Examples of water weed ecological factors which puzzle controllers, and presentation of research developments leading to better controls, occupied 100 members of the Aquatic Weed Control Society meeting at Chicago's Palmer House, Feb. 11-13. Two days of its schedule was in joint session with the aquatic section of the Weed Society of America biennial conference at the Hotel Pick Congress, also in the Windy City.

Major emphasis placed on ecology and ecological shifts (vegetative successions) in waters of the Northeast, Midwest, and Western irrigation systems

Questions were exchanged freely by aquatic weedmen. Noted aquatic applicator Bernard Domogalla (center) and his assistant Rene Weber (right), quizzed Geigy rep James Flanagan about his firm's herbicides.

Fact-Seeking Aquatic Weedmen Stir Up More Questions Than Answers at 1964 Chicago Meet

brought to light many examples of problems confronting controllers regularly.

Leading a trio of experts who presented peculiarities of their regions was Jason Cortell, Consulting Biologist, Brookline, Mass.

"A pond is a body of water which has its littoral (edges) and limnetic (open water above the light penetration level) zones more highly developed than the profundal (deep cold water without vegetation) zone; whereas a lake, properly defined, has a greater profundal zone," Cortell explained, answering questions as to why New England has so many large "ponds."

Lake studies conducted by Cortell attempt to show what happens to the flora of a lake or pond after chemical treatment has been applied.

Preliminary results of this study indicate that there are transition stages of plant growth following chemical applications. First species which becomes dominant in most cases after treatment is the notably resistant *Nitella,* an algae that resembles higher plants.

Nitella, Cortell feels, is a balancing influence in a treated water body and remains dominant until flowering plants become reestablished. To date, the *Nitella* succession or shift is the only pattern Cortell has been able to detect. Secondary reestablishment does not seem to follow a noticeable pattern, Cortell revealed.

Ponds Change Without Chemicals

Over a three-year period, Dr. Robert C. Hiltibran has observed ecological shifts in several ponds near Urbana, Ill., where he teaches at the Ill. Natural History Survey.

In one pond, Hiltibran noted a shift from watermilfoil and *Najas* sp. growth through a mixture-stage of watermilfoil, sago pondweed, *Najas* sp., and *Potamogeton* sp., finishing in 1963 as mainly *Potamogeton* spp. and sago pondweed *(P. pectinatus).* Watermilfoil was dominant in 1960, and *Najas* sp. was dominant in 1962. Shifts such as this without the "aid" of chemicals require more knowledge of the innerworkings of water bodies, Dr. Hiltibran feels.

A shift, similar to Cortell's *Nitella* succession, was noted by Dr. Hiltibran in another study involving control chemicals. In this midwest pond, the dominant plant, after chemical removal of a complete crop of *Potamogeton crispus,* was *Chara* sp., an algae related to *Nitella.*

The following year, according to Dr. Hiltibran, plankton algae were active (in bloom) all summer and by fall there were no weeds found in the pond. "Nature through turbidity and algae growth often cleans up lakes and ponds," Dr. Hiltibran stated, but no experts can explain the details of this phenomenon.

A delegate from the floor commented that even when only a small portion of a pond may be treated, the results are sometimes complete control over the whole pond. This appears not to be a result of chemical diffusion, but rather a "snowballing effect" of dead weeds killing more weeds. This likewise was not explained.

"Part of the ecological problem with aquatic weeds in western irrigation systems is the type of soil the channel is dug

Brains were pooled by a trio of smiling experts. Dr. Duncan McLarty (left) from Canada exchanged views with Floridian Dr. Lyle Weldon (center) and Massachusetts consultant Jason Cortell.

through," Delbert Suggs, U.S. Department of Interior, Bureau of Reclamation, Ephrata, Wash., declared.

"Although many canals are 80 miles long, we find most ecosystems do not exceed 12 miles," Suggs continued. An ecosystem in water is a relatively stable environment of interacting organisms and inert chemical elements. Suggs indicated that canal soil conditions change in both composition and direction ("grain") and tend to cause changes in ecosystems.

"We find highest weed infestation in canals dug in loam soils. Slowest infestation occurs in soils with 50% silt loam," he stated.

"Sago pondweed will infest a new canal at the rate of 3 to 4 miles per year," he added, defining the major weed problem in irrigation canals. Sago grows singly and in floating mats which clog filters and sprayers in watering systems.

Warmed up to these strange twists in aquatic weed control, delegates were very attentive to subsequent sessions dealing with less practical, but equally important aspects of aquatic weed control.

Diquat Continues to Prove Useful

Potamogeton species, previously listed as hard to kill, have shown in tests conducted by Dr. Hiltibran to be susceptible to diquat at 0.5 and 1.0 ppm (parts per million).

Some of the susceptible species are: *P. pectinatus*, *P. crispus*, *P. foliosus*, and *P. pusillus*. American pondweed, *P. nodosus*, was not damaged by surface applications of diquat, according to Dr. Hiltibran.

Northern watermilfoil, white water buttercup, and coontail also succumb to 0.5 ppm of diquat, but regrowth of elodea occurred even at the 1 ppm rate, the Illinois expert's work showed.

Fifty millileters of diquat in 1 gallon of water was effective on several emergent weed species when applied as a foliage spray. Among susceptible species are common arrowhead, waterwillow, creeping water primrose, and cattail.

Related diquat research by James R. Whitley, Missouri Conservation Department, Columbia, showed that Pithophora filamentous algae can be controlled with ½ ppm of the diquat cation.

Public health aspects of aquatic work were discussed by C. Mervin Palmer (left), a health official from Cincinnati and new Society president Charles P. Bolster of Pennsalt, Philadelphia.

A significant piece of research from the Plantation Field Laboratory, USDA Crops Research Division, in Fort Lauderdale, Fla., shows that Amitrole-T applied to a parent waterhyacinth is translocated through connecting stolons to the offshoot plants. This is something which 2,4-D will not do. Researchers involved in this work are Drs. J. W. Conner (deceased), Lyle W. Weldon, Robert D. Blackburn, and Donald E. Seaman. Work was done in cooperation with the Army Corps of Engineers and Florida Flood Control Districts.

After testing with Amitrole-T, results showed that the greater mobility of this compound accounted for excellent control and less regrowth than when 2,4-D was used. If fenac is added to the Amitrole-T, a faster topkill of waterhyacinths results.

Bolster New President

At the business session of the Aquatic Weed Control Society, presided over by President Henry P. Carsner, Northwest Weed Service, Tacoma, Wash., new officers were elected. New president is Charles P. Bolster, Pennsalt Chemicals Corp., Philadelphia, Pa. First vice-president is Kenneth M. Mackenthun, U. S. Public Health Service, Cincinnati, Ohio. E. Victor Scholl, Modern Weed Control, Grand Rapids, Mich., is the 2nd vice-president. Secretary-treasurer for the group next year is Albert Lopinot, Illinois Department of Conservation, Litchfield.

President Bolster told *Weeds & Turf* that the next meeting of the Aquatic Weed Control Society will be at the LaSalle Hotel in Chicago, Feb. 11-12, 1965.