Mellor, J. W.
Higher mathematics for students of chemistry and physics ... 2d ed. New York. 1905. xxi, 631 p. 8°.

Natal. Government astronomer.
Report ... 1907. Durban. 1908. 14 p. f°.

Prussia. Meteorologisches Institut.
Ergebnisse der Beobachtungen an den Stationen II. und III. Ordnung ... 1906. Heft 2. Berlin. 1908. 39–74 p. f°.
Ergebnisse der Gewitter-Beobachtungen ... 1903, 1904, und 1905. Berlin. 1908. xxxi, 102 p. f°.
Ergebnisse der meteorologischen Beobachtungen in Potsdam ... 1904. Berlin. 1908. xlii, 128 p. f°.
Ergebnisse der magnetischen Beobachtungen in Potsdam ... 1905. Berlin. 1908. 82 p. f°.
Ergebnisse der Niederschlags-Beobachtungen ... 1905. Berlin. 1908. xxx, 164 p. f°.

Scott, William B.
An introduction to geology. 2d ed. rev. New York. 1907. xxv, 816 p. 8°.

Selby, A. D.
Fall and early winter injuries to orchard trees and shrubbery by freezing. (Bulletin of the Ohio agricultural experiment station. no. 192. Feb., 1908. p. 129–148.)

Sjutz, Hermann.
Ueber die Bedeutung der Verwitterung für die Umgestaltung der Erdoberfläche. Inaug.-Diss ... Bonn. Lübbecke. 1907.

Tananarive. Observatoire de Madagascar.
Observations météorologiques ... 17 v. 1906. Tananarive. 1908. vi, 273 p. 8°.

Upsala. Université. Observatoire météorologique.
Bulletin mensuel. v. 39. Année 1907. Upsala. 1907. 74 p. f°.

Western Australia. Government astronomer.
Meteorological observations made at the Perth observatory, and other places in Western Australia ... 1906. Perth. 1907. 143 p. f°.

Wetzel, Guilherme.
Contribuiçao para o estudo de climatologie de Rio Grande do Sul. Observaçoes meteorologicas feitas durante o periodo de 1893 a 1907. n. p. n. d. n. pag. 8°.

RECENT PAPERS BEARING ON METEOROLOGY AND SEISMOLOGY.

C. FITZHUGH TALMAN, Librarian.

The subjoined titles have been selected from the contents of the periodicals and serials recently received in the Library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau. Unsigned articles are indicated by a ——

Engineering news. New York. v. 59. June 19, 1908.
Prevost-Murphy, H. M. The moisture in the atmosphere and its effect on the operation of compressed air machinery, especially air-brake, multiple-unit train control and train signal systems. p. 659–663.

Engineering news. New York. v. 60. July 9, 1908.
Creighton, E. E. F. Measurements of lightning, lightning arresters, earth-resistances, and kindred tests. [Abstract]. p. 44–45.

Experiment station record. Washington, D. C. v. 19. April, 1908.
—— Meteorology of the Transvaal. [Abstract of part of work by Praagh.] p. 711.

Forestry and irrigation. Washington, D. C. v. 14. July, 1908.
—— Government to study shelterbelts for benefit of farming interests. p. 399–401. [Describes study of windbreaks and shelterbelts to be undertaken by the U. S. Forest service.]

Meteorological society of Japan. Journal. Tokio. v. 27. May, 1908.
H. I. H. Prince Yamishina. Necrology.

Geographical journal. London. v. 31. June, 1908.
Rickmers, W. R. The climatology of west Turkestan. p. 647. [Review of work by H. von Ficker.]

Physical review. Lancaster. v. 26. June, 1908.
Zeleny, John. The influence of humidity upon the electrical discharge from points in the air. p. 448–453.
Allen, S. J. Radioactivity of a smoke-laden atmosphere. p. 483–486.
Nichols, Edward L. Theories of the color of the sky. p. 497–511.

Royal society of London. Proceedings. London. ser. A. v. 80. June 20, 1908.
Mallock, A. Note on the ascent of meteorological balloons and the temperature of the upper air. 530–534.
Wilson, C. T. R. On the measurement of the atmospheric electric potential gradient and the earth-air current. p. 537–547.
Mallock, A. Effect of a cross wind on rifled projectiles. p. 595–597.
Ramsay, William. Percentage of the inactive gases in the atmosphere: a correction to previous calculations. p. 599.

Science abstracts. London. v. 11. June 25, 1908.
W[ilkinson], A. Bohne aneroid. p. 313. [Abstract of article by Schreiber.]

Scottish geographical magazine. Edinburgh. v. 24. July, 1908.
Mossman, R. C. The South Orkneys in 1907. p. 348–355. [Description of the meteorological work.]

Symons's meteorological magazine. London. June, 1908.
Bonacina, L. C. W. The glamour of the cumulus. p. 87–89.

Ciel et terre. Bruxelles. 29me année. 16 juin 1908.
Vanderlinden, E. Météorologie et tribunaux. p. 186–191.
Vanderlinden, E. La conductibilité électrique des arbres. p. 198–199.

France. Académie des sciences. Comptes rendus. Paris. Tome 146.
Deprez, Marcel. Sur le planement des oiseaux. (13 avril 1908.) p. 797–800.
Bloch, Eugéne. Sur l'ionisation de l'air par la lumiére ultraviolette. (27 avril 1908.) p. 892–898.
Garrigou-Lagrange, Paul. La pluie et la régime des cours d'eau. (22 Juin 1908.) p. 1353–1355.

Géographie. Paris. Tome 17.
Rabot, Charles. La pluviosité en octobre 1907 dans le midi de la France. (15 janvier 1908.) p. 41–42.

Journal de physique. Paris. Tome 7. Juin 1908.
Villard, M. P. Les rayons cathodiques et l'aurore boréale. p. 429–453.
Mathias, M. E. La physique des courants d'air d'après M. Shaw. p. 463–475.

Gaea. Leipzig. 44. Jahrgang. July 1908.
Müllermeister, Otto. Meteorologisches Glaubensbekenntniss. p. 388–392.

Mitteilungen aus den deutschen Schutzgebieten. Berlin. 21. Band. 1908.
——Die Resultate der Regenmessungen in Togo im Jahre 1907. p. 140–145.

Physikalische Zeitschrift. Leipzig. 9. Jahrgang.
Kähler, Karl. Registrierung der Niederschlagselektrizität mit dem Benndorf-Elektrometer. (15. April 1908.) p. 258–260.

Weltall. Berlin. 8. Jahrgang.
Archenhold, F. S. Ueber ein sechsstündiges Gewitter und einen ausserordentlichen Hagelfall am 22 Mai 1908. (1. Juni 1908.) p. 265–269.

Wiener Luftschiffer-Zeitung. Wien. 7. Jahrgang. Juni 1908.
Hildebrandt, A. Ballonforschungen im Eismeere. (Die aëronautisch-meteorologische Schiffsexpedition Hewald-Hildebrandt nach Island, in das nördliche Eismeer und in den Atlantischen Ozean.) p. 97–98.
Fonvielle, Wilfrid de. Die Temperatur in hohen Regionen. p. 119–120.

Reale accademia dei Lincei. Atti. Roma. v. 17. 1. sem. Fasc. 8.
Zappa, Giovanni. Contributo alla spiegazione degli aloni: la deviazione minima con reflessioni interne nei cristalli. p. 519–531.

AN ANNOTATED BIBLIOGRAPHY OF EVAPORATION.[1]

By MRS. GRACE J. LIVINGSTON. Dated Washington, D. C., January 8, 1908.

INTRODUCTION.

The aim of the bibliographer has been not merely to give a list of the titles of publications bearing on or referring to the subject of evaporation, but to set before the reader a sufficiently full summary of each reference, so far as it has been accessible, so that the actual work need not be consulted except in cases where the fullest information is required. Articles bearing on the subject from the point of view of the meteorologist, the agriculturist, the irrigation and hydraulic engineer, have been included wherever found. Hygrometry, however, has been regarded as a distinct subject and only articles which deal with the subject in a general way, or which relate it in any way to the measurement of evaporation have been included. Evaporation from plants, or transpiration, has not been specifically included, as that subject has been so thoroly reviewed by Burgerstein, Transpiration der Pflanzen.

The subject thus restricted has been interesting, mainly

[1] This bibliography is published at the urgent request of many investigators who have examined the manuscript. It has not been practicable to verify all the formulas and references nor to insert any illustrative figures.—*C. A.*

historically, as showing a development similar to that in all sciencies, from the theoretical and vague to the experimental and definite. Until the beginning of the nineteenth century the attention of men of science was centered almost entirely on philosophical discussions of the physical nature of the phenomenon. There were, with one or two exceptions, no attempts to devise instruments for actually measuring the rate which might be expected under given conditions, or for relating the amount to other measured phenomena. Dalton, at the very beginning of the nineteenth century, may be regarded as the first to give definite direction to the interest already aroused in this subject, and by his researches to have laid the foundation for all future work along this line. The impetus thus furnished, fostered in the latter half of the century by such an enthusiast as G. J. Symons, has lasted to the present time. The simple laws which he pointed out have been the starting point for all the work undertaken by later mathematicians who have attempted to show definite relations between evaporation and the meteorological elements which influence and determine it.

The bibliographical study has been interesting secondarily as showing the actual degree of knowledge which has been obtained regarding the subject in all its relations, and finally as pointing out the direction in which further investigation must be conducted in this "most desperate branch of the most desperate science, meteorology."

Acknowledgments are gratefully extended to the officials of the Library of the Weather Bureau at Washington, D. C., and of John Crerar Library at Chicago, where this work has been mostly pursued, for their courtesy in granting free access to their shelves. For the inspiration of the work and for the use of a MS. bibliography of this subject including titles up to 1884 the bibliographer is deeply indebted to Prof. Cleveland Abbe, the Editor of the MONTHLY WEATHER REVIEW

LIST OF ABBREVIATIONS FOR TITLES OF PERIODICALS.

Amer. jour. sci.	American journal of science. New Haven, Conn.
Amer. met. jour.	American meteorological journal. Boston, Mass.
Amer. nat.	The American naturalist. Boston, Mass.
Ann. agron.	Annales agronomiques. Paris.
Ann. chim. et phys.	Annales de chimie et de physique. Paris.
Ann. école nat. agr. Montpellier.	Annales de l'école nationale d'agriculture de Montpelier. Montpellier, France.
Ann. inst. met. Roumania.	Annales de l'institut météorologique de la Roumanie. Bucharest.
Ann. Landw.	Annalen der Landwirtschaft in den preussischen Staaten. Berlin.
Ann. ofic. met.	Annales de la oficina meteorologica Argentina. Buenos Aires.
Ann. Phys.	Annalen der Physik. Halle.
Ann. Phys. und Chem.	Annalen der Physik und Chemie. (Poggendorf) Berlin; (Wiedemann) Leipsic.
Ann. ponts chauss.	Annales des ponts et chaussées. Paris.
Ann. rpt. Smithsn. inst.	Annual report of the board of Regents of the Smithsonian institute. Washington.
Ann. sci. ind.	Annal scientifique et industrielle. Paris.
Ann. soc. agr. Lyon.	Annales de la société d'agriculture, histoire naturelle, et arts utiles, de Lyon. Lyon, France.
Ann. soc. mét.	Annuaire de la société météorologique de France. Paris.
Ann. uffic. cent. met. Ital.	Annali dell'ufficio centrale di meteorologia italiana. Turin.
Anz. k. Akad. Wissen. (Wien.)	Kaiserliche Akademie der Wissenschaften. (Wien.) Mathematisch-naturwissenschaftliche Klasse. Anzeiger. Vienna.
Arch. med. Aarau.	
Arch. sci. phys. et nat.	Archives des sciences physiques et naturelles. Geneva.
Athen.	Athenaeum. London.
Atti. accad. pont. nuovi Lincei.	Atti del l'accademia pontificia dei nuovi Lincei. Rome.
Atti r. accad. Lincei.	Atti della reale accademia dei Lincei. Rome.
Atti soc. veneto-trentina sci. nat.	Atti della societa veneto-trentina di scienze naturali. Padua.
Bayer. met. ephem.	Königliche bayerische Akademie der Wissenschaften. Meteorologische ephemeriden. Munich.
Bibl. ital.	Biblioteca italiana. Milan. (ossia giornale di letteratura, etc.)
	Biblioteca italiana, ou Tableau des progrès des sciences et des arts en Italie. Turin.
Bibl. univ.	Bibliothèque universelle de Génève. Geneva.
Bol. soc. geog. Lima.	Boletín de la sociedad geográfica de Lima. Lima, Peru.
Boston jour. phil. arts.	Boston journal of philosophy and the arts. Boston, Mass.
Brit. rainf.	British rainfall. London.
Bul. acad. imp. sci.	Bulletin of the imperial academy of sciences. St. Petersburg.
Bul. acad. sci. de Belgique.	Bulletin de l'académie royale des sciences, des lettres, et des beaux arts de Belgique. Brussels.
Bul. assoc. sci. de France.	Bulletin de l'association scientifique de France. Paris.
Bul. dir. agr. et com. (Tunis.)	Bulletin de la direction de l'Agriculture et du Commerce. Tunis.
Bul. int. de l'obs. de Paris.	Bulletin internationale de l'Observatoire de Paris. Paris.
Bul. mens. obs. phys. cent.	Bulletin mensuel de l'observatoire physique central de Montsouris. Montsouris, France.
Bul. mét. Hérault.	Bulletin météorologique du département de l'Hérault. Montpellier, France.
Bul. soc. philom.	Société philomathique de Paris. Annual bulletin. Paris.
Bul. soc. vaud. sci. nat.	Bulletin de la société vaudoise des sciences naturelles. Lausanne.
Carnegie Inst. Washington, Pub.	Carnegie institute of Washington publications. Washington.
Centbl. Agr. Chem.	Centralblatt für das gesammte Forstwesen. Vienna.
Chem. Ann.	Chemische Annalen für die Freunde der Naturlehre. Helmstädt, Germany.
Chem. Centbl.	Chemisches Centralblatt. Leipsic.
Ciel et Terre.	Ciel et Terre. Brussels.
Coll. acad. franç.	Collection académique, partie française. Dijon and Paris.
Comment. acad. sci. imp. Petrop.	Commetarii academiae scientiarum imperialis Petropolitanae. St. Petersburg.
Compt. rend.	Comptes rendus hebdomadaires des séances de l'Académie des Sciences. Paris.
Dingler's polytech. Jour.	Dingler's polytechnisches Journal. Stuttgart.
Edinb. encycl.	
Edinb. new phil. Jour.	Edinburgh new philosophical journal. Edinburgh.
Edinb. phil. jour.	Edinburgh philosophical journal, Edinburgh.
Engin. rec.	Engineering record, building record, and sanitary engineer. New York.
Essays obs. phys. lit.	Essays and observations, physical and literary, read before the philosophical society in Edinburgh. 2 vols. (I, II), 8vo., Edinburgh, 1754–56. Vol. III, 1771.
Exp. sta. bul.	U. S. department of agriculture, office of experiment stations. Bulletin. Washington.
Exp. sta. rec.	U. S. department of agriculture, office of experiment stations. Record. Washington.
Forsch. Geb. Agr. Phys.	Forschungen auf dem Gebiete der Agrikultur-Physik. Heidelberg.
Fortsch. f. Met.	
Fortsch. der Phys.	Fortschritte der Physik. Berlin.
Franklin inst. jour.	Journal of the Franklin institute. Philadelphia.
Gaea.	Gaea, Natur und Leben. Cologne.
Geog. Abh.	Geographische Abhandlungen. (Penck), Vienna.
Geog. jour.	Geographical journal. London.
Gior. fis. chim.	Giornale di fisica, chimica, storie naturale, medicina ed arti. Pavia.
Gior. sci. nat.	Giornale di scienze, naturali ed economiche. Palermo.
Glean. sci.	Gleanings in science. Calcutta.
Hist. acad. sci.	Histoire de l'académie royale des sciences. Paris.
Illus. Ztg.	Illustrierte Zeitung. Leipsic.
Izv. Moscov. Selsk. Khoz. Inst. (Ann. inst. agron. Moscou).	Izviestia Moskovskoie Sel skokhozyaistvennei. (Annales de l'institut agronomique de Muscou.) Moscow.

Jahrb. tellur. Obs. Bern.	Jahrbücher des tellurischen Observatoriums zu Bern. Bern.
Jour. agr. prat.....	Journal d'agriculture pratique. Paris.
Jour. agr. sci.....	The Journal of agricultural science. Cambridge, England.
Jour. Amer. chem. soc.	Journal of the American chemical society. Easton, Pa.
Jour. Asiat. soc. Bengal.	Journal of the Asiatic society of Bengal. Calcutta.
Jour. Chem. Phys....	Journal für die Chemie und Physik. (Schweigger), Nuremberg, Germany.
Jour. chem. soc.....	Journal of the chemical society. London.
Jour. de phys. Paris..	Journal de physique théorique et appliqué. Paris.
Jour. dept. agr. So. Aust.	Journal of the department of agriculture of South Australia. Adelaide.
Jour. Landw.....	Journal für Landwirtschaft. Berlin.
Jour. mines.....	Journal des mines. Paris.
Jour. nat. phil. chem.	Journal of natural philosophy, chemistry, and the arts. (Nicholson's), London,
Jour. Phys. Leipsic..	Journal de Physik. Leipsic.
Jour. phys. Paris.....	Journal de physique, de chimie, d'histoire naturalle et sur les Arts. Paris.
Jour. roy. agr. soc....	Journal of the royal agricultural society of England. London.
Jour. roy. geog. soc..	Journal of the royal geographical society of England. London.
Jour. Russ. phys. chem. soc.	Journal of the Russian physico-chemical society. St. Petersburg.
Jour. soc. arts.....	Journal of the society of arts. London.
K. bayer. Akad. der Wiss. Munich, Gelehrte, Anz.	Königliche bayerische Akademie der Wissenschaften. Gelehrte Anzeigen. Munich.
L'atmosphere	.....
Lotos	Lotos. Zeitschrift für Naturwissenschaften-Prague.
Les mondes.....	Les mondes. Paris.
Madras jour. lit. sci..	Madras journal of literature and science. Madras.
Mag. f. neu. Zustand Naturk.	Magazin für den neuesten Zustand der Naturkunde. Jena and Weimar.
Mag. neu. Phys. und Naturgesch.	Magazin für das neueste aus der Physik und Naturgeschichte. Gotha.
Mannheim ephem....	Societas meteorologica palatina. Ephemerides. Mannheim.
Med. repos	Medical repository. New York.
Mél. phys. et chem...	Mélanges physiques et chimiques. St. Petersburg.
Mém. acad. sci	Mémoires de l'académie royale des sciences. Paris.
Mém. inst. nat. sci. et arts.	Mémoires de l'institute national des sciences et arts. Paris.
Mem. lit. phil. soc ...	Memoirs of the Manchester literary and philosophical society. Manchester, England.
Mem. met. ital.....	Memorie meteorologica Italiana. Rome.
Men. r. accad. Torino	Memorie della reale accademia di Torino. Turin.
Mem. reg. accad. sci. Modena.	Memorie della regia accademia di scienzi, lettere ed arti in Modena. Modena, Italy.
Mem. soc. agric. Orleans.	Société royal d'agriculture, des sciences, belles-lettres et arts. Mémoires. Orleans.
Mem. soc. ital. sci ...	Societa italiana della scienze. Memorie. Naples. Rome.
Mém. soc. sci. phys. et nat. Bordeaux.	Mémoires de la société des sciences physiques et naturelles de Bordeaux. Paris.
Met. Soc. Rep	
Met. ital. sup	Meteorologia Italiana. Rome. Supplemento alla Meteorologia Italiana.
Met. Jahrb. Jena.....	Meteorologische Jahrbücher. Jena.
Met. Zeits.....	Meteorologische Zeitschrift. Braunschweig, Germany.
Mitt. forstl. Versuchsw. Ost.	Mittheilungen aus dem forstlichen Versuchswesen Oesterreichs. Vienna.
Mitt. schweiz. Centralanst. Forstl. Versuchsw,	Mittheilungen der schweizerischen Centralanstalt für das forstliche Versuchwesen. Zürich.
Monit. sci	Le moniteur scientifique. Paris.
Mo. weather rev	U. S. Weather Bureau, Monthly weather review. Washington.
München Sternw. Wochenbl.	Annalen der königlichen Sternwarte bei München. Wochenblatt. Munich.
Nat. geog. mag	National geographic magazine. Washington.
Nature.....	Nature. London.
Naturw. Abh	Naturwissenschaftliche Abhandlungen.
Neu. allg. Jour. Chem.	Neues allgemeines Journal der Chemie. Leipsic.
Neu. Hamburg Mag..	
Notiz. Geb. Nat. u. Heilk.	Notizen aus dem Gebiete der Natur- und Heilkunde. (Froriep.) Erfurt, Weimar, Jena.
Nouv. mét.....	Nouvelles météorologiques. Paris.
Nuovo cimento	Nuovo cimento, giornale di fisica, chimica, e storie naturali. Pisa and Turin.
Novi comment. acad. sci. imp. Petrop.	Academia scientiarum imperialis petropolitana. Novi commentarii. St. Petersburg.
Obs. phys.....	Observations sur la physique, sur l'histoire naturelle, et sur les arts. Paris.
Öfvers. k. Svenska. förhandl.	Öfversigt of kongliga Svenska vetenskaps-akademiens förhandlingar. Stockholm.
Oest. landw. Wochenbl.	Oesterreichisches landwirtschaftliches Wochenblatt. Vienna.
Phil. mag.....	London, Edinburgh, and Dublin philosophical magazine and journal of science. London.
Phil. trans.....	Philosophical transactions of the Royal Society of London. London.
Phys. rev. (London)..	.....
Poligrafo	Poligrafo. Verona.
Proc. Amer. forestry assoc.	Proceedings of the American forestry assoc.
Proc. Ashmol. soc....	Ashmolean society. Abstract of the proceedings. Oxford.
Proc. Asiat. soc. Bengal.	Proceedings of the Asiatic society of Bengal. Calcutta.
Proc. Brit. met. soc..	Proceedings of the British meteorological society. London.
Proc. inst. civ. engin.	Proceedings of the institute of civil engineers. London.
Proc. roy. Irish acad.	Proceedings of the royal Irish academy. Dublin.
Proc. roy. soc. Edinb.	Proceedings of the royal society of Edinburgh. Edinburgh.
Proc. roy. soc. London	Proceedings of the royal society. London.
Quart. jour. roy. met. soc.	Quarterly journal of the royal meteorological society. London.
Quart. jour. sci.....	Quarterly journal of science, literature and the arts. London.
Rap. ann. sta. agron. Mauritius.	Colony of Mauritius. Station agronomique. Rapport annuel. Mauritius.
Rpt. Chf. Eng.....	U. S. War Department, Annual Report of the Chief of Engineers. Washington.
Rend. r. ist. Lomb...	Reale instituto lombardo di scienze lettere. Rendiconti. Milan.
Repert. der Phys.....	Repertorium der Physik. (Carl) Munich.
Repert. f. Met.....	Repertorium für Meteorologie. (Wild) St. Petersburg.
Repert. f. Met. Dorpat	Repertorium für Meteorologie. (Kämtz) Dorpat.
Rev. sci.....	Revue scientifique. Paris.
Rev. soc. sav.....	Revue des sociétés savantes. Paris.
Riv. sci. ind	Rivista scientifico industriale. Florence, Italy.
Rpt. Brit. assoc. adv.	Report of the British association for the advancement of science. London.
Samml. Deut. Abh. Akad.	....
Schweiz. met. Beob..	Schweitzerische meteorologische Beobachtungen. Zürich.
Sci. Amer.....	Scientific American. New York.
Sci. Amer. sup.....	Scientific American, supplement. New York.
Science.....	Science. NewYork.
Sci. mem.....	Scientific memoirs (Taylor.) London.
Sci. pour tous.....	La science pour tous. Paris.
Sci. proc. roy. Dublin soc.	Scientific proceedings of the royal Dublin society. Dublin.
Scot. geog. mag.....	Scottish geographical magazine. Edinburgh.
Sitzber. k. Akad. Wiss. (Vienna) Math. Nathurw. Kl.	Sitzungsberichte der kaiserlichen Akademie der Wissenschaften, Mathematisch-Naturwissenschaftliche Klasse. Vienna.
Sitzber. k. bayer. Akad Wiss. Math. Phys. Kl.	Sitzungsberichte der königlichen bayerischen Akademie der Wissenschaften, Mathematisch-Physikalische Klasse. Munich.
Sitzber. k. böhm. Ges. d. Wiss., (Prag).	Sitzungsberichte der kaiserlichen böhmischen Gesellschaft der Wissenschaften. Prague.
Smiths. misc. coll....	Smithsonian Institution. Miscellaneous collections. Washington.
Svenska vetensk. akad Handl.	Königl. svenska vetenskaps Akademi Handlingar. Stockholm.
Symons' met. mag...	Symons' meteorological magazine. London.
Tidskr. math. fys....	Tidskrift för mathematik och fysik. Upsala.

Trans. Amer. phil. soc.	Transactions of the American philosophical society. Philadelphia.
Trans. Amer. soc. civ. engin.	Transactions of the American society of civil engineers. New York.
Trans. Bombay geog. soc.	Transactions of the geographicl society of Bombay. (Bombay.)
Trans. N. Y. State agr. soc.	Society instituted in the State of New York for the promotion of agriculture, arts, and manufactures. Transactions. Albany.
Trans. roy. Irish acad.	Transactions of the royal Irish academy. Dublin.
Trans. roy. Scot. soc. arts.	Transactions of the royal Scottish society of arts. Edinburgh.
Trans. So. African phil. soc.	Transactions of the South African philosophical society. Cape Town.
Utr. Aanteek. prov. genoots.	Provincial utrechtsch genootschap van kunsten, en wetenschappen. Aanteekeningen van het verhandelde in de sectie-vergaderingen. Utrecht.
Van Nostrand's engin. mag.	Van Nostrand's engineering magazine. New York.
Water sup. and irr. papers.	U. S. Geological Survey. Water supply and irrigation papers. Washington.
Wittenberg Wochenbl.	Wittenbergisches Wochenblatt zum Aufnehmen der Naturkunde und des oekonomischen Gewerbes. Wittenberg.
Woburn exp. fruit farm rpt.	Woburn experimental fruit farm. Reports. London.
Zeits. Arch. Ver.....	Zeitschrift des Architecten und Ingenieur Vereins. Hannover, Germany.
Zeits. Deut. geolog. Ges.	Zeitschrift der Deutschen geologischen Gesellschaft. Berlin.
Zeit. Gewässerk.....	Zeitschrift für Gewässerkunde. Leipsic.
Zeits. f. Naturw. Halle.	Zeitschrift für die gesammten Naturwissenschaften. Halle.
Zeits. Oest. Ges. Met.	Zeitschrift der Oesterreichischen Gesellschaft für Meteorologie. Vienna.
Zhur. opuitn. agron. (Russ. Jour. exp. Landw.)	Zhurnal opuitnoi agronomii. (Russisches Journal für experimentelle Landwirtschaft. St. Petersburg.

1670.

Perrault, Claude.
Observations sur l'évaporation de l'eau et sur l'effet du froid sur different huiles. (1670.) Hist. acad. sci., 1666-86, 1:115-6. (1733.)

Various liquids were exposed to evaporation during cold weather. Water evaporated considerably, oils of bitter almonds, olives, aniseed, walnut, and turpentine evaporated a little, and linseed oil and oil of sweet almonds none at all.

1687.

Halley, Edmund.
An estimate of the quantity of vapor raised out of the sea by the warmth of the sun, derived from an experiment shown before the Royal Society. Phil. trans., 1687, 16:366-70; also abridged in Phil. trans., abridged, 1683-94, 3:387-90. (1809.)

A salt solution of the concentration of ordinary sea water (1:40), lost by evaporation at the rate of 0.1 inch in 12 hours. From this it was calculated that the amount evaporated from the Mediterranean in a summer day is at least 5,280 millions of tons. The accelerating influence of wind on evaporation was observed.

1690.

Halley, Edmund.
An account of the circulation of the watery vapors of the sea, and of the cause of the springs. Phil. trans., 1690, 17:468-73; also abridged in Phil. trans., abridged, 1683-94, 3:327-30. (1809.)

Advances the theory that evaporation is partly cause by heat expanding water particles into hollow shells lighter than air. Suggests that the air imbibes a certain quantity of aqueous vapor and retains it "like salts dissolved in water."

1692.

Sedileau.
Observations sur la quantité de l'eau de pluie tombée à Paris, durant prés de trois année, 1686-90, et de la quantité de l'évaporation. (1692.) Mem. acad. sci., 1666-99, 10:27-36 (1730); also Hist. acad. sci., 1686-99, 2:63, 87, 133-5; also Coll. acad. franç., 1754, 1:257-61.

An experiment carried on from June, 1688, to December, 1690, with evaporation of water showed an average annual amount at Paris of 32.1 inches. The annual rainfall was 19 inches. The rate was found to be higher from small vessels than from larger ones.

1694.

Halley, Edmund.
An account of the evaporation of water, as it was experimented in Gresham College in the year 1693, with some observations thereon. Together with a table showing the quantity evaporated each day, with the heights of the thermometer and barometer. Phil. Trans., 18:183-90 (1694); also Phil. trans., abridged, 1683-94, 3:658-9. (1809.)

The low annual evaporation rate of 8 inches, observed from water not exposed to sun and wind, as compared to the annual rainfall of 19 inches at Paris or 40 inches near Lancaster, is believed to show that the sun and wind, especially the wind, are the important factors influencing evaporation.

1709.

Gauteron.
Observations sur l'évaporation qui arrive aux liquides pendant le grand froid, avec des remarques sur quelues effets de la gelée. Mém. acad. sci. 1709, (—):451-71.

An ounce of water allowed to freeze and exposed from 6 p. m. to 8 a. m., lost 24 grains by evaporation. A comparative experiment with various liquids at a low temperature resulted as follows: Ice lost 56 grains; walnut oil, not frozen, 40 grains; brandy and oil of turpentine, not frozen, 54 grains each. Mercury and olive oil were unchanged by the exposure.

1712.

Müller, Johann Heinrich.
Exercitatio. De exhalationibus, tamquam proxima meteorum materia. (Joa. Müller resp.) 4to. Altorfiæ. (Altdorf.) 1712.

1715.

Barlow, E.
Meteorological essays. London. 1715.

"How Vapors, raised by the Sun to several Heights in the Air, grow, by their Descents, condensed into Rain, and Hail, of divers sorts." p. 43-48.

1729.

Desaguliers, Jean Théophile.
An attempt to solve the phenomenon of the rise of vapours, the formation of clouds and the descent of rain. Phil. trans., No. 407, 36:6 (1729); also Phil. trans., abridged, 1724-34, 7:323-31.

The theory expounded by Dr. Niewentyt and others, (see Niewentyt's Religious Philosopher, Contemplation 19, Sections 13-25) that particles of fire separate from sunbeams and combine with particles of water to make molecules specifically lighter than air, wherefore they rise until the air about them is of the same specific gravity as themselves, and that rain is produced by the separation of these particles of fire and water, is objected to on the ground that fire has not been proven to be a distinct element, and that the causes of rain given are contrary to experience. Experimental evidence is presented, favoring the idea that heat gives elasticity to fluids, causing the particles to exert a force of expansion at great distances. Refers to the work of Halley, (1687, 1690, 1694.)

1732.

Musschenbroek, Petro Van.
Ephemerides meteorologicæ, barometricæ, thermometricæ, epîdemicæ, magneticæ, ultrajectinæ. Phil. trans., 37:357-84. (1732.)

Evaporation for the year from a free surface of water was 32 in. 2.75 lines, (Rh.),[2] with a rainfall of 25 in., 1.25 lines, (Rh.).

1734.

Du Fay.
Observations météorologiques faites à Utrecht, pendant l'année 1734, extraites d'une lettre de M. Musschenbroek. Mém. acad. sci., 1734, (—):564-6.

The evaporation for the year 1734 at Utrecht was 25 in., 3 lines (Rh.), and the rainfall was 35 in., 11 7/9 lines (Rh.). The annual average rainfall at Paris is taken as 24 in. (Rh.).

1735.

Du Fay.
Observations météorologiques faites à Utrecht, pendant l'année 1735, extraites d'une lettre de M. Musschenbroek. Mém. acad. sci., 1735, (—):581-4.

Evaporation was 23 inches, 2 lines; the rainfall was 26 inches, 1½ lines (Rh.).

1736.

Du Fay.
Observations météorologiques faites à Utrecht, pendant l'année 1736, extraites d'une lettre de M. Musschenbroek. Mém. acad. sci., 1736, (—):503-5.

Evaporation was 28 inches, 11 lines (Fr.), with a rainfall of 22 inches, 9½ lines (Fr.).

1741.

Bazin.
Observation sur l'évaporation de l'eau. (Communicated by M. de Réaumur.) Hist. acad. sci., 1741, (—):17-19.

Evaporation was found to be more rapid from moist potter's clay than from a free water surface. It is suggested that this may be due to the difference between the temperatures of the two substances and somewhat to the inequalities of the surface of the soil.

1742.

Bouillet, Jean.
Sur l'évaporation des liquides. Hist. acad. sci., 1742, (—):18-21.

The theory that the circular motion of fluids causes the particles at the surface to pass off tangentially is considered a sufficient explanation for the fact of evaporation. The process is regarded as a solution of these particles in air.

1743.

Stock, J. C.
Dissertatio. De exhalationibus sive effluviis. (Joa. Jac. Algoewer resp.) 4to. Jenae. 1743.

1744.

Kratzensteins, Christian Gottlieb.
Théorie de l'élévation des vapeurs et des exhalaisons, démontrée mathématiquement. 4to. Bordeaux. 1745.
Abhandlung vom Aufsteigen der Dünste und Dämpfe, welche von der Akademie zu Bordeaux den Preis erhalten. Halle. 1744. (Translation of the above.)

[2] Rhenish measure is indicated by (Rh.) and french measure by (Fr.). The rhenish foot was to the french foot as 139:144.—*G. J. L.*

According to Saussure (1783), Kratzenstein estimated the vapor vesicles thrown off by evaporation as being of the diameter of a hair.

Richmann, Georg Wilhelm.

Qua ratione instrumentum, quo quantitas aquae, calore atmosphaerae naturali ex superficie aquae certa in aerem elevatae commode mensuratur, construi debeat. Comment. acad, sci. imp. Petrop., 1744–6, 14:273–5.

Describes an instrument for measuring evaporation, in which the vessel containing the evaporating water is partially sunk in a larger closed vessel also containing water.

1746.

Wallerius, Nils.

Rön, Hvarigenomåtskilliga Naturens lagar, angående Vattnets och andra flytande Materiers utdunstande, frambringas. Svenska vetensk. Akad. Handl. 1746, 7:1–21, 145–76.

See German translation 1752.

1747.

Richmann, G. W.

Inquisitio in legem, secundum quam calor fluidi in vase contenti, certo temporis intervallo, in temperie aeris constanter eadem decrescit vel crescit et detectio ejus, simulque thermometrorum perfecte concordantium construendi ratio hinc deducto. Novi comment. acad. sci. imp. Petrop., 1747–8, 1:174–197. Summ., 50–51.

The law deduced from observations is that the variations in the temperature of water, relative to that of the surrounding air, are directly proportional to the surfaces exposed and to the differences between the temperatures of the water and the air, and inversely to the masses. Hence the differences between the temperatures of the air and the water decrease in geometrical progression if the time intervals succeed each other in arithmetical progression.

Richmann, G. W.

Tentamen, legem evaporationis aquæ calidæ in ære frigidiori constantis temperiei definiendi. Novi comment. acad. sci. imp. Petrop., 1747–8, 1:198–205; Summ., 51.

Observations on evaporation of warm water in colder air of a constant temperature, seemed to show that the quantity evaporated is proportional to the successive differences of the differences between the temperature of the water and that of the air.

Richmann, G. W.

Tentamen explicandi phenomenon paradoxon, scilicet thermometro mercuriali ex aqua extracte mercurium in ære, aqua calidiori, descendere et ostendere temperiem minus calidam ac æris ambientis est. Novi comment. acad. sci. imp. Petrop., 1747–8, 1:284–290; Summ., 55.

As a thermometer is drawn from water into air warmer than the water, the temperature indicated continues to fall because the evaporation of the thin layer of water clinging to the bulb of the thermometer cools it.

1751.

Le Roy.

Mémoire sur l'élévation et la suspension de l'eau dans l'air, et sur la rosée. Mém. acad. sci., 1751, (—):481–518.

Observations and experiments are cited to prove the theory that the solution of water in air follows the same laws as solutions of salts in water and other solutions.

Richmann, G. W.

Atmometri sive machinæ hydrostaticæ ad evaporationem aquæ certæ temperiei mensurandam aptæ constructio talis, ut ope ilius decrementum paucorum granorum observari et lex evaporationis confirmari possit. Novi comment. acad. sci. imp. Petrop., [1749–50], 2:121–27; Summ., 9. (1751.)

A closed cylindrical air chamber slides between stationary vertical rods inside of a larger covered vessel containing water. From the upper wall of the air chamber three small rods project vertically thru holes in the cover of the outer vessel and form the support for the metal evaporating vessel. The total weight of the evaporating vessel and contents, the rods and the air chamber, are balanced by the weight of the water displaced by the submerged part of the system. Any loss in weight due to evaporation causes a corresponding rise of the evaporating vessel and can be calculated therefrom.

Richmann, G. W.

Inquisitio in rationem phænomeni, cur aqua profunda in vasis homogenæ materiæ plus evaporet quam aqua minus profunda, et confirmatio experimento nova ratione instituto. Novi comment. acad. sci. imp. Petrop., [1749–50], 2:134–44. (1751.)

Experiments with evaporation from water surfaces at different depths in vessels of similar material showed that less evaporation takes place from the shallower water. The cause of this seems to lie in the observation that if the ratio of the whole surface of the larger mass to the whole surface of the smaller is less than the ratio of the greater mass to the lesser mass, then the latter assumes the temperature of the air more quickly than does the former, and vice versa. This is not believed to be applicable to large natural bodies of water, since many complicating differences arise.

Richmann, G. W.

De evaporatione ex aqua frigidori aere observationes et consectaria. Novi comment. acad. sci. imp. Petrop., [1749–50], 2:145–61; Summ., 11–13. (1751.)

Experiments with evaporation from water colder than the air above it showed the following relations: Condensation, and not evaporation, occurs when the temperature of the air is between 60° and 70° F. if the temperature of the water is more than 15° below it, and also when the temperature of the air is between 75° and 87° if the water is 20° colder. A discussion of the application of these facts to general meteorology follows.

1752.

Wallerius, Nils.

Versuche, wodurch verschiedene Gesetze der Natur die Ausdunstung des Wassers und anderer flüssigen Materien betreffend, entdecket werden. Svenska vetensk. akad. Handl., 1746, 7:1–21, 145–176, Uebersetzt von A. G. Kästner. Hamburg. 1752.

Describes experiments with a weighing evaporometer extending thru 5 years, from which the following laws are deduced: Evaporation is proportional to the surface in contact with the air; increased temperature increases evaporation; increased movement of the air increases evaporation. The addition of salt (NaCl) and saltpeter (KNO_3) to water hindered evaporation at first but not finally. This initial decrease is believed to be due to the cold produced upon the addition of the salt. Sugar and vitriol were used as solutes without the retarding effect. Milk evaporated as rapidly as water until the cream was formed, when the rate decreased. Alcohol, wine and olive oil were also experimented with.

1753.

Baron.

Expériences sur l'évaporation de la glace. Mém. math. phys. acad. sci., 1753, (—):250–68.

Discusses the fact shown by Sedileau and Mariotte, and later confirmed by Gauteron and Mairan, that ice evaporates. In January, 1753, Baron's experiments showed that ice always evaporates more or less, but not proportionally to the coldness of the air. He considers that the phenomenon is due to the blowing off of fine particles of water by the wind, and that it is "not true evaporation."

1756.

Franklin, Benjamin.

Physical and meteorological observations, conjectures, and suppositions. Read June 3, 1756. Phil. trans., 55:182–92.

Considers evaporation a chemical solution of water in air.

1757.

Franklin, B[enjamin].

Letter to John Lining, 1757. Published in his Complete Works, edited by John Bigelow, 1887; 2:498, and 3:22. Also translated in Obs. Phys., 1773, 2:453–7.

An experiment was repeated which had been described by Professor Simson of Glasgow, which consisted in keeping wet the bulb of a thermometer with alcohol and thereby producing a temperature several degrees lower than it would otherwise have. The cooling effect of evaporation is further discussed in 3:22.

1763.

Desaguliers, Jean Théophile.

A course of experimental philosophy. London. 1763. Lecture 10, Hydrostatiks, 2:249–374.

Discusses at length the nature of evaporation, refuting the idea that particles of fire unite with particles of water to lift them into the air; and the other idea that water in sunshine forms spheres with an "aura or finer air" inside which buoys them upward. Proposes the idea that heat increases the repellant force between the particles, a solid thus becoming a liquid and a liquid a gas.

1764.

Haller, Albrecht v.

Sur l'évaporation de l'eau salée. Mém. acad. sci., 1764, (—):9–74. Also abstracted in Hist. acad. sci., 1764, (—):25–31.

A salt solution was found to evaporate less rapidly as it became more concentrated. Gives tables of evaporation from salt water in large shallow basins from March to October in the years 1759–64, with the state of the sky, the average daily temperature, and the product in salt at the end of each experiment. From these observations the annual evaporation at the salt works of Bevaix in Switzerland is valued at 22 in., 1.25 lines.

1765.

Hamilton, Hugh.

A dissertation on the nature of evaporation and several phenomena of air, water, and boiling liquors. Phil. trans., 1765, 55:146–81. Also translated in Neu Hamburg Mag., 1767, 2:147–92.

Refutes all earlier theories which assign "rarefaction by heat" as the chief if not the only cause of evaporation. Considers the process to be nothing more than a gradual solution of water in air, produced and promoted by the same means—attraction, heat and motion—by which other solutions are affected. Gives experiments, observations, and discussion.

1766.

Hamilton, Hugh.

On the ascent of vapors, the formation of clouds, rain, and dew, and on several other phenomena of air and water. In his Philosophical Essays, 8vo, London, 1766; 2d ed., 12mo, 1767; 3d ed., 12mo, 1772; 4th ed., 12mo, 1783. Also in his Works, 2 vols., 8vo, London, 1809.

Same as article of 1765.

1770.

Lavoisier.

De la combinaison de la matière du feu avec les fluides évaporables, et de la formation des fluides élastiques aeriformes. Mém. acad. sci., 1770, (—):420–32.

The cooling produced by evaporation is advanced as proof of his theory that there is an absorption of "matière du feu" or "igneous fluid" in the formation of vapors, or that vapors are a result of the combination of the "matière du feu" with the fluid.

1771.

Kames, H. H.

On evaporation. Essays obs. phys. lit., 1771, 3:99. Also translated in Obs. phys., 1773, 2:97–104.

Further support is given to the theory that evaporation is a solution of water in air.

1773.

Gabler, P. M.

Theoria vaporum. 4to. Ingolstad. 1773.

1774.

Cotte, P.

Traité de Météorologie. 4to. Paris. 1774. xxxvi + 635.

Reviews various theories of evaporation, p. 39 et seq. Discusses (p. 61) evaporation from ice, quoting Gauteron (1709). Sedileau (1692), is quoted, p. 317. Cotte gives 28 inches as the amount of annual evaporation at Montmorenci, from two years' observations.

The size, nature, and exposure of the vessels employed are considered to have a marked influence on the rate of evaporation. He believes Musschenbroek showed that evaporation does not take place equally from two vessels of the same length and breadth but of different depths; it is more rapid from the deeper vessel. M. found that the cubes of the quantities evaporated from two vessels are to each other as the heights of the fluids in the vessels. (Additions de M. Musschenbroek aux expériences de l'Acad. del cimento in Collection académique, vol. 1 (part. étrang.): 142, n. d. Cotte also refers (p. 307) to a large number of experiments on evaporation of water and ice conducted by J. Broval (Mém. de l'Acad. de Stockholm), Hales (Vegetable Statics. London, 1726), Desaguliers (Cours de phys. expér., vol. 2, p. 345, translation of P. Pezenas), Musschenbroek (Cours de Phys., vol. 2, p. 301, translation of M. Sigaud de Labond).

1775.

Barker, Robert.

The process of making ice in the East Indies. Phil. trans., 1775, 65 (pt.2):252–7. Also Phil. trans., abridged, 1770–76, 13:644–5.

The cooling produced by evaporation is taken advantage of in the East Indies where ice is made by leaving water in porous clay pans over night.

1777.

Dobson, Matthew.

Observations on the annual evaporation at Liverpool, in Lancashire; and on evaporation considered as a test of the moisture or dryness of the atmosphere. Phil. trans., 1777, 67:244–59. Also Phil. trans., abridged, 1776–80, 14;137–43. Also abstracted in Obs. phys., 1779, 13:81–5.

The rate of evaporation is considered to be a more accurate test of the moisture or dryness of the air than the quantity of rainfall. A table shows the mean monthly evaporation, rainfall, temperature, and velocity of the wind, and also a comparison of the evaporation rate for the different seasons of the years 1772–5. The annual evaporation at Liverpool, from four years' observations, is given at 36.78 in., with a rainfall of 37.43 in. Halley's experiments are referred to, (1687, 1690, 1694), also those of Cruquius, who observed an annual evaporation at Delft, of 30 inches from water set in the open air but not in the sun and wind. Experiments showing that evaporation did not take place from water placed in a vacuum seemed to prove that air is a chemical solvent of water and as such is an important cause of evaporation. Heat, when of a sufficient degree being another cause, may produce this effect without the intervention of air, the evaporation proceeding rapidly in an exhausted receiver as in the experiments of Dr. Irving in Phipp's Voyage to the North Pole, p. 211.

Hunter, Alex.

Georgical Essays. York, England. 1777. Essay VIII, On air dissolving water, p. 95–130.

Discusses the general facts and theory of evaporation. The author takes the position that evaporation is merely a form of solution, the water dissolving in the air.

1779.

Fontana, l'Abbé.

Mémoire sur l'évaporation des fluides dans l'air non renouvellé. Obs. phys., 1779, 13;22–38.

Experiments seem to show that the more volatile fluids such as ether, which evaporate so easily in the free air, do not evaporate at all when enclosed in air-tight vessels, and that even the action of heat upon these fluids does not increase the rate, proving that there is no sensible evaporation of liquids, although naturally volatile, if the air is not renewed.

1780.

Achard.

Dissertation sur la cause d'élévation des vapeurs. Obs. phys., 15:463–77. (1780.)

Supports the solution theory of evaporation.

Achard.

Mémoire sur le froid produit par l'évaporation. Obs. phys., 16:174–86. (1780.)

Quotes letter to Dr. Lining from B. Franklin (1757). Gives tables of results obtained from observations on the lowering of the temperature of many different liquids when subjected to evaporation.

Schotte, J. P.

Journal of the weather at Senegambia during the prevalence of a very fatal putrid disorder, with remarks on that country. Phil. trans., 1780, 70 (pt. 2):478–506.

The author refers (p. 486) to the enormous rate of evaporation at St. Louis, or Sénégal, 16° N. lat., 16° W. long., where the natives cool water in tanned leather bags hung in the open air. Also quoted by Watson, 1781.

1781.

Cotte, Louis.

Expériences sur les quantités d'évaporations relatives à la hauteur et au diamètre des vases qui servent à les mesurer. Obs. phys., 1781, 18:306–9; translated in Mag. neu. Phys. und Naturgesch., 1 (pt. 3):36–42. (1785.)

Experiments to determine the influence of the dimensions of the containing vessel on the rate of evaporation (cf. Cotte, 1774) show that evaporation has no relation to the height of the vessel, that it is not proportional to the volumes nor to the exposed amount of the interior surface of the walls, but that there is as much variety in the results as there is in the form of the vessels used.

Watson, Richard.

Chemical Essays. London. 1781. 5 vol. 12mo. 7th ed., 1800.

In volume 3, essay 2 (p. 51–74), the evaporation from an acre of "dry ground" is estimated to be over 1,600 gallons in 12 hours of a hot summer day, and more if the ground is moist. In essay 3 (p. 75–117) the process of evaporation is likened to the solution of salts in water. Essay 4 (p. 119–142) contains a discussion of the cooling produced by evaporation, as shown by experiments with the wet bulb thermometer, and by the methods employed in hot countries of cooling wine, water, etc., by wrapping wet cloths about the flasks, or by keeping them in porous jars or leather bags. He cites Professor Braun's table of the degrees of cold produced by the evaporation of different fluids (Novi comment. acad. sci. imp. Petrop., 1764, 10).

1782.

Schwaiger, Herculanus.

Beschreibung eines Verdunstungsmessers. Bayer. met. ephem., 1782, 2.

1783.

Paterson, J.

De evaporatione complectens. Edinburgh. 1783. 8vo.

Saussure, Horace Bénédicte de.

Essais sur l'Hygrométrie. Neuchâtel. 1783. xxiv+367. 2 pls. 4to.

Essay 3 deals with the theory of evaporation in which it is concluded that: (1) evaporation is the effect of the intimate union of elementary heat with water whereby is formed an elastic fluid, called vapor, rarer than air; (2) this vapor is called pure elastic vapor when formed in a void, or when its abundance and sustained heat give it force to repel the air which presses it; (3) but when this same vapor cannot entirely surmount the compressive force of the air, it penetrates and mingles with it and undergoes a true dissolution, and is then called dissolved elastic vapor; (4) when the saturated air is allowed to precipitate the vapor which it contains, this water sometimes takes the form of vesicles or little bubbles; these vesicles, filled with and enveloped by a rare, light fluid, float and rise because they are specifically lighter than air, and constitute vesicular vapor; (5) when the elastic vapor, or the vesicles themselves, are condensed in full drops, differing from rain drops only by their extreme smallness, they are still very different from vapor, properly speaking; but as they float in the air and can even be sustained for some time by its movement and by its viscosity, they are classed with vapors and called concrete vapor.

The essay closes with a discussion of the theories and experiments of Kratzenstein, Priestley, Nollet, Cullen, Lambert, Richmann, Musschenbroek, Wallerius, Kraft, Gautheron, Haller.

Schwaiger, Herculanus.

Descriptio atmidometri nostri et methodi quam in observando adhibemus. Mannheim ephem. soc. met. palat., 1783, 4:300.

Titius, J. D.

Ueber die Ausdunstung des Eises. Wittenberg. Wochenbl., 1783, 16:309–10.

Discusses the results of Braun and Saussure concerning evaporation of ice, and concludes that evaporation follows the same general law in the case of ice as in that of water, except at the moment of freezing, when the evaporation appears to be greater than it should be.

1784.

Saussure, H. B. de.

Versuch über die Hygrometrie. Uebersetzt aus dem französischen von Johann Daniell Titius. Leipsic. 1784. 8vo.

Translation of his Essais sur l'Hygrometrie of 1783 (q. v.).

[*To be continued.*]

CORRIGENDA.

In the MONTHLY WEATHER REVIEW for May, 1908, Vol. XXXVI, No. 5, page 130, column 2, line 6, for "consonants" read "constants." On page 147, column 1, line 49, the A in both instances should be changed to a. On page 147, line 2 from the bottom, for $PS=a=m\,\omega^2 r\cos^2\varphi$ read $PS=a-m\,\omega^2 r\cos^2\varphi$. On page 148, column 1, line 2, insert "in" between (fig. 2) and "the time $t\ldots$" On page 148, column 1, line 8 from the top, instead of $PQ=vt=r(\varphi'-\varphi)\div\frac{vt}{\varphi'-\varphi}$ read $PQ=vt=r(\varphi'-\varphi)$, $\therefore r=\frac{vt}{\varphi'-\varphi}$.