REHABILITATION WILDLIFE COUNCIL

WILDLIFE JOURNAL

Vol. 3 No. 4 Winter 1980

Cataracts in Young Raccoons

There is concern among some rehabilitators that current infant raccoon diets may not be meeting the nutritional needs of this species. In 1978, Wildlife Rescue, Inc. (Palo Alto, CA) received 14 baby raccoons. Prior to release time, it was discovered that 12 of those babies had developed soft cataracts. The cataracts varied in degree from "minor changes" to extensive damage and blindness.



Taken from The Raccoons by Jack D. Stiver

A cataract is a "developmental or degenerative opacity of the lens."1 Degenerative cataracts can be caused by old age, some medications and other processes which cause a breakdown in the eye's lens. Developmental cataracts can occur congenitally (prior to birth) or during early life. The most common cause of congenital developmental cataracts is a maternal infection or virus (for example, rubella). Early life developmental cataracts can be caused by nutritional deficiencies, toxicity, infection and heredity metabolic changes.2

To detect subtle eye changes, the eye must be dilated and the lens examined under a bright light. All 14 baby raccoons were examined by a veterinary ophthalmologist after two of them started bumping into objects. If this medical process had not been done, Wildlife Rescue's raccoon team would have assumed that only the two babies were affected. There is no way to detect the beginnings of lens changes without ophthalmological examination.

There are two probable causes for the cataract development in these raccoons: maternal infection or deficient nutrition. It is possible that some kind of a virus passed among the adult raccoon community on the San Francisco peninsula and South Bay area, and that those pregnant females who were affected transmitted the virus to their offspring. It is also possible that the food provided to the raccoon babies was insufficient to their nutritional needs.

All the baby raccoons were initially raised on Esbilac (powder) formula. The compositions of natural raccoon milk, Esbilac (powder) formula and Borden's K.M.R. are given below:3

	Protein	Fats	Carbohydrates	Solids
Raccoon	30.0%	29.1%	35.0%	13.4%
Esbilac	33.2%	44.1%	15.8%	15.3%
K.M.R.	42.2%	25.0%	26.1%	18.2%

Esbilac and KMR are both lower in carbohydrate content than natural raccoon milk. If a body has insufficient carbohydrate for caloric output needs then it uses protein for energy. In the case of these babies, it is possible that some protein was metabolized for energy needs instead of buildling tissue. The eye, which is the highest percent protein of any tissue in the body, would be most likely to suffer changes during growth periods if the diet is protein deficient.

The lens consists of about 65% water, about 35% protein, and a trace of minerals common to other body tissues. Potassium is more concentrated in the lens than in most tissues. Ascorbic acid and glutathione are present in both the oxidized and reduced forms. There are no pain fibers, blood vessels, or nerves in the lens.4

Two of the raccoons were from the same litter. They were trapped a few days apart by a rancher, and turned over to the Santa Clara Valley Humane Society. They were approximately nine weeks old at acquisition. One raccoon (a female) was given to a family that has a very strong interest in natural foods. The raccoon was started immediately on solid, high quality foods. The other baby (a male) was raised by a family that bottle fed it Esbilac, and did not introduce any solid foods, for four weeks. The female raccoon was one of the few juveniles completely free of eye complications. The male raccoon went totally blind, and died after cataract surgery. This limited experience would seem to suggest a basis to "deficient nutrition" as a cause of these eye changes. Since the raccoons were from the same litter, a virus that affected the mother would, reasonably,have affected them both.

Of the two artificial diets, KMR is closer to the composition of natural raccoon milk than Esbilac. Is it close enough? If this is a "simple" caloric needs problem, is it sufficient to add some kind of caloric booster to the artificial diet of a baby raccoon? Have we been releasing raccoons with "minor eye changes", and not know it?

At the end of the season, the individuals involved in raising these raccoons met to discuss the problem. The following comments were raised. Since there is no definite proof what caused cataract development in so many raccoons, these comments should be taken as the basis for continued discussion, and not as solutions to an as yet undefined problem.

1. We must start all babies on solid foods as soon as possible, even when continuing to offer bottled milk. When do raccoon mothers start to bring home kill for their babies to play with and eat?

2. Can we assume that the first solid foods a baby raccoon would be introduced to would be meat protein? After ten weeks, when the raccoons leave their den for the first time, their diet may start to include more berries and fruits.

3. Do male raccoons have a higher growth rate? Do they need more nutrition and put on body weight faster?

4. Is there anything toxic in the distemper/DHL shots we give to the baby raccoons?

5. Can ground up (milk coated) puppy chow be added to bottle fed milk as a nutritional booster? Starting when? Is solid puppy chow a good "supplemental" day time food to provide a young raccoon?

6. What nutritional instructions do raccoon breeders give to the pet stores that buy their animals?

7. Diarrhea seems to be a fairly common problem with some young captive raccoons. Do continuing digestive problems affect food absorption and metabolism?

8. Is it necessary to add a calorie booster, such as Nutri-Cal, to bottle fed milk?

9. It has been suggested that tri-calcium phosphate, in addition to vitamins, be add to solid foods. The tri-calcium phosphate is less harsh to digest than straight bone meal, and the phosphate aids in a higher degree of absorption of the calcium than when

straight calcium, in the form of bone meal, is eaten. The vitamin supplement must provide D3 to complete this process.

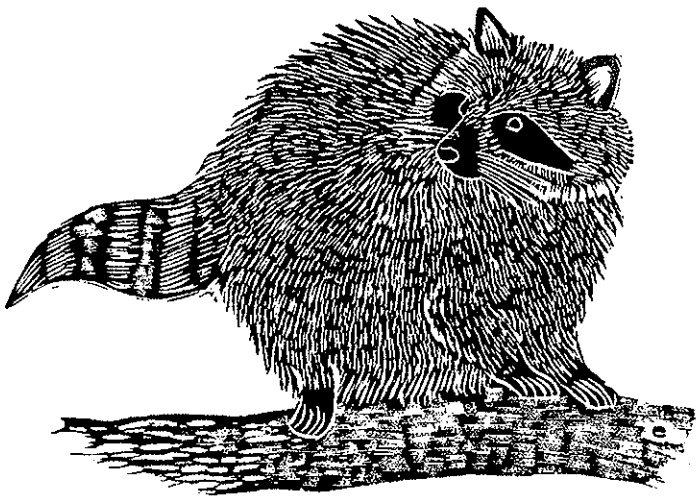
10. Is it harmful to raise a baby raccoon on a diurnal schedule (for our convenience) instead of its natural nocturnal schedule? Does exposure to bright light (for daytime outdoor play periods) have an effect on eyes which are adapted for nighttime vision?

11. "Predators tend to have milk high in protein and fat because the mother must, by necessity, be absent for long periods of time catching food."5 Both KMR and Esbilac are lower in carbohydrate than natural raccoon milk. How does this specifically affect raccoons raised on a non-natural diet?

12. Have some rehabilitators unknowingly been releasing juvenile raccoons with diet related undetectable eye changes? Have any of these raccoons gone blind in the months after release?

13. Was this experience an isolated incident? Could it have been prevented?

Liz Beard
Wildlife Rescue, Inc.



Emily Woodward

Footnotes

1. Berkow, Robert, M.D., Editor The Merck Manual of Diagnosis and Therapy, Thirteenth Edition. p. 1694.

2. Berkow, Ibid.

3. "Mother's Milk is Nature's Most Perfect Food." Handout from Smith-Douglas (Division of Borden Chemical, Borden Inc.)

4. Vaughan, D. and T. Asbury General Ophthalmology, 8th Edition. p. 137.

5. Fowler, Murray Zoological Medicine. p.234

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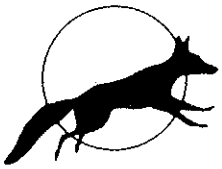
Berkow, Robert, M.D., Editor. The Merck Manual of Diagnosis and Therapy, Thirteenth Edition. Merck Sharp and Dohme Research Laboratories, Merck and Co., Inc., 1977.

Fowler, Murray E. Zoological Medicine - A Teaching Outline for Non-Domestic Mammalian, Reptilian and Amphibian Animal Medicine. U.C. Davis, 1976.

"Mother's Milk is Nature's Most Perfect Food." Handout from Smith-Douglas (Division of Borden Chemical, Borden Inc.)

Vaughan, D. and T. Asbury General Ophthalmology, Eighth Edition. Lange Medical Publications, Los Altos, Cal. 1977.

As this article indicates, there are many questions to be answered about the possible causes of soft cataracts in young raccoons. WRC plans to take a systematic look at this problem next year. Any organizations that would be interested in participating in a study should contact the Council or the Rehabilitation Paper Committe (Jan White, Jay Holcomb, or Susan Kelly). Participation would entail good record keeping and the presentation of study animals for ophthalmologic exam. Results will be published in the Journal.



LIVING DESERT RESERVE

The Living Desert Reserve was founded as an interpretive center for native plants and wildlife in 1953. The Reserve is a privately endowed membership organization dedicated to the preservation and interpretation of the native plants and animals of the Colorado Desert, with emphasis on education for the general public, particularly children. Thousands of youngsters visit the Reserve each year.

Currently the facilities include two major exhibit buildlings, McCallum Hall and Pearl McManus Hall, with capacity for large study groups and frequent nightime programs along with more than six miles of nature trails. The Chase walk-through aviary has just been added to the visitors area, permitting a close look at the native bird life of the low desert in near natural surroundings. In addition, 15 acres of Botanical Gardens are under development to feature examples of all of the major desert plant habitats of North America. The Reserve is comprised of 900 acres under lease from several governmental bodies and encompasses nearly every type of plant and animal habitat in the low desert.

Largely behind the scenes, the Reserve has recently started a rehabilitation program, primarily aimed at wildlife brought in by residents of the surrounding desert areas. In existence for about two years, the program has grown steadily, both in facilities and volunteers and in experience and knowledge. This program was instituted both by a concern for the wildlife involved and the lack of any such similar operation in a considerable surrounding area.

The temporary outdoor cage facility is currently being rebuilt adjacent to the completed Animal Care Center. This small facility has treatment, nursery, and quarantine areas and will replace the back of one of the exhibit halls as the rehabilitation program headquarters. The number of animals brought to the Reserve grow each year and include every type of animal found in the area. Emphasis has recently centered on raptors although other commonly treated birds are roadrunners, quail, hummingbirds, and water birds from the nearby Salton Sea. Water birds such as geese, grebes, and ruddy ducks are released on the many large man made ponds and lakes on the golf courses in the Palm Desert and Palm Springs area.

Probably the most common animal brought into the Reserve is the Desert Tortoise *(Gopherus agassizzi)*. More than 200 of these animals are brought into the Reserve each year. Many of them are sick (upper respiratory infections) from insufficient care and nutrition. Although the Reserve attempted a rehabilitation program to reintroduce these animals to the wild (in cooperation with the California Department of Fish and Game) it was abandoned for the present because of lack of manpower. The tortoises which come in are medicated when necessary, often involving daily treatment with antibiotics. They are then given to various turtle and tortoise societies for continued treatment, adoption, (of those animals too tame to be released) and release when appropriate. The Desert Tortoise is a protected animal in the state and as such can no longer be collected from its natural environment.

Also in conjunction with Fish and Game and the University of California at Riverside, the Reserve maintains a herd of California Desert Bighorn. These animals have been part of a cooperative research program for several years and presently we are concerned with disease factors in the local bighorn populations.

One of the main objectives of the Living Desert Reserve then is to introduce the public to the diversity of plant and animal life that does exist in the desert. Interwoven with that major objective is a commitment of the Reserve to that wildlife and a sincere desire that the desert ecosystem be able to be preserved and cherished in the future.

Fred V. LaRue
Living Desert Association
P.O. Box 1775
Palm Desert, CA 92260



From a Reader:

Thank you very much for your letter of May 7 regarding the raising of mustelids.

I have read Defenders' article on "Weasel Worlds" and found it very interesting. However, I still am looking for detailed information on their development.

We kept a domestic ferret (*M. furo*) as a pet for several years and I think this sparked my interest. Since then, I have visited Patuxent Wildlife Research (where the black-footed ferrets are kept) and collected information from various state and federal agencies. However, there is suprisingly little information on these mammals with the exception of journals such as the Journal of Mammology. I assume that very few of these mammals are raised from infancy, and attribute the lack of information to this.

Right now I am trying to gather information on the behavioral and physical development of young mammals. I am keeping a "colony" of mice and gerbils to study the development of their young, and of course, there are always the babies from the Humane Society. (Thank goodness for mothers--mine helps a great deal with the "midnight feedings" since I am still in high school and feeding babies takes a lot of time!)

Anyway, so far I haven't heard from any of your readers, but I'm sure I will and any information they have will be most appreciated!

Thank you again and please keep in touch!

Sincerely,

Sylvia Feder



P.S. I love drawing animals and if you ever need anyone to draw animals for you, I would love to do them!

9609 Wadsworth Dr.
Bethesda, MD 20034



WELCOME!

The following is list of WRC members who have joined or renewed since September 1979.

Susan Arnette, Dianne Beaton, Janet Boyle, Patricia Burry, JoAnn Camenzind, Toni Childress, Courtenay Dawson-Roberts, Mr. & Mrs. Robert Eichhorn, Brenda Geers, Linda Gaffy, Rachelle Hammerli, Bette Hawes, Bob Henke, Dave Johnson, Carl Jones, Gordon Lane, Mrs. Louis L. Layton, Linda Linde, Barbara Mcknight, Michele K. Oka, Phyllis A. Pierce, Nan H. Pipestrem, Patricia L. Quinn, Dr. Karen F. Snowden.

Organizations:

Eos Bird Rehabilitation, Inc.
Midland, Texas
Hawk Hidaway - Rehabilitation Laboratory
Cuba, New York
Lifeline for Wildlife
Ellenville, New York
Marine World Raptor Research Center
Redwood City, California

NOTE:

RACCOON PAPER IS READY!

After a whole year of writing and rewriting, Raccoon Rehabilitation, a guide to the care, handling and release of raccoons, is at the printer's. The principal authors, Jan White, Fairfield, CA and Debbie Marcum, Austin,Texas, deserve great praise for a job very well done. This paper should be an invaluable resource for anyone who cares for raccoons.

The Rehabilitation Paper Committee is interested in any criticism or suggestions that members may have regarding this latest effort. The intent of the papers is to provide enough information to enable an inexperienced rehabilitator to successfully raise and release a juvenile of the species involved.

All current WRC members will receive complimentary copies of Raccoon Rehabilitation. Additional copies will be available from WRC for $3.00 each plus postage.

Wildlife Conference Review

The Lee White Memorial Wildlife Conference was held on May 25th and 26th at San Francisco State University. The event was sponsored by the Wildlife Rehabilitation Council, the San Francisco Zoological Society and San Francisco State University.

The purpose of this year's conference was to disseminate information on the latest techniques of avian breeding and rehabilitation. In conjunction with this the topics of program management and funding were also discussed.

On Friday, May 25th Norman Gershenz, keeper at the San Francisco Zoo opened the program with a tribute to Lee White. Most of Lee's energy, during her brief lifetime, was devoted to public awareness programs dealing with native American wildlife and to habitat enrichment programs in the San Francisco Zoo.

Following Norman's introduction, Bill Spiker, trainer at Marine World, Africa U.S.A discussed the facilities at Marine World. His slide presentation showed the design and use of the nesting boxes, the incubator and the brooding set-up. He also discussed diet formulas. Many of the facilities used by Marine World were very innovative, as well as being quite inexpensive.

The afternoon presentations dealt with the newest methods being used for avian sexing.

Dr. Arden Berkovitz, the avian physiologist from the San Diego Zoo's Department of Research, started off with a slide show/talk on his work. He is presently doing research on fecal steroids. The technique involves isolating a bird to collect a fecal sample. The collected material is then analyzed for hormone levels to determine sex. The San Diego Zoo has been quite successful in sexing birds using this method, and they are doing analytical work of this sort for other scientific organizations for a nominal fee. If you are interested in this service, please contact:

Dr. Arden Berkovitz
San Diego Zoo
Dept. of Research
San Diego, CA

Dr. Michael Fry of the Avian Science Dept. at U.C. Davis, conducted a workshop on proper techniques for sexing birds with a laproscope. This mehtod involves making a small incision in the bird and then using the scope to look directly at the animal's gonads.

Dr. Fry also discussed his current work on chromosome analysis. This process involves using feather pulp to do a chromosome scan to determine sex in birds. The chromsomes are so minute that sexing by this method is tedious, but its advantage is that it does not stress the bird.

Norman Gershenz gave a short demonstration of waterfowl vent sexing with some rather uncooperative ducks!

Saturday morning was devoted to program funding and management--important topics of discussion for WRC members.

Speakers included respresentatives from the San Francisco Volunteer Bureau, the Packard Foundation (presenting the granter's view), San Francisco Zoological Society Development Office, and the Foundation Library, a grant reference facility in San Francisco.

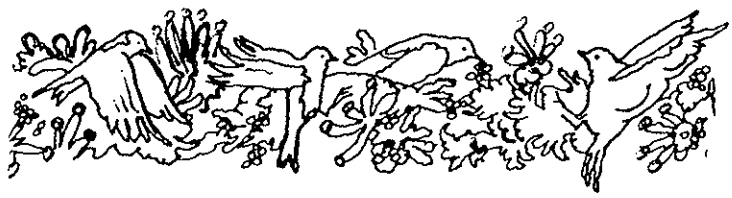
In the afternoon, Matt Mathews from the San Francisco Zoo's Raptor Rehabilitation Program showed a film on a successful Harris Hawk captive breeding project. The film made by George Nicholas, a California raptor breeder showed a full repertoire of breeding behavior from initial courtship to the point where t young were ready to leave the nest.

The other presentation Saturday afternoon was made by Terry Schulz of the U.C. Davis School of Veterinary Medicine.

He has done research on the natural histories of several species of owls in his area, in addition to work on owl physiology and rehabilitation. His informative slide presentation covered the most recent aspects of his work.

This was the first conference sponsored by WRC. It is hoped that there will be many more to come.

Nancy Schofield-Venizelos



Conference Committee

Carol Meaney
Nancy Schofield-Venizelos

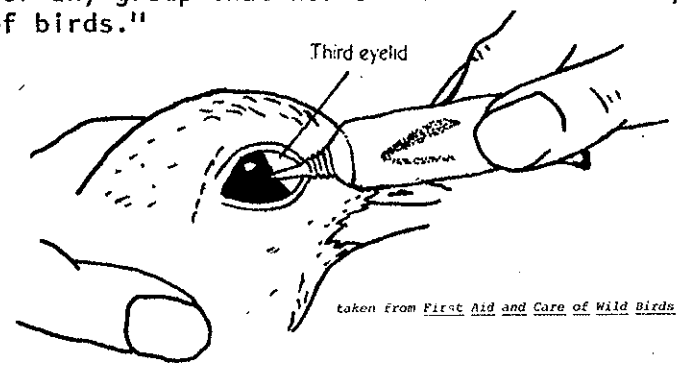
Special thanks to Seiko Watanabe of the San Francisco Zoological Society, who volunteered over fifty hours of her time to make this conference possible.

Correction and Recommendation

An article by Dr. Paul Redig entitled "Initial Exam, Differential Diagnosis and Treatment for Birds" was printed in the Summer 1979 issue of the Wildlife Journal. The editor did not realize that it was part of a longer article by Dr. Redig from First Aid and Care of Wild Birds, edited by J. E. Cooper and J. T. Eley (publisher: David and Charles, Great Britain). We wish to apologize for not giving them proper credit.

We would also like to recommend First Aid and Care of Wild Birds to all bird rehabilitators. Sandi Stadler of the Peninsula Humane Society Wildlife Department in San Mateo, CA has summed up the feeling of many rehabers who have already read it:

"First Aid and Care of Wild Birds has proved to be an invaluable source of information for our wildlife department. A county such as ours receives any and every type of bird. This book supplies facts that help us both on husbandry and medicine. We are now able to better recognize avian problems and deal with them immediately. I would highly recommend First Aid and Care of Wild Birds for any group that works with a wide variety of birds."



taken from First Aid and Care of Wild Birds

SECOND LEE WHITE MEMORIAL CONFERENCE

sponsored by

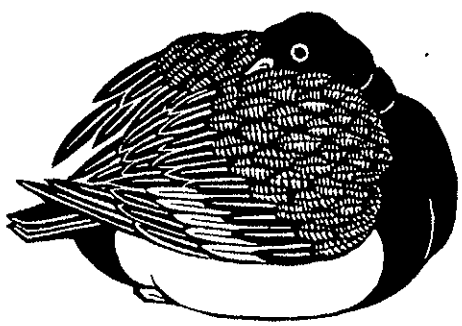
Wildlife Rehabilitation Council

San Francisco Zoo

This one day conference will be oriented toward problem-solving for wildlife rehabilitators. It will be broken into four subject areas--Housing, Diet, Medical Problems and Budget and Fundraising for Small Organizations. Moderators, who are experts on the particular subject, will lead group discussion on each topic.

Details, including names of moderators, exact cost, location (tentatively Los Altos, CA) and other pertinent information will be available by the end of January. To reserve a space and/or have information mailed to you when it is ready, please write:

Nancy Schofield-Venizelos
WRC Conference Committee
San Francisco Zoo
Zoo Road and Skyline Blvd.
San Francisco, CA 94132



MORE ON FAWN CARE

I would like to respond to Jay Holcomb's comments on the article on fawn care I wrote which appeared in the Summer 1979 issue of the Wildlife Journal. I want to begin by thanking him for the opportunity to exchange ideas and information. It would be nice to hear from other groups and individuals about what works for them and what doesn't.

In the fourth paragraph Jay mentioned a herd of eleven young deer that ran up to a solid wood fence because they overheard two strangers having a conversation on the other side. The only thing I could suggest about that is perhaps the deer were very tame. The fawns I have raised have always run to the middle of the yard where they would stand and quiver with ears up very nervous when anyone walks by the fence no matter whether they are talking or not. I do not restrict talking around the fawns. I have found that all baby animals imprint to a voice but if you also restrict contact to one or at most two people they know the difference between the person that cares for them and anyone else they may come in contact with.

In the sixth paragraph Jay notes that it has been his experience that fawns fed straight cow's milk always have diarrhea. It has been our experience that when fawns have diarrhea when they come in they have been overfed irregardless of what they were fed. Upon close questioning we found that often Karo syrup has been added to the cow's milk which adds to the problem of diarrhea as well. I do most definitely agree that cow's milk in large quantities can cause diarrhea.

In the seventh paragraph Jay seems to have been confused by the directions for the Foremost Fawn Formula, I apologize if there was any confusion as to the feeding procedure for the formula, those were the directions given to us with the Formula from Foremost Lab, because we feed the formula reconstituted it never occured to me that anyone would think it meant dry powdered weight. It most assuredly means the weight to be converted, (5 lb. fawn X 16= 80 X .10= 8oz.) to be divided into four feedings daily. This is the feeding schedule suggested by Foremost, as long as you increase slowly there is no harm in feeding more, this is merely a guideline to follow if you are unsure how much you should feed.

Jay mentions using a wet cloth to stimulate the fawn to defecate and urinate; I prefer using dry toilet paper when stimulating the fawns, it absorbs the urine and can be flushed down the toilet, thus eliminating the extra washing of wet and soiled wash clothes. I also should mention that as soon as the fawn is going on its own I stop stimulating them altogether, sometimes as soon as the second day.

I agree with Jay that a cardboard box is a safe place to raise a newborn fawn, but it is difficult to keep clean and doesn't allow very much light. We used to use bathrooms and laundry rooms years ago for fawns but there are certain problems with these. Fawns like to hide and will try to go behind washing machines and dryers. Bathtubs can be particularly hazardous unless they are enclosed and well padded. If you do decide to use your bathroom, be sure and remove the toilet paper, fawns love to eat it and what they don't eat they have fun pulling off the roll. I don't like the idea of using a closet at all unless it has a source of natural light and ventilation.

We have raised well over 300 fawns in playpens without one injury or problem of any kind. There is absolutely no way a fawn can get tangled up in the small mesh nylon the holes are ¼ inch or smaller and the mesh is very rigid when the playpen is up. The nylon me ceases to be transparent when the bedspread is over it, but it still allows light and airflow. If you use the large mesh (which was not recommended) or if you have holes in the mesh fawns could get tangled. The playpen is much easier to keep clean than a cardboard box (unless you change it frequently.) I found a fully enclosed cardboard box dark and stuffy, but this is something you will have to decide for yourself.

Sandra Fender
Wildlife Supervisor
Alexander Lindsay Junior Museum
1901 First Ave.
Walnut Creek, CA



Emily Woodward

Questionnaire Results

Last year WRC members responded to a questionnaire included in the Wildlife Journal, Opossum Rehabilitation Paper and the Informational Literature. Forty people sent back the questionnaire--a good response.

The following is a summary of the responses to each topic:

WILDLIFE JOURNAL

The great majority of the members are pleased with the Journal. They find it relevant and informative and are satisfied with the general format. Almost 20% felt that the articles were too technical, however, so the Journal committee will strive to keep the topics straightforward and readable without sacrificing the content.

The members also indicated a desire to see new members listed. Beginning with this issue new members will be listed as they join, and the Organizational members will be listed with their addresses once a year.

We received many good suggestions for articles and we plan to implement these suggestions in future issues.

OPOSSUM REHABILITATION PAPER

Overwhelmingly, the members found the information to be useful in the Opossum Rehabilitation Paper, but there were several suggestions for changes in format. Almost all of these ideas have been incorporated in the new Raccoon Rehabilitation Paper.

The members also felt that the species papers should be published separately from the Journal. We will, however, continue to publish short, in-depth articles on animal care in the Journal.

Again there were many good suggestions for future papers. Now we just need to find more people with the proper expertise who are willing to devote the great amount of time necessary to produce these papers!

INFORMATIONAL LITERATURE

Generally, the members were satisfied with the informational literature. The paper most in need of revisions was the Raccoon Care Sheet, and this has been replaced by the Raccoon Rehabilitation Paper. People would like to see the informational literature integrated into the Journal but also available as reprints. This may be accomplished by printing some articles as pull-out sections.

Check Your Local Pet Stores

Many communities have pet shops and feed stores, negligent in their care of animals and birds for sale. We all receive questions on what to do about such conditions and here are some answers I use.

1. Your dollars should not be spent in shops that maintain dirty bird cages or animal pens. Check the shop out on Monday morning and see if all of the creatures have food and water and a reasonable amount of soil from weekend collection. If the conditions of housing or the creatures are poor, tell the owner why you are not going to spend your dollars in that store.
2. Complaints must be filed with the Office of the City Attorney. If enough complaints are received, the office will investigate and force improvement in conditions. Your constant surveillance is required to maintain any improvement in the conditions in these stores.
3. If illegal animals are maintained, such as chipmunks or squirrels, call State Fish and Game and ask that they be confiscated.
4. Other legal creatures such as raccoons will never be removed as long as the public will buy them. Start writing letters to local and state officials pushing for banning of sale of these creatures. Write letters to editors of local papers and state what is going to happen to these creatures.
5. Your dollars and your pens are the only weapons you have in a fight to improve conditions for domestic and captive creatures in local stores. Keep in mind that stores that are careless about the creatures, probably are careless with the other supplies they sell. Your support keeps them in business.

The response of the public to these arguments had been positive. They are easy to understand, and positive in their approach to the universal problem of human animal care.

Carol Meaney
Wildlife Rescue, Inc.



CASE HISTORY:

A Screech Owl with Ocular Bee Stings

Wildlife Rescue, Inc. of Palo Alto, CA was called to pick up a Screech Owl found immobilized at the base of a large oak tree.

Initial examination showed no apparent injury to wings, legs or body. His appearance was that of an animal in shock--eyes closed and lethargic. The problem with his eyes was not at first apparent. Fortunately, Jinny Collins, the volunteer who rescued him became suspicious and examined his eyes more closely under a lighted magnifying glass. She was astounded to find several pinpoint bee stingers embedded in the eye. The bird was then transferred to Dr. Campbell and eventually was successfully released.

The following is Dr. Campbell's report:

The ocular examination of a Screech Owl displayed the toxic and traumatic effects which resulted from the repeated penetration and insertion of bee stingers into the cornea and adjacent ocular tissue. Due to the numerous bee stings it was impossible to separate the traumatic effects from the toxic effects.

The initial corneal result was a loss of epithelium over a substantial portion of each cornea. This produced a cloudy appearance to the cornea with an obvious loss of transparency. Portions of four or more bee stingers could be observed within the deep corneal layers.

The most striking ocular effect was the accumulation of a brown, fibrinous material in the anterior, or inner portion of the eye, in front of the iris. In addition, the otherwise yellow colored iris now was brown in color. The effects probably resulted from the absorption of toxin into the eye, which produced a localized vascular response and resulted in the exudation of fibrin and pigment. This response in the left eye was so severe as to completely obstruct visualization of the iris.

Treatment (Atropine 1%; Neomycin Sulfate; Dexamethasome in combination) was directed for the prevention of a secondary infection, to reduce the corneal inflammatory response and to minimize the possible intraocular complications.



Within one week the corneal epithelium of both eyes had begun to regenerate with a reduction in the size of the ulcer. The intraocular inflammation had subsided and had begun to clear, so that an accumulation of cells on the inner aspect of the corneas could be seen. Seventeen days after the initial examination the corneal epithelium of the right eye had completely healed, leaving a moderate subepithelial scar at the site of the original ulcer. The inner portion of the right eye had also cleared. The yellow iris was visible, the pupil was mottled and only a little fibrin was present on the anterior surface of the lens. The left eye also showed remarkable healing with a small epithelial defect. The inner portion of this eye still had fibrin in the ventral portion as adhesions between the iris and the cornea, and the iris and the lens.

Although the bird was not examined after this time, it is remarkable that the cornea showed little response to the bee stingers that remained. The right eye had healed satisfactorily and should provide good vision for the bird. Any further changes in the left eye were really up to Mother Nature and hopefully she wisely allowed the eye to recover.

Lewis H. Campbell D.V.M., Dipolmate, American College of Veterinary Ophthalmologists
Adobe Animal Hospital, 396 First Street, Los Altos, CA 94022

Wildlife Journal Editorial Staff:

Ann Brice
WRC
Susan Kelly
Peninsula Humane Society
Charlene Modena
Marin Wildlife Center
Tina Papenhause
The San Francisco SPCA

THE FOLLOWING IS A LIST OF THE INFORMATIONAL LITERATURE AVAILABLE FROM WRC:

Copies may be ordered for 50¢ each unless otherwise noted. There is also a postage and handling fee of 50¢ for 1-5 papers, 75¢ for 6-10 papers, and $1.00 for more than 10 papers.

"Care and Feeding of Orphaned Birds"
"Raptor Care"
"Emergency Care of Birds and Squirrels"
"Vector Born Disease Potential in California Mammals"
"Care of Sick and Injured Birds"
"Gardening to Discourage Deer Damage"
"Care and Feeding of Bushtit Babies"
"Great Horned Owl Case Study"
"Necropsy Precautions and Procedures"
"WRC Wildlife Care Problem and Solution Paper"
"Care and Feeding of Jack Rabbits"
"Cliff Swallows"
"Substitute Diet for Orphaned Birds"
"Substitute Diet for Orphaned Mammals"
"Care and Feeding of Orphaned or Abandoned Tree Squirrels"
"Water Turtle Care Sheet"
"Initial Care of Injured or Oiled Water Birds"
"Raptor Care and Rehabilitation" Unbound ($7.50)
"Care and Feeding of Baby Doves and Pigeons" ($1.50)
"Avian Drugs and Dosages" ($3.50)
"The Opossum Rehabilitation Paper" ($2.00)
"Our Hummingbirds" ($2.85)



WRC's membership is over the 200 mark for the first time, and about a third of the members live outside of California. In an effort to encourage more organizations to join, the Board of Directors voted to reduce the dues of the "Organizational Member" category from $25 to $20. Once a year a directory of all organizational members will be printed in the Journal. New members in all categories will be acknowledged in the Journal as they join.

If you would like information on organizational or individual WRC members in your area please write and ask for it. You may be surprised to find that there are fellow rehabilitators close by.

FAWN FORMULA

It is time for everyone to order their Fawn Formula for this spring. We have to have our order in no later than January 25th. The formula comes in 50 lb. boxes and should cost between $55 and $60 a box. The exact price depends on the total amount purchased. Please let us know soon; if you don't get your request in you probably will not be able to get any at the last minute. You can order by contacting Sandra Fender at the Alexander Lindsay Junior Museum (415) 935-1988 or mailing your request to WRC. P.O. Box 3007, Walnut Creek, CA 94598.

WRC QUARTERLY MEETING

Date: January 12, 1980

Place: Marine World, Africa, U.S.A.
Belmont, CA
(take Ralston Ave. exit off U.S.101)

Time: 10:00 a.m. Business Meeting
11:00 a.m. General Meeting

Topic: Marine World, Africa, USA: Facts and Fantasy

Speaker: Mary Rose Spivey
Curator, Birds of Prey

INTERNATIONAL RAPTOR DISEASE SYMPOSIUM

A symposium entitled "Recent Advances in Raptor Diseases" will be held on July 1-3, 1980, at the Zoological Society of London, England. The program will be divided into Pathology and Microbiology (Day 1), Surgery and Anesthesia (Day 2) and Medicine and Therapeutics (Day 3). Organizers of the Symposium are J.E. Cooper and A.G. Greenwood (United Kingdom) and P.T. Redig (United States). Further details, including a provisional program, can be obtained by writing:

Dr. P.T. Redig
University of Minnesota
College of Veterinary Medicine
St. Paul, Minnesota 55108