

THE BROLGA BUGLE

INTERNATIONAL CRANE FOUNDATION
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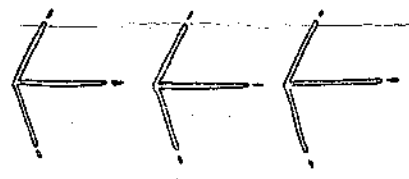
International Crane Foundation Quarterly Newsletter

Volume 6, Number 3 — City View Road, Baraboo, Wisconsin 53913, U. S. A. — A Non-Profit Organization — August, 1980

MAKING TRACKS Sino-Soviet Month at ICF

- news of the foundation

by Ron Sauvey, ICF Cofounder



In George Orwell's 1984, alliances between nations changed hourly, and countries became friends, then enemies, and then friends again with bewildering speed. While international diplomacy in 1980 doesn't quite resemble Orwell's topsy turvy scenario of 1984, times are certainly unstable and nations friendly twenty years ago are unfriendly, and vice versa.

Conserving cranes and other rare birds in such a world may become increasingly difficult because many of the endangered forms fly seasonally between one nation and another, and efforts to aid any one species must necessarily occur on an international scale. The work of the International Crane Foundation, which is a non-profit, non-political organization, takes on added importance since it is often possible for ICF to coordinate conservation practices between countries that have no formal agreements on wildlife protection.

A recent example concerns the Eastern White Stork (*Ciconia boyciana*), a tall, stately Asian relative of the familiar European White Stork. Through an ICF initiative, the Soviet Union will be sending several pre-fledged young of this species to our facility at the Vogelpark Walsrode in the Federal German Republic (West Germany), a country which has no cooperative agreements on wildlife conservation with the Soviet Union. Under the care and expertise of the Walsrode Vogelpark, we expect the young storks to ultimately produce offspring which will be used to reintroduce this species to areas within Japan and other far eastern nations that have lost their own storks.

In the same spirit, ICF this May hosted visiting delegations of naturalists from the Soviet Union and the People's Republic of China. Both were here to discuss crane conservation in Asia, including the fate of the Siberian Crane (*Grus leucogeranus*), a species which the two nations share.

This elegant, snow-white crane with a bright red face breeds in the far north of Soviet Asia and winters somewhere in east-central China. Since 1973, ICF has been working closely with Soviet ornithologist Dr. Vladimir Flint on the conservation of this extremely rare crane. Although strictly protected by law in the Soviet Union, the Siberian Crane ranges through such remote areas that few concrete measures are possible to insure their safety. In 1977 and 1978, ICF in coop-



Dr. Tso-Hsin Cheng of the Peking Zoological Institute.

eration with the U. S. Department of Interior imported a total of eleven eggs of this species from the U. S. S. R. from which we hatched and reared six birds. These birds are the vanguard of a captive population from which we will stock new and safer areas of the Soviet Union.

Last year, the Soviets started their own captive propagation center at the Oka State Reserve some three hundred miles east of Moscow. In order to gain experience in crane aviculture, two Soviet scientists, Dr. Sver Priklońsky, Manager of the Oka Reserve, and Arcadii Klepikov, an official of the Ministry of Agriculture in Moscow, spent ten days at ICF taking part in propagation techniques and discussing the ideal facilities for their new center. This summer, Dr. Flint will return to the Siberian Crane's breeding grounds to collect more eggs for the Oka Reserve.

Also in May, Dr. Tso-Hsin Cheng, China's premier ornithologist and a member of his country's prestigious Academy of Sciences, spent two short but eventful days at ICF. As Dr. Cheng was the first Chinese ornithologist to visit ICF, we were anxious to show him the work going on here and to discuss the possibilities for cooperative studies between ICF and China, a country which harbors seven of the world's fifteen species of cranes. A recurrent subject of our talks was the great need for the Chinese to find where the Siberian Crane is wintering. The location of this wintering area within China should enable us to more accurately census the current numbers of this critically endangered bird and to keep tabs on its status in the future.

The Soviets and Dr. Cheng were not here concurrently. Diplomatic relations between their countries are not cordial at the present time, and the two na-

APRIL
4 Burke, a Red-crowned Crane at ICF, begins testing a radio transmitter that UW-Madison researcher Scott Melvin hopes to attach to migrating Whooping Cranes this fall.

21 Baraboo High School senior biology class begins behavioral study of ICF's non-breeder flock.

27 Kerry Hoffman, ICF aviculturist, attends AAZPA Regional Conference in Cincinnati, Ohio.

MAY 1
Chinese ornithologist Tso-Hsin Cheng visits ICF.

MAY 11 (Mother's Day) A Red-crowned chick, Masanobu, hatches - ICF's first 1980 offspring!

17 ICF's Board of Directors meets.

22-29 Soviet dignitaries visit ICF.

23 First prairie planting at ICF's new site

24 Chris and Vicki LaRue, ICF aviculturists, leave for new positions with Sonora Desert Museum, Arizona.

30 ICF co-founder George Archibald testifies at California Fish and Game Commission hearing regarding captive propagation of California Condor.

JUNE
1 Robin Kaun, John Riley, Shirley Russman, and Shelley Shreffler begin summer internships at ICF.

4 ICF Director Owen Gromme opens an exhibit of his paintings in a Milwaukee Public Museum hall named in his honor.

6 Steve Landfried, ICF Public Affairs Officer, attends Environmental Conference in India.

6 Thunder, a Red-crowned Crane, hatches from an egg laid by Sauwaka, who also hatched at ICF. We're grandparents!



Svat Priklońsky, Arcadii Klepikov, George Archibald, and Ron Sauvey sign protocol for continued cooperation between ICF and USSR.

25-27 Dharmakumarsinghi, one of India's most distinguished ornithologists, visits ICF.

(continued on page 2)

ABS AIDS SEMEN RESEARCH

by
Mike Putnam, Aviculturist
Shirley Russman, ICF Researcher

The sixth Red-crowned Crane (*Grus japonensis*) hatched at the International Crane Foundation this spring has been named "Abs" as an expression of appreciation to American Breeders Service (ABS) of DeForest, Wisconsin for their help and support. ABS, the nation's leading producer of bull semen, has been most generous in aiding our studies of crane semen.

American Breeders Service was founded in 1941 in Illinois by J. Rockefeller Prentice, and was later moved to Wisconsin and sold to R. Grace and Company. In the early 1950's ABS developed techniques to freeze, store, and transport bovine semen. Using these methods, ABS has shipped frozen semen to all 50 states as well as sixty-five foreign countries.

The generosity of American Breeders Service toward the International Crane Foundation (ICF) began in the 1979 breeding season when they allowed us to use a liquid nitrogen tank which maintains frozen semen at -196 degrees C. Their tank was sent to Dr. George Gee, who has been freezing crane semen at Patuxent Wildlife Research Center in Laurel, Maryland. The tank was returned, via bus, with frozen Whooping Crane semen intended for Tex, our female Whooper. This was the first time frozen crane semen had been shipped. ABS allowed us to use the tank throughout the breeding season for storage.

That same year Dr. John Sullivan, Director of Production Laboratories and Research, and Dr. Marvin Pace, Associate Director of Research of ABS, were instrumental in organizing our preliminary work on freezing crane semen, and made their laboratories available to ICF staff. Two freezing methods were tried. The first method, developed by Dr. Tom Sexton of USDA in Beltsville, Maryland and George Gee, involved dropping crane semen with a chemical "extender" added on dry ice, forming pellets. The second method involved a more gradual cooling process modeled after the ABS method used for bull semen. ABS also allowed us to use one of their phase-contrast microscopes - a vast improvement over our old field microscope.

This year ABS again sent us a tank for shipping and holding Whooping Crane semen. Since Tex laid no eggs this spring, ABS is storing the extra semen until next spring. It is important that ICF develop and implement an effective method for freezing crane semen. On a number of occasions females have continued to lay eggs after the males have gone out of breeding condition and ceased semen production. Having frozen

semen available for artificial insemination would allow ICF to produce a maximum number of fertile eggs each year. Equally important, frozen semen can be shipped to various breeding centers to help increase genetic variability in captive flocks of endangered species.

ICF is also fortunate to have Shirley Russman here this summer. Shirley is an M. S. student at the University of Illinois doing research on crane sperm morphology. Shirley will be comparing head length of sperm in the various species of cranes at ICF. Her research will enable us to distinguish normal from abnormal sperm and may furnish an explanation of why males who produce good quantities of motile sperm are not successfully fertilizing eggs. Dr. Sullivan, an expert on semen morphology, Dr. Pace, and Elinor Waterman of ABS will be helping Shirley with her project this summer and next spring by providing needed equipment, along with advice.

We hope to gain much useful information from Shirley's study and improve semen freezing techniques with the help of the people at American Breeders Service. Thanks again to ABS for their continued support.

A. I. - WHY?

*Progeny may come and go
Starting merely with "Hello".
The male and female think it's great
To simply, slyly, propagate.*

*The natural way, we all agree,
Is fun, and more, it's all for free.
To us it's only common sense
To think in terms of future tense.*

*But cattle, sheep, and avian friends
Sometimes won't go to "bitter ends".
They don't agree that it's a treat.
Perhaps, to them, it's indiscrete!*

*But Man just can't respect their wishes.
He probes inside their secret fissures.
It seems he cannot tolerate
Just leaving each to his own fate.*

*So, join the crowd - syringe in hand.
We'll fertilize throughout this land.
And after them - well, wait and see.
You may be next - or even Me!*

-Burton A. Russman*

*Dr. Russman is the father of ICF researcher, Shirley.



Thunder and Twinkle, ICF's first grand-chicks, romping on a summer afternoon.

EGGSTRA, EGGSTRA (Read all about it!)

by
Kerry Hoffman, Aviculturist

The AI (Artificial Insemination) season began in early February this year. Despite sub-zero temperatures, our crack AI team was prepared every morning at 8:00 to make its contribution to crane conservation. We can all remember days when the semen froze before we could inseminate the females, and the day when we discovered we couldn't collect semen from the males if we wore gloves. It was a long, cold spring.

But looking back at those days from the balmy comfort of summer, they don't seem as long or as cold. The results of those early-morning liaisons can now be seen in the chick house at ICF. We have six beautiful Red-crowned Crane (*Grus japonensis*) chicks to warm our memories of those February mornings.

This year the champion egg layer was, as usual, Zhurka, a female Red-crowned Crane on loan from the Moscow Zoo in the USSR. This season she laid 14 eggs. As cranes normally lay only two eggs a year, this represents seven years of production in one season.

Hirakawa, one of our female Siberian Cranes (*Grus leucogeranus*) laid seven eggs this season and was the focus of a great deal of attention. This species has never been raised in captivity, but this year we had four fertile eggs out of the total of seven. Every time an aviculturist attempts to breed a new species in captivity for the first time, however, he or she is presented with a puzzle. Not an ordinary puzzle, but one in which some of the pieces are missing. None of our fertile eggs was able to hatch. We have to find one last piece of the Siberian Crane puzzle before ICF can claim another "first". Our researchers are working hard to find that missing piece.

Sauwaka, a female Red-crowned Crane, has to be given this year's "Mother of the Year" award. She was hatched here in 1976 and this year produced two beautiful chicks. These two, Thunder and Twinkle, are very special to all of us as they represent the first second-generation births at ICF.

The other females who laid eggs this year were two White-naped Cranes (*Grus vipio*) named Bette (4 eggs) and Amazon (3 eggs). Priscilla, our Stanley Crane (*Anthropoides paradisea*) laid an egg and Gloria, our Eastern Sarus Crane (*Grus antigone sharpii*) has laid four eggs to date. She has only just begun, and so have we.

Sino-Soviet Month at ICF

(continued from page 1)

tions have no cooperative agreements on wildlife. Yet both China and the Soviet Union are determined to preserve a bird which spends a portion of its life cycle within their respective borders. ICF is now acting as intermediary in the process to save the Siberian Crane. Through our contacts with both sides, ICF hopes to coordinate the most effective plan to preserve this precious international resource.

We would like to thank the Office of International Affairs - U. S. Department of Interior, the Soviet Ministry of Agriculture, the Oka State Reserve, and the Chinese Academy of Sciences for their assistance in our continuing efforts to conserve the Siberian Crane.

TRIALS OF YOUNG MOTHERHOOD

by
Paula Strasser, Aviculturist

By Wednesday we'd had it! Our young Sarus Crane, Clive, had laid four eggs and had broken three of them. The fourth was rescued only because she practically laid it in front of me and I was able to whisk it out of her pen before she smashed it. This is Clive's first breeding season, and as sometimes happens, she had to be taught what to do (and what not to do) with eggs. They were just strange objects that appeared suddenly in front of her. Cranes, we've found, explore everything new with their beaks first and ask questions later.

On a whim, ICF researcher John Riley (who wanted to measure the temperature inside Clive's eggs) and I decided to place a plaster egg of John's design into Clive's nest to see what she would do. She seemed very interested in the new object when it appeared in her nest on Thursday evening, then spent the next twenty-four hours picking and pecking at it, eventually opening the egg and excavating a crater. (See photo). The plaster egg was removed from the nest on Friday evening. On Saturday Clive produced a whole, real egg, and has been a dutiful mother ever since: sitting on the egg, turning it with the utmost care, and yes, even defending it against her aviculturist

friends who want only to give her fresh feed and water! We're hopeful that the egg will hatch sometime around August 5. We should be able to obtain valuable information in the meantime, since John is getting ready to attach heat-sensing probes to the egg - obtaining data which should refine our artificial incubation procedures.

As for Clive, her motto seems to be: If you can't break it, sit on it!



A battered egg

Brood Patches In Cranes

by
John Riley, ICF researcher

This June at ICF Japanese ornithologist Yoshimitsu Shigeta and ICF researcher John Riley found something that cranes have had for 60 million years. John and Yoshi were the first researchers to discover that cranes possess brood patches.

John is currently studying egg temperatures under nesting cranes at ICF. He and Yoshi were examining incubating Common Cranes to find out how the birds were applying body heat to their eggs, and discovered the brood patches.

Birds are the only warm blooded animals that lay eggs. This poses a special problem, because the embryo developing inside the egg must be kept at a temperature near the body temperature of the adult.

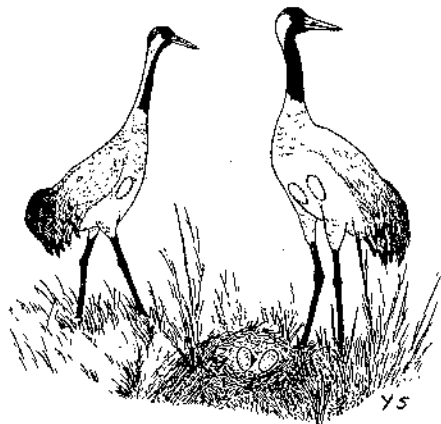
Birds have developed several ingenious solutions to this problem. One group of birds, the Megapodes, bury their eggs in mounds of decaying vegetation. The heat given off by the decaying plant matter provides the heat needed to incubate the eggs. Boobies and gannets have an equally unusual solution: they incubate by standing on their eggs and conducting body heat through the vascularized skin of their feet. The majority of birds, however, sit on their eggs and apply heat from the breast. Most of these species have developed specialized areas called brood patches, which permit a more efficient transfer of heat to the eggs.

A brood patch is, quite simply, a piece of unfeathered hot skin which develops under hormonal control. When a crane comes into breeding condition two areas on either side of the sternum become defeathered (see drawing) and the skin becomes loose and richly supplied with blood vessels. Both male and female cranes develop brood patches, since both participate in incubation. When an adult crane is in full breeding condition the brood patch is reddish and has a temperature close to the internal temperature of the bird. With the brood patch, the incubating parent can maintain the temperature of the egg as if it were an extension of its own body.

When settling down on the egg the parent rocks from side to side to insure adequate contact between brood patch and egg. The parent then maintains unbroken contact with the egg for up to several hours, standing only to turn the egg (to insure even heating) or exchange places on the nest with its mate.

When the egg hatches, or if the parent stops incubating for other reasons, the brood patch loses its reddish color and turns bluish, the usual skin color in cranes. The feathers then grow back as the crane comes out of breeding condition.

This important discovery indicates that cranes maintain a more exact thermal environment for their eggs than was previously thought. In addition, the condition of the brood patch may be a reliable indicator of the bird's breeding state. Finding the brood patches is a significant step forward in our understanding of incubation biology, and an appreciated insight into the fascinating world of cranes.



○ indicates location of brood patch.

Drawing by Yoshimitsu Shigeta, ICF researcher

Planting Day

by
Konrad Liegel

Ecosystem Restoration Program Coordinator

One sunny morning in late May, a group of determined volunteers walked out onto a freshly plowed field at ICF's new property and restored a prairie. Well, it wasn't quite that easy - hundreds of hours were spent in preparation: hand collecting seed from relic prairies, cleaning seed, and designing the restoration experiment. But things happened fast on planting day. Our stalwart volunteers picked up bags of the precious native seed and dispersed to their appointed places. Then all began scattering the 72 species by hand, shouting words of encouragement to the seeds as they fell into place. In less than an hour the "prairie" was in the ground, and all hands joined in a furious rain dance.

Then day after day ICF staff strained on hands and knees to find some sign of new life coming from the parched soil. A month passed. Finally the first faint green of the germinating seeds appeared. With Wisconsin Garden Club Federation members contributing the "seed money", the prairie restoration, christened Federation Fields in honor of WGCF's generous support, began to grow.

The prairie planting signaled the beginning of the Ecosystem Restoration Program at ICF. This habitat restoration program, coordinated by ICF's plant man, Konrad Liegel, will transform the rolling, sandy hayfields and kettle-hole depressions of ICF's new site into the prairies, marshes, oak openings, and oak forests of pristine Wisconsin. ICF's new site will become a refuge for over 150 native wildflowers and grasses which are rapidly vanishing from Wisconsin's cityscape and countryside. Reversing loss of crane habitat, by restoring an example of the prairies and marshes where Sandhill and Whooping Cranes once danced, is the goal of ICF's Ecosystem Restoration Program. Restoration is the work of "putting back the pieces" - an answer to the foolish and unethical destruction of natural ecosystems.

Plant community restoration, like endangered crane restoration, is still in its infancy. ICF's Ecosystem Restoration Program therefore has an important experimental aspect. How are desired numbers of mature plants translated into amounts of seed to be planted? What happens to bird, small mammal, and insect populations when pastures, plowed fields and



Volunteer Richard Howell casts a fortune's worth of prairie seeds to the four winds.

woodlots are restored to prairie, oak savanna, and oak forest? These are some of the questions the Ecosystem Restoration Program wishes to answer in its effort to better understand how to "put back the pieces." Accordingly, ICF student researchers Alexis Duxbury, Matt Goethel, Robin Kaun, Kuni Momose, and Shelley Shreffler have undertaken studies of the land-use history, soils, vegetation, small mammals, and nesting birds of the ICF property, under Konrad's direction.

The Ecosystem Restoration Program has also enlisted the involvement of the University of Wisconsin-Madison's School of Landscape Architecture. The Landscape Department has adopted the ICF property as a field station for courses and student research projects in the design, restoration, and management of native plant communities.

Most important, however, is the educational message the public will receive as they tour the restored environments. Visitors will see part of their forgotten natural heritage - the vegetational mosaic that covered this part of Wisconsin at the time of European settlement. For many, the sight of rolling uplands of "prairie dropseed" and "little bluestem" turning the landscape russet-orange in the October sun, or of a Sandhill Crane, calling from among the cattails of a restored prairie marsh, will be a new and arresting experience. Perhaps, through this experience, we will better understand the wild's place in a crowded world.

REACHING OUT THROUGH TOURS

by

Marge Winski, ICF Tour Guide

Many people are surprised to see birds when they visit ICF for the first time. Often they expect to see huge machines, and are quite surprised to find delicate cranes dancing in their pens.

Tours have been a major focus of the education program this spring, with over 1,000 people visiting in May alone. Many school groups have included an ICF tour as part of their spring field trip itinerary. A trip to the Crane Foundation can be a multi-disciplinary experience - students learn that the study of cranes is not only scientific, but involves politics, geography, art, and diplomacy as well.

We've received thank you notes from children throughout Wisconsin, many illustrated with their own artwork. One fifth grader wrote, "ICF is my favorite crane extinction protecting place!" Tex, the Whooping Crane, and Killer, the Stanley Crane, are clear favorites with the school groups. After a field trip to ICF one teacher wrote that her children were imitating cranes at recess. One child would call "Tex" and the others would "unison call" and dance.

Recently we had a summer school group visit from Lodi, Wisconsin. All the children arrived wearing

"Save the Cranes" T-shirts which they had made in class. Each child had illustrated his/her shirt with a picture of their favorite crane. If only children everywhere could be so conscious of endangered species!

We invite you to visit ICF and take a tour. We'll take groups ranging in size from one to sixty. We ask, however, that you call or write for an appointment, as we cannot accommodate drop-in visitors. Please contact us at least a week in advance, since your first choice of date and time may already have a large group scheduled, at which time we "close" the tour. The tour begins with a 20 minute slide talk which explains ICF's history and goals, and culminates with an hour-long walk around the breeding birds. You'll meet our celebrities: Olga the Brologa, Dr. Watson, Killer, and Tex, just to name a few. Tours are held Tuesday through Saturday, usually at 10 a.m. and 2 p.m. (though times can be scheduled to meet your needs.) There is a charge of \$1.50 for adults and \$1.00 for students under 18. Members are, of course, admitted free. The tours will end around December 1st and will start up again around April 1st. If you are unable to visit Baraboo and would like to learn more about our work, we will provide a speaker and slide presentation to interested groups. Please call or write to find out the details concerning this aspect of ICF's education program.

INTRODUCING. . . New Faces at ICF

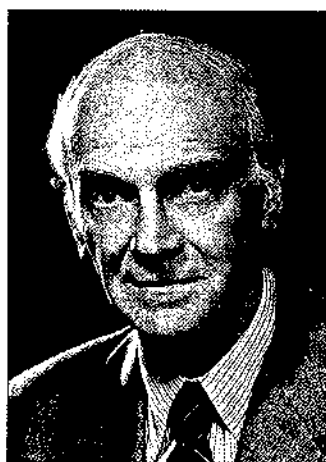


DOROTHY PAIN, ICF Director

The Crane Foundation is pleased to welcome Dorothy Ross Pain, one of the Milwaukee, Wisconsin area's most prominent civic leaders, to its Board of Directors. Mrs. Pain brings to ICF a vital interest in natural history and nature preservation which she acquired firsthand, while on worldwide zoological travels with her late husband, Charles. Her interest in wildlife and outstanding organizational abilities earned her the distinction of being the first woman named to the Board of the Milwaukee Zoological Society.

Mrs. Pain has also been active in leading a variety of Wisconsin-based health organizations, serving terms as a Board member of the Medical College of Wisconsin, the Society to Prevent Blindness, the Lung Association, and the Arthritis Foundation. She currently continues her long-time interest in the Red Cross and the Milwaukee County United Way.

As a newly elected ICF Board member, Dorothy Pain is welcomed to a large and expanding family of cranes, staff, and Foundation members. Successful and close-knit families are nothing new to her, however, as she boasts four children, fourteen grandchildren, and two great grandchildren. In fact, ICF's aviculturists are in awe of the generations Dorothy has inspired, and look forward to learning the secret of her success. The Foundation is delighted to have Dorothy Pain, a most dynamic and sensitive person, join its Board of Directors.



JEFFREY R. SHORT, JR., ICF Director

In the winter of 1978 Jeffrey R. Short, Jr. and his wife Barbara visited the Ghana Bird Sanctuary near Bharatpur, India. In the heart of that magnificent waterfowl refuge the Shorts saw a small flock of gleaming white birds standing in the shallow marsh, probing the mud with their beaks. Jeffrey Short had seen his first Siberian Crane, little aware that two years later he would be directing the organization which is leading the international effort to preserve this endangered species.

Mr. Short joins the International Crane Foundation's Board of Directors already in command of an impressive list of affiliations. He is a former Director of the National Audubon Society, and currently serves on the Board of World Wildlife Fund - U. S. and the Illinois Chapter of The Nature Conservancy. He is also a Trustee of the Chicago Zoological Society and is President of the Chicago Academy of Sciences.

A Chicago native educated at Harvard, Mr. Short distinguished himself in two years of war-time service with the U. S. Department of Intelligence. He returned to Chicago in 1952, when he assumed the presidency of the J. R. Short Milling Company.

Jeffrey Short, Jr. is an eminent industrialist with a life-long love for wildlife and an exceptional dedication to conservation. His enthusiasm for wildlife has taken him on expeditions to over fifteen countries on five continents. His interest in conservation has now brought him to the International Crane Foundation in Baraboo, Wisconsin, where his seasoned advice will help direct the growing effort to protect the cranes around the globe.



Kyoko Matsumoto, Joan Fordham, and friends discuss the upcoming ICF annual meeting.

JOAN FORDHAM, ICF Administrator

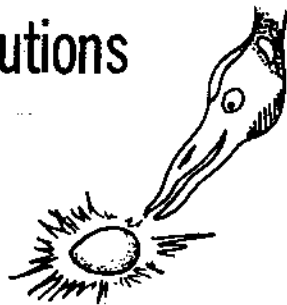
Any staff worth its feathers, especially a young and dynamic one like ICF's, needs a Joan Fordham. Thus spoke ICF's Board of Directors at its May meeting, when Joan was promoted from acting to permanent Administrator. Joan adds a great reservoir of energy, stability, and professionalism to ICF's staff.

Joan's job description is simple. ICF has its goals clearly outlined. The staff has been hired and financial resources are being developed to fulfill those goals. The Administrator's responsibilities are, simply, to "make it work". That Joan does is a tribute to her considerable capabilities.

Born in the heart of New York City, Joan has a degree in Biology from Wells College in Aurora, N. Y. — a scant twenty-six miles from Cornell University, the place where two young men named Ron Sauey and George Archibald first became interested in the good family Gruidae. Her natural and educated talents were honed during her recent tenure as President of the Baraboo School Board.

A mother of three and a wife for fifteen years, Joan possesses an ideal set of qualifications to administer ICF's family: a good ear, an incisive mind, and the tightest pursestrings this side of the Federal Reserve Board. Now when you come to ICF with an idea that needs direction and support, or if you need something or have a job which must be done, you'll be told to "go see Joanie". We hope to be seeing Joanie around ICF for a long time.

Contributions



Sanctuary, Sharon Lantis, A. Ross Manning, The Marine Foundation (Willard Davidson, Pres.), Julia C. McCleary, Charles H. Miller, D. J. Mirabelli, Dorothy C. Nichols, Richard H. Pough, Mrs. Emil Vacin.

Contributions of Labor and Materials

Harold Allen, Libby Anderson, Barbara Bash, Harold Bessac, Gary Bjorge, Mike Cody, Jerry Coughlin, Ken Decker, Mark Decker, Alexis Duxbury, Jaime Enders, Eunice Erickson, Herb Fritz, Gail Gilson, Matt Goethel, Rich Henderson, Marion Hill, Evelyn Howell, Mr. & Mrs. Richard Howell, Ed Klevins, Ken Lange, Sharon Lantis, Mollie Marquardt, Kyoko Matsumoto, Kuni Momose, Darrell Morrison, Dorothy Mudd, Liz Nevers, Barb Nielsen, Tom Peters, Amy Reed, Ron Rich, Dr. Burton Russman, Gerald Scott, Tom & Regina Shea, Yoshi Shigeta, Pam Soine, Toni Sturtz, John Taapken, Lucille Thompson, Dave Vogel, Steve Wilkinson, Wisconsin Power & Light Co.

The International Crane Foundation is a registered, publicly-supported, non-profit organization which is dedicated to the study and conservation of cranes throughout the world. Saving cranes saves earth's vanishing wetlands.

THE WISH LIST

ICF's cranes and staff are working hard. We're refining propagation techniques, doing research on crane ecology, protecting and restoring vanishing habitat, and educating the public about the threats to our magnificent family. Help us do our work a little better, by thinking of us the next time you're rummaging through your attic, garage, or checkbook.

We wish we had . . .

a brush clipper and shovel, \$12.00 each

5 new heat lamps, \$15.00 each

beak clippers, \$25.00

a combination wrench set, \$40.00

a case of semen extender, \$50.00

a circular saw, \$75.00

four-drawer suspension file cabinets for literature, etc., \$110.00 each

a chain saw, \$375.00

and MOST OF ALL, a phase-contrast microscope for examining semen samples used in artificial insemination, \$1,000.00.

Thank you for your generous support.

Photographs on pages 1,2, and 3 were taken by ICF photographer Kyoko Matsumoto.

Life Membership Contributions

John A. Bolz Family Foundation, Wolf Brehm, Mr. & Mrs. Gaylord Donnelley, Alma Doten Fund (John & Mary Wickhem), Griswold Frelinghuysen, James H. Kuehn, Oscar G. Mayer, Edward John Noble Fund, Norman Sauey, Sr., World Wildlife Fund.

Supporter Contributions

Art Center Garden Club, George M. Chester, Grede Foundation, Jeffrey R. Short, Jr., C.W. Wright Foundation (Badger Meter, Inc.).

Associate Contributions

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