

CONTENTS

Papers	Page
EFFECT OF URBANIZATION ON STORM WATER PEAK FLOWS by Pedro C. C. DaCosta	187
NUMERICAL SOLUTION OF FILTRATION EQUATIONS by Arun K. Deb	195
LONGITUDINAL MIXING IN SPIRAL FLOW AERATION TANKS by Keith L. Murphy and Boris I. Boyko	211
TURBULENCE AND FLOCCULATION by Yerachmiel Argaman and Warren J. Kaufman	223
FILTRATION OF TREATED SEWAGE EFFLUENT by George Tchobanoglous and Rolf Eliassen	243
EVALUATION OF ANAEROBIC DENITRIFICATION PROCESSES by Daniel F. Seidel and Ronald W. Crites	267
ESTUARINE OXYGEN RESOURCES—PHOTOSYNTHESIS AND REAERATION by Thomas E. Bailey	279
PLASTIC RELINING OF SMALL-DIAMETER PIPES by Raymond M. Bremner	297
PREDICTING EFFECTS OF DEAD ZONES ON STREAM MIXING by Edward L. Thackston and Karl B. Schnelle, Jr.	319
RESPONSE OF ACTIVATED SLUDGE TO ORGANIC TRANSIENT LOADINGS by Carl E. Adams, Jr., and W. Wesley Eckenfelder, Jr.	333

(over)

This Journal is published bimonthly by the American Society of Civil Engineers. Publications office is at 2500 South State Street, Ann Arbor, Michigan 48104. Address all ASCE correspondence to the Editorial and General Offices at 345 East 47th Street, New York, N.Y. 10017. Allow six weeks for change of address to become effective. Subscription price is \$10.00 per year with discounts to members and libraries. Second-class postage paid at Ann Arbor, Michigan. EM, SA, SM.

	Page
EXAMINATION OF THE THERMOCLINE	
by John C. Sonnichsen and Clarence A. Oster	353
VIRUS INACTIVATION DURING PHOSPHATE PRECIPITATION	
by Dirk R. Brunner and Otis J. Sproul	365
DRYING OF SAND-DIGESTED SLUDGE MIXTURES	
by Martin E. Harper and Brian W. Mar	381
PHOSPHATE RELEASE IN ACTIVATED SLUDGE PROCESS	
by Clifford W. Randall, Duane W. Marshall, and Paul H. King	395
SYSTEM OPTIMIZATION OF WASTE TREATMENT PLANT PROCESS DESIGN	
by Chia Shun Shih and John A. DeFilippi	409
ROLE OF ACTIVATED SLUDGE FINAL SETTLING TANKS	
by Richard I. Dick	423
EFFICIENCY OF REFUSE COLLECTION CREWS	
by Jimmie E. Quon, Robert R. Martens and Masaru Tanaka	437
THEORETICAL EVALUATION OF FILTER MODELING EXPERIMENTS	
by Charles R. Ott and Richard H. Bogan	455
RECENT PAPER INDUSTRY WASTE TREATMENT SYSTEMS	
by William J. Gillespie	467
STATISTICAL ASSESSMENT OF DO IN NAVIGATION POOL	
by Thomas A. Butts, Donald H. Schnepfer, and Ralph L. Evans	477
NITROGEN REMOVAL BY MODIFIED ACTIVATED SLUDGE PROCESS	
by Srinivasalu Balakrishnan and W. Wesley Eckenfelder	501
STREAM ENRICHMENT FROM FARM OPERATIONS	
by Neal E. Minshall, Stanley S. Witzel, and M. Starr Nichols	513
MASS TRANSFER LIMITATIONS IN SUBSTRATE REMOVAL	
by C. Robert Baillood and William C. Boyle	525
PHOTOSYNTHESIS AND OXYGEN BALANCE IN STREAMS	
by Donald J. O'Connor and Dominic M. Di Toro	547
PILOT PLANT TESTING FOR MUNICIPAL SEWAGE TREATMENT	
by Robert C. Moore	573
WATER SUPPLY AND WASTE WATER DISTRICTS IN SUBURBIA	
by Myron K. Nelson and R. L. Chandler	593

DISCUSSION
Proc. Paper 7190

TOXICITY MEASUREMENTS IN ACTIVATED SLUDGE, by Ludwig Hartmann and Gerhard Laubenberger (Apr., 1968. Prior Discussions: Aug., 1969).	
closure and errata	607
DEFINED VELOCITY GRADIENT MODEL FLOCCULATOR, by Francois A. van Duuren (Aug., 1968. Prior Discussion: Aug., 1969).	
closure	609
DEEP-WELL DISPOSAL OF WASTES, by William R. Walker and Ronald C. Stewart (Oct., 1968. Prior Discussion: Oct., 1969).	
closure	610
DIFFERENCE MODELING OF STREAM POLLUTION, by David A. Bella and William E. Dobbins (Oct., 1968. Prior Discussion: Oct., 1969).	
closure	610
PREDICTION OF FILTER PERFORMANCE, by Kou-ying Hsiung and John L. Cleasby (Dec., 1968. Prior Discussion: Oct., 1969).	
closure	611
NEW APPROACHES TO WASTEWATER TREATMENT, by Robert L. Stenburg, John J. Convery and Charles L. Swanson (Dec., 1968. Prior Discussions: Oct., 1969).	
closure and errata	613
VIABILITY OF LONG-STORAGED AIRBORNE BACTERIAL AEROSOLS, by Calvin P. C. Poon (Dec., 1968. Prior Discussions: Oct., 1969).	
closure	615
EFFECTS OF TEMPERATURE ON STREAM AERATION, by Ivan Metzger (Dec., 1968. Prior Discussions: Oct., 1969).	
closure	616
ENTERIC DISEASE CRITERIA FOR RECREATIONAL WATERS, by John M. Henderson (Dec., 1968. Prior Discussion: Oct., 1969).	
closure	617

	Page
THEORY OF SAND FILTRATION, ^a by Arun K. Deb (June, 1969. Prior Discussions: Feb., 1970). by Albert M. Wright and Michael C. Kavanaugh	620
REGIONAL WATER QUALITY STANDARDS, ^a by Ralph Porges (June, 1969). by Irving Grossman	623
AGGLOMERATE SIZE CHANGES IN COAGULATION, ^a by Robert K. Ham and Russell F. Christman (June, 1969). Prior Discussion: Dec., 1969). by Richard I. Dick	624
CHARACTERIZATION OF SETTLING TANKS BY EDDY DIFFUSION, by Hassan M. El-Baroudi (June, 1969). errata	627
ANALOG SIMULATION OF ACTIVATED SLUDGE SYSTEMS, by Carl E. Burkhead and Don J. Wood (June, 1969). errata	628
SULFIDE PRODUCTION IN WASTE STABILIZATION PONDS, ^a by Earnest F. Gloyna and Ernesto Espino (June, 1969). by David D. Mara and David J. A. Williams	628
TRANSFER OF OXYGEN IN AQUEOUS SOLUTIONS, ^a by Edwin L. Barnhart (June, 1969). by P. Wilderer	630
ECONOMIC MEASURE OF EFFECT OF EXTREME DATA, ^a by Myron B. Fiering (Aug., 1969). by Theodore G. Roefs	632
FLUOROMETER CALIBRATION CURVES AND NOMOGRAPHS, ^a by Thomas A. Butts (Aug., 1969). by Thomas E. Bailey	633
SEPTIC TANK SYSTEMS, ^a by Joseph A. Cotteral, Jr. and Dan P. Norris (Aug., 1969). by Rein Laak and Thomas F. Zimmie by John C. Hancock	634 636
LOW TEMPERATURE ACTIVATED SLUDGE SETTLING, ^a by Sherwood C. Reed and R. Sage Murphy (Aug., 1969). by Richard I. Dick by Peter Kos and Ivo Pardus	638 642
PHOSPHATE REMOVAL: SUMMARY OF PAPERS, ^a by Milton Spiegel and Tom H. Forrest (Oct., 1969). by Carl Beer	647

^a Discussion period closed for this paper. Any other discussion received during this discussion period will be published in subsequent Journals.

	Page
PHOSPHATE REMOVAL AT BALTIMORE, MARYLAND, ^a by Marion R. Scaff, Fred M. Pfeffer, Lawrence D. Lively, Jack L. Witherow and Charles P. Priesing (Oct., 1969). by Carl Beer	648
CHARACTERISTICS OF SLUDGE DRYING, ^a by J. Charles Jennett and Israel W. Santry, Jr. (Oct., 1969). by B. W. Mar and M. Harper	651

^a Discussion period closed for this paper. Any other discussion received during this discussion period will be published in subsequent Journals.