

CONTENTS

PAPERS

No.		PAGE
1697	NEW THEORY FOR THE CENTRIFUGAL PUMP.	
	By Allen F. Sherzer.....	1
	Discussion :	
	By J. W. MACMEEKEN.....	30
	THOMSON KINGSFORD.....	33
	SANFORD A. MOSS.....	34
	P. L. REED.....	35
	MAX M. MUNK.....	37
	ELMO G. HARRIS.....	37
	O. GRUENBERGER.....	43
	ELMER G. HOOPER.....	44
	F. THEODORE MAVIS.....	46
	MARIO MEDICI.....	51
	A. H. BLAISDELL.....	63
	MORROUGH P. O'BRIEN.....	66
	R. T. LIDDICOAT.....	67
	LLOYD H. DONNELL.....	71
	S. TIMOSHENKO.....	72
	A. B. COX.....	76
	ALLEN F. SHERZER.....	80
1698	THE GREAT YANGTZE BAR.	
	By A. V. Hugo von Heidenstam.....	102
	Discussion :	
	By A. W. ROBINSON.....	120
	R. L. VAUGHN.....	124
1699	RE-DESIGNING CATAWBA STATION FOR SERVICE ON A LARGE TRANSMISSION SYSTEM.	
	By W. S. Lee.....	127
	Discussion :	
	By H. A. HAGEMAN.....	145
	H. V. JOSLIN.....	148
	T. H. HOGG.....	149
	W. S. LEE.....	151
1700	UNUSUAL ENGINEERING FEATURES OF AN IMMENSE THEATRE BUILDING.	
	By R. McC. Beanfield.....	152
	Discussion :	
	By THEODORE BELZNER.....	182
	FRED A. NOETZLI.....	182
	A. FLORIS.....	183
	LAURENCE J. WALLER.....	187
	R. MCC. BEANFIELD.....	188

No.		PAGE
1701	ADVANCES IN WATERWAYS ENGINEERING DURING A HALF CENTURY.	
	By W. M. Black.....	191
	Discussion :	
	By C. L. HALL.....	214
	DEWITT D. BARLOW.....	214
	W. M. BLACK.....	215
1702	THE DELAWARE RIVER FROM PHILADELPHIA TO THE SEA.	
	By F. C. Boggs.....	218
	Discussion :	
	By CHARLES M. SPOFFORD.....	246
	HENRY J. SHERMAN.....	247
	EARL I. BROWN.....	249
	HARRY TAYLOR.....	253
	F. C. WARNER.....	255
	WILLIAM GERIG.....	258
	F. C. BOGGS.....	259
1703	THE HEAD-WORKS OF THE IMPERIAL CANAL.	
	By C. E. Grunsky.....	262
	Discussion :	
	By E. S. LINDLEY.....	267
	C. E. GRUNSKY.....	269
1704	THE SCIENCE OF FOUNDATIONS—ITS PRESENT AND FUTURE.	
	By Charles Terzaghi.....	270
	Discussion :	
	By CHARLES R. GOW.....	302
	E. P. GOODRICH.....	303
	VICTOR A. ENDERSBY.....	304
	GEORGE PAASWELL.....	305
	C. C. WILLIAMS.....	306
	HERBERT CHATLEY.....	313
	J. ALBERT HOLMES.....	314
	JACOB FELD.....	319
	W. S. HOUSEL.....	322
	FRANK S. BAILEY.....	330
	T. L. CONDRON.....	331
	LAZARUS WHITE.....	333
	R. D. N. SIMHAM.....	346
	FRANK A. MARSTON.....	350
	ARTHUR M. SHAW.....	354
	D. P. KRYNINE.....	357
	S. P. WING.....	365
	M. L. ENGER.....	371
	ALBERT JORGENSEN.....	378
	CHARLES TERZAGHI.....	380
1705	MAXIMUM FLOOD DISCHARGE IN SAN JOAQUIN VALLEY, CALIFORNIA.	
	By Oren Reed.....	406

No.		PAGE
	Discussion :	
	By ROBERT FOLLANSBEE.....	431
	HAROLD K. FOX.....	431
	CHARLES H. LEE.....	433
	OREN REED.....	440
1706	BAFFLE-PIER EXPERIMENTS ON MODELS OF PIT RIVER DAMS.	
	By I. C. Steele and R. A. Monroe.....	451
	Discussion :	
	By EDWARD C. SHERMAN.....	481
	B. E. TORPEN.....	487
	OREN REED.....	497
	HAROLD K. FOX.....	498
	ROBERT F. EWALD.....	499
	F. W. SCHEIDENHELM.....	506
	RALPH L. PARSHALL.....	507
	H. W. DENNIS.....	511
	I. A. WINTER.....	516
	PAUL BAUMAN.....	518
	MORROUGH P. O'BRIEN.....	528
	J. C. STEVENS.....	530
	I. C. STEELE and R. A. MONROE.....	539
1707	METHODS USED IN THE CONSTRUCTION OF TWELVE PRE-CAST CONCRETE SEGMENTS FOR THE ALAMEDA COUNTY, CALIFORNIA, ESTUARY SUBWAY.	
	By Alvin A. Horwege.....	547
	Discussion :	
	By JOSEPH A. KITTS.....	565
1708	THE VIRGINIAN RAILWAY ELECTRIFICATION.	
	By George Gibbs.....	571
	Discussion :	
	By W. B. POTTER.....	628
	MARCEL JAPIOT.....	629
	L. K. SILLCOX.....	630
	I. OFVERHOLM.....	633
	RALPH BUDD.....	634
	GUIDO SEMENZA.....	634
	F. H. SHEPARD.....	635
	E. R. HILL.....	636
	NORMAN LITCHFIELD.....	638
	SIDNEY WITHERINGTON.....	639
	GEORGE J. RAY.....	641
	JOHN P. HOGAN.....	642
	R. D. N. SIMHAM.....	644
	GEORGE GIBBS.....	648
1709	FLOOD CONTROL WITH SPECIAL REFERENCE TO THE MISSISSIPPI RIVER: A SYMPOSIUM.	
	By Edgar Jadwin.....	655
	INTRODUCTION.	
	By Edgar Jadwin.....	657

No.		PAGE
RESUME OF THE MISSISSIPPI RIVER FLOOD PROBLEM.		
By C. McD. Townsend.....		659
RAINFALL CHARACTERISTICS OF THE MISSISSIPPI DRAINAGE BASIN.		
By H. C. Frankenfield.....		675
RUN-OFF CHARACTERISTICS OF THE MISSISSIPPI RIVER DRAINAGE BASIN.		
By Nathan C. Grover.....		690
THE WORK OF THE MISSISSIPPI RIVER COMMISSION.		
By C. W. Kutz.....		697
FOREST COVER AS A FACTOR IN FLOOD CONTROL.		
By E. F. McCarthy.....		716
RESERVOIRS FOR MISSISSIPPI VALLEY FLOOD PROTECTION.		
By William Kelly.....		724
THE BASIS OF THE CASE AGAINST RESERVOIRS FOR MISSISSIPPI FLOOD CONTROL.		
By Arthur E. Morgan.....		737
LEVEES AS A MEANS OF FLOOD CONTROL FOR THE MISSISSIPPI RIVER.		
By J. F. Coleman.....		755
IMPROVEMENT OF NAVIGATION IN RELATION TO FLOOD CONTROL.		
By Stuart C. Godfrey.....		762
THE FLOOD PROBLEM OF NEW ORLEANS, LOUISIANA.		
By Marcel Garsaud.....		782
THE RELIEF OUTLETS AND BY-PASSES OF THE SACRAMENTO VALLEY FLOOD-CONTROL PROJECT.		
By C. E. Grunsky.....		791
RECLAMATION AS AFFECTING FLOOD CONTROL.		
By Elwood Mead.....		812
POWER AS AFFECTING FLOOD CONTROL.		
By F. W. Scheidenhelm.....		815
THE EFFECT OF AGRICULTURAL DRAINAGE UPON FLOOD RUN-OFF.		
By Sherman M. Woodward and Floyd A. Nagler.....		821
Discussion :		
By J. P. SNOW.....		840
FRANK B. MALTBY.....		841

No.		PAGE
	MORRIS KNOWLES.....	845
	CHARLES H. PAUL.....	853
	F. G. JONAH.....	854
	C. S. JARVIS.....	858
	EDWARD H. SCHULZ.....	871
	Q. C. AYRES.....	878
	H. S. GLADFELTER.....	879
	BYRON E. WHITE.....	881
	W. G. PRICE.....	887
	OREN REED.....	890
	HAROLD C. FISKE.....	891
	CHARLES F. BROOKS.....	894
	WILLIAM GERIG.....	898
	C. H. EIFFERT.....	900
	SHERMAN M. WOODWARD.....	903
	W. J. SCHLICK.....	905
	S. L. MOYER.....	907
	WILLIAM M. HALL.....	919
	C. E. RAMSER.....	933
	T. KENNARD THOMSON.....	934
	W. E. ELAM.....	937
	R. W. DAVENPORT.....	947
	E. W. LANE.....	949
	C. McD. TOWNSEND.....	951
	H. C. FRANKENFIELD.....	952
	E. F. McCARTHY.....	953
	WILLIAM KELLY.....	954
	ARTHUR E. MORGAN.....	957
	MARCEL GARSAUD.....	962
	C. E. GRUNSKY.....	963
	SHERMAN M. WOODWARD AND FLOYD A. NAGLER.....	964

1710 THE CONOWINGO HYDRO-ELECTRIC DEVELOPMENT ON THE SUSQUEHANNA RIVER.

By Alexander Wilson, 3d.....	970
------------------------------	-----

Discussion :

By WILLIAM C. L. EGLIN.....	979
J. V. HOGAN.....	981
A. W. CLARK.....	990
H. A. HAGEMAN.....	993
ALEXANDER WILSON, 3d.....	997

1711 PRECISE WEIR MEASUREMENTS.

By Ernest W. Schoder and Kenneth B. Turner.....	999
---	-----

Discussion :

By H. W. KING.....	1111
FLOYD A. NAGLER.....	1114
A. STREIFF.....	1119
R. L. PARSHALL.....	1127
W. S. PARDOE.....	1130
R. E. BALLESTER.....	1136
GARDNER S. WILLIAMS.....	1142
TH. REHBOCK.....	1143
ERIK G. W. LINDQUIST.....	1163
CLEMENS HERSCHEL.....	1176
ERNEST W. SCHODER.....	1179

No.		PAGE
1712	ANALYSIS OF ARCH DAMS BY THE TRIAL LOAD METHOD.	
	By C. H. Howell and A. C. Jaquith.....	1191
 Discussion :		
	By B. F. JAKOBSEN.....	1226
	GEORGE R. RICH.....	1229
	C. A. P. TURNER.....	1233
	F. H. CONSTANT.....	1241
	F. W. HANNA.....	1246
	L. J. MENSCH.....	1250
	WILLIAM CAIN.....	1265
	FRED A. NOETZLI.....	1270
	FREDRIK VOGT.....	1272
	J. L. SAVAGE AND IVAN E. HOUK.....	1289
	A. FLORIS.....	1296
	C. H. HOWELL.....	1306
1713	HYDROSTATIC UPLIFT IN PERVIOUS SOILS.	
	By H. de B. Parsons.....	1317
 Discussion :		
	By F. R. HARRIS.....	1333
	J. C. MEEM.....	1334
	EUGENE E. HALMOS.....	1339
	T. R. LAWSON.....	1340
	J. VIPOND DAVIES.....	1341
	LAZARUS WHITE.....	1342
	T. KENNARD THOMSON.....	1343
	DANIEL E. MORAN.....	1344
	ALEXANDER V. GALLOGLY.....	1344
	ALLEN HAZEN.....	1345
	CHARLES TERZAGHI.....	1346
	FRANK S. BAILEY.....	1353
	CHARLES R. GOW.....	1353
	E. L. CHANDLER.....	1356
	MARTIN J. MCPIKE.....	1357
	JACOB FELD.....	1360
	J. ALBERT HOLMES.....	1362
	E. W. LANE.....	1363
	H. DE B. PARSONS.....	1364
1714	CONTINUOUS BEAMS OVER THREE SPANS.	
	By I. Oesterblom.....	1367
 Discussion :		
	By FRANK S. BAILEY.....	1384
	CLYDE T. MORRIS.....	1385
	A. LINCOLN HYDE.....	1386
	HAROLD E. WEISSMAN.....	1388
	ROBERT M. WILDER.....	1392
	W. F. WAY.....	1394
	H. M. HADLEY.....	1396
	T. F. HICKERSON.....	1405
	JOHN I. PARCEL.....	1410
	R. A. CAUGHEY.....	1410
	JOHN B. SNETHLAGE.....	1420
	T. D. MYLREA.....	1421
	I. OESTERBLOM.....	1422

No.		PAGE
1715	THE O'SHAUGHNESSY DAM AND RESERVOIR.	
	By John H. Gregory, C. B. Hoover, and C. B. Cornell.....	1428
	Discussion :	
	By J. ERNEST CARMAN.....	1493
	B. F. JAKOBSEN.....	1494
	W. H. DITTOE AND G. GALE DIXON.....	1495
	JOHN H. GREGORY, C. B. HOOVER, AND C. B. CORNELL.....	1498
1716	THE TREATMENT OF THE WATER SUPPLY OF THE CITY OF COLUMBUS, OHIO.	
	By Charles P. Hoover.....	1505
	Discussion :	
	By F. II. WARING.....	1519
	GEORGE W. FULLER.....	1522
	ROBERT SPURR WESTON.....	1524
	C. W. FOULK.....	1525
1717	UPWARD PRESSURES UNDER DAMS: EXPERIMENTS BY THE UNITED STATES BUREAU OF RECLAMATION.	
	By Julian Hinds.....	1527
	Discussion :	
	By E. L. CHANDLER.....	1551
	B. F. JAKOBSEN.....	1558
	CHARLES TERZAGHI.....	1559
	J. C. STEVENS.....	1563
	F. W. HANNA.....	1564
	IVAN E. HOUK.....	1565
	C. H. HOWELL.....	1571
	P. WILHELM WERNER.....	1573
	H. DE B. PARSONS.....	1574
	E. W. LANE.....	1576
	C. E. GRUNSKY.....	1578
	JULIAN HINDS.....	1580
1718	HYDRAULIC STUDIES AND OPERATING RESULTS ON THE MIAMI FLOOD CONTROL SYSTEM.	
	By C. H. Eiffert.....	1583
	Discussion :	
	By C. S. BENNETT.....	1602
	MORRIS KNOWLES.....	1605
	WALTER M. SMITH.....	1606
	B. F. JAKOBSEN.....	1607
	K. L. DE BLOIS.....	1610
	E. S. LINDLEY.....	1612
	C. S. JARVIS.....	1614
	E. W. LANE.....	1615
	CHARLES H. PAUL.....	1616
	C. H. EIFFERT.....	1617
1719	LOAD DISTRIBUTION IN HIGH ARCH DAMS.	
	By R. A. Sutherland.....	1623

NO.		PAGE
	Discussion :	
	By WILLIAM CAIN.....	1666
	B. F. JAKOBSEN.....	1668
	PAUL BAUMAN.....	1670
	A. FLORIS.....	1675
	FREDRIK VOGT.....	1676
	F. H. CONSTANT.....	1677
	R. A. SUTHERLAND.....	1678

1720 SILTING OF THE LAKE AT AUSTIN, TEXAS.

By T. U. Taylor.....	1681
----------------------	------

Discussion :	
By L. M. LAWSON.....	1690
C. H. EIFFERT.....	1690
OREN REED.....	1691
CHARLES SCHULTZ.....	1692
JOHN B. HAWLEY.....	1693
H. F. ROBINSON.....	1695
JULIAN MONTGOMERY.....	1703
KIRK BRYAN.....	1703
J. C. STEVENS.....	1707
P. A. WELTY.....	1708
BANKS MC LAURIN.....	1713
R. G. TYLER.....	1715
E. C. H. BANTEL.....	1717
R. F. WALTER.....	1719
WILLIAM JENNER POWELL.....	1728
R. I. MEEKER.....	1731
T. U. TAYLOR.....	1733

1721 ENGINEERING AND ENGINEERING EDUCATION: ADDRESS AT THE ANNUAL CONVENTION AT MILWAUKEE, WIS., JULY 10, 1929.

By Anson Marston.....	1736
-----------------------	------

MEMOIRS OF DECEASED MEMBERS

	PAGE
FREDERIC VAUGHAN ABBOT, M. AM. SOC. C. E.....	1745
HENRY SEWALL ADAMS, M. AM. SOC. C. E.....	1747
ROBERT PAUL ANDERSON, M. AM. SOC. C. E.....	1750
WALTER EUGENE ANGIER, M. AM. SOC. C. E.....	1752
LELAND RELLA BALCH, M. AM. SOC. C. E.....	1754
JOHN WESLEY BALL, M. AM. SOC. C. E.....	1756
JOHN TONER BARR, M. AM. SOC. C. E.....	1758
GEORGE STRONG BAXTER, M. AM. SOC. C. E.....	1760
WILLARD BEAHAN, M. AM. SOC. C. E.....	1762
HEZEKIAH BISSELL, M. AM. SOC. C. E.....	1764
WILLIAM HENRY BIXBY, M. AM. SOC. C. E.....	1768
WILLIAM TITCOME BLUNT, M. AM. SOC. C. E.....	1772
GEORGE HERBERT BOYNTON, M. AM. SOC. C. E.....	1774
GEORGE HAMPTON BREMNER, M. AM. SOC. C. E.....	1777
WILLIAM CHARLES BURKE, M. AM. SOC. C. E.....	1779
EUGENE DICKINSON BURNELL, M. AM. SOC. C. E.....	1781
HENRY JACKSON BURT, M. AM. SOC. C. E.....	1784
DAVID SYLVANUS CARLL, M. AM. SOC. C. E.....	1786