to be well tolerated in horses as a dietary source of energy, the study will also assess the effects of a dietary energy course, fat versus carbohydrates, on the performance of racehorses. Physiological measurements of heart rate, and plasma lactate will be used to assist in the determination and understanding of differences in performance of these two groups. Dr. Hintz and graduate students Lynn Dunn and Vince Soderholm have already developed specialized instrumentation to measure oxygen consumption and carbon dioxide production of horses at hard work.

Recommendations for the allocation of Travers monies were made by the committee of Dr. Robert Playter, director of the Teaching Hospital. Mrs. Penny Chenery, director and past president of the Travers Committee, Dr. Donald Smith, chairman of the Department of Clinical Sciences, Mr. E. Barry Ryan, chairman of the College’s Equine Advisory Council, and Dr. Charles Rickard, professor emeritus of the New York State College of Veterinary Medicine who served as chairman.

MEMORIAL GIFT HELPS NEWBORNS

A GIFT OF $2,500 from Irene H. Kuipers has purchased a pulse/blood pressure monitoring machine for the Equine Neonate Unit. Mrs. Kuipers made the gift in memory of Marshmellow (a.k.a. “Chase the Wind”) the twenty-one-year-old Thoroughbred she affectionately called her own "beautiful partner and adversary." Marshmellow died in October 1986.

Mrs. Kuipers regularly attends equine seminars and programs offered through Cornell’s Programs in Professional Education, and has been generous in her support of the equine reproductive program.

Mrs. Irene Kuipers with Marshmellow.
RECEIVES $3 MILLION
endocrinology, Parturition and the Myome
tus in the uterus

The changing environment of the
brain. Other grants from the National
Institutes of Health support the pur
brain and, in turn, the body growth of
fetus which is under control of
hormones from the brain. Little is
known about contractures at this
point, not even what the normal fre
quency of contractures may be, nor
their correct pattern or rhythm. The
new grant will allow the research
group to monitor the changes in fre
quency and duration of contractures
when the mother experiences change
in medication, stress and feeding. This
is a first step in learning more about
contractures.

Studies on normal and abnormal
growth of the fetus

Further research will determine what
factors regulate the growth of the
fetus. The long-term goal of the Labora
tory’s research is to prevent abnor
malities which do not allow a
fetus to grow to its full capacity. The
normal growth of the fetus involves
normal maternal health and nutrition,
normal blood flow to the uterus and
proper placental function.

The timing of labor and delivery

According to Dr. Nathanielsz, fetal
development and timing of labor are
interdependent, as in the case of a
growth-retarded fetus delivered pre
maturely. In future studies of fetal
development, researchers plan to use
computers to continually monitor fetal
development and uterine muscle activ
ity and analyze their interrelationship.
They hope to be able to predict
abnormal labor and labor that may
occur too early with disastrous conse
quences for the fetus or the newborn.

Research information from all of these
studies may well provide substantial
economic and health savings. The
knowledge obtained will improve the
number and vigor of newborn live
stock. This research could also have
relevance for human pregnancy, where
studies such as these have already led
to improvements in human pregnancy,
ment of Clinical Sciences, and Drs. John King and Lois Roth of the Department of Pathology. Also collaborating were Hans Popper at the Mount Sinai School of Medicine at City University of New York, Robert H. Purcell at the National Institute of Allergy and Infectious Diseases and John L. Gerin in the Division of Molecular Virology and Immunology at Georgetown University Medical Center.

A preliminary report titled "Hepatocarcinogenicity of the woodchuck hepatitis virus," and describing some aspects of the work was published recently in the "Proceedings of the National Academy of Sciences."

Scientists have recognized a link between liver cancer in humans and infection with hepatitis B virus, but their data has been mainly from epidemiological studies. Whether the virus is the cause of liver cancer has been the subject of intensive study in recent years. "The results of our work provide strong experimental support for the view that the woodchuck hepatitis virus and, by analogy, the human hepatitis B virus are oncogenic viruses," Tennant said.

In their study, the scientists induced liver cancer in eight woodchucks from among more than a dozen animals that were experimentally infected with the woodchuck hepatitis virus (WHV) under controlled laboratory conditions. Six of the animals that developed cancer were infected with the virus soon after birth. Two were one year old when they were infected. "The animals developed liver cancer within 17 to 36 months after infection," Tennant reported. "The younger the animals, the more susceptible they were to development of persistent hepatitis infection and liver cancer."

Human infants also are more susceptible to chronic infection with hepatitis B virus than adults, according to Tennant. But the virus may remain inactive without producing any overt symptoms for 20 to 30 years. As a result, millions of adults around the world are carriers of the virus. Many infected people suffer from chronic hepatitis, which sometimes leads to liver scarring (cirrhosis). Ultimately liver cancer may develop.

Dr. Tennant said that the successful induction of liver cancer in woodchucks now establishes the woodchuck as a highly useful animal model for developing new strategies to treat and prevent liver cancer.

Although a vaccine is available and is now being used for human babies born to mothers who are the carriers of the virus, the success of this vaccine in preventing liver cancer will not become known clearly for decades, because the virus stays inactive until infected children become adults. "The model allows testing of new types of vaccines with results available in a few years," Tennant said.

Ultimately, drugs specifically designed to interrupt the replication of the woodchuck hepatitis virus should be directly applicable to the treatment of chronic hepatitis and liver cancer in humans, he added. Christoph Seeger, assistant professor of microbiology, who recently joined the faculty of the Department of Microbiology, is studying the mechanism of hepatitis B virus replication, work that ultimately may lead to an understanding of molecular events that initiate tumor formation. "With the woodchuck model, the door now is wide open for scientists to mount experimental studies that were impossible previously. We also believe investigations of the woodchuck have direct application to our continuing clinical investigations of the pathogenesis of acute hepatitis in the horse and to chronic hepatitis in the dog, diseases which have been suspected of being caused by a virus," Tennant said. The Cornell study is supported by the National Institute of Allergy and Infectious Diseases and the National Cancer Institute.

Yong H. Kim / Cornell University News Service

RABIES & A "HIGH RISK" CAREER

Vaccination Clinic Offers Measurable Safety

VETERINARY MEDICINE wouldn't seem to be a "high risk" occupation, but when it comes to rabies exposure, it ranks in the top. Recently, over 150 people lined up in the college's cafeteria for pre-exposure immunization to rabies; in all, 78 staff and faculty members and 80 students took part in the program conducted in cooperation with Garnett Health Center and under the direction of Dr. Dorothy Holmes. Dr. Holmes notes that despite working in an area where there is a low incidence of rabies, "Veterinary students at Cornell are considered members of an 'at risk' occupation and the vaccination series is recommended but not required." The series consists of three inoculations given this year on April 2nd, 9th and 23rd. Faculty and staff receive theirs free and the College underwrites one-half the cost of a student's vaccination series; the actual cost for the series is $36.00.

All students are offered the opportunity to receive the immunization and the vaccination clinics are well-publicized. Despite this, there is some initial reluctance. "First year students don't jump at the chance," says Holmes, "but as their exposure to clinic cases increases, so does their willingness to have the vaccination." Dr. Holmes estimates that approximately 90% of the students will be vaccinated by the time they are seniors. Practicing veterinary medicine without protection against rabies is not the death-defying feat it was once, although it still carries grave risks. Says Holmes, "In this area a student's chance of being exposed to a rabid animal is low. If an unvaccinated person is exposed, they're given human antiserum followed by five vaccine inoculations. I don't think there has been a rabies-related human death since this protocol was developed."

Some of the people who lined up for vaccinations also gave a blood sample as part of an on-going project with the Center for Disease Control (CDC) in Atlanta. Beginning in 1985 Cornell has been part of a field trial in cooperation with the CDC that is testing the efficacy of two different vaccines made essentially the same way but whose dosages, and routes of administration were varied - and some vaccinations were given at less than the recommended amount, and at various dilutions. The trials are an attempt to determine the safety points for vaccination - what minimum amount of vaccine provides protection. Thus far, no end point has been found; everybody who received the vaccine developed protective antibody titers. Dr. Holmes surmises that those people who received the lowest amount of vaccine won't maintain their titers as long as someone with the maximum dosage.

Although rabid animals are not common in most areas of the Northeast, it is important to remember that two boosters are required should rabies exposure occur in persons who have had prior vaccination. Even if titers are not measurable prior to the booster, the two inoculations result in a rapid rise in antibody level and will provide protection. Veterinarians working in areas where there is a high incidence of rabies, and, of course, people who work with the rabies virus in laboratories are at highest risk. The latter group receives what is considered abnormal exposure and their antibody levels are checked every six months to be certain they are protected against rabies. Veterinarians in rabies endemic areas should receive routine boosters every two years or have their titers checked.

* Exceptions to this general rule in the Northeast include the three "northern counties" in New York State of Jefferson Co., St. Lawrence Co. and Franklin Co. Students, faculty and staff lined up for rabies vaccinations at the recent clinic.
VITAMIN E & EYESIGHT

BLINDNESS IN DOGS, senile macular degeneration in humans and even cellular aging may be linked to a vitamin deficiency, according to Dr. Ellis Loew, retinal physiologist at the New York State College of Veterinary Medicine, Cornell. His research is linking vitamin E deficiency in the diet to severe changes in vision, including blindness, in dogs that may bear directly on the development of senile macular degeneration in humans.

Dr. Loew's investigations into vitamin E deficiency began with a nutritional study by Dr. Ben Shefty at Cornell's James A. Baker Institute for Animal Health, and Dr. Ron Riis in the Small Animal Clinic. In working with dogs deficient in vitamin E, Dr. Riis noticed the dogs also had eye lesions that produced night blindness and eventually, if the deficiency was long-term, complete blindness. The dogs were referred to Dr. Ellis Loew for an assessment of the physiological state of the eye. Using non-invasive clinical tests, he found that severe changes had indeed occurred in the neurophysiology of the eye that correlated with ophthalmoscopic and microscopic retinal damage.

With a college Biomedical Research Support Grant, and awards and grants from the National Eye Institute, regional Hatch funding, and Hoffmann-LaRoche, Dr. Loew with Drs. Riis and Shefty began studying the effects of vitamin E deficiency in young dogs and found that the retina degenerates if the dog does not receive vitamin E in the diet. Fortunately the retinal damage caused by vitamin E deficiency may be halted with early detection and treatment, a possibility suggested by field anecdotes. Breeders told of the occasional dog thought to have progressive retinal atrophy that improved when vitamin E was added to the diet. Progressive retinal atrophy, or PRA, is a serious genetic disease that affects the retina in a very similar way to vitamin E deficiency. As a result, the two could be mistaken for each other and PRA diagnosed when a vitamin E deficiency was actually at the root of the problem. PRA, however, cannot be controlled or cured with vitamin E supplementation.

Dr. Loew's present research concentrates on the interaction of vitamins E and A. Study has already shown vitamin E may not act alone in producing deficiency-related diseases; vitamin A, the “eye vitamin,” is probably involved. (Vitamin A is carotene and the most common source of the vitamin is carrots.) In the body, vitamin E helps maintain the balance between the free and stored forms of vitamin A. When not enough vitamin E is available, the proportion of free-state vitamin A increases. This high concentration of free vitamin A begins to destroy cell membranes. In vitamin E-deficient dogs with adequate vitamin A, the retinal damage is usually severe because the unregulated vitamin A is damaging cell membranes. However, if the animal is vitamin E and vitamin A deficient, the damage is less severe. By itself, a vitamin A deficiency would probably result in night blindness.

After studying the effects of vitamin E deficiency in young dogs, Dr. Loew will look at the condition in older animals. Will older animals develop the disease as quickly as puppies and how susceptible are older animals to vitamin E deficiency? What are the long-term effects of marginal vitamin E deficiencies in older animals? This information may tell us more about an age-related condition in humans. Dr. Loew’s research has shown that the central part of the dog's retina is more sensitive to vitamin E deficiency. This peripheral area of the human eye, the fovea, is also damaged in senile macular degeneration and it has been suggested that there is a connection between this condition and vitamin E deficiency. The association of vitamin E and aging is also shown in the accumulation in cells of the metabolic by-product known as “age pigment.” As we get older, “age pigment” gradually accumulates, but if vitamin E is lacking in the diet, the amount of “age pigment” builds up more rapidly.

In humans, a balanced diet provides adequate vitamin E. Dog owners anxious to provide their pets with the proper amounts of vitamin E should check their dog food storage habits before supplementing. Although most dog food producers add vitamin E and protective antioxidants to their product, oxygen in the air will react with and use up vitamin E. Owners should keep the dog food bag well sealed and/or buy amounts of food that are quickly consumed. Ultimately, the speed of vitamin E degeneration depends on environment, with an open bag in a warm room offering the most destructive storage.

TOUCHING THE NERVE
A Project to Identify the Cause & Treatment of Roaring

SURGEONS IN THE Large Animal Clinic of the Teaching Hospital are looking at the larynx of an anesthesitized horse in search of a nerve 2 millimeters in diameter. Although it is just possible to locate the nerve with the naked eye, it is many times easier with a new $17,500 operating microscope purchased through a project grant from the Harry M. Zweig Fund for Equine Research. The operating scope provides the magnification needed to delve into the neuroanatomy of the equine larynx. This close-up view of the larynx is part of a research project that hopes to shed light on the cause and surgical treatment of laryngeal hemiplegia, or “roaring”; probably the most common upper respiratory disorder in performance horses. With this particular operating scope, binocular co-observation is possible, allowing another surgeon to see the surgical field and assist by retraction and fixation of nerves and surrounding tissues. In addition, the image seen by both surgeons is simultaneously displayed on the television monitor for demonstration purposes and may be recorded for video playback. Dr. Normand Ducharme, assistant professor of clinical sciences, is the principal investigator on the project with co-researchers Dr. John Cummings, professor of anatomy; Dr. Richard Hackett, associate professor of clinical sciences, Dr. Susan Furini, assistant professor of clinical sciences, and Dr. Susan Hackett, a Ph.D. candidate.

In laryngeal hemiplegia, half of the larynx (windpipe opening) is paralyzed, reducing the size of the airway and causing upper respiratory obstruction. Horses with this condition suffer decreased athletic performance. Although there is a 5% clinically significant incidence of “roaring” in Thoroughbreds, some authorities feel that up to 95% of horses are affected clinically or subclinically. Using the operating scope the nerves that supply the equine larynx will be identified and injected with a neuronal marker. The marker will be used to “track” the nerves to the brain and spinal cord. The need for the nerve to be examined is affected and normal horses by light and electron microscopic techniques for a truly comprehensive pathologic study on the location and cause of the nerve damage that leads to roaring. The effectiveness of nerve transplant techniques for re-innervation eventually will be assessed.

Dr. Sam Hackett watches their progress on the monitor.
OPEN HOUSE 1987

The weather was sunny, the exhibits diverse, and the turnout exceptional as some 5,000 visitors made the rounds of displays at the 1987 Open House on April 11. There was something for everyone—information on heartworm disease, a horse-shoeing demonstration, a fistulated cow and milking cow, baby animals, reptiles, the how-to's of poison control, dog and cat nutrition, surgical preparation, ultrasonography, heart sounds and auscultation, electrocardiography, and an anatomy lesson with the painted horse and the painted cow. Buses shuttled crowds to the equine research park while back at the college there were free films, balloons, and an exhibition by a dog drill team. However, the cultural highlight of the day was the noontime performance by Dr. Georgi and his student brass ensemble.

NEW & RENEWED GRANTS

Health Management of Cultured Fishes. Co-Investigators: Paul R. Bowser, DVM, and Julia T. Blue, DVM. Hatch funding from the Agricultural Experiment Station, Cornell University, Department of Agriculture.

Genetic Functions of Conjugative Streptococcal R Factor. Principal Investigator: Gary M. Dunny, Ph.D. $102,110 from the National Institute of Allergy and Infectious Diseases.

The Determination of Intractable Organic Compounds by DLI/Thermospray LC/MS and LC/MS/MS*. Principal Investigator: John Henion, Ph.D. $263,087 from the Environmental Protection Agency, part of a three-year project funded by the EPA at $667,755.

Regulation of Calcium Channels in Heart Cells. Principal Investigator: William A. Horne, DVM. $68,536 from the National Heart, Lung and Blood Institute. Continuation of 5-year Physician Scientist Award.

Characterization of Glutamate Receptors and Ion Channels. Principal Investigator: Linda M. Nowak, Ph.D. $141,340 from the National Institute of Neurological and Communicative Disorders and Stroke. New Grant.


As Veterinary Viewpoints went to press, word was received that Dr. H. Hugh Dukes, died June 8, 1987 at his home in Des Moines, Iowa. His many friends and colleagues at the College wish to express their sympathy to the Dukes family on their loss. Dr. Dukes will long be remembered for his many contributions to veterinary physiology.

Dr. H. H. Dukes

**DR. H. H. DUKES PRIZE IN EXPERIMENTAL PHYSIOLOGY**

THE DEPARTMENT of Physiology at the New York State College of Veterinary Medicine and the Section of Physiology at Cornell have established a permanent endowment fund to honor 91-year-old H. Hugh Dukes, head of the department from 1932 until his retirement in 1960.

The Dr. H. H. Dukes Prize in Experimental Physiology will be awarded annually to a veterinary student who demonstrates evidence of scholarship and the potential of contributing new knowledge in the field of physiology. The first prize will be awarded in the spring of 1988.

Dr. H. H. Dukes was the first non-Cornellian to come to the faculty as a full professor and department head after the original faculty was established. Born in Saint George, South Carolina, he graduated from Clemson College in 1915, then attended Iowa State University where he received his D.V.M. with honors in 1918. By 1923, he had earned a Master's degree. For a time he was in practice at Greer, South Carolina, and he taught at Iowa State College. In 1932, Cornell's Dean Hagan asked him to head the Department of Physiology at the College of Veterinary Medicine. Dukes arrived at Cornell during the early years of the depression when both money and laboratory space, and animal housing were scarce. However, by purchasing some items at the local dime store and borrowing others from his wife's kitchen, he managed to establish an experimental physiology course in the abandoned basement of James Law Hall with quarters for animals in an old boiler room. Students were drawn to Dukes' lecture-demonstration method of teaching which emphasized the reality of physiological phenomenon as well as the conceptual framework of the discipline and the course was soon one of the most popular in the college.

Dukes was honored many times for his pioneer text, *The Physiology of the Domestic Animal*. It was published in 1933 and is now in its tenth edition. By the 1940s he was recognized as one of the leading physiologists of the day and he was invited to lecture around the country. In 1953 he went to Brazil to lecture and received an honorary degree at Rural University. At home, he was awarded the Alumni Merit Award in 1953 by Iowa State College and the Michigan Sate College Centennial Award in 1955. At Clemson an honorary D.Sc. was awarded to him in 1966. Due to his standing within the profession he gave the inaugural Sir Frederick Smith Memorial Lecture in 1965 at the Royal Veterinary College, University of London and in 1973 he received the "Distinguished Physiologist" award from the American Association of Veterinary Physiologists and Pharmacologists.

**PAULI TO HEAD PATHOLOGY**

BENDICHT U. PAULI, DVM, has been selected as chairman of the Department of Pathology at the New York State College of Veterinary Medicine, Cornell University. He was formerly director of research and professor in the Department of Pathology at Rush Medical College, Rush-Presbyterian-St. Luke's Medical Center. Dr. Pauli also held joint appointments as assistant professor in the Department of Biochemistry and General Surgery at the Medical Center.

The new chairman received his DVM degree in 1967 from the School of Veterinary Medicine, University of Bern, Bern, Switzerland, and in 1968 entered a residency in the university's Department of Veterinary Pathology where he completed work on his doctoral thesis in veterinary pathology in 1970. From 1970 until 1974 he was assistant professor in the Department of Veterinary Medicine, University of Bern. Dr. Pauli received the first Faculty Prize for Scientific Research while at Bern's School of Veterinary Medicine and a Swiss National Foundation for Scientific Research fellowship from 1974-1975, a period of 18 months.

Dr. Pauli joined the staff of the Department of Pathology, Rush Medical College in 1976 from a position as instructor and associate scientist in the Department of Pathology at the Tufts University School of Medicine, Boston, Massachusetts. Within the Rush Medical College he conducted laboratories and lectured on general pathology and histology. His research interests are in tumor neovascularization, invasion and metastasis. Dr. Pauli has authored or coauthored nearly 150 abstracts, articles, books and book chapters in his area of research.

A member of the New York Academy of Science, the American Society for Cell Biology, the American Association of Pathologists, and the Electron Microscopy Society of America. Dr. Pauli served as president of the Midwest Society for Electron Microscopists from 1981 to 1982. He is also a member of the International Academy of Pathology, the Tissue Culture Association, the International Society of Stereology, the European Society of Veterinary Pathology, and the Swiss Society of Pathology.

The Pauli family, Bendicht, his wife, Elisabeth, and their three children, are already settled in the Ithaca area. Dr. Pauli, an avid skier, is even looking forward to the resumption of cold weather.

**VETERINARY VIEWPOINTS**

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