

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Water Current Newsletter

Water Center, The

10-1988

Water Current, Volume 20, October 1988

Follow this and additional works at: https://digitalcommons.unl.edu/water_currentnews



Part of the [Water Resource Management Commons](#)

"Water Current, Volume 20, October 1988" (1988). *Water Current Newsletter*. 170.
https://digitalcommons.unl.edu/water_currentnews/170

This Article is brought to you for free and open access by the Water Center, The at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Water Current Newsletter by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

Water Current

Water Center

University of Nebraska

October 1988

Bonneville Power Administrator Compares Missouri Basin Reservoirs with Pacific Northwest's

by Pat Larsen

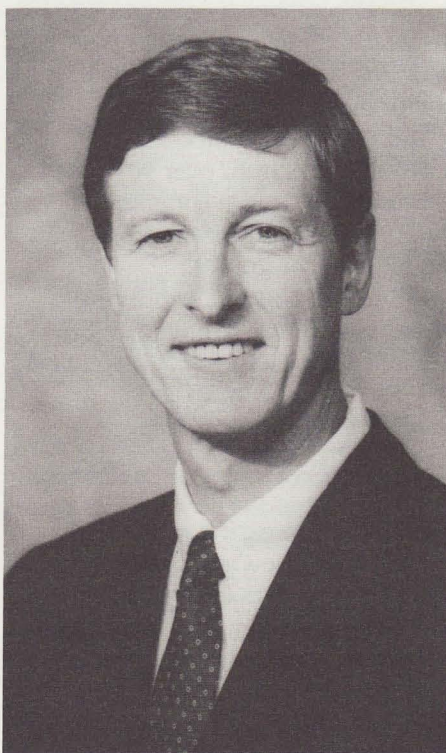
One of the highlights of the Pacific Northwest Water Resources and Irrigation Tour Sept. 8-16 was the dinner speech of a former Nebraskan from Schuyler, James Jura. Now administrator of the Bonneville Power Administration, Portland, Ore., Jura has been with Bonneville for the past 10 years. He spoke to the group in Richland, Wash.

He said that the Columbia River Basin inspires awe, appreciation and humility. Covering 90 percent of the Northwestern continental United States, this area includes Idaho, most of Oregon and Washington, about a fourth of Montana west of the Continental Divide and parts of Wyoming, Utah and Nevada and a large area of British Columbia and Canada.

"The Columbia River has changed dramatically from what it was when Lewis and Clark traveled it and camped near its mouth at Ft. Clatsop in the winter of 1805-1806" He said the changes had kept pace with the westward expansion of the U.S., and have played a major role in the orderly growth and settlement of the region.

"The dams and reservoirs, irrigation projects, hydro plants and electric generation grid, navigation system and fishery resources of the Columbia Basin have been—and will remain—the economic and cultural backbone of the Pacific Northwest."

Jura pinpointed the differences



James Jura
(Formerly of Schuyler)

(See Jura p. 4)

New Associate Director

A new position has been added to the Water Center since its move back to the East Campus. See story on page 2.

Nebraska Ranks Third in Water Use in U.S.

by Charles Flowerday
Conservation & Survey Division

The total volume of water used in Nebraska during 1985 averaged 10,662 gallons per day for every Nebraskan, a recently released report on Nebraska water use shows.

The total amount for the year was estimated to be 19.187 million acre-feet, an average of 17.116 million gallons per day.

Nebraska ranked third in 1985 in consumptive use of freshwater per capita, with 3,059 gallons per day, according to a national water-use survey compiled by the federal government. Consumptive use is water withdrawn that is evaporated, transpired, incorporated into products or crops, consumed by humans or livestock or otherwise removed from the immediate environment.

Idaho led the nation in consumptive freshwater use per capita in 1985, with 5,263 gallons a day; Wyoming was second with 5,245 gallons, and Montana and Colorado followed Nebraska.

Western states with limited populations and heavy use of irrigation have high rates of consumptive water use per capita per year, explained Eugene K. Steele Jr., former hydrologic technician with the U.S. Geological Survey and author of the statewide water-use survey.

Published cooperatively by the Nebraska District office of the Water Resources Division of the USGS and the UNL Conservation and Survey Division, the report is part of the National Water Use Data System, which

(See U.S. Water p. 4)

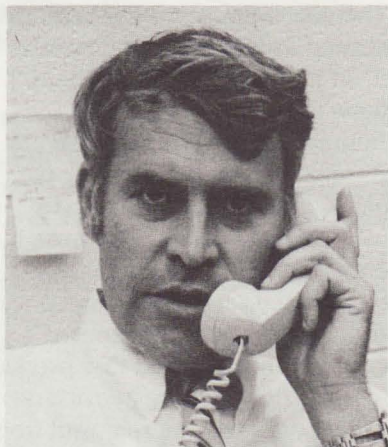
Spalding Appointed Associate Director of UNL Water Center

An internationally prominent hydrochemist has been appointed associate director of the Water Center.

Roger Gold, interim director of the Center, has announced the appointment of Roy Spalding, principal hydrochemist at the UNL Conservation and Survey Division since 1974, to this new position at the Center, now officed in the Natural Resources Hall on East Campus.

"Spalding brings a strong scientific background to the Water Center besides a thorough knowledge of Nebraska," Gold said. "Certainly, his work with groundwater contaminants in Nebraska and his participation on university, state and national committees is an asset."

Spalding's duties since 1974 at the



Roy Spalding

Division have included: hydrogeochemical research, administration of the water section of the Division, procurement and management of \$1.5 million in grants, field design and management of monitoring well installation and sample collection, coordination of vadose zone coring and sampling that included gas sampling and graduate student advising.

He has served as a scientific advisor of the American Council on Science and Health since 1986 and was a member of the Board of Public Health Consultants for National Sanitation Foundation from 1985 until 1988. He also served as chairman of the task force on landfill liners for the National Science Foundation.

Nebraska Water Conference Council Holds Fall Meeting

Expanding activities, moving forward, building on strengths and looking for new horizons is how Irvin T. Omtvedt vice chancellor of the Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln, summarized the Water Center's future role.

Speaking at the annual fall meeting in September of the Nebraska Water Conference Council, he cited changes within the Institute of Agriculture and Natural Resources and the Water Center.

"We must be responsive to change and harness the potential of groups that work together to improve lives of Nebraskans," Omtvedt said. "The Nebraska Water Conference Council is one of those groups."

The Council is composed of representatives from over 90 groups in Nebraska. NWCC is a communications forum on statewide water issues with the following purposes:

- Encouraging and stimulating sound practices in planning and managing the state's water resources;
- Identifying current and anticipated water problems;

He has given expert witness testimony for the Catherland Diversion Project, the Enders Diversion Project and the Twin Valley Diversion Project.

Spalding has numerous publications in professional journals and proceedings.

Before coming to Nebraska, Spalding was coordinator of the Center for Trace Characterization at Texas A&M University and of trace organic sampling activities in the Gulf of Mexico.

With the Oct. 15, University of Nebraska Board of Regents appointment, Spalding will continue to be involved in research as Water Center associate director.

"The Water Center, University and Nebraska can well be assured that water contamination problems have top priority with a Center associate director of the status of Spalding," Gold said.

—Exploring mechanisms for promoting and implementing research and extension programs related to the critical water issues in Nebraska;

—Providing a forum for the exchange of differing views on the vital water issues affecting the future of Nebraska citizens;

—Recognizing major achievements of individuals, agencies, or other groups in water resources.

The Council sponsors an annual two-day water conference in cooperation with UNL IANR and a summer annual tour of water resources facilities. It also sponsors the annual water conference. The 1989 Nebraska Water Conference will be chaired by Roger Gold, interim director of the Center, on March 14-15.

Reports were presented by the following:

Jack Aschwege, state statistician for the Nebraska Agricultural Statistics Service, "The 1988 Nebraska Drought Impacts." Roy Frederick, director of the Nebraska Department of Agriculture, "The Drought Assessment Task Force in Nebraska" and Bill Bailey, assistant director of the Nebraska Game and Parks Commission, "Drought Effects on Fish and Wildlife."

(See NWCC p. 5)

October 1988

Water Center

Roger Gold
Interim Director

Roy Spalding
Associate Director

Pat Larsen
Editor

Audrey Schardt
Editorial Assistant

Natural Resources Hall
University of Nebraska
Phone: 402-472-3305
Lincoln, NE 68583-0844

Former Nebraskans Address Northwest Water Tour Group

by Pat Larsen

Plenty of water, hydroelectric projects, diversified crops and former Nebraskans highlighted the 17th annual Nebraska Water Resources and Irrigation Tour to the Pacific Northwest in mid-September.

At Richland, Wash., former Schuyler resident, James Jura, now Bonneville Power administrator, said, "The Columbia River system is the greatest single natural resource of the Pacific Northwest. It has been the avenue of settlement, development, commerce and economic prosperity for the region."

Jura said that irrigation from the Bonneville system delivers water to more than 3 million acres of some of the most productive farm land in America, in all of the states of the region. He said that the flow of the Columbia River, the second largest river in the United States, at Bonneville Dam is nearly five times the flow of the Missouri River at Omaha. **(See page 1 story.)**

Jack Odgaard, longtime executive director of the Nebraska Water Resources Association, Lincoln, now public affairs officer with the Bonneville Power administration, accompanied the group in Washington and Oregon for several days.

A future Nebraskan, John DeOld, facility manager of US Ecology Nuclear, Inc., Richland, explained the storage of low-level radioactive waste at the Hanford U.S. Department of Energy site. DeOld will be in the Lincoln US Ecology office.

Oregon's diverse agriculture was compared to Nebraska's when Roy G. Arnold, dean of the College of Agricultural Sciences at Oregon State University, Corvallis, spoke to the group. The former vice chancellor of the Institute of Agriculture and Natural Resources at the University of Nebraska-Lincoln, said, "Oregon is a smaller state than Nebraska, but it grows about 170 crops and continues to diversify."

Crops include: peppermint, Oregon ranks first among states with its over 2 million lb. production; hops, second with about 8½ million lbs.; fall potatoes, third, with over 23 million

Cwt.; strawberries and cranberries rank third and fourth; and wheat and oats, 12th and 14th in U.S. production.

He said that OSU, a land grant university, is also a sea grant university, which provides many different opportunities and funding for research. And Oregon has 36 counties, Nebraska has 93 counties to reach in the teaching, service, research mission of land grant universities.

"Interaction with state agencies and OSU is especially productive," Arnold said, "the Oregon Wheat Industry has endowed a \$500,000 chair on our faculty."

One of the area's leading mint growers, Paul Jasa and his nephew, Ben, Madras, Ore., formerly of Wahoo, Neb., explained that mint is planted from roots in the fall and the first harvest is the following fall. They are irrigated about eight times during the growing season and when a blue flower appears on the plants, "we drop everything else. It's time for mint harvest," Ben Jasa said. He said that mint was hand-planted by migrant workers for "a long time" until his uncle, Paul Jasa developed a mint planter.

Mint oil is selling now for \$25 a pound, Jasa said, up from \$10 or \$11 in the past few years. Roots sell for \$2,000 per acre that will plant five acres, he said.

More native Huskers, Robert Ramig and Vance Pumphrey, accompanied the group to Umatilla from Kent to explain the area's agriculture and irrigation. Ramig was formerly at the Nebraska West Central Research and Extension Center at North Platte.

On down the road LaVerne Stetson, agricultural engineer with ARS, USDA, at Lincoln, checked out computerized automatic center pivots at the 12,000-acre Eastern Oregon Farming Co. Stetson had made two previous trips here with Dale Heermann, of Ft. Collins, Colo., to help set up the 104-center pivot system. Lamb, with a partner, Ken Morrison of Hastings, raises potatoes, alfalfa, wheat and melons on land that was formerly desert.

"We raised about 200 bushels of

corn an acre, but it's not profitable to raise corn for feed any longer," Lamb said. The 70-member-tour group walked to the Columbia River bank to see the booster pumping plant that distributed water to this Irrigon, Ore., farm.

Grape vineyards of P. J. Taggares in the Othello, Wash., region and the Chef Reddy potato processing plant that Taggares formerly owned were explained. Taggares has been a potato grower in the Bassett, Neb. area for the past 10 years.

University of Nebraska-Lincoln graduate Bill Hewitt, formerly of Endicott, now chief of water and land operations for the Columbia Basin Irrigation Project at Ephrata, Wash., said "Two-thirds of the agriculture in Washington is irrigated increasing the agricultural output from 15th to 22nd in the nation. He predicted 50 percent more irrigation expansion in the next three decades.

"By that time, though, I will probably have retired back in Nebraska," Hewitt said.

Stan Staab, manager of the Lower Elkhorn Natural Resources District at Norfolk, said, "These irrigation tours have shown Nebraskans options for producing crops and a variety of ways using our most precious natural resource—water.

"We continue to learn how diversified agriculture is across the country and to strengthen our relationships with those within Nebraska who have taken the tours since 1974 and in other states."

The UNL Institute of Agriculture and Natural Resources and the Nebraska Water Conference Council co-sponsored the tour with J. Michael Jess, director of the Nebraska Department of Water Resources, chairman. Tour director was Les Sheffield, extension farm management specialist, IANR-UNL.

(Jura from p. 1)

between the Columbia and the Missouri River dams and reservoirs:

*The Missouri mainstem dams are mostly earthen, while those in the Northwest are mostly concrete;

*The Missouri River dams span wider river valleys where those of the Columbia and other Northwest basins are mostly built in narrow, deeper river valleys;

*Because of the lower runoff and streamflow, the Missouri reservoirs must store more water, so they are much larger. The Northwest has much higher runoff and needs many more reservoirs to manage it because there aren't enough suitable sites for large storage;

He pointed out that in other areas of the U.S. hydro power is generally a "peaking power" resource. "But not in the Pacific Northwest where hydro power from our many dams and reservoirs forms the base of the entire electric energy supply," Jura said.

Hydro power provides 12 percent of the total U.S. electric generating capacity, but it's 90 percent of the total capacity in the Pacific Northwest. Furthermore, the Northwest has nearly 40 percent of the installed hydro generation capacity of the U.S., and as an energy source, the Columbia is mightier than any other river in the U.S.

Big, concrete dams will stand longer than Egyptian pyramids, Jura says.

Jura said that several entities are involved in the direct operations of the Columbia Basin facilities for hydroelectric generation, irrigation, flood control, navigation and fish flows. These include: the Army Corps of Engineers, the Bureau of Reclamation, British Columbia Hydro Authority of Canada and several public and private generating utilities in the U.S.

Jura quoted the Smithsonian Magazine: "Our big concrete dams, like Grand Coulee, will give the Egyptian pyramids, now 4,500 years old, tough competition for the title of the longest-lived artificial structures." Grand Coulee will probably stand 20,000 years and will probably last until the next ice age when it will be swept away, the article said.

Calendar

Nov.

17-18:

Breimyer Seminar on "Water Quality and Soil Conservation Conflict of Rights Issues." University of Missouri-Columbia, phone 314-882-9556 for information.

Dec. 1:

Research proposals due in Water Center for FY 1989.

Abstracts for Pesticide Research Conference at Virginia Polytechnic Institute May 11-12 due. For more information, phone Dr. Tamin Younos, Water Resources Research Center, VPI, 703-961-5624.

Jan.

**21-29:
1989**

1989 Water Management Seminar, Vail, Colorado. For more information, contact Buddy Blain, Fink, Inc., 202 Madison St., Tampa, FL 33602.

March

14-15

Annual Nebraska Water Conference sponsored by the Nebraska Water Conference Council. Call the Water Center, 402-472-3305 for more information.

April

Celebration of 25th Anniversary of the 1964 Water Resources Act that established 54 Water Resources Research Institutes/Centers. (The Water Center is one of these.)

(U.S. Water from p. 1)

compiles national water-use data in computer files every five years. The two agencies cooperate on the Nebraska Water Use Program, a statewide water-use survey.

Surface water supplied 67.4 percent—12,925 million acre feet—of the total volume of water used in the state in 1985. The remaining 32.6 percent was pumped from the groundwater reservoir, the report said.

Water use for power generation, a largely non-consumptive use, was 80.4 percent of the total surface water use and 54.3 percent of the total use in 1985. Excluding this use, estimated total water use in the state in 1985 was 8.772 million acre-feet, or 7.825 million gallons per day. Groundwater accounted for 71 percent of the total; surface water for nearly 29 percent.

Irrigation water use was estimated at 42.4 percent of the total water use in the state during 1985, or 8.144 million acre-feet. Excluding power production, it was 92.8 percent of total water use.

That total was nearly 13 times greater than the combined off-stream water use for all other categories, excluding power production, and was 42 times larger than the next largest offstream use, domestic use, the report said. Nebraska ranks second in the nation in irrigated acreage; California is first.

"Acreage irrigated during 1985 was estimated to be 7,480,140, with an average application of 13 inches of water per acre for the irrigation season," the report noted. Irrigated acreage for 1985 was highest in Holt County, which had 281,890 irrigated acres.

Water use was also broken down by basins, called hydrologic units. The hydrologic unit in the Platte River basin had the most irrigated acres—657,260—of any such unit. This unit consists of parts of Lincoln, Dawson, Gosper, Phelps, Kearney, McPherson, Logan, Custer, Frontier, Buffalo, Adams and Hall counties.

This newsletter was published with funds that were in part provided by the U.S. Geological Survey, Department of the Interior, as authorized by the 1984 Water Resources Research Act.

Water Research Proposals are Due Dec. 1

Research project proposals are due in the Water Center Dec. 1, according to Roger Gold Water Center interim director. He said that the U.S. Geological Survey, Department of the Interior, deadline is March 1, 1989. The Technical Review Committee of the Water Center will meet early in January to review Nebraska proposals.

Copies of the proceedings of the Workshop on Water Research and Information Needs that was sponsored by the Water Center last winter are available at the Water Center. Gold said that proposals should be in the range of \$10,000 to \$20,000 per year for consideration under the FY 1989 program.

"Researchers addressing research and information needs from the Workshop will receive priority consideration for funding," Gold said. However, proposals that address significant state or regional water problems will be reviewed also.

Each federal dollar requested for research must be matched with two non-federal dollars. Gold explained that indirect costs and principal investigators' time may be used to match federal funds.

FY 1989 grants will begin June 1, 1989 and end May 31, 1990. Projects requested for more than a year will end May 31, 1991 or May 31, 1992, Gold said.

For more information, call the Water Center, 472-3305.

(NWCC from p. 2)

Other reports were from:

—J. Michael Jess, Surface Water Rights in 1988;

Status of Deer Creek Dam in Wyoming; and Status of the Two Forks Reservoir in Colorado.

—Dayle Williamson, director of the Nebraska Natural Resources Commission; Status of NRD's Review Study in LB 148; Outlook for Water-related Legislation in the 1989 Nebraska Legislature and the Status of Water Rights and Transfer study due in the Governor's office Nov. 30, 1988.

Answers to Water Quality Questions Closer with Burlington Northern Foundation \$ Million Grant

A million dollars goes a long way in helping to ensure that Nebraska maintains its high quality water supply.

The Burlington Northern Foundation's grant, \$200,000 a year over a five-year period, and its largest single grant, enabled several University scientists to launch a six-pronged assault on water contamination.

This research has been centered at the UNL South Central Research and Extension Center at Clay Center with field sites near Grand Island and Fremont and in the Department of Agronomy laboratories on the University's East Campus.

The report of the Nebraska Agriculture 2001 Committee, in 1984, noted that "Irrigation is now, and will be over the next 20 years, the largest user of the state's water. Thus, we must improve management of our irrigation systems to protect both the quantity and quality of this resource."

Then on Oct. 5, 1984 the University of Nebraska Foundation announced the first major gift received for implementing recommendations of the Agriculture 2001 Committee appointed by the NU Board of Regents.

"This research funding helps to evaluate water quality problems in Nebraska and allows us to examine issues that affect all Nebraskans," Roger Gold, interim director of the Water Center, said. He noted a few questions about water quality that concerned Nebraskans:

"What happens to the groundwater if a chemigation system malfunctions or an accidental chemical spill contaminates the water source or well? Is it more cost efficient to apply agricultural chemicals by chemigation than by other methods? Is it possible to clean-up contaminated water?"

Gold, research project director, said that the threat to water quality and the documented evidence of high nitrate levels in many locations has made the protection of groundwater quality a priority research objective for the next 20 years. And Gov. Orr included water quality as one of her research initiatives.

The Burlington Northern Foundation research is divided into six subprojects: nitrogen mineralization and leaching, Herbicide - Irrigation - Tillage (HIT),



Edwin Thieszen, Henderson, who farms 440 corn and soybean acres, connects hose to low pressure drain on his chemigation check valve. The 1986 Chemigation Law called for check valves to prevent backflow of chemicals into the groundwater from center pivot systems.

"We're beginning to get some answers to water quality questions"—Gold

insectigation, chemigation safety equipment, excursion and cleanup from chemigation backflow and the pesticide analytical laboratory to help find a solution to groundwater contamination.

"We're beginning to get some answers to questions we've been concerned about for some time," Gold said.

"Experts estimate that about 40 percent of the more than 27,000 center pivot irrigation systems in Nebraska are used to apply agrichemicals by chemigation which allows for the potential of widespread contamination."

Results of the five-year research will be available in 1989. So, thanks Burlington Northern Foundation for helping us provide some of the answers to water quality questions that concern Nebraskans.

Drought Responses Discussed at Forum

Drought is a creeping phenomenon—it's hard to tell exactly when it starts and when it ends, a drought researcher told the University of Nebraska Water Policy Forum October 4.

Don Wilhite, UNL Center for Agricultural Meteorology and Climatology (CAMaC), said, "Besides this, the lack of a precise definition of drought causes confusion among government decision-makers." Generally, when the demand for water exceeds the supply, "you have a drought," he said.

However, sometimes it rains during a drought to add to the confusion, Wilhite said at the third annual Forum.

The past summer's drought was "a continuation of drought that has been present for several years."

Nebraska responds to drought in a variety of ways, according to Don Wilhite, drought researcher.

He said that the Red Cross in 1984 reported that drought effects more people than any other environmental hazard and it is the least understood.

Wilhite called for state-legislated and regional drought plans and methods to improve the effects of drought at this forum sponsored by the Water Center.

"In 1982 three states, Colorado, South Dakota and New York had

drought plans; now 15 states, including Nebraska, have plans and several others are developing them," Wilhite said. Nebraska's drought plan, administered by the Drought Assessment and Response Team (DART), has worked well from 1983 to 1988," he said. However, soil monitoring methodology is a much needed addition to the state plan.

Steven Meyer, CAMaC, described the 60 Automated Weather Data System (AWDS) stations in Nebraska that monitor wind speed, precipitation, soil temperature and humidity. AWDS, one of the first in the nation, is one way to keep tabs on weather, Meyer said.

Another response to drought in Nebraska was the Drought Hotline. Jim Bushnell, assistant director of UNL Cooperative Extension, reported that 421 calls were received on the Drought Hotline. He said that many of the calls were referred to state and county ASCS offices, the AGNET Haylist or UNL specialists.

Roy Frederick, director of the Nebraska Department of Agriculture, said, "In the past we've always said, 'only two things in life are certain: death and taxes.' We should add drought to those two things." Frederick, DART chairman, said that it is difficult to know exactly when to react in drought.

He said that on May 25 he informed Gov. Orr that there was less moisture than usual in some areas of Nebraska. On June 10 a Governors' Conference

was held in Chicago that assessed drought and appropriate actions to take. And then on Aug. 11, President Reagan signed the drought bill.

Also, DeLynn Hay, UNL extension irrigation specialist, described four areas for improved drought management techniques:

—Non-irrigated crops: Change cropping patterns, increase fallow acres, plant drought-resistant varieties, reduce planting rates, reduce evapotranspiration, leave residue on soil surface and invest in irrigation development.

—Irrigated crops: Improve irrigation management and irrigation system application efficiency, change crops and use drought resistant varieties.

—Livestock: Reduce numbers, purchase supplemental feed, use alternative feed supplies, change grazing distribution, use alternative sources of water and protect range and pasture resources.

—Urban: Change lawn-watering practices and landscape materials, consider using vegetation in yards that requires very little moisture.

"Irrigation development Nebraska experienced in the 1950s won't be repeated," Hay said. He suggested institutional drought responses that included: educational programs for youth and adults, genetic research emphasizing drought-resistant varieties, water-use allocations, restrictions on new wells, credit arrangements and disaster aid mechanisms.



**Water Center
The University of Nebraska—Lincoln
103 Natural Resources Hall
Lincoln, NE 68583-0844**

**NON-PROFIT ORG.
U.S. POSTAGE
PAID
Lincoln, Nebr.
Permit No. 46**

