REFERENCES

- ALBERTSON, O.E. (1961). Ammonia Nitrogen and the Anaerobic Environment.

 JWPCF, Vol. 33, No.9, pp. 978-995.
- ANDREWS, J.F., and PEARSON, E.A. (1965). Kinetics and Characteristics of Volatile Acid Production in Anaerobic Fermentation Processes.

 Int.J. Air Wat. Poll., Vol. 9, pp. 439-461.
- BABBITT, H.E., and BAUMANN, E.R. (1958). Sewage and Sewerage Treatment,
 John Wiley & Sons, Inc., New York.
- BARKER, H.A. (1956). Biological Formation of Methane. <u>Industrial and</u>
 <u>Engineering Chemistry</u>, Vol. 48, No. 9, pp. 1,438-1,443.
- BUSWELL, A.M., and MORGAN, G.B. (1963). Paper Chromatographic Method for Volatile Acids: III Toxicity of Propionic Acid.

 Proc. of the 17th Ind. Waste Conf., Purdue University. Ext. Ser. 112, p 377.
- CAMP, T.R. (1963). <u>Water and Its Impurities</u>. Reinhold Publishing Corporation, London.
- CARPENTER, P.L. (1967). Microbiology, W.B. Saunders Company, U.S.A.
- CHITTENDEN, J.A., and WELLS, W.J., Jr. (1971). Rotating Biological
 Contactors Following Anaerobic Lagoons. <u>JWPCF</u>, Vol. 43, No.5
 pp. 746-754.
- CLARK, R.H., and SPEECE, R.E. (1970). The pH Tolerance of Anaerobic Digestion. International Association of Water Pollution Research, Vol. 2, pp. 27/1 27/14.
- COOKSON, J.T., and BURBANK, N.C., Jr. (1965). Isolation and Indentification of Anaerobic and Facultative Bacteria Present in the Digestion Process. JWPCF, Vol. 37, No. 6, pp. 822-841.
- COULTER, J.B., SONEDA, S., and ETTINGER, M.B. (1975). Anaerobic

 Contact Process for Sewage Disposal Sewage and Industrial

 Wastes, Vol. 29, No. 4, pp. 468-477.
- DAGUE, R.R. (1968). Application of Digestion Theory to Digester Control.

 <u>JWPCF</u>, Vol. 40, No.12, pp. 2,021 2,031.
- DILALLO, R., and ALBERTSON, O.E. (1961). Volatile Acids by Direct Titration. JWPCF, Vol. 33, No. 4, pp. 356-365.

- ECKENFELDER, W.W., Jr. (1967). Mechanisms of Sludge Digestion.
 Water and Sewage Works, June, pp. 207-210.
- ECKENFELDER, W.W., Jr., and O'Connor, D.J. (1961). Biological Waste Treatment, Pergamon Press, Oxford.
- EL-SHAFIE, A.T., and BLOODGOOD, D.E. (1973). Anserobic Treatment in a Multiple Upflow Filter System. <u>JWPCF</u>, Vol. 45, No.11, pp. 2,345 2,357.
- FILBERT, J.W. (1967). Procedures and Problems of Digester Startup.

 JWPCF, Vol. 39, No. 3, pp. 367-372.
- FINSEN, P.O., and SAMPSON, D. (1959). Denitrification of Sewage

 Effluents. The Water and Waste Treatment Journal,

 May/June.
- GALLER, W.S., and GOTAAS H.B. (1964). Analysis of Biological Filter Variables. <u>Journal of The Sanitary Engineering Division</u>, ASCE, 90, SA 6, Proc. Paper 4174, pp. 59-79.
- GHOSH, S. (1972). Literature Review on Anaerobic Processes. <u>JWPCF</u>, Vol. 44, No. 6, pp. 948-959.
- GHOSH, S. (1973). Literature Review on Anaerobic Processes. <u>JWPCF</u>, Vol. 45, No. 6, pp. 1,063-1,074.
- GHOSH, S. (1975). Anaerobic Acidogenesis of Wastewater Sludge.

 JWPCF, Vol. 47, No. 1, pp. 30-45.
- HEMENS, J., MEIRING, P.G.J., and STANDER, G.J. (1962). Full-Scale
 Anaerobic Digestion of Effluent From the Production of
 Maize-Starch. Water Waste Treatment, May-June,
- HEUKELEKIAN, H., and HEINEMANN, B. (1939). Studies on the Methane-Producing Bacteria: I Development of a Method for Enumeration. Sewage Works Journal, Vol. 11, No. 3, pp. 426-444.
- Producing Bacteria: IV Growth of Methane-Producing Organisms in Supernatant Sludge Liquors. Sewage Works Journal, Vol.11, No. 6, pp. 965-970.
- HEUKELEKIAN, H., and BERGER, H.F. (1951). Production of Volatile Neutral Compounds During Digestion of Sewage Solids and Industrial Wastes. Sewage Ind. Wastes, Vol. 23, pp. 1,373-1,379.

- HOEHN, R.C., and RAY, A.D. (1973) Effects of Thickness on Bacterial Film. JWPCF, Vol. 45, No. 11, pp. 2,302-2,320.
- IVES, K.J. (1965). Research on Vaviables Affecting Filtration.

 Journal of the Sanitary Engineering Division, ASCE, August,
 pp. 1-18.
- JENNETT, J.C., and DENNIS, N.D., Jr. (1975). Anaerobic Filter Treatment of Pharmaceutical Waste. JWPCF, Vol. 47, No. 1, pp. 104-121.
- JERIS, J.S., and Mc CARTY, P.L. (1962). The Biochemistry of Methane
 Fermentation Using C¹⁴ Tracers. <u>JWPCF</u>, Vol. 37, No. 2,
 pp. 178-192.
- JESUITAS, E.P. (1966). An Investigation of Tapioca Wastes. Master of Engineering Thesis No. 136, SEATO Graduate School of Engineering, Bangkok.
- KAPLOVSKY, A.J. (1951). Volatile Acid Production During the Digestion of Seeded, Unseed, and Limed Fresh Solids. Sewage and Industrial Wastes, Vol. 23, pp. 713-721.
- KEEFER, C.E., and WATKINS, H. (1968). Decomposition of Pyruvic Acid.

 JWPCF, Vol. 40, No. 5, pp. R230-R234.
- KLUYVER, A.J., and SCHNELLEN, C.G.T.P. (1947). On the Fermentation of Carbon Monooxide by Pure Cultures of Methane Bacteria.

 Arch. Biochem., Vol. 14, pp. 57-70.
- KUGELMAN, I.J. and Mc CARTY, P.L. (1965). Cation Toxicity and Stimulation in Anaerobic Waste Treatment. <u>JWPCF</u>, Vol. 37, No. 1, pp. 97-115.
- KUGELMAN, I.J., and CHIN, K.K. (1971). Toxicity, Synergism, and

 Autoganism in Anaerobic Waste Treatment Processes.

 Anaerobic Biological Treatment Process, Adv. in Chem. Series

 105 (Ed. GOULD, R.F.) Am. Chem. Soc., Washington D.C..
- LAWRENCE, A.W., and Mc CARTY, P.L. (1969). Kinetics of Methane

 Fermentation in Anaerobic Treatment. <u>JWPCF</u>, Vol. 41, No. 2,

 Part 2, pp. R1-R17.
- LAWRENCE, A.W. (1971). Application of Process Kinetics to Design of
 Anaerobic Processes. Anaerobic Biological Treatment Process,
 Adv. in Chem. Series 105 (Ed. GOULD, R.F.), Am. Chem. Soc.,
 Washington D.C..

- LEVY, J., CAMPBELL, J.J., and BLACKBURN, T.H. (1973). Introductory Microbiology, John Wiley & Sons, Inc., New York.
- LOVAN, C.R., and FOREE, E.G. (1971). The Anaerobic Filter for the Treatment of Brewery Press Liquor Waste. Proc. of the 26th
 Ind. Waste Conf., Purdue University, pp. 1,074-1,086.
- LYNAM, B. Mc DONNELL, G., and KRUP, M, (1967). Start-Up and Operation of Two New High-Rate Digestion Systems. <u>JWPCF</u>, Vol. 39, No.4, pp. 518-534.
- Mc CARTY, P.L., and Mc KINNEY, R.E. (1961). Volatile Acid Toxicity in Anaerobic Digestion. <u>JWPCF</u>, Vol. 33, No. 3, pp. 223-232.
- Mc CARTY, P.L., and Mc KINNEY, R.E. (1961). Salt Texicity in Anaerobic Digestion. JWPCF, Vol. 33, No. 4, pp. 399-415.
- Mc CARTY, P.L., and VAT, C.A. (1962). Volatile Acid Digestion at High Loading Rates. Int. J. Air Wat. Poll., Vol. 6, pp. 65-73.
- Mc CARTY, P.L. (1964). Anaerobic Waste Treatment Fundamentals: Part One. Public Works, September, pp. 107-112.
- Mc CARTY, P.L. (1964). Anaerobic Waste Treatment Fundamentals: Part Two. Public Works, October, pp. 123-126.
- Mc CARTY, P.L. (1964). Anaerobic Waste Treatment Fundamentals: Part Three.

 Public Works, November, pp. 91-94.
- Mc CARTY, P.L. (1964). Anaerobic Waste Treatment Fundamentals: Part Four. Public Works, December, pp. 95-99.
- Mc CARTY, P.L. (1968). Anaerobic Treatment of Soluble Wastes. Advances
 in Water Quality Improvement, (Eds.GLOYNA, E.F., and ECKENFELDER, W.W., Jr.), University of Texas, Austin, pp. 336-351.
- Mc CARTY, P.L., BECK, L., and AMANT, P.S. (1969). Biological Denitrification of Wastewaters by Addition of Organic Materials. Proc. of the 24th Ind. Waste Conf., Purdue University, pp. 1,271-1,284.
- Mc GARRY, M.G., and PESCOD, M.B. (1970). Stabilization Pond Design
 Criteria for Tropical Asia. 2nd International Lagoon Symposium,
 Kansuscity.

- Mc GARRY, M.G., SHUTO, N., WHITAKER, T., and CHAVANICH, L. (1972).

 Coastal Water Pollution Survey of Chonburi Province, Asian
 Institute of Technology, Thailand.
- Mc GHEE, T.J. (1971). Volatile Acid Concentration in Batch Fed Anaerobic Digestion. Water and Sewage Works, May, pp. 130-132.
- Mc MINNEY, R.E. (1962). Microbiology for Sanitary Engineers, Mc Graw-Hill Book Co., Inc., New York.
- Mc NARY, R.R., WOLFORD, R.W., and DOUGHERTY, M.H. (1954). Experimental Treatment of Citrus Waste Water. Proc. of the 8th Ind. Waste Conf., Purdue University, pp. 256-274.
- METCALF and EDDY, Inc. (1972). Wastewater Engineering, Mc Graw-Hill Book Co., Ltd., New York.
- MONOD, J. (1942). Recherches sur la croissance des cultures bacteriennes. Hermann and Cie (France), Paris.
- NEWTON, D., KEINATH, H.L., and HILLIS, L.S. (1962) Pilot Plant Studies for the Evaluation of Methods of Treating Brewery Wastes.

 Proc. of the 16th Ind. Waste Conf., Purdue University, pp. 332-350.
- OLDHAM, W.K., and NEMETH, L. (1973). Anaerobic Lagoons for Treatment of High-Strength Organic Wastes. <u>JWPCF</u>, Vol. 45, No. 11, pp. 2,397-2,403.
- PAINTER, H.A., HEMENS, J., and SHURBEN, D.G. (1960). Treatment of Malt Wiskey Distillery Wastes by Anaerobic Digestion. Brewer's Guard.
- PAYNTER, M.J.B., and HUNGATE, R.E. (1968). Characterization of Methanobacterium Mobilis, sp.n., Isolated From the Bovine Rumen. J. Bacteriol, Vol. 95, pp. 1,943-1,951.
- PEARSON, E.A. (1968), Kinetics of Biological Treatment. Advances in Water Quality Improvement, (Eds., GLOYNA, E.F., and ECKEN-FELDER, W.W., Jr.), University of Texas Press, Austin, pp. 381-394.

- PETTET, A.E.J., TOMLINSON, T.G., and HEMENS, J. (1959). The Treatment of Strong Organic Wastes by Anaerobic Digestion, <u>J. Inst.</u>
 Public Health Engr., July, pp. 170-191.
- PFEFFER, J.T., LEITER, M., and WORLUND, J.R. (1967). Population Dynamics in Anaerobic Digestion. JWPCF, Vol. 39, No. 8, pp. 1,305-1,322.
- PLUMMER, A.H., Jr., MALINA, J.F., Jr., and ECKENFELDER, W.W., Jr. (1968).

 Stabilization of a Low Solids Carbohydrate Waste by an Anaerobic Submerged Filter. Proc. of the 23rd Ind. Waste Conf., Purdue University, pp. 462-473.
- POHLAND, F.G., and BLOODGOOD, D.E. (1963). Laboratory Studies on Mesophilic and Thermophilic Anaerobic Sludge Digestion.

 JWPCF, Vol. 35, pp. 11-42.
- POHLAND, F.G., and KANG, S.J. (1971). Liturature Review on Anaerobic Processes. JWPCF, Vol. 43, No. 6, pp. 1,129-1,134.
- RAMAN, V., and CHAKLADAR, N. (1972). Upflow Filters for Septic Tank Effluents. JWPCF, Vol. 44, No. 8, pp. 1,552-1,560.
- RAO, B.S., et.al., (1971). Anaerobic Activated Sludge Process.

 Environ. Health (Ind.), Vol. 13, No.4, pp. 285.
- REYNOLDS, T.D. (1967). Anaerobic Digestion of Waste Activated Sludge.

 Water and Sewage Works, February, pp. 37-42.
- ROY F. WESTON, INC. (1971). Process Design Manual for Upgrading Existing

 Wastewater Treatment Plants, Environmental Protection Agency,

 Technology Transfer, U.S.A.
- SANDERS, F.A., and BLOODGOOD, D.E. (1965). The Effect of Nitrogen-to-Carbon Ratio on Anaerobic Decomposition. <u>JWPCF</u>, Vol. 37, No. 12, pp. 1,742-1,752.
- SAWYER, C.N., and Mc CARTY, P.L. (1967). Chemistry for Sanitary Engineers,
 Mc Graw-Hill Book Co., Ltd., New York.
- SCHROEPFER, G.J., FULLEN, W.J., JOHNSON, A.S. ZIEMKE, N.R., and ANDERSON, J.J. (1955). The Anaerobic Contact Process as Applied to Packinghouse Wastes. <u>Sewage and Industrial Wastes</u>, Vol.27, No. 4, pp. 460-486.

- SCHROEPFER, G.J., and ZIEMKE, N.R. (1959). Development of the Anaerobic Contact Process: I Pilot-Plant Investigations and Economics. Sewage and Industrial Wastes, Vol. 31, No.2, pp. 164-190.
- SCHROEPFER, G.J., and ZIEMKE, N.R. (1959). Development of the Anaerobic Contact Process: II Ancillary Investigations and Special Experiments. Sewage and Industrial Wastes, Vol. 31, No.6, pp. 698-711.
- SCHULZE, K.L., and NAGA RAJU, B. (1958). Studies on Sludge Digestion and Methane Fermentation: II Methane Fermentation of Organic Acids. Sewage and Industrial Wastes, Vol. 30, No.2, pp. 164-184.
- SMITH, P.H., and HUNGATE, R.E. (1958). Isolation and Characterization of Methanobacterium ruminantium n.sp.. J. Bacteriol, Vol.75, pp. 713-718.
- SPEECE, R.L., and Mc CARTY, P.L. (1962). Nutrient Requiremnets and
 Biological Solids Accumilation in Anaerobic Digestion.

 Proceeding of the International Conference on Water Pollution
 Research, Pergamon Press.
- STANDARD METHODS (1974). Standard Methods for the Examination of Water and Wastewater. 13th Ed., APHA, AWWA, and the WPCF, New York.
- STADTMEN, T.C., and BARKER, H.A. (1951). Studies on the Methane
 Fermentation: VIII Tracer Experiments on Fatty Acid Oxidation
 by Methane Bacteria. J. Bacteriol, Vol. 61, pp. 67-80.
- STEFFEN, A.J., and BEDKER, M. (1962). Operation of Full-Scale Anaerobic Contact Treatment Plant for Meat Packing Wastes. Purdue University, pp. 423-437.
- STEWART, M.J. (1964). Activated Sludge Process Variations. The Complete Spectrum. Part III. Effluent Quality-Process Loading Relationship. Water and Sewage Works, Reference No., R-260.

- TAYLOR, D.W. (1971). Full-Scale Anaerobic Trickling Filter Evaluation.

 Proceedings Third National Symposium on Food Processing Wastes,
 U.S. EPA., pp. 151-162.
- THIMANN, K.V. (1963). The Life of Bacteria, The McMillan Co., New York, pp. 167.
- TOERIEN, D.F., THIEL, P.G., and PRETORIUS, W.A. (1971). Substrate Flow in Anaerobic Digestion. <u>International Association of Water Pollution Research</u>, Vol. 2, pp. 29/1 19/7.
- TONGKASAME, C. (1968). Anaerobic Treatment of Tapioca Starch Waste.

 Master of Engineering Thesis No. 228, Asian Institute of
 Technology, Thailand.
- TORPEY, W.N. (1955). Loading to Failure of a Pilot High-Rate Digester.

 Sewage and Industrial Wastes, Vol. 27, No.2, pp. 121.
- TORPEY, W.N., and MELBINGER, N. (1967). Reduction of Digested Sludge Volume by Controlled Recirculation. <u>JWPCF</u>, Vol.39, No.9, pp. 1,464-1,474.
- UDDIN, M.D. (1970). Anaerobic Pond Treatment of Tapioca Starch Waste.
 <u>Master of Engineering Thesis No. 440</u>, Asian Institute of Technology, Thailand.
- USUK, V. (1975). Master of Engineering Thesis, Chulalongkorn University, Bangkok.
- WILLIMON, E.P., Jr. and ANDREWS, J.F. (1969). Multistage Biological Processes for Wastes Treatment. JWPCF, Vol. 41, No.1, pp.99-111.
- WOOD, W.A. (1962). Fermentation of Carbohydrates and Related Compounds.

 The Bacteria. Vol. 11: Metabolism, pp. 59-149, Acadamic

 Press, New York.
- WPCF MANUAL OF PRACTICE No. 16. Anaerobic Sludge Digestion, Water Pollution Control Federation, Washington, D.C.
- YOUNG, J.C., and Mc CARTY, P.L. (1969). The Anaerobic Filter for Waste Treatment. JWPCF, Vol.41, No.5, Part 2, pp. R160-R173.
- ZABLATZKY, H.R., and PETERSON, S.A. (1968). Anaerobic Digestion Failures. JWPCF, Vol.40, No. 4, pp. 581-585.

VITA

The author, Mr. Suraphon Saiphanich, was born on September 7, 1951 at Chantaburi province, Thailand. He received a bachelor degree in civil engineering from Kasetsart University in 1972. He then, worked with the Engineering Department, the Metropolitan Water Works Autority as a civil engineer responsible for construction supervision. In 1973 he took a leave to further his postgraduate study in Sanitary Engineering at Graduate School, Chulalongkorn University. Presently, he is still working with the MWWA.