

P

- Philco Radio Company,
Philadelphia, Pa.
Philips Research Reports,
Eindhoven, Holland
Philips Technical Review,
Eindhoven, Holland
Philosophical Magazine,
London, England
Physica,
The Hague, Holland
Physical Review,
New York, N. Y.
Prentice-Hall Publishing Company,
New York, N. Y.
Princeton University Press,
Princeton, N. J.
Proceedings, Cambridge Philosophical
Society,
London, England
Proceedings, Institute of Radio Engineers,
New York, N. Y.
Proceedings, Institution of Electrical
Engineers,
London, England
Proceedings, National Electronics Confer-
ence,
Chicago, Ill.
Proceedings, Physical Society,
London, England
Proceedings, the Royal Society,
London, England

Q

- Quarterly of Applied Mathematics,
Providence, R. I.

QST,

West Hartford, Conn.

R

- Radiation Laboratory,
Boston, Mass.
Radio-Electronic Engineering,
Chicago, Ill.
Radio Research Laboratory,
Boston, Mass.
RCA Review,
Princeton, N. J.
Reports of the Physical Society on Progress
in Physics,
London, England
Research Laboratory of Electronics,
Boston, Mass.
Review of Scientific Instruments,
New York, N. Y.
Reviews of Modern Physics,
New York, N. Y.
Revue Générale de l'Électricité,
Paris, France
Revue Scientifiques,
Paris, France

S

- Science Reports of the Research Institute of
Tohoku University,
Japan
Servomechanism Laboratory,
Boston, Mass.
Sylvania Technologist,
Kew Gardens, N. Y.

T

- Telecommunication Research
Establishment,
England
Tele-Tech,
New York, N. Y.
Tijdschrift van het Nederlandsch Radio-
genootschap,
Baarn, Holland
Transactions of the IRE,
New York, N. Y.
TV Engineering,
New York, N. Y.

U

- United States Naval Research Laboratory,
Washington, D. C.
University of Michigan,
Ann Arbor, Mich.

V

- Van Nostrand Publishing Company,
New York, N. Y.

W

- Wireless Engineers,
London, England
Wireless World,
London, England

Z

- Zeitschrift für angewandte Physik,
Berlin, Germany
Zhurnal Tekhnoskoi Fiziki,
Leningrad, U.S.S.R.

Supplement to

A Bibliography of Information Theory (Communication Theory—Cybernetics)

F. L. STUMPERS*

CONTENTS

I.	General theory	31	VII.	(a) Other biological applications. (Cybernetics and the nervous system)	44
II.	(a) Bandwidth and transmission capacity, time-frequency uncertainty	33		(b) Human engineering	42
	(b) Signal-to-noise ratios	34		(c) Group communication and learning	42
	(c) Instantaneous frequency	34	VIII.	Television	43
	(d) Analytical Signals	34	IX.	(a) Miscellaneous applications	43
III.	Definition, relation with statistical mechanics, philosophy	34		(b) Games	44
IV.	Correlation, prediction, filtering, storage	35		(c) Optics	44
V.	(a) Radar	37		(d) Servomechanisms	44
	(b) Radionavigation	37	X.	Mathematics: (a) Statistics	45
VI.	(a) Speech	38		(b) Games	45
	(b) Hearing	39		(c) Relay-algebra	45
	(c) Vision	39		(d) Noise analysis	45
	(d) Linguistics, semantics	40	XI.	Pulse modulation, multiplex, coding	46

I. GENERAL THEORY

Books:

Bell, D. A., *Information Theory and its Engineering Applications*, London, Pitman, 138 pp., 1953.

* Philips Research Labs., Eindhoven, Netherlands.

Black, H. S., *Modulation Theory*. New York, van Nostrand, 345 pp., 1953.

Cherry, E. C., *Introduction to Communication Theory*. New York, Wiley, 1954.

Polytechnic Institute of Brooklyn: *Symposium Information Networks*. Networks Symposia Series III, 1954.

Papers:

- Adler, F. P., and Felker, J. H., "Figure of Merit for Communication Devices." *Proc. IRE*, Vol. 42 (1954), p. 1191.
- Andrew, A. M., "Information Theory." *Electronic Eng.*, Vol. 25 (1953), pp. 471-475.
- Anglès d'Auriac, H., "Analyse des signaux et analyse des opérateurs linéaires de transmission." *H. F.* (Brussel), Vol. 2 (1953), pp. 119-138, 162-172, 179-187.
- Aschoff, V., "Die Technik der menschlichen Mitteilung." *E. T. Z.*, Vol. 72 (1951), pp. 140-144.
- Bassore, B. L., *The Concept of Efficiency in the Communication of Information*. Master's Thesis, El. Eng. Dept. M.I.T., 58 pp., (1950)
- , "Threshold Detection." 1954 IRE Convention Record, pt. 4, pp. 65-68.
- Blanc Lapierre, A., "Considérations sur la transmission de l'information et sur son application à certains domaines de la physique." *Ann. Inst. Poincaré*, Vol. 13 (1953), pp. 245-296. (A10726-1953).
- Cheatham, T. P., and Tuller, W. G., *Communication Theory and Network Synthesis*. Symp. Information Networks, 1954, pp. 11-17.
- Cherry, E. C., "Communicating Information: Languages, Codes and Symbols." *Electrotechnics*, (India), Vol. 24 (1952), pp. 137-141.
- , "Information Theory and Instrumentation." *Research*, Vol. 6 (1953), pp. 265-270.
- Coggeshall, I. S., "The Transmission of Intelligence in Typescript." *TRANS. IRE C. S-1*, Vol. 1 (1953), pp. 4-13.
- C. C. I. R., Study Programme Nr. 47: *Communication Theory*. London, 1953.
- Com. Nat. Français U.R.S.I., *Rapport sur le point 2 du programme d'études 10 du C.C.I.R.*, Proc. U.R.S.I. meeting Sydney, Vol. IX, fasc. 7, comm. VI, (1953), pp. 23-26.
- Dantzig, D. van, "Some Informal Information on 'Information'." *Synthese*, Vol. 9 (1954), pp. 137-144.
- Davis, H., and Trautman, D. L., "Removal of the Redundancy Due to Intersymbol Interference." (Abstr.) *Proc. IRE*, Vol. 43 (1955), p. 376.
- Dessoulavy, R., "Théorie du signal et de l'information et application aux télécommunications." *Bull. Schweiz. elektrotech. Ver.*, Vol. 44 (1953), pp. 534-543.
- Dolansky, L., and Dolansky, M. P., "Table of $\log_2 1/p$, $p \log_2 1/p$, $p \log_2 1/p + (1-p) \log_2 1/(1-p)$. Tech. Rep. 227, M.I.T., Res. Lab. Electronics.
- Esser, P. H., General Review (of the programme of the 9th Intern. Signifie Summer Conf.) *Synthese*, Vol. 9 (1954), pp. 133-136.
- Fano, R. M., *Information Theory and Generalized Networks*. Symp. Inform. Networks, 1954, pp. 3-9.
- , "Information Theory—Past, Present and Future." 1954 IRE Nat. Conv. (Abstr.) *Proc. IRE*, Vol. 42 (1954), p. 604.
- , "Information Theory, Past, Present and Future." 1954 IRE Conv. Rec., Pt. 4, 1954, pp. 2-5.
- Faverge, J. M., "La théorie de l'information en psychologie expérimentale." *Année psychol.*, Vol. 53 (1953), pp. 463-476. (B28, 8298, 1954).
- Feinstein, A., "A New Basic Theorem of Information Theory." *TRANS. IRE—Information Theory* 4 (September, 1954), pp. 2-22. M.I.T. Res. Lab. Electron., Techn. Rep. 282, 1954.
- Feinstein, J., "Toward an Information Theory of Propagation Through Time Varying Media." 1954 IRE Nat. Conv. (Abstr.), *Proc. IRE*, Vol. 42 (1954), p. 627.
- Feldman, C. B., "Information Theory." *Bell Labs. Record*, Vol. 31 (1953), pp. 326-332.
- Flanagan, J. E., *Topics in Information Theory*. Doctor's Thesis, Illinois, June, 1953.
- Francesco, S. de, "Note on a Theorem of Shannon." *Ann. Geofis.*, Vol. 7 (1954), pp. 195-207.
- Fritz E., "Information Theory in Air Traffic Control." *TRANS. IRE—Aeronautical-Navigational Electronics*, (December, 1953), pp. 16-20.
- Frühaufl, H., "Information Theory as a Tool of the Communication Engineer." *Wiss. Z. Tech., Hochschule Dresden* 3 nr. 4 (1953-1954), pp. 571-580 (1955), p. 381.
- , "Ueber die Grundprobleme der Theorie der Nachrichtenübertragung." *Nachrichtentechnik*, Vol. 4 (1954), pp. 49-54, 259-263.
- Gabor, D., "Communication Theory and Cybernetics." *TRANS. IRE—Circuit Theory* 1, (1954), pp. 19-31, (Intern. Symp. Electr. Telev. Milan, 1954).
- , "Der Nachrichtengehalt eines elektromagnetischen Signals." *Archiv. el. Uebertr.*, Vol. 7 (1953), pp. 95-99.
- Gamba, A., "Information Theory and Knowledge: Remarks on a Paper by D. K. C. MacDonald." *Jour. Appl. Phys.*, Vol. 25 (1954), p. 1549.
- Harwood, E. H., "Introduction to Communication Theory." *Trans. S. Afr. Inst. Elect. Engrs.*, Vol. 44 (1953), pp. 241-253.
- Huffman, D. A., "Information Conservation and Sequence Transducers." Symp. Inform. Networks, 1954.
- Ito, H., "On the Theory of Continuous Information." *Proc. Jap. Acad.*, Vol. 28 (1952), pp. 187-191.
- Kirk, J. R., "Communication Theory and Methods of Fixing Belief." *Etc. Rev. gen. Semantics*, Vol. 10 (1953), pp. 298-305. (B 28, 7456, 1954).
- Klausner, S. Z., "Communication Theory as the Unifying Theme in Teaching Educational Psychology." *Jour. Educ. Psychol.*, Vol. 44 (1953), pp. 483-489. (B 28, 6867, 1954).
- Kullback, S., "A Note on Information Theory." *Jour. Appl. Phys.*, Vol. 24 (1953), pp. 106-107.
- Kunisawa, K., "The mathematical foundation of Shannon's information source and its application to binary coding." (A statistical treatment of binary coding.) *Rep. Statist. Appl. Res. Union Jap. Sci. Eng.*, Vol. 2 (1952), nr. 1, pp. 4-26.
- Kunze, A. A., and Schermerhorn, J. G., "A New Horizon in Communication Theory—the Polyphase Concept." (Abstr.) *Proc. IRE*, Vol. 43 (1955), p. 350.
- Laemmel, A. E., "Characteristics of Communication Systems." Rep. R-233-51, P.I.B. 178 (1951), Polytech. Inst. Brooklyn.
- , "Application of Linear Graphs to Communication Problems." *TRANS. IRE—Info. Theory* 3 (March, 1954), p. 138 (Abstr.).
- Laffeur, Ch., "Les données fondamentales de la théorie de l'information." *H. F. Brussel*, Vol. 2, nr. 8 (1953), pp. 219-228.
- Lehan, F. W., and Parks, R. J., "Optimum Demodulation." 1953 IRE Convention Record, Pt. 8 (1953), pp. 101-103.
- Levine, D., "Information-Cells on Intensity Modulated C.R.T. Screens." *Proc. IRE*, Vol. 41 (1953), pp. 1766-1768.
- Loeb, J., "La cybernétique." *La Technique moderne*, Vol. 44 (1952), pp. 193-200.
- , "Sur l'application des théories de Shannon au codage binaire." U.R.S.I. doc. 70-VI (1954).
- , "Théorie de l'information." "Techniques de l'ingénieur," E. 2820, 1-8, Paris, 1953.
- , "La probabilité des causes dans la technique des télécommunications et des mesures." *Ann. Télécomm.*, Vol. 9 (1954), pp. 15-19.
- , "Les deux types d'erreurs dues au Bruit." *Ann. Télécomm.*, Vol. 9 (1954), pp. 29-34.
- MacDonald, D. K. C., "Information Theory and Knowledge." *Jour. Appl. Phys.*, Vol. 25 (1954), pp. 619-622.
- MacKay, D. M., "Operational Aspects of Some Fundamental Concepts in Human Communication." *Synthese*, Vol. 9 (1954), p. 182-198.
- Maillard, J., "Caractéristiques techniques liées à l'information. Application aux télécommunications et à la détection." *Onde électr.*, Vol. 32 (1952), pp. 500-514.
- Malatesta, S., "Contributo allo studio statistico della comunicazione." *Alta freq.*, Vol. 21 (1952), pp. 163-198.
- Mayer, H. F., "Die Bedeutung der Informationstheorie für die Nachrichtentechnik." *E.T.Z.A.*, Vol. 74 (1953), pp. 422-423.
- McGill, W. J., "Multivariate Information Transmission." *TRANS. IRE—Information Theory* 4 (September, 1954), pp. 93-111.
- McMillan, B., "Information Rates and the Information Lattice." (Abstr.) *Bull. Amer. Math. Soc.*, Vol. 60 (1954), p. 558.
- , "The Basic Theorems of Information Theory," *Ann. Math. Stat.*, Vol. 24, (1953), pp. 169-219.
- Meter, D. van, and Middleton, D., "Modern Statistical Approaches to Reception in Communication Theory." *TRANS. IRE—Information Theory* 4 (September, 1954), pp. 119-145.
- Meijer Eppler, W., "Informationstheorie." (Autorenreferat eines Vortrages.) *Elektron.*, Rdschau 9 (1955), p. 34.
- , "Neue Aufgabe und Wege der Nachrichtenforschung." *Arch. el. Uebertr.*, Vol. 7 (1953), pp. 201-206.
- Middleton, D., "Information Loss Attending the Decision Operation in Detection." *Jour. Appl. Phys.*, Vol. 25 (1954), pp. 127-128.
- Moles, A., "Information et cybernétique." *Onde électr.*, Vol. 33 (1953), pp. 637-651.
- Morita, K., "Report to Comm. VI U.R.S.I. from Japanese Nat. Comm." Pt. III. Information Theory, U.R.S.I. (1954), doc. 143-VI.

- Muller, F. A., *Communication in the Presence of Additive Gaussian Noise*, Tech. Rep. 244, M.I.T. Res. Lab. Electronics (1953).
- Muroga, S., "On the Capacity of a Discrete Channel I. Mathematical Expression of Capacity of a Channel Which is Disturbed by Noise in its Everyone Symbol and Expressible in one State Diagram." *Jour. Phys. Soc., Japan*, Vol. 8 (1953), pp. 484-494.
- Nasvytio, A., "Die Gesetzmässigkeiten kombinatorischer Technik." (Kap. 5-7). Springer, 103S, (1953).
- Neidhart, D., "Die Bedeutung der Informationstheorie für die Entwicklung der modernen Nachrichten und Elektrotechnik." *Nachr. Tech.*, Vol. 4 (1954), p. 248.
- Page, Ch. H., "Information Theory." *Jour. Wash. Acad. Sci.*, Vol. 41 (August, 1951), pp. 245-249.
- Parke, N. G., and Samson, E. W., "Distance and Equivalence in Sequence Space." Air Force Cambridge Res. Labs. E. 4080 (1951).
- Peroni, G. B., "Sulla teoria della informazione." *Poste e Telecomm.*, Vol. 19 (1951), pp. 310-318.
- Pierce, J. H., "Communication Theory." *Physics Today*, Vol. 4 (May, 1951), pp. 6-12.
- Preston, G. W., "The Equivalence of Optimum Transducers and Sufficient and Most Efficient Statistics." *Jour. Appl. Phys.*, Vol. 24 (1953), pp. 841-844.
- Rapoport, A., "What is Information" *Synthese*, Vol. 9 (1954), pp. 157-176. *Etc. Rev. gen. Semant.*, Vol. 10 (1953), pp. 247-260. (B28, 7462, 1954).
- Ridenour, L. N., *Information and its Communication*. (Part III, *Modern Physics for the Engineer*) New York, McGraw Hill, 1954, 490 pp.
- Rideout, V., *Noise and Information theory*. Ch. 15, *Active networks*. 430-455. New York, Prentice Hall, 485 pp., 1954.
- Robbins, H., "A Note on Information Theory." *Proc. IRE*, Vol. 42 (1954), p. 1193.
- Rosa, G., "Metodologia dell'informazione." *Atti. Congr. Metodol. Torino* (1952), pp. 225-231.
- Rosa, L. A. de, "Recent Advances in Information Theory." 1953 IRE Convention Record, Pt. 8, pp. 35-38.
- Rothstein, J., "An Informational Approach to Organization and System Engineering Design." *TRANS. IRE, PGEM-1*, (February, 1954), pp. 25-29.
- Rous, R. F., and Speed, R. F. B., "The Significance of Information Theory to Communication Systems." *Comm. and Electronics* (London), Vol. 2 (1955), pp. 56-59.
- Sakagachi, M., "Notes on Statistical Application of the Information Theory." *Rep. Statist. Appl. Res. Union. Jap. Sci. Eng.*, Vol. 1 Nr. 4 (1952), pp. 27-31.
- Samson, E. W., "Fundamental Natural Concepts of Information Theory." *Etc. Rev. gen. Semant.*, Vol. 10 (1953), pp. 283-297.
- , *Fundamental Natural Concepts of Information Theory*. Rep. E. 5079, Air Force Cambridge Center, 25 pp., 1954.
- , *Information Theory: Questions and Uncertainties*. Tech. Rep. 54-1, Air Force Cambridge Research, 45 pp. 1951.
- , *Compressing Information for Relay Transmission: An Introductory Survey of Basic Principles and Problems*. Rep. E. 5056, Air Force Cambridge Res. Labs., 27 pp. 1950.
- , *Theory of Information: The Basic Theorems on System Uncertainty*. Rep. 53-37, Air Force Cambridge Res. Center, 25 pp., 1953.
- Schouten, J. F., "Informatietheorie en de overdracht en herkenbaarheid van spraak en beeld." *Hand. 33e Ned. Natuur. Geneesk. Congres*, pp. 95-97, 1953.
- Shannon, C. E., "The Rate of Approach to Ideal Coding." (Abstr.) *Proc. IRE*, Vol. 43 (1955), p. 356.
- Slomin, G. W., "Cybernetics, a Super Science." *Iron Age*, Vol. 168 (1951), pp. 124-126.
- Soest, J. L. van, "Introduction to the Theory of Scientific Information." *Synthese*, Vol. 9 (1954), pp. 177-181.
- , "Het synthetisch element in de informatietheorie." *Hand. 33e Ned. Natuur. Geneesk. Congres*, (1953), pp. 97-98.
- Surindar Suri, "The Communication Process." *Synthese*, Vol. 9 (1954), pp. 289-298.
- Takahashi, H., "Quantum Theory of Communication." U.R.S.I. doc. 34-VI (1954).
- U.R.S.I., *Resolutions and Recommendations for Future Work Commission VI*. U.R.S.I. Bulletin No. 88, (November, December, 1954), pp. 8-13.
- Vries, H. de, "Informatietheorie met toepassing op zintuigen." *Ned. T. v. Natuurk*, Vol. 20, (1954), pp. 229-232.
- Waldelius, E., "Basic Concepts in the Theory of Information." *Tele. (Stockholm)* (1952). (In Swedish), pp. 97-117.
- Weaver, W., "Probability, Rarity, Interest and Surprise." *Scient. Mo.*, Vol. 67 (1948), pp. 390-392.
- , "Recent Contributions to the Mathematical Theory of Communication." *Etc. Rev. gen. Semant.*, Vol. 10 (1953), pp. 261-281. (B2. 8, 7648, 1954).
- , "Information Theory I. Information Theory to 1951—a Non-Technical Review." *J. Speech Hearing Disorders*, Vol. 17 (1952), pp. 166-174.
- Weston, J. D., "A Note on the Theory of Communication." *Phil. Mag.*, Vol. 40 (1949), pp. 449-453.
- Woodward, P. M., "Irreversible Processes and the Extraction of Information." *McGill Univ. Symp. Microwave Optics*, paper 47 (1953), 4 p.
- , "Information Theory." *Brit. Jour. Appl. Phys.*, Vol. 4 (1953), pp. 129-133.
- , Davies, I. L., "Information Theory and Inverse Probability in Telecommunication." *Proc. IEE*, Vol. 99 III (1952), pp. 37-44.
- Young, G. O., "Effect of Limiting on the Information Content of Noisy Signals." 1954 IRE Convention Record, *Proc. IRE* (Abstr.), Vol. 42, p. 614.
- , Gold, B., "Effect of Limiting on the Information Content of Noisy Signals." 1954 IRE Convention Record, Pt. 4, pp. 76-81.
- Zadeh, L. A., "Some Basic Problems in Communication of Information." *Trans. N. Y. Acad. Sci.*, Vol. 14 II (1952).
- Zemanek, H., "Informationstheorie." *Elektrotech. u. Masch.*, Vol. 71 (1954), pp. 153-160.
- , "Ungewöhnliche Zahlen aus der Informationstheorie." *Radio-technik* (Wien), Vol. 46 (1954), pp. 188-192.

II. (a) BANDWIDTH AND TRANSMISSION CAPACITY, TIME-FREQUENCY UNCERTAINTY; (b) SIGNAL-TO-NOISE RATIOS; (c) INSTANTANEOUS FREQUENCY; (d) ANALYTICAL SIGNALS

(a)

- Bayard, R., *Relation entre la largeur de bande passante et les temps d'établissement des signaux*. U.R.S.I. doc. 183/VI/1954.
- Benz, F., *A Method of Modulation Achieving Frequency Compression*. Information Networks Symposium, 1954, pp. 155-174.
- Blanc Lapierre, A., Dumontet, P., *Sur la liaison possible entre les notions de bande passante et de temps d'établissement d'un signal dans un filtre*. U.R.S.I. doc. 75/VI/1954.
- Bourassin, L., Colombo, S., *Sur les problèmes posés par la recherche de relations entre les largeurs des bandes passantes et les temps d'établissement des signaux*. U.R.S.I. doc. 96/VI/1954.
- Boxer, R., "Analysis of Sampled Data Systems and Digital Computers in the Frequency Domain." *Proc. IRE*, Vol. 43 (1954), (Abstr.), p. 353.
- Broderson, S., "Noise Filter Effects in Recording Spectroscopes." *Jour. Opt. Soc. Amer.*, Vol. 43 (1953), pp. 1216-1220.
- Coales, J. F., "The Application of Information Theory to Data Transmission Systems, and the Possible Use of Binary Coding to Increase Channel Capacities." *Proc. IEE*, Vol. 100 III (1953), pp. 291-302.
- Colombo, S., "Méthodes de calcul de la distortion transitoire basée sur les propriétés générales des fonction de transfert." *Cah. de Phys.* Nr. 49 (1954), pp. 1-22.
- Cuccia, C. L., *Harmonics, Sidebands and Transients in Communication Engineering*. New York, McGraw Hill, 465 pp. 1952.
- Dawson, Ch. H., "Approximation of Transient Response from Frequency Response Data." *Trans. AIEE, Appl. and Ind.*, Vol. 9 (November, 1953), pp. 289-291.
- Earp, C. W., "Relationship Between Rate of Transmission of Information, Frequency-Bandwidth and Signal-to-Noise Ratio." *Electr. Comm.*, Vol. 25 (1948), pp. 178-195.
- Enomoto, H., *Transmission Rate of a Communication Channel, Subjected to Fading*. U.R.S.I. doc. 31/VI/1954.

- Fetzer, V., "Der Zusammenhang zwischen Zeitfunktion und Frequenzfunktion nebst praktischen Beispielen zur Bestimmung des Einschwingvorganges in linearen Uebertragungssystemen." *Arch. el. Uebertr.*, Vol. 8 (1954), pp. 163-172.
- Fink, D. G., "Bandwidth Versus Noise in Communication Systems." *Electronics*, Vol. 21, Nr. 1, (1948), pp. 72-75.
- Golay, M. J. E., *Notes on the Relations Between Bandwidth, Available Energy and Reception of Information in Communication Systems*. Tech. Memo M1148, Sign. Corps Eng. Labs., 56 pp., 1948.
- Graham, D., and Lathrop, R. C., "The Synthesis of Optimum Transient Response Criteria and Standard Forms." *Trans. AIEE*, Vol. 9 (November, 1953), pp. 273-288.
- Jager, F. de, "Les limites théoriques pour la transmission en cas de niveau de bruit élevée dans quelques systèmes de modulation continue et de modulation codée." *Onde élect.*, Vol. 34 (1954), pp. 675-682. (543, 1955).
- Jänke, M., Prensler, E., and Speer, W., "Dynamikpresser und -dehner für Fernsprechverbindungen." *F.T.Z.*, Vol. 6 (1953), pp. 459-468.
- Leonhard, A., "Determination of Transient Response from Frequency Response." *Trans. ASME*, Vol. 76 (1954), pp. 1215-1236.
- Lyons, W., "Design Considerations for F.S.K. Circuits." (IRE Nat. Conv. Abstr.) *Proc. IRE*, Vol. 42 (1954), p. 615.
- Mallinckrodt, A. J., and Sollenberger, T. E., "Optimum Pulse-Time Determination." *TRANS. IRE, Information Theory* 3 (1954), pp. 151-159.
- Mertz, P., *Transmission Line Characteristics and Effects on Pulse Transmission*. Inform. Networks Symposium, 1954, pp. 85-114.
- Poincelot, P., "Sur les relations entre la bande passante d'un circuit et la durée d'établissement d'un signal." *CR Acad. Sci. Paris*, Vol. 237 (1953), pp. 1217-18. (664, 1954).
- , "Sur les relations entre la largeur de bande d'un circuit et sa constante de temps." *Ann. Télécomm.*, Vol. 9 (1954), pp. 191-192. (50, 1955).
- Rosenbloom, A., *Analysis of Linear Systems with Randomly Time-Varying Parameters*. Inform. Network Symposium, 1954.
- Scott, N. R., "An Experimental Study of the Bandwidth of a Digital Computer." (IRE Conv. Abstr.), *Proc. IRE*, Vol. 42 (1954), p. 610.
- , "An Experimental Study of the Information Rate of a Digital Computer." 1954 IRE Conv. Rec. Pt. 4, pp. 35-39, 1954.
- Squires, W. K., and Newman, H. C., "Video Amplifiers for Optimum Transient Response." *Proc. Nat. Electr. Conf.*, Vol. 8 (1952), pp. 218-230.
- Standards Committee IRE, *Standards on Modulation Systems: Definition of Terms*. *Proc. IRE*, Vol. 41 (1953), pp. 612-615.
- Taieb, J., "Réduction du temps de mesure des amplificateurs de courants faibles sans réduction de sensibilité." *CR. Paris*, Vol. 233 (1951), pp. 785-787.
- (b)
- Blachman, N. M., "The Output Signal-to-Noise Ratio of a Power-Law Device." *Jour. Appl. Phys.*, Vol. 24 (1953), pp. 783-785.
- , "A Comparison of the Informational Capacities of Amplitude- and Phase-modulation Systems." *Proc. IRE*, Vol. 41 (1953), pp. 748-759.
- Davenport, W. B., "Signal-to-Noise Ratio in Bandpass-Limiters." *Jour. Appl. Phys.*, Vol. 24 (1953), pp. 720-727.
- Fontanellaz, G., "Der Empfang kleiner amplitudenmodulierter Signale bei linearer Gleichrichtung." *Tech. Mitt. P.T.T.*, Vol. 31 (1953), pp. 177-182.
- , "Vergleich zwischen Frequenz- und Phasenmodulation bei Sprache." *Tech. Mitt. P.T.T.*, Vol. 31 (1953), pp. 371-374.
- Hamer, E. G., "Theoretical Performance of Simple Multichannel Systems Using Frequency Modulation." *Jour. Brit. IRE.*, Vol. 12 (1952), pp. 411-415.
- Holtzwarth, H., "Ein Vergleich der wichtigsten Modulationsverfahren für Richtfunkverbindungen nach neueren Erkenntnissen." *Archiv. el. Uebertr.*, Vol. 7 (1953), pp. 213-222.
- Lampard, D. G., "The Minimum Detectable Change in the Mean Noise-Input Power to a Radio Receiver." *IEE Mon.* (1953), Nr. 80, 11 pp.
- Lange, H. de, "Decrease of Low-Frequency Signal-to-Noise Ratio When Increasing the Intermediate-Frequency Bandwidth, Using a Square-law or a Linear am Detector." *Comm. News*, Vol. 13 (1953), pp. 128-138.
- Marcou, P., "Bruit et radiotéléphonie en modulation d'amplitude." *Ann. Télécomm.*, Vol. 8 (1953), pp. 339-351.
- Miotto, G., "A New Advance in Telegraph Communication." (in Italian) *Telecomunicazione*, Vol. 6 (1953), pp. 116-120.
- Montgomery, G. F., "A Comparison of Amplitude and Angle Modulation for Narrowband Communication of Binary-Coded Messages in Fluctuation Noise." *Proc. IRE*, Vol. 42 (1954), pp. 447-454, 1560.
- , "Message Error in Diversity Frequency-Shift Reception." *Proc. IRE*, Vol. 42 (1954), pp. 1184-1187. (3036, 1954).
- Nichols, M. H., "Comparison of Required Radiofrequency Power in Different Methods of Multiplexing and Modulation." (IRE Nat. Conv. Abstr.), *Proc. IRE*, Vol. 42 (1954), p. 606.
- Page, R. M., "Comparative Study of Modulation Methods." *IRE Conv. Rec.*, Pt. 8, pp. 15-25, 1953. Also, *TRANS. IRE, C.S.-1* (1953), pp. 13-22.
- Schmidt, K. O., "Frequenzbandbreite, Uebermittlungszeit und Amplituden Stufenzahl (Gerauschaabstand) bei den verschiedenen Nachrichtenarten im Rahmen der Shannon Theorie." *Fern. tech. Zeits.*, Vol. 6 (1953), pp. 555-563; Vol. 7 (1954), pp. 33-43.
- Schooley, A. H., and George, S. F., "Input vs. Output Signal-to-Noise Ratio Characteristics of Linear, Parabolic and Semi-Cubical Detectors." *Proc. Nat. Electr. Conf.*, Chicago, Vol. 7 (1951), pp. 151-161.
- Vasseur, J. P., "Comparaison des modulations codées et des modulations classiques." *Ann. Radioélect.*, Vol. 9 (1954), pp. 137-149.
- (c)
- Poincelot, P., "La notion de fréquence instantanée." *Onde élect.*, Vol. 33 (1953), pp. 214-216.
- Robin, L., *Sur la règle de la fréquence instantanée en modulation de fréquence sinusoïdale*. U.R.S.I. doc. 68/VI/1954.
- Schultheis, P. M., and Wogrin, C. A., Zweig, F., "Short-Time Frequency Measurement of Narrow-band Signals in the Presence of Wide-Band Noise." *Jour. Appl. Phys.*, Vol. 25 (1954), pp. 1025-1036. (206, 1955).
- (d)
- Blanc Lapierre, A., "Remarques sur un théorème d'interpolation." *C.R. Paris*, Vol. 234 (1952), pp. 139-150.
- Cherry, E. C., "Quelques remarques sur le temps considéré comme variable complexe." *Onde élect.*, Vol. 34 (1954), pp. 7-13.
- Kohlenberg, A., "Exact Interpolation of Band-Limited Functions." *Jour. Appl. Phys.*, Vol. 24 (1953), pp. 1432-1436.
- Vasseurs, J. P., "Impulsions de Gauss," *Onde élect.*, Vol. 34 (1954), pp. 139-142. *Ann. Radioélect.* Vol. 8 (1953), pp. 286-300.
- Ville, J., "Signaux analytiques à spectre borné." *Cables et Transm.*, Vol. 7 (1953), pp. 44-53.

III. DEFINITION, RELATION WITH STATISTICAL MECHANICS, PHILOSOPHY

- Balasz, N. L., "L'effet des statistiques sur le démon de Maxwell." *C.R. Paris*, Vol. 236 (1954), pp. 2385-2386.
- Bar-Hillel, Y., "An Examination of Information Theory." *Phil. of Science*, 1955.
- Blachman, N. M., "Bounds for Entropy," *Jour. Appl. Phys.* Vol. 24 (1953), p. 1340.
- Brillouin, L., "Can the Rectifier Become a Thermodynamical Demon?" *Phys. Rev.*, Vol. 78 (1950), pp. 626-627.
- , "Information Theory and Uncertainty Principle." *Jour. Appl. Phys.*, Vol. 25 (1954), pp. 887-893. (A 7142, 1954).
- , "Principe de Négentropie pour l'Information." *L. de Broglie, physicien et penseur*. Edit. A. Miché, Paris (1953), pp. 358-368.
- , "The Negentropy Principle of Information." *Jour. Appl. Phys.*, Vol. 24 (1953), pp. 1152-1162.
- , "Negentropy and Information in Telecommunication, Writing and Reading." *Jour. Appl. Phys.*, Vol. 25 (1954), pp. 595-599. (3053-1954).

- Dubarle, D., "Mécanique Quantique et Information." *Rev. Questions Sci.*, Vol. 5 (1952), pp. 347-368.
- Fogel, L. J., "A Note on the Fourth Dimension." *Proc. IRE*, Vol. 42 (1954), p. 1699.
- Golay, M. J. E., "Maxwell's Demon Must Remain Incommunicado." *Jour. Appl. Phys.*, Vol. 25 (1954), p. 1062.
- Hinčin, A. Ya., "The Concept of Entropy in the Theory of Probability." *Uspehi Matem. Nauk.*, (N.S.) 8, no. 3, (55) (1953), pp. 3-20. (C 238, 1954).
- Itô, H., "Principle of the Minimum Entropy in Information Theory." *Proc. Japan Acad.*, Vol. 29 (1953), pp. 194-197.
- Jancel, R., Kahan, Th., "Chaîne de Mesures Quantiques et Principe de Négentropie." *CR Acad. Sc.*, Paris, Vol. 240 (1955), pp. 54-57.
- Jongh, B. H. de, *Egalisation Disparity and Entropy*, 50 pp. Utrecht, Bruna, 1952.
- Kellogg, P. J., and Kellogg, D. J., "Entropy of Information and the Odd Ball Problem." *Jour. Appl. Phys.*, Vol. 25 (1954), pp. 1438-1439.
- Matschinsky, M., "Résultats d'Observation et Leurs Probabilité a Priori et a Fortiori." *CR Paris*, Vol. 238 (1954), pp. 1861-1863.
- , "Sur les Compositions Applicables à l'Estimation de la Probabilité d'une Hypothèse." *CR Paris*, Vol. 236 (1953), pp. 1849-1851.
- Morowitz, H. J., "The Information Content of Living Systems." *Bull. Am. Phys. Soc.*, Vol. 28 (1953), Nr. 3, pp. 68-69.
- Rothstein, J., "Can a Well-Informed Heat Engine (W.H.E.) Have a Free Will?" *Bull. Am. Phys. Soc.*, Vol. 29 (1954), Nr. 4, p. 55.
- Schouten, J. F., "Information, Manipulation and Entropy." *Synthese*, Vol. 9 (1954), pp. 199-204.
- Vernotte, P., *Les principes Physiques de la Formulation des lois Expérimentales*. 254 pp. Service de Documentation de l'Aéronautique, Paris, 1952.
- Wanatabe, S., "A Study of Ergodicity and Redundance Based on Intersymbol Correlation of finite range." *TRANS. IRE PGIT-4* (1954), pp. 85-92.

IV. CORRELATION, PREDICTION, FILTERING, STORAGE

- Barker, R. G., and Connon, G. L., "The periodometer." *Wire. Eng.*, Vol. 30 (1953), pp. 274-275.
- Bartlett, M. S., "Periodogram Analysis and continuous spectra." *Biometrika*, Vol. 37 (1950), pp. 1-16.
- Beard, C. I., and Skomal, E. N., "R.C. Memory Commutator for Signal-to-Noise Improvement." *Rev. Scient. Instr.*, Vol. 24 (1953), pp. 276-280.
- Becker, R., "Ueber die Beschreibung stationärer statischer Funktionen." *Z. Angew. Phys.*, Vol. 6 (1954), pp. 231-235.
- Bell, D. A., "Wiener's Theory of Linear Filtering." *Wire. Eng.*, Vol. 30 (1953), pp. 136-142.
- Bell, H., and Rideout, V. C., "A High-Speed Correlator." *TRANS. IRE EC-3* (1954), Nr. 2, pp. 30-36.
- Bennett, R. R., "Analog Computing Applied to Noise Studies." *Proc. IRE*, Vol. 41 (1953), pp. 1509-1513.
- Bennett, W. R., "The Correlatograph." *Bell Sys. Tech. Jour.*, Vol. 32 (1953), pp. 1173-1185.
- Berkowitz, R. S., "Optimum Linear Shaping and Filtering Networks." *Proc. IRE*, Vol. 41 (1953), pp. 532-537.
- Blassel, P., "Erreur due à une durée d'intégration finie dans la détermination des fonctions d'autocorrélation." *Ann. Télécomm.*, Vol. 8 (1953), pp. 406-414.
- Brogan, J., *Filters for Sampled Signals*. Brooklyn Inform. Networks Symp., 1954.
- Bubb, F. W., "Linear Noise Smoothing and Predicting Filters." *Proc. first U.S. National Congress Applied Mechanics*, Chicago, 1951, pp. 167-174. (Am. Soc. Mech. Eng., New York, 1952).
- , *Linear Noise Filtering and Predicting Systems*. Tech. Rep. 6331, U.S. Air Force, 6586, 1951, 43 pp.
- Burford, Th. M., "Qualitative Evaluation of Correlation Coefficients from Scatter Diagrams." *Jour. Appl. Phys.*, Vol. 26 (1954), pp. 56-57.
- Chang, S. S. L., "On the Filter Problem of the Power-Spectrum Analyzer." *Proc. IRE*, Vol. 42 (1954), pp. 1278-1282. (3168-1954).
- Cherry, E. C., *Generalized Concept of Networks*. Brooklyn Inform. Networks Symp., 1954.
- Davis, R. C., "On the Detection of Sure Signals in Noise." *Jour. Appl. Phys.*, Vol. 25 (1954), pp. 76-82.
- , "The Spectral Method of Hypothesis Testing Concerning Continuous Gaussian Stationary Random Processes." *Ann. Math. Stat.*, Vol. 25 (1954), pp. 616-617.
- Deutsch, R., and Hance, H. V., "A Note on Receivers for Use in Studies of Signal Statistics." *Conv. Rec. IRE*, Pt. 8 (1953), pp. 7-13.
- Deutsch, R., "Detection of Modulated Noise-Like Signals." *TRANS. IRE PGIT-3* (1954), pp. 106-122.
- Doelz, M. L., and Heald, E. T., "Predicted Wave Radio Teletype." *IRE Nat. Conv. Abstr.*, *Proc. IRE*, Vol. 42 (1954), p. 615.
- Drenick, R. F., and Nesbeda, P., "On a Class of Optimum Linear Predictors." *Ann. Math. Stat.*, Vol. 24 (1953), pp. 497-498.
- Drenick, R. F., "A Nonlinear Prediction Theory." *TRANS. IRE Information Theory 4* (1954), pp. 146-162.
- Flanagan, J. E., "Coding to Achieve Markov Type Redundancy." *Jour. Math. Phys.*, Vol. 33 (1954), pp. 258-268.
- Franklin, G., "The Linear Filtering of Sampled Data." *Abstr.*, *Proc. IRE*, Vol. 43 (1955), p.370.
- Friedland, M. S., and Marchand, N., "A Correlation Direction Finder for Guided Missile Range Instrumentation." *IRE Nat. Conv. Abstr.*, *Proc. IRE*, Vol. 42 (1954), p. 605.
- Golay, M. J. E., "Correlation vs. Linear Transforms." *Proc. IRE*, Vol. 41 (1953), pp. 268-272. (disc. D.A. Bell: *Proc. IRE*, Vol. 42 (1953), p. 1187.)
- Grenander, U., and Rosenblatt, M., "On Spectral Analysis of Stationary Time Series." *Proc. Nat. Acad. Sci.*, Vol. 38 (1952), pp. 519-521.
- , "Statistical Spectral Analysis of Time Series Arriving from Stationary Stochastic Processes." *Ann. Math. Stat.*, Vol. 24 (1953), pp. 537-558. (C448, 1954).
- Hance, H., *The Optimization and Analysis of Systems for the Detection of Pulsed Signals in Random Noise*. Master's Thesis, M.I.T., 144 pp., January, 1951.
- Harmuth, H., "Nachrichtenübertragung durch Integration codierter Zeichen." *Archiv el. Uebertr.*, Vol. 8 (1954), pp. 132-136. (2505, 1954).
- , "Der Empfang codemodulierter Zeichen durch Integration." *F.T.Z.*, Vol. 7 (1954), pp. 461-464.
- , "A New Teletypewriter Using the Integration Method of Detection." *Abstr.*, *Proc. IRE*, Vol. 43 (1954), p. 351.
- Hauser, A. A., "Geometric Aspects of Least Squares Smoothing." *Proc. IRE*, Vol. 42 (1954), pp. 701-704. Also *Proc. Nat. Electr. Conf.*, Vol. 9 (1953), pp. 363-369.
- Hausman, A. H., "An Analysis of Dual Diversity Receiving Systems." *Proc. IRE*, Vol. 42 (1954), pp. 944-947. (2756, 1954).
- Itô, H., "Observed Value of the Autocorrelation Function." *Proc. Japan Acad.*, Vol. 29 (1953), pp. 198-202.
- , "The Observation Theory of the Stationary Random Process." *Proc. Japan Acad.*, Vol. 29 (1953), pp. 305-310.
- Kanô, S., "On the Filter Problem of a Stationary Stochastic Process." *Bull. Math. Stat.*, (1953), Vol. 5, pp. 47-51. (C 638, 1954).
- , "On the Prediction Problem of a Stationary Stochastic Process." *Mem. Fac. Sci.*, Kyûsyû Univ., A 6 (1952), pp. 173-178.
- Karnowsky, M. I., "Suppression of Fluctuation Interference in the Correlation Method of Reception." *Radiotekhnika* (Moscow), Vol. 9 (1954), pp. 3-11. (May-June) (3344, 1954).
- Kaufman, W. M., and Woodford, J. B., "A New Series Representation for Correlation Functions." *Abstr.*, *Proc. IRE*, Vol. 43 (1955), p. 365.
- Kawata, Tatsuo, "On Wiener's Prediction Theory." *Rep. Statist. Appl. Res. Union Jap. Sci., Eng.*, Vol. 2 (1952), pp. 120-129.
- Knudtzon, N. G., "Experimental Study of Statistical Characteristics of Filtered Random Noise." *Fra Fysikkens Verden* (1951), pp. 209-224; (1952), pp. 26-42, (in Norwegian).
- Koschman, A. H., "Time Varying Filters for Nonstationary Signals on a Finite Interval." *Abstr.*, *Proc. IRE*, Vol. 43 (1955), p. 370.
- Krein, M. G., "On a Basic Approximation Problem of the Theory of Extrapolation and Filtration of Stationary Random Processes." *Doklady Akad. Nauk. S.S.S.R.* (N.S.), Vol. 94 (1954), pp. 13-16. (in Russian) (C 53, 1955).

- Lampard, D. G., "A New Method of Determining Correlation Functions of Stationary Time Series." *Jour. IEE*, Vol. 104, 1954. (A 10723, 1954).
- , "Generalization of the Wiener-Khinchine Theorem to Non-stationary Processes." *Jour. Appl. Phys.*, Vol. 25 (1954), pp. 802-803. (C 969, 1954).
- Lee, Y. W., *On Wiener Filters*. Brooklyn Inform. Networks Symp., 1954.
- Le Page, W. R., Cahn, C. R., and Brown, J. S., "Analysis of a Comb Filter Using Synchronously Commutated Capacitors." *Trans. AIEE Comm. Electr.*, Vol. 5 (1953), pp. 63-68.
- Levin, M. J., and Reintjes, J. F., "A Five Channel Electronic Analog Correlator." *Proc. Nat. Electr. Conf.*, Vol. 8 (1952), pp. 647-656. *Tele-tech.*, Vol. 12 (1953), nr. 3 pp. 70-72.
- Marique, J., "Réponse des analyseurs de spectre radioélectriques à des signaux morse non périodiques." *Ann. Télécomm.*, Vol. 9 (1954), pp. 215-223, 247-255.
- Marshall, J. S., and Hitschfeld, W., "Interpretation of the Fluctuating Echo from Randomly Distributed Scatterers." *I. Canad. Jour. Phys.*, Vol. 31 (1953), pp. 962-994.
- Mazelsky, B., "Extension of Power Spectral Methods of Generalized Harmonic Analysis to Determine Non-Gaussian Probability Functions of Random Input Disturbances and Output Responses of Linear Systems." *Jour. Aeronaut. Sci.*, Vol. 21 (1954), pp. 145-153. (C 545, 1954).
- Meijer Eppler, W., "Korrelation und Autokorrelation in der Nachrichtentechnik." *Arch. el. Uebertr.*, Vol. 7 (1953), pp. 501-504. 531-536.
- , "Die Gewinnung visueller Information durch Schwingungs-Analyse." *Zts. V.D.I.*, Vol. 96 (1954), pp. 293-297.
- Minozuma, F., and Enomoto, H., "The Mechanism and Distribution of Short-Period Fading Under Conditions of Ionospheric Turbulence." *Proc. Phys. Soc.*, Vol. 67 (1954), pp. 211-216. (2752, 1954).
- Neilsen, K. L., and Heyda, J. F., *Mathematical Theory of Airborne Fire Control*, Naval Ordnance Rep. 1493, July, 1951, Gov. Printing Office.
- Nozick, S., and Winkler, S., "Noise Limitations on Storage Tube Operation." 1954 IRE Nat. Conv., Abstr., Proc. IRE, Vol. 42 (1954), p. 626.
- Page, R. M., Brodzinsky, A., and Zirn, R. R., "A Microwave Correlator." Proc. IRE, Vol. 41 (1953), pp. 128-131.
- Pallari, R., "Perturbazione e rigenerazione dei segnali." *Alta Freq.*, Vol. 23 (1954), pp. 16-36.
- Pebay, J. C., and Peyronlo, P. S., "Réalisation d'un corrélateur électronique à lecture directe." *Le Journal de Phys. Radium. Phys. Appl.*, Vol. 15, supplement nr. 5 (1954), pp. 101A-108A. (3144, 1954).
- Pike, E. W., "A New Approach to Optimum Filtering." *Proc. Nat. Electr. Conf.*, Vol. 8 (1952), pp. 407-418.
- Preston, G. W., "On the Theory of Prediction of Nonstationary Stochastic Processes." *Jour. Appl. Phys.*, Vol. 24 (1953), pp. 230-231.
- , *The Design of Optimum Transducer Characteristics Using the Methods of Statistical Estimation*. Brooklyn Inform. Networks Symp., 1954, pp. 51-60.
- Quenouille, W. H., "Associated Measurements." London, Butterworth Sci. Publ., 242 pp., 1952. (*Rev. in Math. Rev.*, Vol. 14 p. 569, 1953).
- Reich, E., and Swerling, P., "The Detection of a Sine Wave in Gaussian Noise." *Jour. Appl. Phys.*, Vol. 24 (1953), pp. 289-296.
- Revesz, G., "An Autocorrelogram Computer." *Jour. Sci. Inst.*, Vol. 31 (1954), pp. 406-410.
- Robin, L., "Étude d'un signal formé d'impulsions rectangulaires périodiques superposés à un bruit thermique, l'ensemble étant écarté, recherche de l'optimum éventuel." *Ann. Télécomm.*, Vol. 8 (1953), pp. 127-130.
- Rocheffort, J. S., "Matched Filters for Detecting Pulsed Signals in Noise." 1954 IRE Nat. Conv. Abstr., Proc. IRE, Vol. 42 (1954), p. 609.
- Rudnick, P., "The Detection of Weak Signals by Correlation Methods." *Jour. Appl. Phys.*, Vol. 24 (1953), pp. 128-131.
- Schoenberg, L. J., "On Smoothing Operations and Their Generating Functions." *Bull. Am. Math. Soc.*, Vol. 59 (1953), pp. 199-230.
- Schooley, A. H., "Simple Computer Automatically Plots Correlation Functions." *Tele-Tech.*, Vol. 12 (1953), Nr. 5, pp. 71-73, 156.
- Sewell, H. R., and Wadsworth, G. P., "A New Development in Ocean-Wave Research." *Science*, Vol. 109 (1949), pp. 271-274.
- Slade, J., et al., *On the Transmission and Detection of Gaussian Noise Pulses*. Tech. Rep., Rutgers Univ., New Jersey, April, 1952.
- Slade, J. J., Fich, S., and Molony, D. A., "Detection of Information by Moments." 1953 IRE Conv. Rec., Pt. 8 (1953), pp. 66-71.
- Slepian, D., "Estimation of Signal Parameters in the Presence of Noise." *TRANS. IRE Information Theory* 3 (1954), pp. 68-90.
- Smith, O. J. M., "Statistically Almost Optimum Nonlinear Network Design." (Abstr.) *TRANS. IRE Information Theory* 3 (1954), p. 123.
- Smith, R. A., "The Relative Advantages of Coherent and Incoherent Detection." *Jour. IEE*, Mon. 6 (1951).
- Spetner, L. M., "Errors in Power Spectra Due to Finite Sample." *Bull. Am. Phys. Soc.*, Vol. 29 (1954), Nr. 1, p. 41.
- , "Errors in Power Spectra due to Finite Sample." *Jour. Appl. Phys.*, Vol. 25 (1954), pp. 653-659. (2997, 1954) (C 887, 1954).
- Stateman, M. J., "Cross-Correlation Applied to Automatic Frequency Control." 1953 IRE Conv. Rec., Pt. 8 (1953), pp. 91-95.
- Stockman, H., Dickey, Jr., F. R., and Emslie, A. G., "Extraction of Weak Signals from Noise by Integration." *Proc. Nat. Electr. Conf.*, Vol. 4 (1948), pp. 102-120.
- Stone, W. M., "On the Statistical Theory of Detection of a Randomly Modulated Carrier." *Jour. Appl. Phys.*, Vol. 24 (1953), pp. 935-939.
- Sugar, G. R., "Estimation of Correlation Coefficients from Scatter Diagrams." *Jour. Appl. Phys.*, Vol. 25 (1954), pp. 354-357. (A 4092, 1954).
- Turner, C. H. M., "On the Concept of an Instantaneous Power Spectrum and its Relationship to the Autocorrelation Function." *Jour. Appl. Phys.*, Vol. 25 (1954), pp. 1347-1351.
- Villain, F., and Weiskopf, V. F., "The Scattering of Electromagnetic Waves by Turbulent Atmospheric Fluctuation." *Phys. Rev.*, Vol. 94 (1954), pp. 232-240.
- Wallace, P. R., "Interpretation of the Fluctuating Echo from Randomly Distributed Scatterers, Pt. II." *Canad. Jour. Phys.*, Vol. 31 (1953), pp. 995-1009.
- Weinberg, L., and Kraft, L. G., "Measurement of Detector Output Spectra by Correlation Methods." Proc. IRE, Vol. 41 (1953), pp. 1157-1166.
- Weller, R. K., "A Discussion of Auto-Correlated Error Terms in Time Series Analysis." 1954 IRE Conv. Rec., Pt. 4 (1954), pp. 45-46.
- , "A Discussion of Auto-Correlated Error Terms in Time Series Analysis." 1954 IRE Nat. Conv. Abstr., Proc. IRE, Vol. 42 (1954), p. 610.
- White, W. D., "The Role of Nonlinear Filters in Electronic Systems." *Proc. Nat. Electr. Conf.*, Vol. 9 (1953), pp. 505-512.
- , "Nonlinear Filters." *Jour. Appl. Phys.*, Vol. 24 (1953), p. 1412.
- Whittle, P., "Estimation and Information in Stationary Time Series." *Ark. Math.*, Vol. 2 (1953), pp. 423-434.
- Wilcox, R. H., "A Simple Microwave Correlator." Proc. IRE, Vol. 42 (1954), pp. 1512-1515.
- Williams, E. J., and Kloot, N. H., "Interpolation in a Series of Correlated Observations." *Aust. Jour. Appl. Sci.*, Vol. 4 (1953), pp. 1-17.
- Winkler, S., and Nozick, S., "Noise in Storage Tubes." *Bull. Am. Phys. Soc.*, Vol. 28 (1953), Nr. 3, p. 68.
- Wold, H., *A Study in the Analysis of Stationary Time Series*. 2 ed. (Appendix by P. Whittle) Stockholm, Almqvist Wiksell, 1954, 236 pp. (C 810, 1954).
- Woodbury, M. A., "Information Theory and Prediction." *Abstr. Jour. Amer. Stat. Assoc.*, Vol. 49 (1954), pp. 360-361.
- Youla, D. C., "The Use of the Method of Maximum Likelihood in Estimating Continuous-Modulated Intelligence Which has been Corrupted by Noise." *TRANS. IRE Information Theory* 3 (1954), pp. 90-105.
- Young, J. E., "Correlation Functions for Noise Fields." *Jour. Acoust. Soc. Amer.*, Vol. 26 (1954), pp. 788-789. (A 150, 1955).
- Zadeh, L. A., "A Contribution to the Theory of Nonlinear Systems." *Jour. Frankl. Inst.*, Vol. 255 (1953), pp. 378-408.
- , "Comment on Nonlinear Filters." *Jour. Appl. Phys.*, Vol. 24 (1953), pp. 1412-1413.
- , "Nonlinear Multipoles." *Proc. Nat. Acad. Sci., U.S.A.*, Vol. 39 (1953), pp. 274-280.
- , "Theory of Filtering." *Jour. Soc. Ind. Appl. Math.*, Vol. 1 (1954), pp. 35-51. (C 545, 1954).

- , "Optimum Nonlinear Filters." *Jour. Appl. Phys.*, Vol. 24 (1953), pp. 396-404.
- , "General Filters for Separation of Signals and Noise." Brooklyn Inform. Networks Symp., 1954.

- , "Optimum Nonlinear Filters for the Extraction and Detection of Signals." 1953 IRE Conv. Rec., Pt. 8 (1953), pp. 57-65.
- , and Ragazzini, J. R., "An Extension of Wiener's Theory of Prediction." *Jour. Appl. Phys.*, Vol. 21 (1950), pp. 645-655.

V. RADAR AND RADIONAVIGATION

- (a)
- Bassore, B. L., "Threshold Detection." 1954 IRE Nat. Conv. Abstr., Proc. IRE, Vol. 42 (1954), pp. 613-614.
- Bernstein, R., "An Analysis of Angular Accuracy in Search Radar." Abstr., Proc. IRE, Vol. 43 (1954), p. 358.
- Blake, L. V., *Application of Mathematical Probability Theory to Analysis of Radar Signal Detection on a Collapsed Display*. Master's Thesis, Univ. of Maryland, 1950.
- , "The Effective Number of Pulses per Beamwidth for a Scanning Radar." Proc. IRE, Vol. 41 (1953), pp. 770-774; Vol. 41 (1953), p. 1785.
- Brill, E. R., *Improvement in Minimum Detectable Signal in Noise Through the Use of the Long Afterglow Tube and Through Photography*. Rep. 411-84, Harvard Univ. Radio Res. Lab., 20 p., 1944.
- Burgess, R. E., "The Rectification and Observation of Signals in the Presence of Noise." *Phil. Mag.*, Vol. 42 (1951), pp. 475-503.
- Conger, R. L., and Schilberg, L. E., "Noise Discriminator for Periodic Signals." *Rev. Sci. Instr.*, Vol. 25 (1954), pp. 52-54.
- Corum, C. E., *Signal-to-Noise Improvement by Pulse Integration*. Rep. 3699, U.S. Nav. Res. Lab., 12 p., 1950.
- Davis, H., "Radar Problems and Information Theory." 1953 IRE Conv. Rec., Pt. 8 (1953), pp. 39-47.
- Davis, R. C., "On the Detection of Sure Signals in Noise." *Jour. Appl. Phys.*, Vol. 25 (1954), pp. 76-82. Also Abstr., *Ann. Math. Stat.*, Vol. 24 (1953), p. 682. (C 542, 1954).
- , "The Detectability of Random Signals in the Presence of Noise." TRANS. IRE, Information Theory 3 (1954), pp. 52-61.
- Dwork, B. M., "Detection of a Pulse Superimposed on Fluctuation Noise." Proc. IRE, Vol. 38 (1950), pp. 771-774.
- Eaton, T. T., and Wolf, I., *An Experimental Investigation of the Factors which Determine Signal-to-Noise Discrimination, in Particular the Effect of Integration*. Rep. P.T.R.-7, RCA Labs., 27 pp., 1943.
- Eckart, C., *The Measurement and Detection of Steady a.c. and d. c. Signals in Noise*. Univ. California Inst. Oceanography, S.I.O. ref. 51-39, 1951.
- George, S. F., and Zamanakos, A. S., "Comb Filters for Pulsed Radar Use." Proc. IRE, Vol. 42 (1954), pp. 1159-1164.
- George, T. S., "Fluctuations of Ground Clutter Return in Airborne Radar Equipment." *Jour. IEE*, Vol. 99 IV, (1952), pp. 92-99.
- Gerardin, L., "Le signal minimum utilisable en réception radar et son amélioration par certains procédés de corrélation." *Onde élect.*, Vol. 34 (1954), pp. 67-72.
- Haefl, A. V., "Minimum Detectable Radar Signal and its Dependence Upon Parameters of Radar Systems." Proc. IRE, Vol. 34 (1946), pp. 857-861; disc., Proc. IRE, Vol. 36 (1948), p. 126.
- Haller, Raymond, Brown Inc., "Rafax Bandwidth Compressor." *Electronics*, Vol. 26 (1953), Nr. 2, pp. 317-318.
- Heaps, H. S., "The Effect of a Random Noise Background Upon the Detection of a Random Signal." *Canad. Jour. Phys.*, Vol. 33 (1955), pp. 1-10.
- Hollis, R., "False Alarm Time in Pulse Radar." Proc. IRE, Vol. 42 (1954), p. 1189.
- Kellogg, W. R., Kohler, R., and Morris, H. N., "Porpoise Sounds as Sonar Signals." *Science*, Vol. 117 (1953), pp. 239-243.
- Kirschstein, F., "Die Fernübertragung von Funk-Messbildern (Radar-relay)." *F.T.Z.*, Vol. 6 (1953), pp. 389-395.
- Lano, R. H. de, and Pfeffer, I., "The Effect of Age on Radar Tracking Noise." Abstr., Proc. IRE, Vol. 43 (1955), p. 376.
- Lucas, J. Mc., "Narrow-Band Link Relays Radar Data." *Electronics*, Vol. 25 (1952), Nr. 9, pp. 142-146.
- Marcum, J. S., *A Statistical Theory of Target Detection by Pulsed Radar*. Rand Corp., R.M. 753, R.M. 754, 1947-1948.
- Middleton, D., "Statistical Criteria for the Detection of Pulsed Carriers in Noise." I: *Jour. Appl. Phys.*, Vol. 24 (1953), pp. 371-378; II: *Jour. Appl. Phys.*, Vol. 24 (1953), pp. 379-391. Disc. W. W. Peterson and T. G. Birdsall, *Jour. Appl. Phys.*, Vol. 25 (1954), pp. 127-128.

- , "Further Remarks on the Nature of the Statistical Observer." *Jour. Appl. Phys.*, Vol. 25 (1954), p. 127.
- , "Statistical Theory of Signal Detection." TRANS. IRE, Information Theory 3 (1954), pp. 26-51.
- Moxon, L. A., *Coherent Detection in Relation to Communication and Radar Theory*. U.R.S.I. doc. 269 (U.S.A.), Zürich, 1950.
- Norton, K. A. and Omberg, A. C., "The Maximum Range of a Radar Set." Proc. IRE, Vol. 35 (1947), pp. 2-24.
- O'Neil, S. J., "Operational Analysis of Track-While-Scan Radars." 1954 IRE Nat. Conv. Abstr., Proc. IRE, Vol. 42 (1954), p. 606.
- Otto, W., "Radar Signal Sampler Compresses Bandwidth." *Electronics*, Vol. 25 (1952), Nr. 4, pp. 132-133.
- Peterson, W. W., Discussion on "The Detection of a Sine Wave in the Presence of Noise," T. G. Slattery. Proc. IRE, Vol. 42 (1954), p. 1124.
- , Birdsall, T. G., *The Theory of Signal Detectability*. Tech. Rep. 13, Elect. Def. Group, Dept. Elect. Eng., Univ. Michigan, 1953.
- , —, and W. C. Fox, "The Theory of Signal Detectability." TRANS. IRE, Information Theory 4 (1954), pp. 171-212.
- Price, R., "The Detection of Signals by Scatter and Noise." TRANS. IRE, Info. Theory 4 (1954), pp. 163-170.
- Quarles, L. R., and Breazeale, W. M., "Factors Affecting the Range of Radar Sets." *Trans. AIEE*, Vol. 65 (1946), pp. 546-548.
- Rocheffort, J. S., "Matched Filters for Detecting Pulsed Signals in Noise." 1954 IRE Conv. Rec. Pt. 4 (1954), pp. 30-34.
- Roeszler, E., "Eine besondere Art von Impulsmodulation zur Uebertragung von Radarbildern" (Durchmusterung). *F.T.Z.*, Vol. 6 (1953), pp. 78-79.
- Schwarz, M., *A Statistical Approach to the Automatic Search Problem*. Doct. Diss., Harvard Univ., June, 1951.
- Sponsler, J. C., and Shader, F. L., "P.P.I. Light Spot Brightness Probability Distributions." *Jour. Appl. Phys.*, Vol. 25 (1954), pp. 1271-1277.
- Stone, W. M., "On the Effect of Integration in a Pulsed Radar, Randomly Modulated Carrier." *Jour. Appl. Phys.*, Vol. 25 (1954), pp. 1543-1548.
- , "On the Effect of a Randomly Modulated Carrier in Pulsed Radar Theory." Abstr., *Bull. Am. Math. Soc.*, Vol. 59 (1953), p. 456.
- Tanner, W. P., Jr., and Swets, J. A., "The Human Use of Information. I. Signal Detection for the Case of the Signal Known Exactly." TRANS. IRE, Information Theory 4 (1954), pp. 213-221.
- Tanner, W. P., Jr., and Norman, R. Z., "The Human Use of Information. II. Signal Detection for the Case of an Unknown Signal Parameter." TRANS. IRE, Info. Theory 4 (1954), pp. 222-227.
- Tanter, H., "Le récepteur L.C.T. de radar à élimination des échos sur obstacles fixes." *Onde élect.*, Vol. 34 (1954), pp. 99-109.
- Tiberio, U., "Avvistamento radar e teoria delle informazioni." *Alla. Freq.*, Vol. 22 (1953), pp. 161-183.
- , "The Reduced Range in a Radar Subjected to an External Noise Generator." Proc. IRE, Vol. 42 (1954), pp. 1791-1798. (722, 1955).
- Tower, W. R., "The Role of Stereo in '3-D' Radar Indicating Systems." 1954 IRE Nat. Conv. Abstr., Proc. IRE, Vol. 42 (1954), p. 610.
- Tucker, D. G., and Griffith, J. W. R., "Detection of Pulse Signals in Noise." *Wire. Eng.*, Vol. 30 (1953), pp. 264-273.
- Urkowitz, H., "Filters for Detection of Small Radar Signals in Clutter." *Jour. Appl. Phys.*, Vol. 24 (1953), pp. 1024-1032.
- Woodward, P. M., *Probability and Information Theory with Applications to Radar*. London, Pergamon Press, 128 pp., 1953 (rev., J.W.H. *Wire. Eng.*, Vol. 31, p. 77, 1954).

(b)

- IRE Standards on Radio Aids to Navigation: Definition of Terms 1954*. Proc. IRE, Vol. 43 (1955), pp. 189-209.
- Masonson, M., "Radiodirection Finding from the Standpoint of Sampling and Interpolation." Abstr., Proc. IRE, Vol. 43 (1955), p. 358.

VI. (a) SPEECH; (b) HEARING; (c) VISION; (d) LINGUISTICS AND SEMANTICS

(a)

- Anon. "Increasing Mean Modulation Depth by Speechclipping." *Marconi Rev.*, Vol. 16 (1953), p. 184.
- Arosenius, L., *Amplitude Distribution for Signals of Certain Speech Sounds Coherent Speech*. U.R.S.I. doc. 89, 90-VI-1954.
- Biddulph, R., "Short Term Autocorrelation Analysis and Correlatogram of Spoken Digits." *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), pp. 539-541.
- Bogert, B. P., "On the Bandwidth of Vowel Formants." *Jour. Acous. Soc. Amer.*, Vol. 25 (1953), pp. 791-792.
- , "The Vobanc-Voice Band Compressor." *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), p. 137. Abstr.
- Davis, K. H., "Automatic Recognition of Phonetic Elements in Speech." *Jour. Acous. Soc. Amer.*, Vol. 25 (1953), p. 832. Abstr.
- Di Toro, M. J., *Time-Varying Networks for Removing Noise from Speech*. Brooklyn Inform. Networks Symp., 1954.
- , "Time-Varying Quasi-Linear Method of Speech Noise Suppression," 1954 IRE Nat. Conv. Abstr., Proc. IRE, Vol. 42 (1954), p. 610.
- , "Time-Varying Quasi-Linear Method of Speech Noise Suppression." 1954 IRE Conv. Rec., Pt. 4 (1954), p. 41.
- Dreyfus-Graf, J., "Le typo-sonographe phonétique ou phonétographe." *Tech. Mitt. P.T.T.*, Vol. 30 (1952), pp. 363-379.
- Dudley, H., and Davis, K. H., "A Narrow-Band Speech Transmission System Employing the Recognition of Phonetic Elements." *Jour. Acous. Soc. Amer.*, Vol. 25 (1953), pp. 831-832.
- Dukes, J. C. M., "The Effect of Severe Amplitude Limitation on Certain Types of Random Signal: a Clue to the Intelligibility of 'Infinitely' Clipped Speech." *Proc. IEE*, Mon. 111 R, (1954), 10pp. (15 November).
- Fairbanks, G., Everitt, W. L., and Jaeger, R. P., "Method for Time or Frequency Compression Expansion of Speech." 1953 IRE Conv. Rec., Pt. 8 (1953), pp. 120-124.
- Fant, G., "Speech Communication Research." I.V.A. Stockholm, Vol. 24 (1953), pp. 331-337. (613, 1954).
- Feldman, E. F., "An Automatic Sonic Spectrum Analyser and Curvetracer." Abstr., Proc. IRE, Vol. 43 (1955), p. 349.
- Fletcher, H., *Speech and Hearing in Communication*. New York, Van Nostrand, 1953. (Rev., *Science*, Vol. 118 (1953), pp. 495-496.
- Foch, A., Rateau, J., and Counord, R., "Sur l'utilisation des circuits intégrateurs et différentiateurs dans la technique acoustique." *CR Acad. Sci. Paris*, Vol. 239 (1954), pp. 528-529.
- Fry, D. B., "The Experimental Study of Speech." *Nature*, Vol. 173 (1954), pp. 844-846. (2555, 1954).
- Garvey, W. D., "The Intelligibility of Speeded Speech." *Jour. Exp. Psychol.*, Vol. 45 (1953), pp. 102-108.
- Gäzler, G., "Die Grenzen der Hörbarkeit nichtlinearer Verzerrungen bei der Uebertragung von Instrumentenklängen." *Frequenz*, Vol. 9 (1955), pp. 15-25.
- Gemelli, A., Sacerdote, G. G., and Bellusi, G., "Analisi elettroacustica della voce cantata." *Boll. Soc. Ital. Fonetica Sperimentale*, etc., Vol. 4 (1954), pp. 3-36.
- Grier, G. W., "The Information Content of Air-Ground Messages." *TRANS. IRE, Aero., Nav'g. Electronics 1* (1954), pp. 5-16.
- Harris, C. M., "A Study of the Building Blocks in Speech." *Jour. Acous. Soc. Amer.*, Vol. 25 (1953), pp. 962-969.
- , "A Speech Synthesizer." *Jour. Acous. Soc. Amer.*, Vol. 25 (1953), pp. 970-975.
- Hawley, M. E., Wong, W., and Meeker, W. F., "A Sequential Statistical Analysis for Word Articulation Tests." *Jour. Acous. Soc. Amer.*, Vol. 25 (1953), p. 192.
- Hirsh, I. J., Reynolds, E. G., and Joseph, M., "Intelligibility of Different Speech Materials." *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), pp. 530-538. (10, 1955).
- Hirsh, I. J., and Bowman, W. D., "Masking of Speech Sounds by Bands of Noise." *Jour. Acous. Soc. Amer.*, Vol. 25 (1953), pp. 1175-1180.
- Holmes, J. N., and Dukes, J. M. C., "A Speech-Wave Form Correlator with Magnetic-Tape Delay and Electronic Multiplication." *Proc. IEE*, Vol. 101 III (1954), pp. 225-237. (3113, 1954).
- Huggins, W. H., "A Note on Autocorrelation Analysis of Speech Sounds." *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), pp. 790-792. (A 149, 1955).
- Kallenbach, W., "Applications of Sound Spectrography in Acoustics Research." *Akust. Beihefte*, Nr. 1 (1954), pp. 403-407. (3107-1954).
- Marcou, M. P., and Daguët, M. J., "Une propriété particulière de la parole et quelques unes de ses applications." U.R.S.I. doc. 281-VI-1954.
- Mayer, N., "Ueber die Hörbarkeit von linearen Verzerrungen bei natürlichen Klängen." *Funk u. Ton*, Vol. 8 (1954), pp. 1-6.
- Meeks, W. M., Borst, J. M., and Scooper, F., "Syllable Synthesizer for Research in Speech." (Abstr.) *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), p. 137.
- Meijer Eppler, W., "Uebersicht über die Verfahren zur Charakterisierung aleatorischer Schallvorgänge und deren Anwendbarkeit auf die Geräuschlaute." *Zeits. für Phonetik u. allgem. Sprachwiss.*, Vol. 6 (1952), pp. 269-284.
- , "Improving the Speech Intelligibility in Channels of Reduced Bandwidth." U.R.S.I. doc. 65-VI-1954.
- Peterson, G. E., "Basic Physical Systems for Communication Between two Individuals." *Jour. Speech and Hearing Disorders*, Vol. 18 (1953), pp. 116-120.
- , "Design of 'Visible Speech' Devices." *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), pp. 406-413. (2839, 1954) (A 7223, 1954).
- , "Information Theory 2: Application of Information Theory to Research in Experimental Phonetics." *Jour. Speech and Hearing Disorders*, Vol. 17 (1952), pp. 175-187.
- Pollack, I., "Intensity Discrimination Thresholds under Several Psychophysical Procedures." *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), pp. 1056-1059.
- , "Masking of Speech by Repeated Bursts of Noise." *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), pp. 1053-1055.
- , "Method of Reproduction and the Identification of Elementary Auditory Displays." *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), pp. 1060-1063.
- , "The Information of Elementary Auditory Displays. II," *Jour. Acous. Soc. Amer.*, Vol. 25 (1953), pp. 765-769.
- , Pickett, J. M., and Sumbly, W. H., "On the Identification of Speakers by Voice." *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), pp. 403-406. (2839, 1954).
- Pollack, I., and Fick, L., "Information of Elementary Multidimensional Auditory Displays." *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), pp. 155-158.
- Saxe, R. K., and Lacy, R. E., "Some Aspects of Clipped Speech." 1954 IRE Nat. Conv. Abstr., Proc. IRE, Vol. 42 (1954), p. 613.
- Schmidt, K. O., "Eine Betrachtung über die Aufbaulemente der Sprache (Vokale und Konsonanten) und ihre Anteile an der Silbenverständlichkeit." *Arch. el. Uebertr.*, Vol. 7 (1953), pp. 579-584.
- , "Einige Betrachtungen zu Sprach-Verschlüsselungsanlagen." *F.T.Z.*, Vol. 7 (1954), pp. 57-64.
- Smith, C. P., "Selective Compression of Speech Sounds." *Jour. Acous. Soc. Amer.*, Vol. 25 (1953), p. 832. (Abstr.)
- Smith, S. L., and Licklider, J. C. R., "Non-effect upon Speech Intelligibility of Phase Distortion Produced by h. p. and Low Pass Filters." *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), p. 138. (Abstr.)
- Stevens, K. N., "Representation of Speech Signals in Terms of Articulatory Positions." *Jour. Acous. Soc. Amer.*, Vol. 25 (1953), p. 183. (Abstr.)
- , Kasowski, S., and Fant, C. G. M., "An Electrical Analog of the Vocal Tract." *Jour. Acous. Soc. Amer.*, Vol. 25 (1953), pp. 734-742.
- Stubbs, K. L., "Discriminatory Analysis Applied to Speech Sound Recognition." 1954 IRE Nat. Conv. Abstr., Proc. IRE, Vol. 42 (1954), p. 610.
- Sumbly, W. H., and Pollack, J., "Visual Contribution to Speech Intelligibility in Noise." *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), pp. 212-215, 583.
- Uygur, I., *Correlation Functions and Spectra of Music and Speech*, Report 250, M.I.T. Res. Lab. Electr., 1954.
- Vilbig, F., "Visible-Speech Rotary-field Coördinate-Conversion Analyzer." *TRANS. IRE Audio 2* (1954), pp. 76-80. (3440, 1954).
- Winckel, F., "Analyse und Synthese der Sprachlaute." *Funk u. Ton*, Vol. 8 (1954), pp. 50-54, 99-102.
- , "Die Selbststeuerung der menschlichen Stimme." *Funk u. Ton*, Vol. 7 (1953), pp. 124-132.

Witte, A. J. de, "Transformation of Speech into Writing and Simplification." *Synthese*, Vol. 9 (1954), pp. 321-325.

(b)

- Baumann, R. H., and Licklider, J. C. R., "An Electronic Word Recognizer." *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), (Abstr.), pp. 137-138.
- Biddulph, R., and Howland, B., "Autocorrelation Analysis and Correlatograms of Spoken Digits." *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), (Abstr.) p. 138.
- Black, J. W., "Multiple Choice Intelligibility Tests." Rep. 17, A.S. Naval Sch. Aviat. Med. Res. No. 17 (1953), 20 pp. (B 28, 8451, 1954).
- Bürck, W., "Neuere Erfahrungen bei objectiven Lautstärkemessungen." *Phys. Verh.*, Vol. 5 (1954), p. 60.
- , *Zur Physik und Psychologie der Geräuschmessung*. Rohde Schwarz, Mitt H 5, 1954.
- Burkowitz, P., "Beitrag zu einer wissenschaftlichen Grundlage der Einkanal Schallübertragung." *Funk u. Ton*, Vol. 7 (1953), pp. 10-26, 241-249.
- Bytel, J., "The Physiology of the Hearing Organ in the Light of Recent Data." *Acta Oto-Laryngologica*, Vol. 40 (1951-1952), pp. 264-272.
- Challier, L., "Le typosonographe phonétique ou phonéotographe de J. Dreyfus Graf." *Onde électr.*, Vol. 34 (1954), p. 267.
- Cherry, E. C., "Some Experiments on the Recognition of Speech with One and with Two Ears." *Jour. Acous. Soc. Amer.*, Vol. 25 (1953), pp. 975-979.
- , Taylor, W. K., "Some Further Experiments upon the Recognition of Speech with One or with Two Ears." *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), pp. 554-559.
- Chocholle, R., "Etude Statistique des seuils auditifs monauraux et binauraux. Interprétation des résultats." *Acustica*, Vol. 4 (1954), pp. 341-350. (A 7949, 1954).
- Christman, R. J., "Shifts in Pitch as a Function of Prolonged Stimulation with Pure Tones." *Amer. Jour. Psych.*, Vol. 67 (1954), pp. 484-491.
- David, E. E., Jr., "Ears for Computers." *Sci. Amer.*, Vol. 192 (1955), Nr. 2, pp. 92-98.
- Davis, H., "Information Theory 3. Application of Information Theory to Research in Hearing." *Jour. Speech Hearing Disorders*, Vol. 17 (1952), pp. 189-197.
- Egan, J. P., Carterette, E. C., and Thwing, E. J., "Some Factors Affecting Multichannel Listening." *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), pp. 774-782. (A 668, 1955).
- Feldtkeller, R., and Zwicker, E., "Die Grösze der Elementarstufen der Tonhöhenempfindung und der Lautstärkeempfindung." *Akust. Beih. Acustica H 1* (1953), pp. 97-100.
- Garner, W. R., "A Technique and a Scale for Loudness Measurement." *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), pp. 73-88.
- , "An Informational Analysis of Absolute Judgments of Loudness." *Jour. Exp. Psychol.*, Vol. 46 (1953), pp. 373-380. (B 28, 7050, 1954).
- Hartman, E. B., "The Influence of Practice and Pitch-Distance Between Tones on the Absolute Identification of Pitch." *Amer. Jour. Psych.*, Vol. 67 (1954), pp. 1-14.
- Hirsh, I. J., "Psychophysics of Hearing." *Acta Oto-Laryngologica*, Vol. 40 (1951-1952), pp. 273-282.
- Hudler, H., "Die Nachbildung der menschlichen Hörfläche." *Ost. Z. Telegr. Teleph. Funk Fernsicht.*, Vol. 8 (1954), pp. 113-122.
- Husson, R., "Etude expérimentale des conditionnements acoustiques, physiologiques et psychophysiques de l'esthétique musicale." *Ann. Télécomm.*, Vol. 8 (1953), pp. 51-72.
- Licklider, J. C. R., "A Duplex Theory of Pitch Perception." *Experientia*, Vol. 7 (1951), pp. 128-134.
- Mankowskii, V. S., "Optical Method for Noise Reduction in a Phonogram." (in Russian) *Jour. Tech. Phys. (Moscow)*, Vol. 24 (1954), pp. 2025-2035.
- Meijer Eppler, W., "Kurzer Bericht über den internationalen Kongress 'Musik und Elektroakustik' in Gravesano." *Acustica*, Vol. 4 (1954), pp. 680-682.
- Mol, H., "Comprimerende eigenschappen van het gehoororgaan." *Tijds. Ned. Radiogen.*, Vol. 16 (1951), pp. 277-291.
- Moles, A., "Essai de classification de quelques méthodes de préparation sonore du signal musical." *Ann. Télécomm.*, Vol. 9 (1954), pp. 201-204.

- , "Studium und Darstellung des komplexen Tones in der musikalischen Akustik." *Funk u. Ton*, Vol. 7 (1953), pp. 277-287.
- Peterson, G. E., "Basic Physical Systems for Communication Between two Individuals." *Jour. Speech Hearing Disorders.*, Vol. 18 (1953), pp. 116-120. (B 28, 2547, 1954).
- , "The Phonetic Value of Vowels." *Language*, Vol. 27 (1951), pp. 541-553.
- Quietsch, G., "Neue Untersuchungen über subjektive und objektive Lautstärkemessungen." *Phys. Verh.*, Vol. 5 (1954), pp. 57-58.
- , "Zur Theorie der Lautstärke und Lautheit." *Tech. Haus Mitt.*, N.W.D.R., Vol. 5 (1953), pp. 169-177.
- Robinson, D. W., "The Relation Between the Sone and Phone Scale of Loudness." *Acustica*, Vol. 3 (1953), pp. 344-358. (1276, 1954).
- Rosenblith, W. A., "Man, a Somewhat Neglected Component of hi-fi Systems." (Abstr.) *Proc. IRE*, Vol. 43 (1955), p. 359.
- , Stevens, K. N., "On the D.L. for Frequency." *Jour. Acous. Soc. Amer.*, Vol. 25 (1953), pp. 980-985.
- , *Electrical Responses from the Auditory Nervous System*. Brooklyn Inform. Networks Symp., 1954, pp. 223-248.
- Snow, W. B., "Basic Principles of Stereophonic Sound." *Jour. Soc. Mot. Pict. Telev. Engrs.*, Vol. 61 (1953), pp. 567-589. (1651-1954).
- , "Effect of Arrival Time on Stereophonic Localization." *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), pp. 1071-1074.
- Spieß, W., Curtis, J. F., and Webster, J. C., "Responding to One or Two Simultaneous Messages." *Jour. Acoust. Soc. Amer.*, Vol. 26 (1954), pp. 391-396. (2837, 1954).
- Stevens, S. S., "Pitch Discrimination, Mels and Koch's Contention." *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), pp. 1075-1077.
- Stubbs, H. L., "Discriminatory Analysis Applied to Speech Sound Recognition." 1954 Conv. Rec., Pt. 4 (1954), pp. 41-44.
- Sund, H., "Audio Spectrometer." U.R.S.I. doc. 92/VI/1954.
- Veckmans, J. L., and Van Weyenbergh, G., "Essai d'explication de l'audition supraliminaire et analyse mathématique." *Ann. Télécomm.*, Vol. 8 (1953), pp. 123-126.
- Vries, H. de, "Information Capacity of the Human Ear and the Acoustic Nerve." *Synthese*, Vol. 9 (1954), pp. 252-254.
- , "Microphonische Effecten van het Acustico-Laterale System." Hand. 33e Ned. Natuur. Geneesk. Congres (1953), pp. 99-100.
- Ward, W. D., "Information and Absolute Pitch." *Jour. Acous. Soc. Amer.*, Vol. 25 (1953), p. 833. (Abstr.)
- , "Subjective Musical Pitch." *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), pp. 369-380.
- Webster, J. C., and Thompson, P. O., "Responding to Both of two Overlapping Messages." *Jour. Acous. Soc. Amer.*, Vol. 26 (1954), pp. 396-402. (A 7947, 1954) (2838, 1954).
- Wever, E. G., Lawrence, M., and Rahm, W. E., "The Phase Characteristics of the Ear." *Proc. Nat. Acad. Sci.*, Vol. 40 (1954), pp. 209-218.
- Wever, E. G., Lawrence, M., and Bekesy, G. von, "A Note on Recent Developments in Auditory Theory." *Proc. Nat. Acad. Sci.*, Vol. 40 (1954), pp. 508-512.
- Winckel, F., *Klangwelt unter der Lupe*. Berlin, Max Hesse Verlag, 1952. (Rev., *Frequenz*, Vol. 7 (1953), pp. 276-277.)
- Zwicker, E., "Ueber Lautheitsmessungen an Rauschen verschiedener Bandbreiten." *Phys. Verh.*, Vol. 5 (1954), p. 58.

(c)

- Adrian, E. D., "The Nervous Reactions of the Retina." *Trans. Illum. Eng. Soc.*, Vol. 18 (1953), pp. 105-112.
- Baumgardt, E., "Les réponses électriques de la rétine humaine." *Ann. psychol.*, Vol. 51 (1949).
- , "Seuils visuels et quanta de lumière. Précisions." *Ann. Psychol.*, Vol. 53 (1953), pp. 431-441. (B 28, 8409, 1954).
- , "Sehmehanismus und Quantenstruktur des Lichtes." *Naturwiss.*, Vol. 39 (1952), pp. 388-393.
- Benham, T. A., "A Guidance Device for the Blind." *Physics Today*, Vol. 7 (1954), Nr. 12, pp. 11-14.
- Bitterman, M. E., Krauskopf, J., and Hochberg, J. E., "Threshold for Visual Form: a Diffusion Model." *Amer. Jour. Psych.*, Vol. 67 (1954), pp. 205-219.
- Blackwell, H. R., "Brightness Discrimination Data for the Specification of Quantity of Illumination." *Illum. Eng.*, Vol. 47 (1952), pp. 602-607.
- Bouman, M. A., and v. d. Velden, H. A., "The Two Quanta Explanation of the Dependence of the Threshold Values and Visual Acuity on the Visual Angle and the Time of Observation." *Jour. Opt. Soc. Amer.*, Vol. 37 (1947), pp. 908-919.

- Brindley, G. S., "The Order of Coincidence Required for Visual Threshold." *Proc. Phys. Soc. (London)*, B 67 (1954), pp. 673-676. (A 11685, 1954).
- Burian, H. M., "Electric Responses of the Human Visual System." *A.M.A. Arch. Ophthalmol.*, Vol. 51 (1954), pp. 509-524. (B 28, 8411.)
- Chritchley, M., "Tactile Thought With Special Reference to the Blind." *Brain*, Vol. 76 (1954), pp. 19-35.
- Comm. on Colorimetry, Opt. Soc. Amer., *The Science of Color*. New York, Crowell, 285 p. 1953.
- Connor, J. P., and Ganoung, R. E., "An Experimental Determination of Visual Thresholds at low Values of Illumination." *Jour. Opt. Soc. Amer.*, Vol. 25 (1934), pp. 287-294.
- Denton, E. J., and Pirenne, M. H., "The Absolute Sensitivity and Functional Stability of the Human Eye." *Jour. Physiol.*, Vol. 123 (1954), pp. 417-442.
- Dresler, A., "The Nonadditivity of Hetero-Chromatic Brightnesses." *Trans. Illum. Eng. Soc.*, Vol. 18 (1953), pp. 141-165.
- Gabor, D., "Louis de Broglie et les limites di monde visible." *L. de Broglie, physicien et Penseur*. Paris Edit. A. Michel, 1953, pp. 241-253.
- Henneman, R. H., "Vision and Audition as Sensory Channels for Communication." *Quart. Jour. Speech*, Vol. 38 (1952), pp. 326-330. (B 28, 847, 1954).
- Kallman, H. E., "Optar, a Method of Optical Automatic Ranging as Applied to a Guidance Device for the Blind." *Proc. IRE*, Vol. 42 (1954), pp. 1438-1446. (3641, 1954).
- Krauskopf, J., Duryea, R. A., and Bitterman, M. E., "Threshold for Visual Form: Further Experiments." *Amer. Jour. Psych.*, Vol. 67 (1954), pp. 427-440.
- Lange, H. de, "Relationship Between Critical Flicker Frequency and a set of Low Frequency Characteristics of the Eye." *Jour. Opt. Soc. Amer.*, Vol. 44 (1954), pp. 380-389. (A 7935, 1954).
- Landis, C., "Temporal and Intensity Limits of the Flicker Fusion Threshold." *Science*, Vol. 120 (1954), p. 783.
- Levonian, E., "Stereography and the Physiology of Vision." *Jour. Soc. Mot. Pict. Tele. Eng.*, Vol. 62 (1954), pp. 199-207.
- Maréchal, M. A., "Le calcul du contraste des images optiques." *Le journal de physique et le radium*, Vol. 14 (1953), pp. 62^a-63^a.
- Michels, W. C., "An Interpretation of the Brill Scale of Subjective Brightness." *Jour. Opt. Soc. Amer.*, Vol. 44 (1954), pp. 40-74.
- Mol, H., "Conversation with the Deaf and the Blind." *P.T.T. Bedrijf*, Vol. 6, Nr. 1, (April, 1954), pp. 11-19. (D 775, 1955).
- Muller, C. G., "A Quantitative Theory of Visual Excitation for the Single Photo-Receptor." *Proc. Nat. Acad. Sci.*, Vol. 40 (1954), pp. 853-863.
- Pirenne, M. H., "Quantum Physics of Vision: Theoretical Discussion." *Progress in Biophysics*, Vol. 2 (1951), pp. 193-223.
- , Marriot, F. H. C., "Quantum Theory of the Absolute Threshold: The Influence of Retinal Position and Area." *Optica Acta*, Vol. 1 (1954), pp. 151-155.
- Rose, A., "The Sensitivity of the Human Eye on an Absolute Scale." *Jour. Opt. Soc. Amer.*, Vol. 38 (1948), pp. 196-208; *Television*, Vol. 5 RCA (1948), pp. 272-292.
- , "Quantum and Noise Limitations of the Visual Process." *Jour. Opt. Soc. Amer.*, Vol. 43 (1953), pp. 715-716.
- Rushton, W. A. H., and Cohen, R. D., "Visual Purple Level and the Course of Dark Adaptation." *Nature*, Vol. 173 (1954), p. 301.
- Ségal, J., "La densité optique des pigments photosensibles de l'oeil et le mécanisme de l'adaptation." *Rev. d'Optique*, Vol. 32 (1953), pp. 385-404.
- Sholl, D. A., and Muttley, A. M., "Pattern Discrimination and the Visual Cortex." *Nature*, Vol. 171 (1953), pp. 387-388.
- Simonson, E., Brožek, J., "Flicker Fusion Frequency. Background and Applications." *Phys. Rev.*, Vol. 32 (1952), pp. 349-378.
- Spottiswoode, R., and Spottiswoode, N. *The Theory of Stereoscopic Transmission and its Application to the Motion Picture*. Univ. California Press, 180 pp., 1953.
- Stevens, S. S., "On the Brightness of Light and the Loudness of Sounds." (Abstr.) *Science*, Vol. 118 (1953), p. 576.
- Toraldo de Francia, G., "The Eye as a Transmitter of Information." *Atti. Fond. Ronchi*, Vol. 8 (1953), pp. 203-211. (in Italian).
- Vernon, M. D., *A Further Study of Visual Perception*. Camb. Univ. Press, 1952.
- Vries, H. de, "The Quantum Character of Light and its Bearing Upon Threshold of Vision, the Differential Sensitivity and Visual Acuity of the Eye." *Physica*, Vol. 10 (1943), pp. 553-564.
- Wald, G., "On the Mechanism of the Visual Threshold and Visual Adaptation." *Science*, Vol. 119 (1954), pp. 887-892. (A 10691.)
- Weston, H. C., "Visual Fatigue (with Special Reference to Lighting)." *Trans. Illum. Eng. Soc.*, Vol. 18 (1953), pp. 39-66.
- Witcher, C. M., and Washington, L., Jr., "Echo Location for the Blind." *Electronics*, Vol. 27 (December, 1954), pp. 136-137. (820, 1955).
- (d)
- Anon. "Electronic Translation." *Jour. Frankl. Inst.*, Vol. 257 (1954), pp. 257-260.
- Bar-Hillel, Y., "A Quasi-Arithmetical Notation for Syntactic Description." *Language*, Vol. 29 (1953), pp. 47-58.
- , "Can Translation be Mechanized?" *Amer. Scientist*, (April, 1954.)
- , "Information and Content: A Semantic Analysis." *Synthese*, Vol. 9 (1954), pp. 299-305.
- , "Machine Translation." *Computers and Automata*, Vol. 2 (1953), pp. 1-6.
- , "Some Linguistic Problems Correlated with Machine Translation." *Phil. of Science*, Vol. 20 (1953), pp. 217-225. (B 28 4255, 1954).
- , "The Present Status of Mechanical Translation." *Amer. Docum.*, Vol. 2 (1951), pp. 229-237.
- Boldrini, M., *Le statistiche letterarie e i fonemi elementari nella poesia*. Contr. del laboratori de statistica 6th sec. Univ. Cat., Milano, 1948.
- Bresson, F., "Language et Communication." *Ann. Psych.*, Vol. 53 (1953), pp. 477-502.
- Cherry, E. C., Halle, M., and Jakobson R., "Toward the Logical Description of Languages in their Phonemic Aspects." *Language*, Vol. 29 (1953), pp. 34-46.
- Donnelly, J. B., "Traductores Automaticas." *Calc. Aut. y Cybern.*, Vol. 3 (1954), pp. 40-47.
- Elderton, Sir W. P., "A Few Statistics on the Length of English Words." *Jour. Roy. Stat. Soc.*, Vol. A 112 (1949), pp. 436-445.
- Fant, G., "The Relative Frequency of Words and Phonemes in the Swedish Language." U.R.S.I. doc. 91/VI/1954.
- Fucks, W., "On Nahordnung und Fernordnung in Samples of Literary Texts." *Biometrika*, Vol. 41 (1954), pp. 116-132.
- , "Eine statistische Verteilung mit Vorbelegung. Anwendung auf mathematische Sprachanalyse." *Naturwiss.*, Vol. 42 (1955), p. 10.
- , "Mathematische Analyse des literarischen Stils." *Studium Generale*, Vol. 6 (1953), pp. 506-523.
- , "Mathematical Analysis of Style." *Biometrika*, Vol. 39 (1952), pp. 122-129.
- Guiraud, P., "Language et communication: le substrat informationnel de la langue." *Bull. Soc. linguistique de Paris*, . . . , 1955.
- , *Les caractères statistiques du vocabulaire*. Presses Univ. de France, 1954.
- , Houchin, Th. D., Puhvel, J., and Watkins, C. W., *Bibliographic critique de la statistique linguistique*. 123 p. Utrecht, Spectrum, 1954.
- Herdan, G., "Informationstheoretische Analyse als Werkzeug der Sprachforschung." *Naturwiss.*, Vol. 41 (1954), pp. 293-295.
- Hockett, Ch. F., "An Approach to the Quantification of Semantic Noise." *Phil. Sci.*, Vol. 19 (1952), pp. 257-260.
- Howes, D., and Osgood, Ch. E., "On the Combination of Associate Probabilities in Linguistic Contents." *Am. Jour. Psych.*, Vol. 67 (1954), pp. 241-258.
- Kupfmüller, K., "Die Entropie der deutschen Sprache," *F.T.Z.*, Vol. 7 (1954), pp. 265-272. (3675, 1954).
- MacDonald, N., "Language Translation by Machine." *Computers and Automata*, Vol. 3 (1954), Nr. 2, pp. 6-10.
- Mandelbrot, B., *On Recurrent Noise Limiting Coding*. Inform. Networks Symp., Brooklyn, 1954.
- , (title unknown), *Scientific Monthly*, (September, 1954.)
- , "Structure formelle des textes et communication." *Word*, Vol. 10 (1954), pp. 1-27.
- , "Simple Games of Strategy Occurring in Communication Through Natural Languages." *TRANS. IRE, Information Theory—3* (1954), pp. 124-127.
- Mannoury, G., and Vuysje, D., "Semantic and Signific Aspects of Modern Theories of Communication." *Synthese*, Vol. 9 (1954), pp. 147-156.
- Meijer Eppler, W., "Zur Anwendung informationstheoretischer Methoden auf sprachlichen Probleme." *Zts. f. Phonetik u. Sprachwiss.*, Vol. 8 (1954), pp. 32-40.

- Olmstedt, D. L., and Moore, O. K., "Language, Psychology and Linguistics." *Psychol. Rev.*, Vol. 59 (1952), pp. 414-420. (B 28, 886, 1954).
- Pol, Balth. van der, *An Iterative Translation Test*. Geneva, 13 pp., C.C.I.R., 1954.
- Reifler, E., "The First Conference on Mechanical Translation." *Mech. Transl.*, Vol. 1, Nr. 3 (1954), pp. 47-55.
- Reiser, O. L., "Logic, Cybernetics and Semantics." *Synthese*, Vol. 9 (1954), pp. 306-320.
- Reynolds, A. C., "The Conference on Mechanical Translation." (M.I.T. June, 1952), *Mech. Transl.*, Vol. 1, No. 2 (1954), pp. 22-32.
- Ross, A. S., "Philological Probability Problems." *Jour. Roy. Stat. Soc.*, A. Vol. 114 (1950), pp. 19-59.
- Shuey, R. L., "Bits, Language Efficiency and Information Theory." *Gen. El. Review*, Vol. 5, Nr. 56, (September, 1953), pp. 15-19.
- Vuysjen, J. D., "Semantische en signifiſche aspecten der moderne informatietheorieën." *Wetenschap en samenleving*, Vol. 7 (1953), pp. 537-551.
- Yngve, V. H., "Mechanical Translation (a Bibliography)." *Mech. Transl.*, Nr. 1, Vol. 1 (1954).
- , "The Machine and the Man." *Mech. Transl.*, Vol. 1, Nr. 2 (1954), pp. 20-22.
- Yule, G. N., *A Statistical Study of Vocabulary*. Cambridge, 1944.
- Zipf, G. K., *Selected Studies of the Principle of Relative Frequencies in Language*. Harv. Univ. Press, 1932.
- , *Psycho-Biology of Language*. Boston, Houghton-Mifflin Co., 1935.

VII. (a) OTHER BIOLOGICAL APPLICATIONS (CYBERNETICS AND THE NERVOUS SYSTEM); (b) HUMAN ENGINEERING; (c) GROUP COMMUNICATION AND LEARNING

(a)

Books:

- Eccles, J. G., *The Neurophysiological Basis of Mind*. Oxford Univ. Press, 314 pp., 1953.
- Foerster, M. von, *Cybernetics*, 9th Macy Conference, New York, 1952.
- Geldard, F. A., *The Human Senses*. New York, Wiley, 365 pp., 1953.
- Gellhorn, E., *Physiological Foundations of Neurology and Psychiatry*. Univ. of Minneapolis Press, 556 pp., 1953.
- Grey, Walter W., *The Living Brain*. London, Duckworth, 216 pp., 1953.
- Latil, P. de, *Introduction à la cybernétique. La pensée artificielle. L'avenir de la science* 34, 332 pp., Paris, Gallimard, 1953.
- Merritt, H. H., *Nerve Impulse*, 3rd Macy Conference, 1952.
- Monnier, dir., M., *L'organisation des Fonctions Psychiques*. 108 pp. Bibl. Scient. 22, Dialectica ser. Griffon, Neuchatel-Dunod, Paris, 1951.
- Muralt, A. von, *Die Signalübermittlung in Nerven*. Basel, Birkhäuser, 1946.
- Piéron, H., Fessard, A., and Fraise, P., *L'année psychologique*. 51, 1951, 592 p. Presses Universitaires de France 1951. (rev. in *Rev. Scient.*, Vol. 90 (1952), p. 384.
- Quastler, H., *Essays on the Use of Information Theory in Biology*. Univ. Illinois Press, 273 pp., 1953.
- Rosenblueth, A., *The Transmission of Nerve Impulses at Neuro-Effector Junctions and Peripheral Synapses*. New York, Wiley, 326 pp., 1950.
- Russell, Brain W., *Mind, Perception and Science*. Blackwell Sci. Publ., 90 pp., 1951.
- Tasaki, I., *Nervous Transmission*. Ch. Thomas, Springfield, Ill., 164 pp., 1953.
- Wilkie, J. S., *The Science of Mind and Brain*. New York, Longmans Green, 160 pp., 1953.
- Davis, H., "Biological Transducers." *Feder. Proc.*, Vol. 12 (1953), pp. 661-665.
- Drooglever, Fortuijn J., "Introduction (to the Cybernetics and the nervous system section of the 9th Signific Summer Conference)." *Synthese*, Vol. 9 (1954), pp. 137-144.
- Duhamel, J., "Conductibilité électrique du nerf et équation des télégraphistes." *Ann. Télécomm.*, Vol. 8, (1953), pp. 197-205.
- Eccles, J. G., "A Discussion on Excitation and Inhibition (under the Leadership of . . .)." *Proc. Roy. Soc. B.*, Vol. 140 (1952), pp. 169-202.
- El-A'lem, M. A., "Cybernetics." (in Arabic) *Egypt. J. Psychol.*, Vol. 8 (1953), pp. 315-326. (B 28, 43, 1954).
- Farby, B. G., and Clark, W. A., "Simulation of Self-Organizing Systems by Digital Computers." *TRANS. IRE, Information Theory* 4 (1954), pp. 76-84.
- Favre, A., Caviglio, J., Rinaldi, R., and Audier, M., "Autocorrelation d'un électrocardiogramme." *CR. Acad. Sci.*, Paris, Vol. 238 (1954), pp. 1672-1674.
- Fessard, A., "Quelques propriétés de systèmes de neurones." *Cah. de Phys.*, Vol. 46 (1953), pp. 23-33.
- Ford, A., "Bioelectrical Integrator Gages Strain and Effort." *Electronics*, Vol. 26, No. 4 (1953), pp. 172-174.
- Fraise, P., "La perception comme processus d'adaptation; l'évolution des recherches récentes." *Année psychol.*, Vol. 53 (1953), pp. 443-461.
- Galifret, Y., Piéron, H., "Vitesse de réaction et intensité de sensation." *Ann. Psych.*, Vol. 51 (1951), pp. 1-16.
- Gastaut, H., "L'activité cérébrale et les grands problèmes psychologiques." *Ann. Psych.*, Vol. 51 (1951), pp. 63-88.
- Gonzales del Valle, R., "El concepto de cybernetica." *Calc. Automatica y cybernetica*, Vol. 3, No. 8 (1954), pp. 60-62.
- Grand, Y. le, "Bases physiques de l'excitation sensorielle." *Cah. de Phys.*, No. 46 (November, 1953), pp. 17-22.
- Grey, Walter W., *Networks of Neurons*. Brooklyn Inform. Networks Symp., 1954, pp. 185-186.
- , "Patterns in Your Head." *Discovery*, Vol. 13 (1952), pp. 56-62.
- , "An Electro-Mechanical 'Animal'." *Discovery*, Vol. 11 (1950), pp. 90-93.
- Gruenberg, E. L., "Reflective Thinking in Machines." *Computers and Automata*, Vol. 3, Nr. 2 (1954), pp. 12-19, 26-28.
- , "The Concept of Thinking." *Computers and Automata*, Vol. 3, Nr. 4 (1954), pp. 18-20.
- , "Autonomy and Self-Repair for Computers." A Symposium. *Computers and Automata*, Vol. 3, Nr. 5 (1954), pp. 12-13.
- Hainer, R. M., Emslie, A. G., and Jacobson, A., "An Information Theory of Olfaction." *Ann. New York Acad. Sci.*, Vol. 58, Art. 2 (1954), pp. 158-174.
- Hick, W. E., "The Impact of Information Theory on Psychology." *Advanc. of Science*, Vol. 10, No. 40 (1954), pp. 397-402.
- Hofstaetter, R. R., "Psychologie und Mathematik." *Studium Generale*, Vol. 6 (1953), pp. 652-662.
- Hutchinson, G. E., "Turbulence as Random Stimulation of Sense Organs." 9th Macy Conf. (1952), pp. 155-158.
- Kalchalsky, A., and Lifson, S., "Muscle as a Machine." *Scien. Amer.*, Vol. 190, No. 3 (1954), pp. 72-76.
- Karreman, G., "Recent Mathematical-Biological Studies on Excitation." *Synthese*, Vol. 9 (1954), pp. 233-247.
- , "Recent Mathematical-Biological Studies on Communication," *Synthese*, Vol. 9 (1954), pp. 255-264.

Papers:

- Ashby, W. R., "Homeostatis," 9th Macy Conf., (1952), pp. 73-108.
- Barrett, E., and Post, G., "Introduction to Some Principles of Applied Cybernetics." *Jour. Psych.* (July, 1950), pp. 3-10.
- Bateson, G., "The Position of Humor in Human Communication." 9th Macy Conf., (1952), pp. 1-47.
- Beecher, H. K., "A Method for Quantifying the Intensity of Pain." *Science*, Vol. 118 (1953), pp. 322-324.
- Bok, S. T., "Norm en evenwicht." *Hand. 33e Natuur. Geneesk. Congres*, (1953), pp. 5-20.
- Bonhoeffer, K. F., "Modelle der Nervenerregung." *Naturwiss.*, Vol. 40 (1953), pp. 301-311.
- Bresson, F., "L'étude de la pensée et les processus conceptuels." *Ann. Psych.*, Vol. 51 (1951).
- Bullock, Th. H., "Comparative Aspects of Some Biological Transducers." *Feder. Proc.*, Vol. 12 (1953), pp. 666-672.
- Chanchard, P., "Evolution de la science et conscience de l'évolution." *La Revue Scientifique*, Vol. 91, fasc. 1 (1953), pp. 35-45.
- , "Louis Lapicque et la machine nerveuse." *La Revue Scientifique*, Vol. 91, fasc. 2 (1953), pp. 116-126.
- Cohen, Sir Henry, "The Status of Brain in the Concept of Mind." *Philosophy, Jour. Roy. Inst. Philosophy*, Vol. 27 (1952), pp. 195-210.

- Kattsoff, L. O., "Brains, Thinking and Machines." *Methodos*, Vol. 6, No. 24 (1954), pp. 279-286.
- Köhler, W., "Direction of Processes in Living Systems." Symp. on Organism and Machine. *Scientific Monthly* (January, 1955).
- Kubie, L. S., "The Place of Emotions in the Feedback Concept." 9th Macy Conf., (1952), pp. 48-72.
- Latil, P. de, "Les libertés cybernétiques." Actes du XI^e Congrès Intern. de Philos., Bruxelles, 1953.
- MacKay, D. M., "On Comparing the Brain with Machines." *Advance. Sci.*, Vol. 10 (1954), pp. 402-406.
- Mays, W., "Can Machines Think." *Philosophy*, Vol. 27 (1952), pp. 148-162.
- McCulloch, W. S., "Mysterium Iniquitates of Sinful Men Aspiring to the Place of God." *Sci. Monthly* (January, 1955).
- , "Information in the Head." *Synthese*, Vol. 9 (1954), pp. 233-247.
- Mittelstaedt, H., "Regelung und Steuerung bei der Orientierung der Lebewesen." *Regelg. t. 2* (1954), pp. 226-232.
- Mittelstaedt, H., "Regelung in der Biologie." *Regelg. t. 2* (1954), pp. 177-181.
- Moles, A., "Le rôle de la cybernétique dans le développement futur de la psychophysologie." *Rev. Gén. Sci.*, Vol. 57 (1950), p. 253.
- Muller, H. J., "Life," *Science*, Vol. 121 (1955), pp. 1-9.
- Nachmansohn, D., "Generation of Bioelectric Potentials." *Science*, Vol. 120 (1954), p. 787.
- Piaget, J., "Structures Operationelles et Cybernétique." *Année Psychol.*, Vol. 53 (1953), pp. 379-390. (B 28 8294, 1954).
- Pitts, W., "Investigations on Synaptic Transmission." 9th Macy Conf. (1952), pp. 159-166.
- Post, G., "The Design of Automatic Factories." 1954 IRE Nat. Conv. Abstr. Proc. IRE, Vol. 42 (1954), p. 624.
- Quastler, H., "Feedback Mechanisms in Cellular Biology." 9th Macy Conf. (1952), pp. 167-181.
- Rapoport, A., "Mathematical Biophysics, Cybernetics and Significs." *Synthese*, Vol. 6 (1951), pp. 182-193.
- , "Response Time and Threshold of a Random Net." *Bull. Math. Biophys.*, Vol. 14 (1952), pp. 351-363.
- Rashevsky, N., "Topology and Life: In Search of General Mathematical Principles in Biology and Sociology." *Bull. Math. Biophysics*, Vol. 16 (1954), pp. 317-348.
- , "Mathematical Biology of the Central Nervous System with Special Reference to the Problems of Gestalt and Perception of Relations." *Thales*, Vol. 7 (1951), (1953), pp. 51-68.
- , "Is the Concept of an Organism as a Machine a Useful One?" Symp. Organism and Machine., *Scientific Monthly* (January, 1955).
- Reid, A. T., "On Stochastic Processes in Biology." *Biometrics*, Vol. 9 (1953), pp. 275-289.
- Robert, R., Young, J. Z., "The Flying Spot Microscope." *Proc. IEE*, Vol. 99, III (1952), pp. 747-757.
- Rogers, J. L., and Householder, A. S., "Can Machines Think?" *Computers and Automata*, Vol. 2, No. 9 (1953), pp. 14-15.
- Saucer, R. F., "The Nature of Perceptual Processes." *Science*, Vol. 117 (1953), pp. 556-558.
- Schmitt, O. H., "Biological Servomechanisms and Circuitry." *Proc. IRE*, Vol. 42 (1954), p. 615. Abstr.
- Shannon, C. E., "Computers and Automata." *Proc. IRE*, Vol. 41 (1953), pp. 1234-1241, *Methodos*, Vol. 6 (1954), pp. 115-130.
- Stevens, S. S., "Biological Transducers." 1954 IRE Nat. Conv. Abstr., *Proc. IRE*, Vol. 42, (1954), p. 613.
- Sugita, M., "Thermodynamics of Life I, Thermodynamics of Transient Phenomena II. On the Maximum Principle of Transient Phenomena III. Mathematical Analysis of Metabolism." *Jour. Phys. Soc. Japan*, Vol. 8 (1953), pp. 693-713.
- Suhara, K., "On the Frequency Analysis of the Brain Wave and its Statistical Interpretation." *Folio psychiat. Neur. Jap.*, Vol. 6 (1952), pp. 1-38. (B 28, 6921, 1954).
- Tamari, D., "Une contribution aux theories modernes de communication: machine de Turing et problèmes de mot." *Synthese*, Vol. 9 (1954), pp. 205-230.
- Taylor, R. L., and Straube, H. M., "'Nervetype' Transmission Line." *Bell Labs. Rec.*, Vol. 32 (1954), pp. 21-24.
- Thomson, R., and Sluckin, W., "Cybernetics and Mental Functioning." *Brit. Jour. Phil. Sci.*, Vol. 4 (1953), pp. 130-146. (B 28, 3532, 1954).
- Trucco, E., "The Smallest Value of the Axon Density for which 'Ignition' Can Occur in a Random Net." *Bull. Math. Biophys.*, Vol. 14 (1952), pp. 365-374.
- Turing, A. M., "Computing Machinery and Intelligence." *Methodos*, Vol. 6 (1954), pp. 195-223.
- Vries, H. de, "De betekenis van de natuurkunde voor de medische wetenschap." *Hand. 33e Ned. Natuur. Geneesk. Congres* (1953), pp. 20-33.
- Walshe, F. M. R., "Thoughts Upon the Equation of Mind with Brain." *Brain*, Vol. 76 (1954), pp. 1-8.
- Wiersma, C. A. G., "Neural Transmission in Invertebrates." *Physiol. Rev.*, Vol. 33 (1953), pp. 326-355.
- Wilkes, M. V., "Can Machines Think?" *Discovery*, Vol. 14 (1953), pp. 151-154. *Proc. IRE*, Vol. 41 (1953), pp. 1230-1234.
- Wyke, B. D., "Biophysical Aspects of Nervous Functions." *Progress in Biophysics*, Vol. 2 (1952), pp. 117-192.
- Young, J. Z., "Growth and Plasticity in the Nervous System." *Proc. Roy. Soc., B*, Vol. 139 (1951), pp. 18-37.
- , "Measurement with the Flying Spot Microscope and Measurement of Shape." *Proc. IEE*, Vol. 100 I (1953), pp. 256-258.

(b)

- Birmingham, H. P., and Taylor, F. V., "A Design Philosophy for Man-Machine Control Systems." *Proc. IRE*, Vol. 42 (1954), pp. 1748-1758.
- Glassmann, I., "A Dynamic Aircraft Simulator for Study of Human Response Characteristics." *TRANS. IRE, PGAE-5* (1952), 6 pp.
- Klopsteg, P. E., and Wilson, Ph.D., et al., "Human Limbs and their Substitutes." *Advis. Comm. Artif. Limbs*, Nat. Acad. Sci. Nat. Res. Council, (1954), 844 pp.
- Krulce, G. K., "Information Theory and Man-Machine Systems." *Jour. Oper. Res. Soc. Amer.*, Vol. 2 (1954), pp. 320-328.
- Mead, L. C., "Human Engineering." 1954 IRE Nat. Conv. (Abstr.), *Proc. IRE*, Vol. 42 (1954), p. 615.
- Michels, W., and Helson, H., "Der Mensch als physikalisches Mess-Instrument." *Physik. Blätter*, Vol. 3 (1954), pp. 114-118. *Physics Today*, Vol. 6, No. 8 (1953), pp. 4-6.
- Munson, W. A., and Karlin, J. E., "The Measurement of Human Channel Transmission Characteristics." *Jour. Acoust. Soc. Amer.*, Vol. 26 (1954), pp. 542-553. (8-1955) (B 28, 9861, 1954).
- Williams, D. T., "Man and Machine." *Battelle Tech. Rev.*, Vol. 4 (1955), pp. 3-8.

(c)

- Aborn, M., and Rubenstein, H., "Information Theory and Immediate Recall." *Jour. Exp. Psych.*, Vol. 44 (1952), pp. 260-266.
- Bakan, D., "Learning and the Principle of Inverse Probability." *Psychol. Rev.*, Vol. 60 (1953), pp. 360-370. (C 56, 1955).
- Bartlett, F. D., and Shepard, H. A., "A Bibliography of Cybernetics." *Proc. Amer. Acad. Arts Sciences*, Vol. 80 (1953), pp. 204-222.
- Bush, R. B., and Mosteller, F., "A Stochastic Model with Applications to Learning." *Ann. Math. Stat.*, Vol. 24 (1953), pp. 559-585. (C 449, 1954).
- Christie, L. S., "Organization and Information Handling in Task Groups." *Jour. Oper. Res. Soc. Amer.*, Vol. 2 (1954), pp. 188-196.
- Deutsch, K. W., *Nationalism and Social Communication, An Inquiry into the Foundations of Nationality*. New York, Wiley, 292 pp., 1953. (B 28, 5912, 1954).
- Gabor, D., and Gabor, A., "An Essay on the Mathematical Theory of Freedom." *Proc. Roy. Stat. Soc. A*, Vol. 117 (1954), pp. 31-72.
- Goodman, L. A., "On Optimal Arrangements in Some Social Learning Situations." *Bull. Math. Biophys.*, Vol. 14 (1952), pp. 307-312.
- Guthrie, E. R., *The Psychology of Learning*. New York, Harper, 310 pp., 1952.
- Kalmus, H., "More on the Language of Bees." *Sci. Amer.*, Vol. 189, Nr. 1 (July, 1953), pp. 60-66.
- Kochen, M., "On Information Theoretical Models of Organizations." *TRANS. IRE, Information Theory 4* (1954), pp. 67-75.
- Luce, R. D., Macy, J. Jr., Christie, L. S., and Hay, D. H., *Information Flow in Task Oriented Groups*. Tech. Rep. 264, M.I.T. Res. Lab. Electr., 1954.
- Miller, G. A., and McGill, W. J., "A Statistical Description of Verbal Learning." *Psychometrika*, Vol. 17 (1952), pp. 369-396. (B 27, 7640, 1953).
- Poortman, B., "Foundations of Organization. Formulation of a Theory on the Organization of Human Beings." *Synthese*, Vol. 9 (1954), pp. 274-288.
- Rapoport, A., and Rebhun, L. I., "On the Mathematical Theory of Rumor Spread." *Bull. Math. Biophys.*, Vol. 14 (1952), pp. 375-383.

- Ribbands, C. R., Kalmus, H., and Nixon, H. L., "New Evidence of Communication in the Honeybee Colony." *Nature*, Vol. 170 (1952), pp. 438-442.
- , *The Behaviour and Social Life of Honeybees*. London, Bee Res. Ass., 352 pp., 1953.
- Rothstein, J., "Information, Organization and Systems." TRANSACTIONS INSTITUTE OF RADIO ENGINEERS, Information Theory 4 (1954), pp. 64-66.
- Sabetier, H., "En marge de la cybernétique: les corrélations entre les phénomènes de la physique et le comportement de l'individu isolé ou en société." *Bull. Inf. Sci. Tech. Min. Armée* 1950, 29g-30g, pp. 421-441.
- Shimbel, A., "Structural Parameters of Communication Networks." *Bull. Math. Biophys.*, Vol. 15 (1953), pp. 501-507.
- Soest, J. L. van, "A Contribution of Information Theory to Sociology." *Synthese*, Vol. 9 (1954), pp. 265-273.
- Trucco, E., "Studies in Imitative Behaviour: a Generalization of the Rashevsky Model; its Mathematical Properties." *Bull. Math. Biophys.*, Vol. 16 (1954), pp. 279-316.
- Young, J. Z., "Discrimination and Learning in Octopus." 9th Macy Conf. (1952), pp. 109-119.

VIII. TELEVISION

- Anon., "Saving Television Bandwidth." *Wire. World*, Vol. 59 (April, 1953), pp. 158-162.
- Bedford, L. H., "Problems of Television Cameras and Camera Tubes." *Jour. Brit. IRE*, Vol. 14 (1954), pp. 464-474. (561-1955).
- Bell, D. A., "Economy of Bandwidth in Television." *Jour. Brit. IRE*, Vol. 13 (1953), pp. 447-470. Disc., Vol. 13 (1953), pp. 590-591.
- Benson, J. E., "A Survey of the Methods and Colorimetric Principles of Colour Television." *Jour. Brit. IRE*, Vol. 13 (1953), pp. 9-49.
- Bingley, F. J., "Colorimetry in Color Television." *Proc. IRE*, Vol. 41 (1953), pp. 838-851. Also, Vol. 42 (1954), pp. 48-58.
- Bridges, J. E., "Detection of Television Signals in Thermal Noise." *Proc. IRE*, Vol. 42 (1954), pp. 1396-1405. (3703, 1954).
- Cherry, E. C., and Gouriet, G. G., "Some Possibilities for the Compression of Television-Signals by Recording." *Proc. IEE*, Vol. 100^{III} (1953), pp. 9-18.
- Dennison, R. C., "Aperture Compensation for Television Pick-up Equipment." *Proc. N.E.C.*, Vol. 9 (1953), pp. 567-574.
- Haantjes, J., and Teer, K., "Multiplex Television Transmission." *Wire. Eng.*, Vol. 31 (1954), pp. 225-233, 266-273. (3692, 1954).
- Hatton, W. L., *Pre-emphasizing Video Signals*. Rep. 202, M.I.T. Res. Lab. Electr., 1951.
- Hirsch, C. J., "A Review of Recent Work in Color Television." *Adv. in Electronics*, Vol. 5 (1953), pp. 293-366.
- Jesty, L. C., "Television as a Communication Problem." *Proc. IEE*, Vol. 99^{IIIa} (1952), pp. 761-770.
- Jones, C. H., "Effects of Noise on N.T.S.C. Color Standards." *Proc. Nat. Electr. Conf.*, Vol. 8 (1952), pp. 185-200.
- Kelly, R. D., and Schroeder, A. C., "Optimum Utilization of the Radio-Frequency Channel for Color Television." *TRANS. IRE PG BTR-3* (1953), pp. 33-39. *IRE Conv. Rec. Pt. 4* (1953), pp. 91-96.
- Kovaszny, L., and Joseph, H. M., "Processing of Two-Dimensional Pattern by Scanning Techniques." *Science*, Vol. 118 (1953), pp. 475-477.
- Kretzmer, E. R., "Redundancy in Television." *Bell. Labs. Record*, Vol. 32 (1954), pp. 401-404.
- Labin, E., "Note sur le canal nécessaire à la transmission de la télévision en couleurs." *Onde élect.*, vol. 33 (1953), pp. 85-92.
- Livingston, D. C., "Colorimetric Properties of Gamma-Corrected Colortelevision Systems." 1953 *IRE Conv. Rec.*, Pt. 4 (1953), pp. 51-56.
- Loughren, A. V., "Recommendations of the Nat. Tel. Syst. Comm. for a Color Television Signal." *Jour. Soc. Mot. Pict. Telev. Eng.*, Vol. 60 (1953), pp. 321-336.
- Neidhart, P., "Der Informationsinhalt der Farbfernsehensendung als Funktion der Nachrichtenkapazität des Uebertragungs-Kanals." *Nachrichtentechnik*, Vol. 4 (1954), pp. 54-63.
- , "Methoden zur Redundanzverminderung im Fernsehen." *Nachrichtentechnik*, Vol. 4 (1954), pp. 254-258, 305-309.
- Parmet, B. S., and Kaminson, I. M., "Transient Considerations in the N.T.S.C. Color System." *TRANS. IRE, PG BTR-3* (1953), pp. 47-67. (543-1954).
- Rose, A., "The Relative Sensitivities of Television Pick-up Tube, Photographic Film and the Human Eye." *Proc. IRE*, Vol. 30 (1942), pp. 295-300.
- , "A Unified Approach to the Performance of Photographic Film Television Pick-up Tubes and the Human Eye." *Jour. Soc. Mot. Pict. Eng.*, Vol. 47 (1946), pp. 273-294.
- Schade, O. H., "Image Gradation, Graininess and Sharpness in Television and Motion Picture Systems. II. The Grain Structure of Motion Picture Images—An Analysis of Deviations and Fluctuations of the Sample Number." *Jour. Soc. Mot. Pict. Telev. Eng.*, Vol. 58 (1952), pp. 181-222, III The Grain Structure of Television Images. *Jour. Soc. Mot. Pict. Telev. Eng.*, Vol. 61 (1953), pp. 97-164.
- Schreiber, W. F., *Probability Distributions of Television Signals*. Thesis, 73 pp. Cruft Lab. Harvard Univ., 1952.
- , "Probability Distribution Measurement of Television Signals." 1953 *IRE Conv. Rec.*, Pt. 4 (1953), pp. 35-44.
- Schroeter, F., "Fernsehen und moderne Informationstheorie." *Archiv. el. Uebertr.*, Vol. 9 (1955), pp. 1-7.
- , "Réflexions sur l'évolution future de la télévision." *La Ricerca Scientifica*, (Ital.), Vol. 24 (1954), pp. 1613-1640. (556-1955).
- , "Speicherempfang und Differenzbild im Fernsehen." *Archiv. el. Uebertr.*, Vol. 7 (1953), pp. 63-70.
- Sproson, W. W., Gilbert, Miss M., and West, W., "Some Fundamental Aspects of Television." *Proc. IEE*, Vol. 99^{IIIa} (1952), pp. 842-953.
- Stamman, M. J., and Ritterman, M. B., "Theoretical Improvement in Signal-to-Noise Ratio of Television Signals by Equivalent Comb Filter Technique." 1954 *IRE Nat. Conv. Abstr.*, *Proc. IRE*, Vol. 42 (1954), p. 604.
- Stier, H., "Fernsehübertragungsverfahren im Lichte der Informationstheorie." *Nachrichtentechnik*, Vol. 4 (1954), pp. 249-253.
- Winch, G. T., "Colour-Television: Some Subjective and Objective Aspects of Colour Rendering." *Proc. IEE*, Vol. 99^{IIIa} (1952), pp. 854-860.

IX. (a) MISCELLANEOUS APPLICATIONS; (b) GAMES; (c) OPTICS; (d) SERVOMECHANISMS

- (a)
- Becking, A. G. Th., and Rademakers, A., "Noise in Condenser Microphones." *Acustica*, Vol. 4 (1954), pp. 96-98.
- , *Fluctuatierschijnselen bij bolometers*; Utrecht Thesis, 1952.
- Brown, G. W., and Ridenour, L. N., "The Processing of Information Containing Documents." *Proc. Western Comp. Conf.*, Vols. 4-6 (February, 1953), p. 231.
- Cope, A. D., and Rose, A., "X-ray Noise Observation Using a Photoconductive Pick-up Tube." *Jour. Appl. Phys.*, Vol. 25 (1954), pp. 240-242.
- Fairthorne, R. A., "Automata and Information." *Jour. of Documentation*, Vol. 8 (1952), pp. 164-172.
- Fenner, E., and Schott, O., "Möglichkeiten und Grenzen der Bildverstärkung." *Zeits. angew. Phys.*, Vol. 6 (1954), pp. 88-95. (A 7957-1954).
- Fogel, L. J., "A Communication Theory Approach Toward the Design of Aircraft Instrument Displays." *Abstr.*, *Proc. IRE*, Vol. 43 (1954), p. 354.
- Goodeve, Sir Charles, "Operational Research as a Science." *Research*, Vol. 6 (1953), pp. 465-472.
- Greenwood, T. L., "Analysis of Data Recording Systems." *Proc. IRE*, Vol. 43 (1955), pp. 357.
- Halbach, K., "Berechnung linearer realisierbarer Netzwerke zur Erziehung optimaler Signal-Rauschverhältnisse." *Helv. Phys. Acta.*, Vol. 26 (1953), pp. 65-74.

- Heumann, K. F., "Information Theory in Library and Documentation Activities." *Libr. of Congress. Inf. Bull.* 13, Nr. 9 (September 27, 1954), Appendix II, pp. 1-4.
- Higgins, G. C., and Jones, L. A., "The Nature and Evaluation of the Sharpness of Photographic Images." *Jour. Soc. Mot. Pict. Telev. Eng.*, Vol. 58 (1952), pp. 277-290.
- Hill, W., "Operational Research for the Army in War and Peace." *De Ingenieur*, Vol. 65A (1953), pp. 307-314.
- Hyde, W. L., "Detectors of Radiation." *Trans. Instrum. Meas. Conf.* (1952), pp. 120-125.
- Jones, R. C., "'Detectivity' the Reciprocal of Noise Equivalent Input of Radiation." *Nature*, Vol. 170 (1952), pp. 937-938.
- , "Performance of Detectors for Visible and Infrared Radiation." *Adv. in Electronics*, Vol. 5 (1953), pp. 2-96.
- Koopmans, B. O., "New Mathematical Methods in Operations Research." *Jour. Oper. Res. Soc. Amer.*, Vol. 1 (1952), pp. 3-9.
- Lathrop, J. B., "Principles of Operations Research." *Electr. Eng.*, Vol. 73 (1954), pp. 343-345.
- Mandel, J., and Stiehler, R. D., "Sensitivity—a Criterion for the Comparison of Methods of Test." *Jour. Res. Nat. Bur. Stand.*, Vol. 53 (1954), pp. 155-159.
- Mandelbrot, B., "Recurrence in Coding." *Brooklyn Inform. Networks Symp.*, (1954), pp. 205-221.
- McCombie, C. W., "Fluctuation Theory in Physical Measurement." *Rep. Progress Physics*, Vol. 16 (1953), pp. 266-320.
- Mooers, C. N., "Choice and Coding in Information Retrieval Systems." *TRANS. IRE Information Theory* 4 (1954), pp. 112-118.
- , "Information Retrieval Viewed as Temporary Signalling." *Proc. Int. Congr. Math.*, Vol. 1 (1950), pp. 572-573.
- , "Zato Coding Applied to Mechanical Organization of Knowledge." *Amer. Docum.*, Vol. 2 (1951), pp. 20-32.
- , *Application of Random Codes to the Gathering of Statistical Information.* Zator Tech. Bull. 31 (1949), 28 pp. (Zator Cy., Boston.)
- Moon, R. J., "Concerning the Use of High Energy Particles and Quanta in the Determination of the Structure of Living Organisms." 1953 IRE Conv. Rec., Pt. 9 (1953), pp. 117-119.
- Oosterkamp, W. J., and Tol, T., "Prinzipielle und praktische Grenzen der Detaillierbarkeit bei verschiedenen röntgenologischen Beobachtungsmethoden insbesondere bei Verwendung der Bildverstärkerrohre." *Fortschr. Röntgenstr.*, Vol. 81 (1954), pp. 381-392.
- Ruark, A. E., *The Theory of Discrimination and Reliability in Crowded Situations.* Inst. Coop. Research, John Hopkins Univ. Progr. Res. Unit P.R.U. 175, 15 pp.
- Sturm, R. E., and Morgan, R. H., "Screen Intensification Systems and Their Limitations." *Amer. Jour. Roentgenol. Radiumther.*, Vol. 62 (1949), pp. 617-634.
- Tol T., and Oosterkamp, W. J., "Visibility of X-ray Quantum Fluctuations on Image Intensifier Radiographs." *Nature*, Vol. 174 (1954), p. 397.
- Trimmer, J. D., "The basis for a Science of Instrumentology." *Science*, Vol. 118 (1953), pp. 461-465.
- Tustin, A., *The Mechanisms of Economic Systems.* Harvard Univ. Press., 161 pp., 1954.
- Vries, M. de, *Statistical Methods in Cryptanalysis.* Math. Centr. Amsterdam. Rapport Z. W. 1953, 014, 15 pp. (in Dutch) (C 974, 1954).
- , "Concealment of Information." *Synthese*, Vol. 9 (1954), pp. 326-338.
- (b)
- Ashby, W. R., "Mechanical Chess Player." 9th Macy Conf., (1952), pp. 151-154.
- Schliebs, G., "Ueber die Grundzüge eines Programmes für eine schachspielende Rechenmaschine." *Funk. u. Ton*, Vol. 7 (1953), pp. 257-265.
- (c)
- Barthélemy, R., "Images Differentielles." *CR. Acad. Sci. Paris*, Vol. 229 (1949), p. 161.
- Blanc, Lapierre, A., "Application de l'analyse harmonique et la théorie de l'information à l'étude de la correspondance objet-image en optique. Comparaison avec la correspondance signal-réponse en radioélectricité." U.R.S.I. doc. 74/VI/54.
- , "Upon Some Analogies Between Optics and Information Theory." McGill Univ. Symp. Microwave Optics, Paper 46 (1953), 5 pp.
- , "Transposition au domaine de l'optique de certains résultats de la théorie de l'information." *Disc. Bull. Soc. Franç. Electr.*, 7 ser. t III (1953), pp. 231-235.
- , Dumontet, P., "Sur la notion de cohérence en optique." *CR. Acad. Sci. Paris*, Vol. 238 (1954), pp. 1005-1007.
- Cheatham, T. P., "Optical Filters—Their Equivalent to and Difference from Electrical Networks." 1954 IRE Nat. Conv., Abstr. Proc. IRE, Vol. 42 (1954), p. 604.
- Cheatham, T. P., Jr., and Kohlenberg, A., "Optical Filters: Their Equivalence to and Difference from Electrical Networks." IRE Conv. Rec., Pt. 4 (1954), pp. 6-12.
- Coltman, J. W., "Scintillation Limitations to Resolving Power in Imaging Devices." *Jour. Opt. Soc. Amer.*, Vol. 44 (1954), pp. 234-237. (A 6452, 1954).
- Duffieux, P. M., "La théorie des images et le rayonnement. I. Forme optique du photon." *Cah. de Phys.*, Vol. 41 (1953), pp. 55-72. II. "Essai sur une optique du photon." *Cah. de Phys.*, Vol. 47 (1954), pp. 1-35. III. "Le problèmes des formes matérielles."
- Dumontet, P., "Discussion d'un schéma général, applicable en particulier à la théorie de la formation des images d'objets partiellement cohérents." *CR. Acad. Sci. Paris*, Vol. 238 (1954), pp. 1109-1111.
- Elias, P., "Optics and Communication Theory." *Jour. Opt. Soc. Amer.*, Vol. 43 (1953), pp. 229-232.
- , "Optical Systems as Communication Channels." Brooklyn Inform. Netw. Symp., pp. 321-328, 1954.
- Fowler, C. A., and Fryer, E. M., "Reduction of Photographic Noise." *Jour. Opt. Soc. Amer.*, Vol. 44 (1954), p. 256.
- Fracastoro, M. G., "On an Evaluation of the Capacity of Photography for Information" (in Ital.) *Acte Fond. Rocchi*, Vol. 8 (1953), pp. 385-392. (A 7960, 1954).
- Grey, D., "Multi-Dimensional Filtering Processes." McGill Univ. Symp. Microwave Optics, Paper No. 45 (1953), 3 pp.
- Ingelstam, E., "An Optical Uncertainty Principle and its Application to the Amount of Information Obtainable from Multiple Beam-Interference." *Ark. Fys.*, Vol. 7 (1953), pp. 309-322.
- Kardas, R. S., "The Photographic Information Volume." *Photogr. Eng.*, Vol. 5 (1954), pp. 91-108.
- Lochard, J., "Enregistrement et corrélation optique." *Onde élect.*, Vol. 34 (1954), pp. 276-279.
- Ratcliffe, J. A., "Theory of Random Noise Applied to Problems of Optical Diffraction." U.R.S.I. doc. 272, Zürich, 1950.
- Rhodes, J. E., "Microscope Imagery as Carrier Communication." *Jour. Opt. Soc. Amer.*, Vol. 43 (1953), pp. 848-852.
- Schade, O. H., "A New System of Measuring and Specifying Image Definition. Optical Image Evaluation." N.B.S. Circular 526 (April 29, 1954), pp. 231-258.
- Selwyn, E. W. H., "Theory of Resolving Power. Optical Image Evaluation." N.B.S. Circular 526 (April 29, 1954), pp. 219-230.
- Wawilow, S. I., *Die Mikrostruktur des Lichtes.* Berlin, Akademie Verlag, 1954.
- Wolf, E., "Recent Researches on the Foundations of Geometrical Optics and Related Problems in Electromagnetic Theory." U.R.S.I. doc. 159/VI/1954.
- (d)
- Caywood, W. P., Lyman, R. C., and Kaufman, W. M., "Generalized Servomechanism Evaluation." Abstr., *TRANS. IRE Information Theory* 3 (1954), p. 150.
- Coales, J. F., and Bell, D. A., Disc., "The Application of Information Theory to Data-Transmission Systems and the Possible Use of Binary Coding to Increase Channel-Capacity." *Proc. IEE*, Vol. 101^{III} (1954), p. 76.
- Committee Report, "Bibliography on Feedback Control," *AIEE Trans.*, Vol. 72^{II} (1953-1954), pp. 430-461.
- Herschel, R., "Information-theorie und Technik." *Regelg. t. Vol. 2* (1954), pp. 18-21, 41-44.
- June, S. A., et al., "The Automatic Factory." *Instr. and Automation*, Vol. 27 (1954), pp. 1476-1478, 1620-1621; Vol. 28 (1955), pp. 110-114.
- Lathrop, R. C., and Graham, D., "Transient Response of Servomechanisms." *Elec. Eng.*, Vol. 73 (1954), p. 620; *Trans. AIEE*, Vol. 73^{II} (1954), pp. 10-17.

- Lyman, R. C., and Caywood, W. P., "Optimization of Servosystems (for Time-Varying Spectra)." 1954 IRE Nat. Conv. Abstr., Proc. IRE, Vol. 42 (1954), p. 629.
- Neidhart, D., "Sowjetische Beiträge zur automatischen Regelung elektrischer Maschinen als Anwendungsgebiet der Nachrichtentheorie." *Nachrichtentech.*, Vol. 4 (1954), pp. 507-512.
- Neiswandler, R. S., and MacNeal, R. H., "Optimization of Non-linear Control Systems by Means of Nonlinear Feedbacks." *Trans. AIEE Appl. Ind.*, Vol. 72^{II} (1953), pp. 262-272.
- Newton, G. C., "Compensation of Feedback-Control Systems Subject to Saturation." *Jour. Franklin Inst.*, Vol. 254 (1952), pp. 281-296, 391-413.
- Pélegrin, M. J., "A Statistical Approach to Servomechanisms and Regulators." *Trans. A.S.M.E.*, Vol. 76 (1954), pp. 1291-1301.
- , "Applications des théories de Wiener aux systèmes asservis." *Disc. Bull. Soc. Franç. Electr.*, 7^e ser. III, (1953), pp. 235-239.
- , "Calcul statistique des systèmes asservis." *Publ. Scient. et tech. de l'air.*, No. 285 (September, 1953), 58 pp. (C 546, 1954).
- Ragazzini, J. R., and Zadeh, L. A., "The Analysis of Sampled Data Systems." *Trans. AIEE, Appl. Ind.*, Vol. 71^{II} (1952), pp. 225-234.
- Rosenbloom, A., and Heilfron, J., "Analysis of Linear Systems with Randomly Varying Inputs and Parameters." Abstr., Proc. IRE, Vol. 43 (1955), p. 370.
- Salzer, J. M., "Frequency Analysis of Digital Computers Operating in Real Time." Proc. IRE, Vol. 42 (1954), pp. 457-466.
- Silva, L. M., "Predictor Servomechanisms." *TRANS. IRE, Circuit Theory 1* (1954), pp. 56-70.
- Sundström, M., "Some Statistical Problems in the Theory of Servomechanisms." *Ark. Math.*, Vol. 2 (1952), pp. 139-246.
- Truxal, J. G., *Automatic Feedback Control System Analysis*. New York, McGraw Hill, 675 pp., 1955.
- Tsien, H. S., *Engineering Cybernetics*. New York, McGraw Hill, 289 pp., 1954.
- Vowels, R. S., "The Application of Statistical Methods to Servomechanisms." *Austr. Jour. Appl. Sci.*, Vol. 4 (1953), pp. 469-488. (C 546, 1954) (2582-1954).
- Westcott, J. H., "Synthesis of Optimum Feedback Systems Satisfying a Power Limitation." *Trans. ASME*, Vol. 76 (1954), pp. 1253-1263.

X. MATHEMATICS

(a) STATISTICS; (b) GAMES; (c) RELAY-ALGEBRA; (d) NOISE ANALYSIS

(a)

- Annis, M., Cheston, W., and Primakoff, H., "On Statistical Estimation in Physics." *Rev. Mod. Phys.*, Vol. 25 (1953), pp. 818-830.
- Feinstein, J., "Some Stochastic Problems in Wave Propagation." *TRANS. IRE A.P.-2* (1954), pp. 23-30, 63-70. (2746, 1954).
- Fisher, R. A., "Probability, Likelihood and Quantity of Information in the Logic of Uncertain Interference." *Proc. Roy. Soc., A*, 146 (1934), pp. 1-8.
- , "The Concept of Inverse Probability and Fiducial Probability Referring to Unknown Parameters." *Proc. Roy. Soc., A*, 139 (1933), pp. 343-348.
- Good, I. J., "The Population Frequency of Species and the Estimation of Population Parameters." *Biometrika*, Vol. 40 (1953), pp. 237-264.
- Kullback, S., "Some Inequalities in Information Theory and the Cramer-Rao Inequality." *Annals Math. Stat.*, Vol. 25 (1954), pp. 745-751.

(b)

- Bagno, S., "Communication Theory Models and Economics." Abstr., Proc. IRE, Vol. 43 (1955), p. 376.
- Blackwell, D., and Girshick, M. A., *Theory of Games and Statistical Functions*. New York, Wiley, 356 pp. 1954.

(c)

- Bowman, J. R., "Reduction of the Number of Possible Boolean Functions." 9th Macy Conf., (1952), pp. 120-126.
- Braae, R., "An Introduction to Boolean Algebra and its Application to Electric Relay Circuits." *Trans. S. Afr. Inst. Elect. Engrs.*, Vol. 43 (1952), pp. 237-252.
- Burks, A. W., and Wright, J. B., "Theory of Logical Nets." Proc. IRE, Vol. 41 (1953), pp. 1357-1363.
- Gawrilow, M. A., *Relaisschalttechnik*, V.E.B. Berlin, Verlag Technik, 1953. (Rev. in *Nachrichtentech.*, Vol. 5 (1955), pp. 47-48.
- Gilbert, E. N., "Lattice Theory Properties of Frontal Switching Circuits." *Jour. Math. Phys.*, Vol. 33 (1954), pp. 57-67. (C 1009, 1954).
- Grca, R., and Higonnet, R., "Etude logique de circuits de contact." *Rev. Gén. de l'Elect.*, Vol. 38 (1954), pp. 19-34.
- Hohn, F. E., and Schissler, L. R., "Boolean Matrices and the Design of Combinational Relay Switching Circuits." *Bell. Sys. Tech. Jour.*, Vol. 34 (1955), pp. 177-202.
- Huffman, D. A., "The Synthesis of Sequential Switching Circuits." *Jour. Franklin Inst.*, Vol. 257 (1954), pp. 161-190, 275-303. (C 1008, 1954).
- Karnaugh, M., "The Map Method for Synthesis of Combinational Logic Circuits." *Trans. AIEE*, Vol. 72 I (1953), pp. 593-599.
- Keister, W., Ritchie, A. E., and Washburn, S. H., *The Design of Switching Circuits*. New York, Van Nostrand, 556 pp., 1951.

- Muller, D. E., "Application of Boolean algebra to switching circuits design and to error detection." *TRANS. IRE, EC-3*, No. 3 (1954), pp. 6-12.

—, "Boolean Algebras in Electric Circuit Design." *Amer. Math. Monthly* 61, No. 7, II (1954), pp. 27-28.

Okada, S., "Topology Applied to Switching Circuits." Brooklyn Inf. Netw. Symp., 1954.

Patterson, G. W., "Symbolic Methods in the Design of Delay- and Cycle-Free Logical Nets." 1954 IRE Conv. Rec., Pt. 4 (1954), pp. 58-64.

—, "Symbolic Methods in the Design of Delay- and Cycle-Free Logical Nets." 1954 IRE Nat. Conv. Abstr., Proc. IRE, Vol. 42 (1954), p. 613.

Pirson, R., "Une théorie de la communication électrique exposée au moyen de l'algèbre de la logique." *H.F. Brussels*, Vol. 2 (1953), pp. 109-116.

Raspanti, M., "A Complex Algebra for Relay Circuits." *Electr. Eng.*, Vol. 72 (1953), pp. 992-993.

Samson, E. W., and Mills, B. E., *Circuit Minimization: Algebra and Algorithms for New Boolean Canonical Expressions*. Tech. Rep., 54-21 Air Force Cambridge Res. Center (April, 1954), 54 pp.

Schwab, M. H., "L'algèbre des chaînes de contact dans la télé-mécanique et les télécommunications." *Disc., Bull. Soc. Franç. Electr.*, 7^{III} (1953), pp. 227-230.

Serrell, R., "Elements of Boolean Algebra for the Study of Information-Handling Systems." Proc. IRE, Vol. 41 (1953), pp. 1366-1380.

Shannon, C. E., and Moore, E. F., "Machine Aid for Switching Circuit Design." Proc. IRE, Vol. 41 (1953), pp. 1348-1351.

Smith, B. D., "Analysis of Commutated Networks." *TRANS. IRE, Aeronaut., Nav'g Electr.*, Nr. 10 (1953), pp. 21-26.

Smith, E. J., "Logical Design of Computer Circuits." Brooklyn Inform. Networks Symp., 1954, pp. 249-226.

Washburn, S. H., "An Application of Boolean Algebra to the Design of Electronic Switching Circuits." *AIEE Trans. Comm. Electr.*, Vol. 72 (1953), pp. 380-388.

Zeheb, D., and Caywood, W. P., "A Symbolic Method for Synthesis of 2-Terminal Switching Circuits." *Trans. IEE Comm. Electronics*, 73, I (1955), pp. 690-693.

(d)

Arthur, G. R., "The Statistical Properties of the Output of a Frequency Sensitive Device." 1953 IRE Conv. Rec., Pt. 8 (1953), pp. 80-90.

Blanc Lapierre, A., "Remarque sur l'analyse harmonique des fonctions aléatoires." *Rev. Scient.*, Vol. 85 (1947), pp. 1027-1040.

—, Fortet, R., *Théorie des fonctions aléatoires. Applications à divers phénomènes de fluctuation*. Masson, 694 pp., 1953.

Duncan, D. B., "Response of Linear Time-Dependent Systems to Random Noise." *Jour. Appl. Phys.*, Vol. 24 (1953), pp. 609-611.

- , "Response of Undamped Systems to Noise." *Jour. Appl. Phys.*, Vol. 24 (1953), pp. 1252-1253.
- Emerson, R. C., "First Probability Densities for Receivers with Square Law Detectors." *Jour. Appl. Phys.*, Vol. 24 (1953), pp. 1168-1176
- Gold, B., and Young, G. O., "The Response of Linear Systems to Non-Gaussian Noise." *TRANS. IRE Information Theory* 3 (1954), pp. 63-67.
- Kac, M., "Signal and Noise Problems." *Amer. Math. Monthly*, Vol. 61, II, No. 7 (1953), pp. 23-26. (C 53, 1955).
- Magness, T. A., "Spectral Response of a Quadratic Device to Non-Gaussian Noise." *Jour. Appl. Phys.*, Vol. 25 (1954), pp. 1357-1365
- Meyer, M. A., and Middleton, D., "On the Distribution of Signals and Noise after Rectification and Filtering." *Jour. Appl. Phys.*, Vol. 25 (1954), pp. 1037-1052. (254, 1955).
- Siegert, A. J. F., "Passage of Stationary Processes Through Linear and Nonlinear Devices." *TRANS. IRE Information Theory*, 3 (1954), pp. 4-25.
- Stewart, J. L., "The Power Spectrum of a Carrier Frequency Modulated by Gaussian Noise." *Proc. IRE*, Vol. 42 (1954), pp. 1539-1542.
- Young, G. O., and Gold, B., "Noise Problems of Theoretical and Practical Interest." 1953 IRE Conv. Rec., Pt. 8 (1953), pp. 2-6.
- Ziel, A. van der, "Fluctuation Phenomena." *Adv. in Electronics*, Vol. 4 (1952), pp. 110-156.

XI. PULSE MODULATION; MULTIPLEX; CODING

- Bayard, M., and Roquet, R., "Design of Corrective Networks by Coding of Information." Brooklyn Inform. Networks Symp., 1954.
- Beauchamp, A. J., "A Technique of Intermodulation Interference Determination." 1953 IRE Conv. Rec., Pt. 8 (1953), pp. 26-34.
- Bell, D. A., "Ideal Coding versus Redundancy." *Wire. Eng.*, Vol. 30 (1953), pp. 73-74.
- , Duggan, T. C., "Finite Groups in Shannon Coding." *Proc. IRE*, Vol. 42 (1954), pp. 1569-1570.
- Blachman, N. M., "Minimum Cost Encoding of Information." *TRANS. IRE, Information Theory* 3 (1954), pp. 139-149.
- Blake, R. F., "Pulse Group Coding and Decoding by Passive Networks." *Proc. Nat. El. Conf.*, Vol. 8 (1952), pp. 760-765.
- Boisvieux, J., "Le multiplex a 16 voies a modulation codée de la C.F.T.H." *Onde Elect.*, Vol. 34 (1954), pp. 363-371.
- Boroditch, S. W., "Mehrfachausnutzung von Leitungen mittels Zeitmodulation." *Nachrichtentech.*, Vol. 5 (1955), pp. 13-15.
- Bosse, G., "Die Berechnung des Spektrums bei Vielkanal Richtfunkverbindungen mit Frequenzmodulation." *Frequenz*, Vol. 27 (1954), pp. 239-244.
- Brooke, D. A., "Frequency Shift Keying Radiotelegraph Equipment." *Telecomm. Jour. Austr.*, Vol. 9 (1952), pp. 42-51.
- Carbrey, R. L., "Decoding in pcm." *Bell Labs. Rec.*, Vol. 26 (1948), pp. 451-456.
- Deloraine, E. M., "Evolution de la technique des impulsions appliquée aux télécommunications." *Onde élect.*, Vol. 34 (1954), pp. 339-341.
- Drenick, R. F., Gartenhaus, S., and Nesbeda, P., "Detection of Coherent and Noncoherent Pulsed Signals." *Abstr., Proc. IRE*, Vol. 43 (1955), p. 370.
- Dupont, J. J., "Le système de radiotélégraphie multiplex. T.O.R. (Teleprinting over radio-circuits)." *Onde élect.*, Vol. 34 (1954), pp. 449-459.
- Earp, C. W., "A Recent Development in Communication Technique." *Disc., Proc. IEE*, Vol. 101, III, (1954), p. 20.
- , —, *Electr. Comm.*, Vol. 30 (1953), pp. 61-70.
- Elias, P., "Error-Free Coding." *TRANS. IRE, Information Theory* 4 (1954), pp. 29-37.
- , "Coding for Noisy Channels." *Abstr., Proc. IRE*, Vol. 43 (1955), p. 356.
- Fagot, J., "Causes diverses de diaphonie dans les systèmes multiplex à impulsions." *Onde élect.*, Vol. 34 (1954), pp. 21-31.
- Fitzpatrick, A. G., "A New Coding System for Pulse Communication." 1953 IRE Conv. Rec., Pt. 8 (1953), pp. 126-131.
- Flood, J. F., "Time-Division Multiplex Systems." *Electronic. Eng.* Vol. 25 (1953), pp. 2-5, 101-106, 146-150.
- Fortet, R., "Average Spectrum of a Periodic Series of Identical Pulses, Randomly Displaced and Distorted." *Elect. Comm.*, Vol. 31 (1954), pp. 283-287.
- , "Spectre moyen d'une suite d'impulsions en principe périodiques et identiques, mais déplacées et déformées aléatoirement." *Onde élect.*, Vol. 34 (1954), pp. 683-687. U.R.S.I. doc. 184/VI/1954.
- Gates, G. R., "Coincidence Detectors for Binary Pulses." 1953 IRE Conv. Rec. Pt. 8 (1953), pp. 132-136.
- Golay, M. J. E., "Binary Coding." *TRANS. IRE, Information Theory* 4 (1954), pp. 23-28.
- Harmuth, H., "Nachrichtenübertragung durch Integration codisierter Zeichen." *Archiv el. Uebertr.*, Vol. 8 (1954), pp. 132-136.
- Harp, M. C., Kebley, M. H., and Rudisuhle, E. J., "Application of Componders to f.m. Radio-Systems with Frequency Division Multiplexing." *TRANS. IRE M.T.T.* 2 (April, 1954), pp. 36-40. Also, *TRANS. IRE C.S.-2* (July, 1954), pp. 36-40. (D 424-1955).
- Hayton, T., Hughes, C. J., and Saunders, R. L., "Telegraph Codes and Code Convertors." *Proc. IEE*, Vol. 101, III (1954), pp. 137-150, 158-164. (2507, 1954).
- Herreng, P., "Le multiplex a 12 voies a modulation par impulsions codées de la S.A.C.M." *Onde élect.*, Vol. 34 (1954), pp. 413-417.
- Holloway, D. G., "Optimum Coding for Maximum Repeater Spacing." *A.T.E.J.*, Vol. 10 (1954), pp. 188-198. (260, 1955).
- Incollingo, I., "Les méthodes de synchronisation et de distribution dans les systèmes multiplex a division sans le temps." *Onde élect.*, Vol. 34 (1954), pp. 431-448.
- Kautz, W. H., "Optimized Data Encoding for Digital Computers." 1954 IRE Convention Record, Part 4 (1954), pp. 47-57.
- , —, 1954 IRE Nat. Conv. Abstr., *Proc. IRE*, Vol. 42 (1954), p. 613.
- Kiyasu, Z., "General Theory of Error Correcting Codes." U.R.S.I. doc. 33/VI/1954.
- Kleinwächter, H., and Weiss, H., "Folgerungen aus dem Amplitudenspektrum der Impulstechnik." *Funk u. Ton*, Vol. 5 (1953), pp. 221-229.
- Kunisawa, K., Honda, N., and Ikeno, N., "Equal Length Coding in Discrete Channels." U.R.S.I. doc. 32/VI/1954.
- Lab. Central de Télécomm., "Note on delta Modulation." *Electr. Comm.*, Vol. 30 (1953), pp. 71-74.
- Laemmel, A. E., "Design of Digital Coding Networks." Brooklyn Inf. Netw. Symp., 1954, pp. 309-320.
- Lippel, B., "A Systematic Survey of Coders and Decoders." 1953 IRE Conv. Rec. Pt. 8 (1953), pp. 109-119.
- Lyons, W., "Design Considerations for Frequency-Shift Keyed Circuits." *RCA Rev.*, Vol. 15 (1954), pp. 230-237. (3037, 1954).
- Maçhand, N., "Analysis of Multiplexing and Signal Detection by Function Theory." 1953 IRE Convention Record, Part 8 (1953), pp. 48-56.
- Marcou, P., "L'intermodulation dans les communications par impulsions." *Ann. Télécomm.*, Vol. 9 (1954), pp. 122-125. (3353, 1954).
- Metzer, S., and Grieg, D. D., "General Considerations in Pulse-Count Modulation." *Proc. Nat. El. Conf.*, Vol. 3 (1947), pp. 457-467.
- Narayana Rao, V., "Experimental Investigation of Noise Associated with Modulated Pulses." *Proc. Indian Acad. Sci. A* 38 (1953), pp. 184-193.
- Oxford, A. J., "Pulse Code Modulation Systems." *Proc. IRE Austr.*, Vol. 13 (1952), pp. 281-287. *Proc. IRE*, Vol. 41 (1953), pp. 859-865.
- Preston, G. W., and Gardner, R. K., "The Noise Performance of Triggered Pulse Generators." 1953 IRE Conv. Rec. Pt. 8 (1953), pp. 96-100.
- Reed, I. S., "A Class of Multiple-Error-Correcting Coding and Decoding Schemes." *TRANS. IRE Information Theory* 4 (1954), pp. 38-49.

- Reiger, S., "Error Probabilities of Binary Data Transmission Systems in the Presence of Random Noise." 1953 IRE Nat. Conv. Rec., Pt. 8 (1953), pp. 72-79.
- Rice, S. O., "Communication in the Presence of Noise—Probability of Error for Two Encoding Schemes." *Bell Syst. Tech. Jour.*, Vol. 29 (1950), pp. 60-93.
- Rivière, P., "Les multiplex a impulsions de la Soc. Franç. radio-électrique." *Onde élect.*, Vol. 34 (1954), pp. 356-362.
- Sabbatini, A., "Spettri di serie modulate d'impulsi." *Alta. Frequenza*, Vol. 23 (1954), pp. 255-277.
- Sardinas, A. A., and Patterson, G. W., "A Necessary and Sufficient Condition for the Unique Decomposition of Coded Messages." 1953 IRE Conv. Rec. Pt. 8 (1953), pp. 104-108.
- Schroeter, F., "Quantisierungstechnik." *Telef. Ztn.*, Vol. 25, H 95 (1952), pp. 115-127.
- , "Sistema de telecomunicacion con señales cuantificados." *Rev. Cienc. Appl.*, Vol. 7 (1953), pp. 289-301.
- Schultheis, H. B., "Frequency Code Telemetering Systems." *Electronics*, Vol. 27, No. 4 (1954), pp. 172-176.
- Silleni, S., "Applications of Polyphase Modulation in Telecommunications." *Poste e Telecomm.*, Vol. 21 (1953), pp. 403-415, (843, 1954).
- Silverman, R. A., and Balsler, M., "Coding for Constant Data Rate Systems I. A New Error Correcting Code." *Proc. IRE*, Vol. 42 (1954), pp. 1428-1435. (3674, 1954). *TRANS. IRE Information Theory* 4 (1954), pp. 50-63.
- Smith, B. D., "Coding by Feedback Methods." *Proc. IRE*, Vol. 41 (1953), pp. 1053-1058.
- Stampfl, R., "Bemerkungen zur Impuls-Delta-Modulation." *Oesterr. Z. Telegr. Telef. Funkt., Fernsehtech.*, Vol. 8 (1954), pp. 58-63, 92-97.
- Steffenhagen, K., "Entkodungsvorgänge bei der Impulskodemodulation." *Nachrichtentechnik*, Vol. 3 (1953), pp. 310-314.
- Sunde, E. D., "Theoretical Fundamentals of Pulse Transmission." *Bell Sys. Tech. Jour.*, Vol. 33 (1954), pp. 721-788, 987-1010. (2763, 3352, 1954).
- Tischer, F. J., "Elastische Impulsmodulation." *F.T.Z.*, Vol. 7 (1954), pp. 187-189. (3029, 1954).
- Vasseur, J. P., "Comparaison des modulations codées et des modulations classiques." *Onde élect.*, Vol. 34 (1954), pp. 509-514. (3027-1954).
- Villars, C., "Etude sur la modulation par impulsions codées." *Tech. Mitt. P.T.T.*, Bern, Vol. 32 (1954), pp. 449-472.
- Ville, M., "Modulation par impulsions conjuguée d'une détection linéaire." *Onde élect.*, Vol. 34 (1954), pp. 372-375. (3030, 1954).
- Weg, H. van de, "Quantizing Noise of a Single Integration Delta-Modulation System, with an N-Digit Code." *Philips Res. Rep.*, Vol. 8 (1953), pp. 367, 385.
- White, W. D., "Information Losses in Regenerative Pulse-Code Systems." 1954 IRE Conv. Rec., Pt. 4 (1954), pp. 18-22. *IRE Nat. Conv. Abstr.*, *Proc. IRE*, Vol. 42 (1954), p. 604.
- Zellerberg, L. H., "Comparison Between Delta and Pulsecode Modulation." U.R.S.I. doc. 93, VI, 1954.

Note on Abstracts

- (381, 1955) at the end of a line refers to abstract 381 of the abstracts and references section of *Proc. IRE* (1955).
- (A 10726, 1953) refers to abstract 10726 of *Physics Abstracts* 1953.
- (B 28,8298, 1954) refers to *Psychol. Abstracts* 28(1954), Abstract 8298.
- (C 974, 1954) refers to *Math. Rev.* 974, 1954.
- (D 775, 1955) refers to *Elec. Engrg.* Abstract 775, 1954.
- No attempt has been made to list all available abstracts.

