

Guide to the Papers of Jule G. Charney

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Finding aid prepared by Elizabeth Craig-McCormack; IASC collections staff

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Table of Contents

<u>Summary Information</u>	3
<u>Biography</u>	4
<u>Scope and Contents of the Collection</u>	7
<u>Arrangement note</u>	8
<u>Administrative Information</u>	8
<u>Related Materials</u>	9
<u>Controlled Access Headings</u>	9
<u>Publications about Jule Charney</u>	10
<u>Publications by Jule Charney</u>	10
<u>Collection Inventory</u>	15
<u>Personal Materials</u>	15
<u>Correspondence and Subject Files</u>	20
<u>Massachusetts Institute of Technology Materials</u>	57
<u>Writings and Lectures</u>	65
<u>Research Materials</u>	90
<u>Articles by Others</u>	112

Summary Information

Repository	Massachusetts Institute of Technology. Institute Archives and Special Collections
Creator	Charney, Jule G.
Title	Jule G. Charney papers
Date [inclusive]	1921-1981
Extent	28.9 cubic feet (28 record cartons, 3 manuscript boxes)
Language	English
Abstract	<p>These papers document the career of Jule G. Charney, whose research focused on the mathematical description of large-scale atmospheric circulations and included work on the theory of ocean currents, atmospheric wave propagation, large-scale hydrodynamic instability, hurricanes, drought, and atmospheric blocking ridges. The papers document his scientific, academic, professional, and political activities, dating from 1936 to 1981. Part of his career was spent at the Massachusetts Institute of Technology where he was professor of meteorology. Contributions to the field of meteorology are described in extensive files of project reports, conferences and seminars, correspondence, and committee records of the many national and international organizations in which he participated.</p>

Citation

Jule G. Charney Papers, MC 184, box X. Massachusetts Institute of Technology, Institute Archives and Special Collections, Cambridge, Massachusetts.

Biography

Jule Gregory Charney, 1917-1981, was an international leader in theoretical meteorology and pioneer in the field of numerical weather prediction. He earned a BA in mathematics and physics in 1938 from UCLA, an MA in mathematics in 1940, and a PhD in meteorology in 1946. During World War II he assisted in the training of weather officers for the armed services at the Army Air Forces Training School at UCLA.

In 1946 Charney went to the University of Chicago as a research associate of Carl-Gustaf Rossby, one of the founders of modern meteorology. He continued his post-doctoral work as a National Research Fellow in 1947-1948 at the University of Oslo, Norway. Charney spent the years in Chicago and Oslo developing his theory of quasi-geostrophic dynamics, deriving systematic approximations to the equations of fluid motions, thereby allowing large-scale atmospheric circulations to be described mathematically. His landmark research was to form the core of all theoretical work in modern dynamical meteorology.

In 1948 Charney joined the Institute for Advanced Study (IAS) in Princeton, New Jersey, as director of the Meteorological Research Group. At IAS he collaborated with mathematician John von Neumann in pioneering the development of numerical weather prediction through the use of high-speed computers. Initial computations were made on the Electronic Numerical Integrator and Calculator (ENIAC) in 1950. The results were the first numerical predictions of a two-dimensional model approximating the actual flow at a mid-level in the atmosphere. In 1952-1953 Charney obtained the first prediction of cyclogenesis with a three-dimensional model. The results prompted the United States government's interest in the practical application of operational numerical prediction. Consequently, Charney contributed to the establishment of the Joint Numerical Weather Prediction Unit in Maryland for the routine daily prediction of large-scale weather patterns. The facility served the Air Force, the Navy, and the United States Weather Bureau. The latter, with Charney's encouragement, established the Geophysical Fluid Dynamics Laboratory, a research-orientated facility utilizing computers for basic atmospheric and oceanic research.

In 1956 Charney came to the Massachusetts Institute of Technology (MIT) as professor of meteorology and director of the Atmospheric and Ocean Dynamics Project. In the quarter of a century until his death in 1981, he continued to make fundamental contributions to the theory of ocean currents, atmospheric wave propagation, large-scale hydrodynamic instability, hurricanes, drought, and atmospheric blocking ridges.

In 1966 Charney was appointed the Alfred P. Sloan Professor of Meteorology at MIT, the first individual to occupy the chair established through a fund pledged by A. P. Sloan, Jr. In 1974 Charney became head of the MIT Department of Meteorology and was responsible for its reorganization into the Department of Meteorology and Physical Oceanography. In 1977 he resigned his post as department head in order to pursue his research interests.

During the years 1960 to 1965, while a member of the Committee on Atmospheric Sciences of the National Academy of Sciences, and later as chairman of the Committee on International Meteorological Cooperation, Charney assisted in organizing the Global Atmospheric Research Program (GARP). GARP developed from several sequences of scientific, technical and political advancements. The United States began to concentrate on the establishment of an American space program during the years following

the first successful Soviet satellite launch in 1957. In April 1961 President John F. Kennedy, anxious to strengthen the US space effort and lessen tensions generated by Cold War politics, consulted Special Assistant for Science and Technology Jerome B. Wiesner for suggestions to promote collaborative space programs with other nations, including the USSR. Charney, contacted by Wiesner, was instrumental in initiating a series of discussions among atmospheric scientists on methods to advance international cooperation. In 1962 the International Council of Scientific Unions joined the World Meteorological Organization (WMO) in the administration of the Global Atmospheric Research Program. Charney continued to be active in GARP projects and became the first chairman of the United States Committee on GARP.

Charney was a Fellow of the American Meteorological Society, the American Association for the Advancement of Science, the American Geophysical Union, and an Honorary Fellow of the Indian Academy of Sciences. He was a member of the National Academy of Sciences and a foreign member of the Swedish Academy of Sciences and the Norwegian Academy of Sciences. He was the recipient of numerous honors and awards including the American Meteorological Society's Meisinger Award, the Carl-Gustaf Rossby Research Medal, the Losey Award of the Institute of Aeronautical Sciences, the Symons Memorial Gold Medal of the Royal Meteorological Society, the Hodgkins Medal of the Smithsonian Institution, the Bowie Medal of the American Geophysical Union, and the Cleveland Abbe Award of the American Meteorological Society. Jules Charney died June 16, 1981.

link to National Academy of Sciences Biographical Memoir: <http://www.nap.edu/readingroom.php?book=biomems&page=jcharney.html>

Chronology

1917	Born, San Francisco, January 1
1938	BA, Mathematics and Physics with honors, UCLA
1938-1940	Teaching Assistant in Mathematics, UCLA
1940	MA, Mathematics, UCLA
1940-1941	University Fellow in Mathematics, UCLA
1941-1942	Teaching Assistant in Physics-Meteorology, UCLA
1942-1946	Instructor and Lecturer in Physics-Meteorology, UCLA
1946	PhD, Meteorology, UCLA. Awarded National Research Fellowship
1946-1947	Research Associate in Meteorology, University of Chicago
1947-1948	National Research Fellow, Institute of Astrophysics, University of Oslo

1948-1951	Staff Member, Institute for Advanced Study, Princeton, New Jersey
1948-1956	Director, Theoretical Meteorology Project, Institute for Advanced Study
1951-1956	Long-term Member, Institute for Advanced Study
1950-1954	Guest Lecturer, University of Chicago (summers)
1951	Guest Lecturer, University of Stockholm (summer)
1954	Woods Hole Associate Lecturer, Woods Hole Oceanographic Institution (summer)
1956-1981	Professor of Meteorology, MIT (Alfred P. Sloan Professor, 1966-); Principal Investigator, Dynamics of Atmospheres and Oceans Project, MIT
1957	Guest Lecturer, Universities of Oslo and London (summer)
1964	Visiting Professor, Harvard University
1967	Visiting Professor, UCLA
1970	Guest Lecturer, Summer School of Space Physics of the Centre National d' Etudes Spatiales, Lannion, France
1970-1975	Summer Lecturer, Italian National Research Council Laboratory for the Study of the Dynamics of Large Masses, Venice, Italy
1972-1973	Guggenheim Fellow: Cambridge University, England (Overseas Fellow, Churchill College), September 1972-February 1973; Weizmann Institute of Sciences, Israel, February 1973-July 1973
1974-1977	Head, Department of Meteorology, MIT
1981	Died June 16

Honors

1937	Phi Beta Kappa
1949	Meisinger Award, American Meteorological Society
1957	Losey Award, Institute of Aeronautical Sciences
1957	Fellow, American Academy of Arts and Sciences

1961	Fellow, American Geophysical Union (President, Meteorological Section, 1970-1971)
1961	Symons Memorial Gold Medal, Royal Meteorological Society
1963	Carl-Gustav Rossby Research Medal, American Meteorological Society
1964	Member, National Academy of Sciences (Committee on Atmospheric Science, 1957-1967; Chairman, GARP, 1968-1971)
1965	Foreign Member, Royal Swedish Academy of Sciences
1966	Fellow, American Meteorological Society
1969	Hodgkins Medal, Smithsonian Institution
1970	Foreign Member, Norwegian Academy of Science
1970	Doctor of Science, Honorary, University of Chicago
1970-72	President, Meteorology Section, American Geophysical Union
1971	International Meteorological Organization Prize, WMO
1974	Symons Memorial Lecturer, Royal Meteorological Society
1974	John von Neumann Lecturer, Society for Industrial and Applied Mathematics
1976	Bowie Medal, American Geophysical Union
1976	Andrew Thompson Lecturer, Atmospheric Environment Service of Canada, Canadian Meteorological Society and University of Toronto
1980	Honorary Fellow, Indian Academy of Sciences
1980	Cleveland Abbe Award, American Meteorological Society
1980	Honorary Member, Royal Meteorological Society

Scope and Contents of the Collection

The papers of Jule G. Charney document the scientific, academic, professional and political activities of Charney during the period 1921 to 1981. The bulk of the material dates from 1948 when Charney began his professional career as director of the Theoretical Meteorology Project at the Institute for Advanced Study at Princeton and terminates with his death in 1981 while professor of meteorology at the Massachusetts Institute of Technology (MIT). The collection provides documentation of Charney's research and professional contributions in the field of theoretical meteorology and numerical weather prediction.

Arrangement note

The collection is organized into the following six series: 1. Personal Materials; 2. Correspondence and Subject Files; 3. Massachusetts Institute of Technology Materials; 4. Writings and Lectures; 5. Research Materials; 6. Articles by Others.

In general, the papers are in their original folder units, and original folder headings have been retained whenever possible. The arrangement is alphabetical except where noted. Correspondence pertaining to related subjects may be located both in correspondence files and under relevant subject headings.

Administrative Information

Publication Information

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Revision Description

Finding aid created in 1984 by Elizabeth Craig-McCormack and revised by other IASC collections staff. 2009, 2016

Access note

The collection is open for research. Access to MIT records is governed by Institute record policy.

Intellectual Property Rights

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Processing Information note

In Series 1, Personal Materials, box 1, folder numbers 55 to 60 were not used.

Related Materials

Related Materials in the Institute Archives and Special Collections

Massachusetts Institute of Technology, Department of Meteorology records. AC 177.

"Conversations with Jule Charney," published transcript of George W. Platzman's interview with Jule Charney, August 25-28, 1980. MC 411.

Controlled Access Headings

Corporate Name(s)

- American Geophysical Union
- Global Atmospheric Research Programme
- Institute for Advanced Study (Princeton, N.J.). Electronic Computer Project--1946-1955
- Institute for Advanced Study (Princeton, N.J.). ENIAC Project--1918-1951
- Institute for Advanced Study (Princeton, N.J.). Theoretical Meteorology Project--1948-1956
- Massachusetts Institute of Technology. Computation Center
- Massachusetts Institute of Technology. Dept. of Earth, Atmospheric, and Planetary Sciences
- Massachusetts Institute of Technology. Dept. of Meteorology
- National Academy of Sciences (U.S.). Committee on Atmospheric Sciences
- National Center for Atmospheric Research (U.S.)
- University of California, Los Angeles. Army Air Forces Training School

Occupation(s)

- Meteorologists--Archives.

Personal Name(s)

- Bjerknes, Jakob, 1897-1975
- Charney, Jule G.
- Eliassen, Arnt
- Platzman, George W.
- Rossby, Carl-Gustaf
- Von Neumann, John, 1903-1957

Subject(s)

- Massachusetts Institute of Technology--Faculty.
- Meteorology--Research.
- Meteorology--Study and teaching.
- Numerical weather forecasting--History.

Publications about Jule Charney

Philips, Norman A. "Jule Charney's Influence on Meteorology." *Bulletin of the American Meteorological Society* 63, no. 5 (May 1982).

Phillips, Norman A. "Jule Gregory Charney, 1917-1981, a Biographical Memoir." Washington, D.C.: National Academies Press, 1995.

Lindzen, R., E. Lorenz, and G. Platzman, eds. *The Atmosphere—A Challenge: The Science of Jule Gregory Charney*. The American Meteorological Society, 1990.

Publications by Jule Charney

1945 Section of radiation. Handbook of Meteorology. McGraw-Hill, 283-311.

1947 Dynamics of long waves in a baroclinic westerly current, J. Meteor., 4, 135-162.

- 1947 On the general circulation of the atmosphere in middle latitudes. (with C.-G. Rossby et al.) Bull. Amer. Met. Soc., 28, 255-280.
- 1948 On the scale of atmospheric motions, Geofys. Publikasjoner, 17, 1-17.
- 1949 On a physical basis for numerical prediction of large-scale motions in the atmosphere. J. Meteor., 6, 371-385.
- 1949 with A. Eliassen: A numerical method for predicting the perturbation of the middle latitude westerlies. Tellus, 1, no. 2, 38-54.
- 1950 Progress in dynamic meteorology. Bull. Amer. Met. Soc., 31, 231-236.
- 1950 with R. Fjortoft and J. von Neumann: Numerical integration of the barotropic vorticity equation. Tellus, 2, 237-254.
- 1951 with B. Bolin: Numerical tendency computations from the barotropic vorticity equation. Tellus, 3, 248-257.
- 1951 Dynamic forecasting by numerical process. Compendium of Meteorology, Am. Met. Soc., 470-482.
- 1951 On baroclinic instability and the maintenance of the kinetic energy of the westerlies. Trans. Internat. Assoc. Meteor. I.U.G.G., Brussels. Transactions of the Symposium on the General Circulation of the Oceans and Atmosphere, 47-63.
- 1951 I progressi della meteorologia dinamica. Revista di Meteorologia Aeronautica, 11, 3-9.
- 1951 Reply to "Atmospheric Signal Velocity" by R.S. Scorer, J. Meteor., 8, 69-70.
- 1951 Remarks on coordinating meteorological research and weather forecasting. Bull. Amer. Met. Soc., 33, 355-364.
- 1953 with N.A. Phillips: Numerical integration of the quasi-geostrophic equations for barotropic and simple baroclinic flows. J. Meteor., 10, 71-99.
- 1954 Numerical prediction of cyclogenesis. Proc. Nat. Acad. of Sci., 40, 99-110.
- 1954 Numerical weather prediction. Proc. Workshop on Num. Weather Pred., Amer. Met. Soc.
- 1955 The use of the primitive equations of motion in numerical prediction. Tellus, 7, 22-26.
- 1955 The generation of ocean currents by wind. J. Mar. Res., 14, 477-498.
- 1955 Numerical methods in dynamic meteorology. Proc. Nat. Acad. Sci., 41, 798-802.
- 1955 The Gulf Stream as an inertial boundary layer. Proc. Nat. Acad. Sci., 41, 731-740.
- 1956 Some basic problems in dynamic meteorology. J. Geophys. Res., 61, 323-328.
- 1956 with B. Gilchrist and F. Schuman: The prediction of general quasigeostrophic motion. J. Meteor., 13, no. 5.
- 1959 On the theory of the general circulation of the atmosphere. Rosby Memorial Volume, Rockefeller Institute Press, New York, 1959, 178-193.

- 1959 Hydrodynamics of the atmosphere and numerical weather prediction: a synthesis. Proc. Nat. Acad. Sci., 45, no. 12, 1650-1655, Dec. 1959.
- 1959 Non-linear theory of a wind-driven homogeneous layer near the equator. Deep-Sea Research, 6, no. 4, 303-310.
- 1960 Numerical Prediction and the General Circulation. Dynamics of Climate, Pergamon Press, ed. R.J. Pfeffer. pp. 12-17.
- 1960 Integration of the primitive and balance equations. Proc. Intern. Symp. on Numerical Weather Prediction, Tokyo, Japan, Nov. 7-11, 1960, 131-152. Published by Met. Soc. of Japan, 1962.
- 1960 Article on numerical weather prediction. McGraw-Hill Encyclopedia of Science and Technology, McGraw-Hill, New York.
- 1961 with P.G. Drazin: Propagation of planetary-scale disturbances from the lower into the upper atmosphere. J. Geophys. Res., 66, no. 1, 83-109.
- 1962 with M.E. Stern: On the stability of internal baroclinic jets in a rotating atmosphere. J. Atmos. Sci., 19, 159-172.
- 1963 A note on large-scale motions in the tropics. J. Atmos. Sci., 20, no. 6.
- 1963 Numerical experiments in atmospheric hydrodynamics. Proc. Symposia Appl. Math., 15, Amer. Math. Soc., 289-310.
- 1963 with J. Pedlosky: Propagation of the energy of unstable waves from the lower to the upper atmosphere. J. Geophys. Res., 68, no. 24.
- 1964 A time-variable differencing lattice for the control of truncation error. Presented IUGG- WMO Symposium on Research and Development Aspects of Long-Range Forecasting, June 29 - July 4, 1964, NCAR, Boulder, Colorado.
- 1964 with A. Eliassen: On the growth of the hurricane depression. J. Atmos. Sci., 21, no. 1, 68-75.
- 1965 Energy cascades and fronts in quasi-geostrophic flow. Presented at IAMAP-WMO Symposium on Large-Scale Processes, June 23-30, 1965, Moscow.
- 1966 with R. Fleagle, V. Lally, H. Riehl, D. Wark: The feasibility of a global observation and analysis experiment. A Report of the Panel on International Meteorological Cooperation to the Committee on Atmospheric Sciences, Nat. Acad. of Scis., National Research Council. Publication 1290. Washington, D.C.
- 1966 Some remaining problems in numerical weather prediction. Advances in Numerical Weather Prediction. 1965-66 Seminar Series sponsored by Travelers Research Center, Hartford, Connecticut.
- 1969 The intertropical convergence zone and the Hadley circulation of the atmosphere. In Proc. of the WMO/IUGG Intern. Symp. on Numerical Weather Prediction, in Tokyo, Japan, Dec. 1968. III, 73-79. Published in 1969 by the Japanese Met. Agency.
- 1969 What determines the depth of the planetary boundary layer in a neutral atmosphere? Oceanology, Acad. Sci. USSR, 9, no. 1, 143-145.

- 1969 A further note on large-scale motions in the tropics. J. Atmos. Sci., 26, no. 1.
- 1969 Chapter on predictability in Plan for U.S. Participation in the Global Atmospheric Research Program. A report of the U.S. Committee for the Global Atmospheric Research Program to the National Academy of Sciences, Washington, D.C.
- 1969 with M. Halem. and R. Jastrow: Use of incomplete historical data to infer the present state of the atmosphere. J. Atmos. Sci., 26, 5(2), 1160-1163.
- 1971 with S. Spiegel: Structure of wind-driven equatorial currents in homogeneous oceans. J. Phys. Ocean., 1, 149-160.
- 1971 Geostrophic turbulence. J. Atmos. Sci., 28, 6.
- 1971 Tropical cyclogenesis and the formation of the intertropical convergence zone. Mathematical Problems in the Geophysical Sciences, Volume 13 of Lectures in Applied Mathematics. Published by the American Mathematical Society.
- 1972 Impact of Computers on Meteorology. Computer Physics Communications, 3, Suppl. North-Holland Publishing Company, pp. 117-126.
- 1973 Movable CISK. J. Atmos. Sci., 30, 1, 50-52.
- 1973 Planetary Fluid Dynamics. Dynamic Meteorology (ed. P. Morel). D. Reidel Publishing Co., Dordrecht, Holland, pp. 97-352.
- 1974 Reply to Comments by J. Holton on "Movable CISK." J. Atmos. Sci., 31, 3, 834-835.
- 1975 with P.H. Stone and W.J. Quirk: Drought in the Sahara: A Biogeophysical Feedback Mechanism. Science, 187, 435-436.
- 1975 Dynamics of Deserts and Drought in the Sahel. Quart. J. Roy. Met. Soc., 101, 193-202.
- 1975 Dynamics of Deserts and Drought in the Sahel. GARP Publications Series No. 16. "The Physical Basis of Climate and Climate Modelling." Report of the International Study Conference in Stockholm, 29 July 10 August, 1974, pp. 171-176.
- 1976 with P.H. Stone and W.J. Quirk: Reply to comments by E.A. Ripley. Science, 191, 100-101.
- 1976 Reply to E.A. Ripley. Quart. J. Roy. Met. Soc., 101, 468.
- 1977 "A Biogeophysical Feedback Mechanism in Arid Lands." Chapter 13 in Arid Zone Development, Ballinger Publishing Co., Cambridge, Massachusetts, 181-188.
- 1977 with W.J. Quirk, S.H. Chow and J. Kornfield: A comparative study of the effects of albedo change on drought in semi-arid regions. J. Atmos. Sci., 34, no. 9.
- 1976 "Drought in the Sahara; insufficient biogeophysical feedback?" Reply to comments by E. A. Ripley. Science, 191, 100-102.
- 1976 "Dynamic and equilibrium problems in climatology"

1977 "A comparative study of the effects of albedo change on drought in semi-arid regions" (with W. J. Quirk, S.H.- Chow and J. Kornfield), J. Atmos. Sci., 34, 1366-1385.

1977 "A biogeophysical feedback mechanism in arid lands". Chapter 13 in Arid Zone Development. Bollinger Publishing Company.

1979 "Multiple flow equilibria in the atmosphere and blocking" (with J. deVore) J. Atmos. Sci., 36, 1205-1216.

1980 "Form-Drag Instability, Multiple Equilibria and Propagating Planetary Waves in Baroclinic, Orographically-Forced, Planetary Wave Systems" (with David M. Straus) to be published in J. Atmos. Sci.

1981 "Oceanic Analysis of Large-Scale Atmospheric Phenomena" To be published.

Collection Inventory

Series 1. Personal Materials 1936-1980

Scope and contents note

Series 1 documents Charney's family life and college education at UCLA in the early 1940s. There is also information about Charney's trip to the Soviet Union in 1961 to observe Soviet meteorological and oceanographic facilities. Organized alphabetically.

Family correspondence reflects Charney's relationship with his mother, Stella Litman Charney, and his children, Nicholas, Nora, and Peter. Correspondence between Charney and Nicholas offers information about Nicholas's role in founding the magazine *Psychology Today* in the mid-1960s (box 1, folder 20).

Course and lecture notes chronicle Charney's undergraduate and graduate years at the University of California at Los Angeles and include notes generated during his appointment as instructor/lecturer in physics/meteorology at the Army Air Force Meteorology Training School at UCLA during the years 1941 to 1946 (boxes 1 & 2, folders 57-72).

In 1961 Charney traveled to the Soviet Union under the auspices of the National Academy of Sciences National Research Council. As an invited American scientist, he was allowed to visit Soviet meteorological and oceanographical research institutions and subsequently wrote a report of his observations. His wife, Elinor, who had accompanied him, also wrote a short account of her impressions of the trip. Additional materials include notes of a lecture Charney delivered May 31, 1961, at the Institute of Atmospheric Physics in Moscow and an address presented to the Boston Meteorological Society on May 5, 1962, describing the status of meteorological science in the Soviet Union (box 1, folder 56).

	Box	Folder
Address book undated	1	1

Personal Materials

Awards and honors: Alfred P. Sloan Professor of Meteorology, MIT 1966	1	2
Awards and honors: Carl-Gustav Rossby Research Medal, American Meteorological Society 1964	1	3
Awards and honors: Cleveland Abbe Award for Distinguished Service to Atmospheric Sciences by an Individual, American Meteorological Society 1980	1	4
Awards and honors: Hodgkins Medal, Smithsonian Institution 1969	1	5
Awards and honors: Honorary Degree, University of Chicago 1970	1	6
Awards and honors: Honorary Fellow, Indian Academy of Sciences 1980	1	7
Awards and honors: International Meteorological Organization Prize, World Meteorological Organization 1971	1	8
Awards and honors: Robert M. Losey Award for 1957, Institute for Advanced Study 1957	1	9
Awards and honors: Symons Memorial Gold Medal, Royal Meteorological Society 1961	1	10
Awards and honors: William Bowie Medal, American Geophysical Union 1976	1	11
Biographical information	1	12

Personal Materials

Calendars 1959-1967	27	13
General note		
This folder is oversized.		
Calendars 1968-1971	27	14
General note		
This folder is oversized.		
Calendars 1973-1978	27	15
General note		
This folder is oversized.		
Correspondence, A 1953-1980	1	16
Correspondence, B 1957-1978	1	17
Correspondence, C 1945-1977	1	18
Correspondence, D 1964-1980	1	19
Correspondence, E 1950-1980	1	20
Correspondence, F 1965-1972	1	21

Personal Materials

Correspondence, G 1952-1970	1	22
Correspondence, H-K 1952 to 1957, undated	1	23
Correspondence, L 1953-1961	1	24
Correspondence, M 1952-1968	1	25
Correspondence, N-P 1962-1980	1	26
Correspondence, R 1952-1962	1	27
Correspondence, S 1952-1970	1	28
Correspondence, T 1959-1980	1	29
Correspondence, U 1964, 1974	1	30
Correspondence, W 1970, undated	1	31
Correspondence 1964-1980	1	32
Diaries and appointment books 1961-1980	1	33
Fellowships 1945-1948	1	34
Get well cards 1979-1980	1	35

Personal Materials

Get well cards 1980	1	36
Itineraries 1962, undated	1	37
Military travel documents 1945-1948	1	38
News clippings, Jule Charney 1949-1975	1	39
Passports and travel documents 1945, 1962 to 1979	1	40
PhD thesis 1946, undated	1	41
Appointments 1945 to 1946; 1956 to 1959	28	42
General note		
This folder is restricted.		
Security clearance forms 1957-1961	1	43
Trip to Soviet Union 1961-1962	1	44
Family correspondence	1	46,47,48,49, 50
University of California at Los Angeles (UCLA), Army Air Forces Meteorology Training School 1942-1946	1	51
UCLA, course and lecture notes 1942 to 1945, undated	1	52, 53, 54

Correspondence and Subject Files

UCLA, course and lecture notes: Astronomy 117-A, radiation undated	2	61
UCLA, course and lecture notes: "Essentials of Dynamic Meteorology," by Jorgen Holmboe undated	2	62-63
UCLA, course and lecture notes: "Hydrodynamics," by Jorgen Holmboe	2	64
UCLA, course and lecture notes: introduction to quantum theory 1936 September	2	65
UCLA, course and lecture notes: math 1939, undated	2	66
UCLA, course and lecture notes: "Meteorology: Basic Principles of Dynamics," by Jorgen Holmboe undated	2	67-68
UCLA, course and lecture notes: meteorology of the lower layers of the atmosphere 1943-1944	2	69
UCLA, course and lecture notes: general undated	2	70
UCLA, course and lecture notes: "Quantum Mechanics," by Kenaey undated	2	71-72

Series 2. Correspondence and Subject Files 1946-1981

Scope and contents note

Series 2 documents Charney's diverse professional activities and relationships with colleagues. The series is organized alphabetically by name of individual, organization, institution, or subject.

Correspondence and Subject Files

Conferences and Seminars provide a source of information on scientific convocations attended. Included here are programs, announcements, committee agendas, and related correspondence. The papers delivered by Charney are filed in Series 4.

Materials relating to the Institute for Advanced Study (IAS) offer a rich account of the nascent field of numerical weather prediction (box 9, folders 296-305). In 1946 the Theoretical Meteorology Project and the Electronic Computer Project were jointly developed at IAS with the expectation that the computer would prove to be a powerful research tool in the investigation of the fundamental problems of dynamical meteorology. Two years later in 1948, Charney was invited to direct the Theoretical Meteorology Project. Materials reflecting his eight-year contribution to the project include log books of research performed on the Electronic Numerical Integrator and Calculator (ENIAC), progress reports of the Meteorology Group, and contracts with the Office of Naval Research. The Office of Naval Research initially funded the Meteorology Project with supplemental support begun in 1951 by the Geophysical Research Division of the Air Force Cambridge Research Center.

In 1961 the Global Atmospheric Research Program (GARP) was proposed by President John F. Kennedy in an address before the General Assembly of the United Nations. In the following year the World Meteorological Organization (WMO) and the International Council of Scientific Unions (ICSU) agreed to develop complementary programs to advance international cooperative efforts to gather information concerning the atmospheric processes. WMO and ICSU proceeded autonomously until 1967 when the Joint Organizing Committee (JOC) was established to provide for the joint planning and execution of GARP objectives by the parent organization. National committees of the participating countries assumed responsibility for the coordination of field experiments. In the United States, the U.S. Committee on the Global Research Program (USC-GARP) was established in 1967 under the aegis of the National Academy of Sciences.

Charney's contribution to the establishment and success of the Global Atmospheric Research Program is richly documented in five cubic feet of materials in the GARP and National Academy of Sciences sections. During the years 1960 to 1965, while a member of the Committee on Atmospheric Sciences of the National Academy of Sciences (NASCAS) and later as Chairman of the NASCAS Panel on International Meteorological Cooperation, Charney participated in the conceptualization and organization of the Global Atmospheric Research Program. In 1962 he prepared a position paper for NASCAS in which he outlined an international cooperative effort to measure the atmosphere on a global scale ("A Suggested International Meteorological Observation Program," box 11, folder 378). The following year he was appointed Chairman of the NASCAS Panel on International Meteorological

Correspondence and Subject Files

Cooperation. In March 1966, the NASCAS Panel published the report "The Feasibility of a Global Observation and Analysis Experiment," the so-called "Charney Report," (box 11, folder 390) which led to the August 1966 meeting at the National Center for Atmospheric Research in which plans for the Line Islands Experiment (box 13, folder 408) and the major tropical experiments of GATE (GARP-Atlantic Tropical Experiment) were outlined (box 7, folders 236-239).

One well-documented GARP project is the Barbados Oceanographic and Meteorological Experiment (BOMEX). During the summer of 1969, atmospheric research was begun above a 90,000 square mile region located 50 miles east of Barbados in order to conduct the first large-scale experiment involving the ocean and atmosphere. JGC, as one of the principal investigators, headed the portion of the experiment to measure the fields of motion and cloud distribution in the Western Atlantic Intertropical Convergence Zone. Among the materials documenting the BOMEX effort is a proposal jointly written by Charney and H. Rielhl, "Exploration of the Planetary Boundary Layer Within and Without the Rain Areas of Tropical Disturbances"; printouts of electronically transmitted data relaying such information as flight formations, instrumentation readings, systems operations, schedules and weather variations; and observational data from aircraft, radar, satellites and other platforms (boxes 7 and 8, folders 240-244).

Charney was appointed Chairman of the United States Committee on GARP for a term beginning March 1, 1968, to June 1, 1971. His administration is well documented by USC-GARP reports, correspondence, and meeting minutes generated during his three-year tenure (boxes 6 and 7, folders 204, 222).

The National Center for Atmospheric Research (NCAR), a major government meteorological research laboratory, contributed financial assistance, scientific personnel, and the use of aircraft and computer terminals to the Global Atmospheric Research Program. Because of this collaboration, NCAR-related materials may be found through the GARP section, particularly with materials documenting GARP experiments. In 1967 the Tropical Meteorological Experiment (TROMEX) was initiated by NCAR in order to attain an understanding of the physical and dynamic characteristics of the tropical atmosphere and apply that knowledge to the understanding of global atmospheric circulation. Preliminary work for the study was organized by three working groups; Charney was chairman of Working Group C which focused on the observational needs and opportunities for investigating large-scale motions in the tropics. Among the records offering documentation of Charney's chairmanship are reports of Working Group C, memoranda relating to TROMEX seminars and conferences, and materials describing the Line Islands Experiment.

Additional GARP and NCAR-related materials may be found in the files of NCAR's parent organization, the University Corporation for Atmospheric Research (UCAR). Charney served on the Science Advisory

Correspondence and Subject Files

Committee which coordinated NCAR scientific programs with UCAR's consortium of academic institutions. Documentation of Charney's contribution to the Science Advisory Committee is sparse but his participation is reflected in committee meeting minutes, membership lists, and memoranda (box 15, folders 494-495).

Charney's role in the establishment of a meteorological and physical oceanographic community in Italy is documented by the papers of the 1973 Summer School on Mesoscale Meteorological Phenomena (box 14, folders 479-480, 480.1). Included are workshop study programs, bound lectures, study group reports, summary of cyclogenesis lectures, notes from discussions led by Charney, and correspondence reflecting Charney's position as chairman and organizer of the Italian Summer School.

The Universities National Anti-War Fund (UNAF), established in the wake of the United States invasion of Cambodia, was an ad hoc political organization composed of college and university faculty opposed to the Vietnam War. The initial focus of UNAF was to provide financial support to congressional candidates committed to the termination of the war in Indochina. UNAF efforts later turned to voter registration projects with the registration of the national student population as the primary goal. Charney's participation as President of the Board of Directors and Chairman of the Harvard/MIT UNAF Organizing Committee is reflected in strategy notes and other handwritten communications by Charney, budget information, meeting agendas and minutes, news clippings, and a notebook documenting financial contributions (boxes 15-16, folders 496-512).

Correspondence between Charney and pioneering members of the international meteorological community is extensively documented. Prominent correspondents include Jacob Bjerknes, Arnt Eliassen, Carl-Gustaf Rossby, and mathematician John von Neumann. Correspondence with von Neumann offers a rich account of the close working and personal relationship between the two scientists. Among the correspondence is a letter dated August 24, 1948, in which JGC discusses his ideas on numerical forecasting and presents his proposal for the "immediate attack on the numerical forecast problem" (box 16, folder 516). Of additional interest is correspondence with Carl-Gustaf Rossby in which Charney outlines his landmark research in numerical weather prediction with von Neumann at the Institute for Advanced study (box 14, folders 459-460).

	Box	Folder
A, general correspondence 1946-1981	2	73-74

Correspondence and Subject Files

A, correspondence 1964-1978	28	75
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General note**This folder is restricted.**

Academic Press 1957-1960	2	76
Advanced Research Projects Agency 1958	2	77
Air Force Cambridge Weather Center 1949-1964	2	78
Air Weather Service (Department of Air Force) 1952-1974	2	79
American Academy of Achievement 1965-1966	2	80
American Academy of Arts and Sciences 1958-1977	2	81
American Association for the Advancement of Science 1958-1966	2	82
American Chemical Society 1960-1961	2	83
American Geophysical Union (AGU) 1949-1975	Boxes 2-3	84-88
AGU, Committee on Atmospheric Electricity 1970	3	89
AGU, Bowie Medal Subcommittee 1977-1980	3	90-91

Correspondence and Subject Files

AGU, International Participation 1961-1969	3	92
American Mathematical Society 1955-1971	3	93
American Meteorological Society (AMS) 1949-1979	3	94-96
AMS, Awards Committee 1951-1980	3	97-98
AMS, Compendium of Meteorology Committee 1948-1951	3	99
AMS, Fellows Committee 1966-1967	3	100
AMS, Forecasting Committee 1957-1961	3	101
AMS, International Cooperation Committee 1966	3	102
AMS Council 1959-1965	3	103
AMS, <u>Journal of Atmospheric Sciences</u> 1947-1978	3	104-105
AMS, Publications Commission 1960-1969	3	106
American Physical Society 1970	3	107
<u>Annual Review of Earth and Planetary Sciences</u> 1977-1980	3	108-110
<u>Applied Mechanics Reviews</u> 1952, 1964	3	111

Correspondence and Subject Files

Atmospheric Sciences Panel on the President's Sciences Advisory Committee, 1960-1963	3	112
Atomic Energy Commission 1955-1956	3	113
B, general correspondence 1949-1980	3	114-115
B, correspondence 1960-1978	28	116
General note This folder is restricted.		
Baum, Wener A. 1949-1973	Boxes 3-4	117-118
Berkofsky, Louis 1973-1978	4	119
Bjerknes, Jacob 1947-1976	4	120
Bolin, Bert 1951-1964	4	121
British Broadcasting Corporation 1976-1978	4	122
Byers, Horance R. 1950-1959	4	123
C, general correspondence 1949-1980	4	124
C, correspondence 1972-1974	28	125

Correspondence and Subject Files

General note**This folder is restricted.**

California, University of 1954-1977	4	126
Visiting professorship, UCLA 1966-1967	4	127
Centre National d'Études Spatiales 1970	4	128
Chicago, University of 1951-1963	4	129
Chicago, University of: course in hydrodynamics 1946 October 3 to December 20	4	130-131
Chinese Meteorological Society 1975	4	132
Churchill College, Cambridge, England 1972-1973	4	133
Conferences and seminars: Conference on the Meteorological Computing Project, Institute for Advanced Study, Princeton, New Jersey 1946 August 29 to August 31	4	134
Conferences and seminars: A Practical Numerical Weather Forecasting Meeting, Institute for Advanced Study 1952 August 5	4	135
Conferences and seminars: Program of the 121st National Meeting of the American Meteorological Society, Atlantic City, New Jersey 1953 March 7 to March 19	4	136

Correspondence and Subject Files

Conferences and seminars: Program of the 122nd National Meeting of the American Meteorological Society, Washington, DC 1953 April 29 to May 4	4	137
Conferences and seminars: Program of the American Physical Society, Washington DC Meeting 1953 April 30 to May 2	4	138
Conferences and seminars: Electronic Computer Project Conference, Princeton, New Jersey 1955 October 25 to October 27	4	139
Conferences and seminars: Conference on Theoretical Geophysics, Washington, DC 1956 February 1 to February 3	4	140
Conferences and seminars: Symposium on Planetary Atmospheres and Convections in Rotating Fluids, London 1957 May 23 to May 24	4	141
Conferences and seminars: Symposium on the Changing Pacific Ocean in 1957 and 1958, Rancho Santa Fe, California 1958 June 2 to June 4	4	142
Conferences and seminars: Program of the Seventh Weather Radar Conference and Technical Conference on Hurricanes, American Meteorological Society, Miami Beach, Florida 1958 November 17 to November 22	4	143
Conferences and seminars: First Conference on Cumulus Convection, Portsmouth, New Hampshire 1959 May 19 to May 22	4	144

Correspondence and Subject Files

Conferences and seminars: Program for the Twelfth Annual Conference of the Institute of Geophysics, Los Angeles, California 1959 November 5 to November 7	4	145
Conferences and seminars: 40th Anniversary Meeting of the American Meteorological Society, Boston, Massachusetts January 19 to January 22	4	146
Conferences and seminars: Third Numerical Weather Prediction Conference 1960 June 27 to June 30	4	147
Conferences and seminars: International Association of Meteorology and Atmospheric Physics, IUGG 12th General Assembly, Helsinki 1960 July 26 to August 6	4	148
Conferences and seminars: International Cooperation in the Peaceful Uses of Outer Space, World Meteorological Organization, Geneva, Switzerland 1962 April 3 to April 6	4	149
		Box
Conferences and seminars: Tepper Morris, statement for the Second National Conference on Peaceful Uses of Space 1962 May 8		31
	Box	Folder
Conferences and seminars: United States Air Weather Service Orientation Program for Reserve Weather Officers, MIT 1962 May 20 to June 3	4	150
Conferences and seminars: International Symposium on Dynamics of Large-Scale Processes, Boulder, Colorado 1963 September 3 to September 7	4	151

Correspondence and Subject Files

Conferences and seminars: Tenth General Assembly of the International Council of Scientific Unions, Vienna, Austria 1964 March 12 to March 20	4	152
Conferences and seminars: International Union of Theoretical and Applied Mechanics: Symposium of Rotating Fluid Systems, La Jolla, California 1966 March 28 to April 2	4	153
Conferences and seminars: Air Weather Service Military Airlift Command, United States Air Force, Orientation Program for Reserve Weather Officers, MIT 1966 May 23 to June 3	4	154
Conferences and seminars: Technique Development Conference, Washington, DC 1966 May 24 to May 26	4	155
Conferences and seminars: Ocean Circulations and Climatic Changes, Goddard Institute for Space Studies	4	156
Conferences and seminars: Sixth Technical Conference on Hurricanes 1969 December 2 to December 4	4	157
Conferences and seminars: Fourth Arizona Conference on Planetary Atmospheres 1970 March 2 to March 4	4	158
Conferences and seminars: Symposium on Tropical Meteorology, Honolulu, Hawaii 1970 June 2 to June 11	4	159
Conferences and seminars: Fifteenth General Assembly of the International Union of Geodesy and Geophysics, Moscow, USSR 1971 July 30 to August 14	4	160

Correspondence and Subject Files

Conferences and seminars: Second Conference on Numerical Prediction of the American Meteorological Society, Monterey, California 1973 October 1 to October 4	4	161
Conferences and seminars: IAS Session at National Computer Conference 1975 May 21	4	162
Conferences and seminars: First Conference on Parameterization in Meteorology of the American Meteorological Society and the University of Chicago 1975 December 3 to December 5	4	163
Conferences and seminars: Conference on Atmospheric and Oceanic Waves and Stability of the American Meteorological Society, Seattle, Washington. 1976 March 29 to April 2	4	164
Conferences and seminars: Conference on Comparative Fluid Dynamics, Annapolis, Maryland 1979 June 11 to June 13	4	165
Conferences and seminars: Symposium on Geophysical Fluid Dynamics, European Geophysical Society, Vienna, Austria 1979 September 11 to September 14	4	166
Conferences and seminars: Geophysical Fluid Dynamics Laboratory Symposium, "A Quarter Century of Modeling of Geophysical Fluid Processes--A Retrospective," Princeton, New Jersey 1980 October 9 to October 10	4	167
Conferences and seminars: conference programs and correspondence 1949-1981	4	168

Correspondence and Subject Files

Conferences and seminars: numerical weather prediction conferences 1951-1961	4	169
Cooperative Institute for Marine and Atmospheric Studies 1977-1980	5	170
Cressman, George 1954-1978	5	171
D, general correspondence 1950-1980	5	172
D, correspondence 1968-1973	28	173
General note This folder is restricted.		
Davies, T. V., manuscript 1951	5	174
<i>Deep-Sea Research</i> 1959-1975	5	175
E, general correspondence 1951-1980	5	176
E, correspondence 1958-1963	28	177
General note This folder is restricted.		
Eliassen, Arnt 1948-1980	5	178-179

Correspondence and Subject Files

F, general correspondence 1949-1980	5	180
F, correspondence 1960-1976	28	181
General note		
This folder is restricted.		
Fjortoft, Ragnar 1949-1962	5	182
Forsythe, George E. 1948-1957	5	183
<u>Fortune Magazine</u> 1953-1961	5	184
Frank Capra Productions, Inc. 1955-1957	5	185
Franklin Institute 1968-1973	5	186
Frassetto, Roberto 1970-1975	5	187
Frenkiel, Francis N. 1952-1962	5	188
G, general correspondence 1947-1980	5	189
G, correspondence 1930-1980	28	190
General note		
This folder is restricted.		

Correspondence and Subject Files

Gambo, Kanzaburo 1949 to 1962, 1980	5	191
Garcia, Rolando V. 1954-1971	5	192
Global Atmospheric Research Program (GARP), Joint GARP Organizing Committee (JOC) 1966-1968	5	193-194
GARP: JOC 1969-1978	5	195-196
GARP: JOC, first session, study group on tropical disturbances, Madison, Wisconsin 1968 October 21 to November 8	5	197
GARP: JOC, second session, Princeton, New Jersey 1969	5	198-199
GARP: JOC, third session, Paris 1969	5	200-201
GARP: JOC, fourth session, Moscow 1970	5	202
GARP: JOC, fifth session, Trivandrum 1971	5	203
GARP: United States Committee for the Global Atmospheric Research Program (USC-GARP) 1967	6	204-205
GARP: USC-GARP 1968	6	206-207
GARP: USC-GARP 1969	6	208-211
GARP: USC-GARP 1970	6	212-213

Correspondence and Subject Files

GARP: USC-GARP 1971	6	214-216
GARP: USC-GARP 1972-1973	6	217-219
GARP: USC-GARP 1974-1976	6	220
GARP: USC-GARP, data assimilation 1969-1970	6	221
GARP: USC-GARP, technological planning group 1960-1970	6	222
GARP conferences, symposiums, and workshops: 11 GARP Study Conference," Stockholm, Sweden 1967 June 28 to July 11	7	223-224
GARP conferences, symposiums, and workshops: Plan for U.S. Participation in the Global Atmospheric Research Program, Boulder, Colorado 1969 October 15 to October 17	7	225
GARP conferences, symposiums, and workshops: tropical experiments workshop, Miami, Florida 1970 June 22 to June 24	7	226-227
GARP conferences, symposiums, and workshops: "International Symposium on Four Dimensional Data Assimilation," Princeton, New Jersey 1971 April 19 to April 22	7	228
GARP conferences, symposiums, and workshops: GATE workshop on cumulus parameterization 1972 July 11	7	229

Correspondence and Subject Files

GARP conferences, symposiums, and workshops: "The Impact of GATE on Large-Scale Numerical Modeling of the Atmosphere and Ocean," Woods Hole, Massachusetts 1979 August 20 to August 29	7	230
GARP Alpine Experiment (ALPEX) 1960-1980	7	231-233
GARP ALPEX experiment design proposals 1979-1980	7	234-235
GARP Atlantic Tropical Experiment (GATE) 1971-1976	7	236-239
		Box
GARP GATE 1974-1975		31
GARP GATE study proposal 1975 May 1		31
	Box	Folder
GARP Barbados Oceanographic and Meteorological Experiment (BOMEX) 1968-1976	7	240-242
GARP Bomex advisory panel 1968-1969	7	243
GARP Bomex Analysis Program (BOMAP) 1969-1971	8	244
GARP Monsoon Experiment (MONEX) 1973	8	245
		Box
GARP Monsoon Experiment (MONEX) 1980		31
	Box	Folder

Correspondence and Subject Files

GARP MONEX panel meeting, Geophysical Fluid Dynamics Laboratory/ NOAA, Princeton, N.J. 1974	8	246
GARP Polar Research (POLEX)	8	247
GARP Tropical Experiment (TROPEX) council 1970-1971	8	248
GARP TROPEX interim group 1970-1971	8	249
GARP TROPEX working group 3 1967	8	250
GARP panels: Air/Sea Interaction 1966-1967	8	251
GARP panels: Clear Air Turbulence 1968-1971	8	252
GARP panels: Climatic Variation 1971-1974	8	255-254
GARP panels: Data Management 1970-1971	8	255
GARP panels: Global Monitoring of Containment 1969-1970	8	256
GARP panels: Meso-Macro Interaction 1967	8	257
GARP panels: Ocean-Atmosphere Monitoring 1971	8	258
GARP panels: Tropical Meteorology 1968	8	259

Correspondence and Subject Files

GARP publicity 1969-1978	8	260
GARP working groups: cumulus convection 1968-1969	8	261
GARP working groups: internal motions 1968	8	262
GARP working groups: internal turbulence 1968-1969	8	263
GARP working groups: large-scale, long-period air-ocean interactions 1968-1969	8	264
GARP working groups: numerical experimentation 1968-1970	8	265-266
GARP working groups: ocean surface observations 1964	8	267
GARP working groups: planetary boundary layer 1968-1969	8	268
GARP working groups: planetary exploration 1965	8	269
GARP working groups: predictability and data requirements 1968	8	270
GARP working groups: radiation 1969-1970	8	271
GARP working groups: structure of the tropical atmosphere 1968-1969	8	272-273
		Box
GARP Federal Republic of Germany: plan for participation in 1970 February		31
	Box	Folder

Correspondence and Subject Files

Goddard Institute for Space Studies 1972-1975	8	274
Goody, Richard M. 1956-1973	8	275
Gun control legislation 1968	8	276
H, general correspondence 1950-1981	9	277-278
H, correspondence 1953-1981	28	279
General note		
This folder is restricted.		
Halem, Milton 1968-1971	9	280
Harvard University, Ad Hoc Committee on Rotch Professorship 1969	9	281
Harvard University Committee on Oceanography 1963-1964	9	282
Harvard College Observatory 1956-1974	9	283
Harvard University visiting professorship 1965-1966	9	284
Hebrew University of Jerusalem 1973	9	285
Hidaka, Koji 1955	9	286

Correspondence and Subject Files

Hide, Raymond 1954-1977	9	287
Hines, Colin O. 1960-1975	9	288
Holmboe, Jorgen 1946-1963	9	289
Hovmoller, Ernest 1952-1953	9	290
I, general correspondence 1960-1980	9	291
I, correspondence 1970-1981	28	292
General note		
This folder is restricted.		
Iberall, Arthur 1964-1979	9	293-294
Illinois, University of 1968	9	295
Institute for Advanced Study (IAS), committee on numerical weather prediction 1953	27	296
General note		
This folder is oversized.		
IAS correspondence 1948-1957	9	297

Correspondence and Subject Files

IAS, Electronic Computer Project: contract correspondence 1946-1955	9	298
IAS, Electronic Numerical Integrator and Calculator (ENIAC) 1948-1951	9	299
IAS, ENIAC log book, barotropic models 1951	9	300
IAS, ENIAC log book undated	9	301
IAS, meteorology project 1946 to 1956, undated	9	302
IAS, personnel records 1951-1954	28	303
General note		
This folder is restricted.		
IAS, progress report of the meteorology group 1946-1952	9	304
IAS, progress report of the meteorology group 1953-1955	9	305
Institute of Aeronautical Sciences 1958-1962	9	306
Institute of Space Studies 1961-1979	9	307
Interagency Committee for International Meteorological Programs 1964-1965	9	308
International Business Machines (IBM) 1951-1977	9	309

Correspondence and Subject Files

International Civil Aviation 1954	9	310
International Cooperation Year 1964-1967	9	311
International Institute for Applied Systems Analysis (IIAS) 1975-1979	9	312
IIAS summer workshop on computation of equilibria and stability regions 1975	9	313-314
International Union of Geodesy and Geophysics (IUGG), Committee on Atmospheric Sciences 1963-1966	10	315
IUGG, International Association of Meteorology and Atmospheric Physics (IAMAP) 1958-1981	10	316-317
IUGG quadrennial report 1970-1971	10	318
Irish meteorological service 1975, 1978	27	319
General note		
This folder is oversized.		
Isaacs, John D. 1958-1959	10	320
J, general correspondence 1957 to 1974, 1982	10	321
J, correspondence 1968-1969	28	322

Correspondence and Subject Files

General note**This folder is restricted.**

Jastrow, Robert 1960-1974	10	323
Jet Propulsion Laboratory, California Institute of Technology, 1978-1979	10	324
John Hopkins University 1962-1963	10	325
John Simon Guggenheim Memorial Foundation 1971-1974	10	326
<i>Journal of Computational Physics</i> 1965-1966	10	327
<i>Journal of Fluid Dynamics</i> 1973-1979	10	328
<i>Journal of Geophysical Research</i> 1959-1964	10	329
<i>Journal of Marine Research</i> 1960-1965	10	330
K, general correspondence 1950-1980	10	331-332
K, correspondence 1960-1977	28	333

General note**This folder is restricted.**

Kistiakowsky, George B. 1971-1973	10	334
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Correspondence and Subject Files

Koo, C. C. 1949-1958	27	335
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General note**This folder is oversized.**

L, general correspondence 1960-1980	10	336-337
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L, correspondence 1960-1979	28	338
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General note**This folder is restricted.**

Lecture announcements 1951-1980	10	339
---------------------------------	----	-----

Lewis, Harold W. 1958-1974	10	340
----------------------------	----	-----

Long, Robert R. 1958-1965	10	341
---------------------------	----	-----

M, general correspondence 1949-1981	10	342-343
-------------------------------------	----	---------

M, correspondence 1950-1981	28	344
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General note**This folder is restricted.**

Malone, Thomas F. 1959-1965	10	345
-----------------------------	----	-----

Correspondence and Subject Files

Massachusetts Scientists and Engineers for Johnson and Humphrey 1964	10	346
McGraw-Hill Book Company 1958-1979	10	347-348
Merkine, Lee-Or 1976-1979	10	349
Meteorology Society of Japan 1960-1972	10	350
Miles, John W. 1963-1965	11	351
Mintz, Yale 1946-1964	11	352
Monin, Andrei, S. 1968-1979	11	353
<i>Monthly Weather Review</i> 1958-1962	11	354
Morrison, Philip 1969-1977	11	355
Munk, Walter H. 1955-1966	11	356
Murray, Francis W. 1958-1960	11	357
N, general correspondence 1949-1981	11	358
N, correspondence 1959-1975	28	359
General note		

Correspondence and Subject Files

This folder is restricted.		
Nakagawa, Y.: manuscripts 1960, undated	11	360
Namias, Jerome 1947-1978	11	361
National Academy of Sciences (NAS), 1954-1976	11	362-363
	Box	Folder
Climate Research Board, 1975-1980	11	364-366
Committees		
	Box	Folder
Agassiz Medal Award Committee, 1975-1979 Committee on Atmospheric Sciences (NASCAS)	11	367
	Box	Folder
1957	11	368-369
1958	11	370-371
1959	11	372-373
1960	11	374
1961	11	375-376

Correspondence and Subject Files

1962	11	377-378
1963	Boxes 11-12	379-380
1964	12	381
1965	12	382
1966	12	383
1967	12	384
1968	12	385
1969-1970	12	386
1971	12	387
1972-1979	12	388
Panel on Balloon-Satellite System, 1964-1965	12	389
Panel on International Meteorological Cooperation: "The Feasibility of a Global Observation and Analysis Experiment," Report to the Committee on Atmospheric Sciences, 1966	12	390
Panel on Weather and Climate Modification, 1964-1972	12	391-392

Correspondence and Subject Files

	Box	Folder
Earth Sciences Board, 1971-1972	12	393
Exchange Program, 1959-1964	12	394
Geophysics Research Board, 1964-1975	12	395-397
Physics Survey Report, 1970-1971	12	398
Space Science Board, 1959-1965	12	399
Summer Study on the Fire Problem, 1961	12	400
National Aeronautics and Space Administration (NASA), 1949-1981	12	401-402
	Box	Folder
Global Observation and Analysis Experiment, 1964-1965	12	403
Nimbus D-IRLS Balloon Experiment, 1966-1971	12	404-405
National Center for Atmospheric Research (NCAR), 1958-1978	13	406-407
		Box
Conclusions and recommendations 1974 July 8		31
	Box	Folder
Line Island Experiment (LIE), 1967-1968	13	408
		Box

Correspondence and Subject Files

	Box	Folder
Technical reports 1955-1968		31
Tropical Meteorology Program (TROMEX), 1965-1968	13	409-410
National Climate Program Act, 1977	13	411
National Coalition for a Responsible Congress, 1970	13	412
National Meteorological Research Laboratory, 1957	13	413
National Science Foundation (NSF), 1955-1981	13	414-416
Neiburger, Morris, 1947-1965	13	417-418
New York Academy of Sciences, 1958-1972	13	419-420
New York University, 1954-1978	13	421-422
North American Aviation Science Center, 1966	13	423
Nova Scotia Research Foundation, 1954-1959	13	424
O, General Correspondence, 1952-1973	13	425
O, Correspondence, 1960-1978	28	426
General note		

Correspondence and Subject Files

This folder is restricted.		
Office of Naval Research (ONR), Department of the Navy, 1949-1965	13	427-429
	Box	Folder
Travel Authorizations, 1957-1960	13	430
Ogura, Yoshi, 1957-1975	13	431-432
Oppenheimer, Robert, 1949-1956	13	433-434
	Box	Folder
"Notes on Quantum Mechanics, Physics 221, Oppenheimer, 1939," by B. Peters	13	435
Otterman, Joseph: Reprints, 1974-1976	13	436-437
P, General Correspondence, 1949-1980	13	438-440
P, Correspondence, 1963-1981	28	441
General note		
This folder is restricted.		
Panofsky, Hans A., 1947-1966	13	442-443
Pedlosky, Joseph, 1962-1979	14	444

Correspondence and Subject Files

Pergamon Press, Inc., 1957-1960	14	445
Petterssen, Sverre, 1949-1963	14	446
Pfeffer, Richard, 1959-1980	14	447-448
Phillips, Norman A., 1952-1979	14	449
Platzman, George W., 1948-1979	14	450-451
Q, General Correspondence, 1954-1957	14	452
R, General Correspondence, 1953-1977	14	453-454
R, Correspondence, 1959-1978	28	455
General note		
This folder is restricted.		
Rand Corporation, 1956-1965	14	456
Reprint Requests, 1964-1979	14	457
Riehl, Herbert, 1949-1966	14	458
Rosby, Carl-Gustaf	14	459-460

Correspondence and Subject Files

Rosby (Carl-Gustaf) Memorial Volume, 1956-1960	14	461-462
Royal Meteorological Society, 1961-1979	14	463
Royal Swedish Academy of Sciences, 1965-1973	14	464
S, General Correspondence, 1952-1978	14	465-467
S, Correspondence, 1953-1981	28	468-469
General note		
This folder is restricted.		
<u>Science</u> , 1975	14	470
Science Service, 1951-1960	14	471
<u>Scientific American</u>	14	472
		Box
Shuman, Frederick G. 1972 March to April		31
	Box	Folder
Smagorinsky, Joseph, 1949-1980	14	473
Speranza, Antonio, 1974-1981	Boxes 14-15	474-475

Correspondence and Subject Files

Stratton, Julius, 1960-1962	15	476
Stommel, Henry, 1950-1980	15	477-478
Summer School on Mesoscale Meteorological Phenomena, 1973	15	479-480
Summer School on Mesoscale Meteorological Phenomena, 1973	27	480b
General note		
This folder is oversized.		
Supersonic Transports, 1971-1977	14	481-483
T, General Correspondence, 1950-1980	14	484
T, Correspondence, 1958-1975	28	485
General note		
This folder is restricted.		
<u>Tellus</u> , 1950-1977	15	486
Thompson, Phillip D., 1947-1976	15	487
Travelers Research Center, Inc., 1959-1976	15	488
U, General Correspondence, 1957-1970	15	489

Correspondence and Subject Files

Union Geofisica Mexicana, 1963-1964	15	490
United National Educational, Scientific and Cultural Organization (UNESCO), 1954-1961	15	491
United States Coast Guard Academy: National Data Buoy System, 1968-1969	15	492-493
University Corporation for Atmospheric Research, 1973-1978	15	494-495
Universities National Anti-War Fund (UNAF), 1970-1973	15	496
	Box	Folder
Campus Coordinators, 1970-1971	15	497
Candidate Information, 1970	16	498
Candidate Information, House of Representatives, 1970	16	499-500
Candidate Information, Senate, 1970	16	501-502
Contribution Record Book, n.d.	16	503
Correspondence, Incoming, 1970-1972	16	504-506
Correspondence, Outgoing, 1971	16	507
Mailings to Contributors, 1970-1972	16	508

Correspondence and Subject Files

National Board, 1970	16	509
Reorganization, 1970-1971	16	510
Sponsors, 1970-1971	16	511
Volunteers, n.d.	16	512
V, General Correspondence, 1951-1981	16	513
V, Correspondence, 1953-1981	28	514
General note		
This folder is restricted.		
Van Mieghem, J., 1951-1954	16	515
Von Neumann, John, 1946-1955	16	516-517
W, General Correspondence, 1951-1978	16	518-519
W, Correspondence, 1959-1979	28	520
General note		
This folder is restricted.		
Weather Bureau, United States Department of Commerce, 1950-1965	16	521

Correspondence and Subject Files

	Box	Folder
Joint Numerical Weather Prediction Unit, 1954-1957	16	522
National Hurricane Research Project, 1955-1961	16	523
Weizmann Institute of Science, 1971-1973	16	524
Wexler, Harry, 1948-1962	16	525
Wiesner, Jerome B., 1961-1965	16	526
World Meteorological Organization, 1964-1977	Boxes 16-17	527-528
Wurtele, M.G., manuscript, n.d.	16	529
Y, General Correspondence, 1948-1970	16	530
Y, Correspondence, 1968-1970	28	531
General note		
This folder is restricted.		
Yeh, Tu Cheng, 1948-1950, 1980	17	532
Young, David, manuscript, 1951	17	533
Z, General Correspondence, 1962-1979	17	534

Miscellaneous Correspondence, 1950, 1981, n.d.

17

535

Series 3. Massachusetts Institute of Technology Materials 1955-1981**Scope and contents note**

Series 3 records Charney's activities at MIT as a teacher, researcher, and administrator. The series is arranged alphabetically.

The MIT Computation Center was utilized by the Numerical Weather Prediction (NWP) Group in the MIT Meteorology Department to assist in the development of techniques to predict and understand large-scale atmospheric motions. Materials reflecting the meteorological problems researched by Charney and other NWP members include applications for computer usage, problem approval forms, problem abstracts, and progress reports from 1957 to 1962. A significant amount of correspondence filed in the Computation Center subseries is directed to and from Norman A. Phillips, associate professor and professor of meteorology from 1956 to 1974 and head of the meteorology department from 1970 to 1974. Phillips-related correspondence is scattered throughout the MIT series and appears sporadically in other series, particularly Series 2 (box 14, folders 449).

Materials filed in the Department of Meteorology section are generally a mixture of routine departmental correspondence, colloquia announcements, course schedules and memoranda. There is sparse documentation of Charney's tenure as head of the Department of Meteorology and Physical Oceanography during the years 1974 to 1977 (box 17, folder 572).

Among the grant projects documented from 1961 to 1978 in which Charney was the principal investigator are "Application of High-Speed Computers to Dynamical Meteorology and Oceanography" and "Theory of Large-Scale Atmospheric and Oceanic Processes." Materials representing his scientific and administrative participation include grant proposals, progress reports, budgets, and correspondence between Charney and NSF grant administrators.

Courses taught by Charney are richly documented by course and lecture notes generated between 1959 and 1972. Additional materials relating to his teaching include student notes, papers, problem sets, and examinations (box 18).

Box**Folder**

Massachusetts Institute of Technology Materials

Committee, centennial panel discussion 1960-1961	17	536
Committee on Planetary and Space Studies (COMPASS) 1962-1963	17	537
Corporation Visiting Committee for the Earth Sciences 1960-1962	28	538-539
General note		
This folder is restricted.		
Corporation Visiting Committee for the Earth Sciences 1974-1977	28	540-541
General note		
This folder is restricted.		
Committee, dedication of the Green Building 1963-1964	17	542
Committees, earth sciences 1956	17	543
Committees, geophysics 1958-1963	17	544
Interdepartmental Committee for the Field of Oceanography 1959-1960	17	545
Computation Center 1957-1961	17	548
Committees, outside professional activities 1966-1972	17	546
Committee, science and engineering connected with outer space 1963	17	547

Massachusetts Institute of Technology Materials

Computation Center projects: atmospheric dissociation rates 1962	17	549
Computation Center projects: balance equations 1957	17	550
Computation Center projects: barotropic code 1957-1958	17	551
Computation Center projects: dynamical model of a hurricane 1959-1960	17	552
Computation Center projects: energy conversion in the polar stratosphere 1961	17	553
Computation Center projects: energy transfer in 2-D turbulence 1960-1961	17	554
Computation Center projects: general circulation of the atmosphere 1957-1958	17	555
Computation Center projects: geostrophic vertical motions 1961	17	556
Computation Center projects: hemispheric master program 1957-1959	17	557
Computation Center projects: hemispheric weather forecasts 1959-1961	17	558
Computation Center projects: integration of balance equations 1959-1960	17	559
Computation Center projects: meteorology input-output 1960-1961	17	560
Computation Center projects: one-dimensional line 1958-1959	17	561

Massachusetts Institute of Technology Materials

Computation Center projects: primitive eulerian equations 1957-1958	17	562
Computation Center projects: stability of the stratosphere 1959-1960	17	563
Computation Center projects: wind analysis 1957-1958	17	564
Course evaluation 1973 February	17	565
Industrial Liaison Office 1956-1975	17	566
Joint program in oceanography 1969-1972	17	567
Libraries 1959-1978	17	568
Meteorology, Department of 1955-1965	17	569
Meteorology, Department of 1966-1969	17	570
Meteorology, Department of 1970-1973	17	571
Meteorology, Department of 1974-1981	17	572
National Science Foundation, grants and contracts 1961-1966	17	573
National Science Foundation, grants and contracts 1967-1968	17	574
National Science Foundation, grants and contracts 1969-1973	17	575-577

Massachusetts Institute of Technology Materials

National Science Foundation, grants and contracts 1974-1978	17	578
"Reports on Research" 1958-1962	17	579
Sea Grant Program 1978	18	580
Teaching materials: general examinations for doctoral candidates in Meteorology 1957-1970	28	581-583
General note		
This folder is restricted.		
Teaching materials: general examinations for doctoral candidates in Meteorology 1972-1980	28	584-585
General note		
This folder is restricted.		
Teaching materials: planetary fluid dynamics examinations 1958-1972	18	586-587
Teaching materials: planetary fluid dynamics problem sets 1959-1973	18	588-589
Teaching materials: planetary fluid dynamics problem sets undated	18	590
Teaching materials: quizzes, examinations and problems 1965-1978	18	591

Massachusetts Institute of Technology Materials

Teaching materials: dynamics of tropical atmospheres and oceans, course and lecture notes 1967	18	592
Teaching materials: introduction to atmospheric dynamics, course and lecture notes 1970	18	593-594
Teaching materials: lecture notes 1959	18	595
Teaching materials: lecture notes 1960 Spring	18	596
Teaching materials: lecture notes 1962	18	597
Teaching materials: lecture notes 1967-1970	18	598
Teaching materials: lecture notes 1975	18	599
Teaching materials: lecture notes 1977	18	600-601
Teaching materials: planetary fluid dynamics (19.67) second term course and lecture notes 1957-1958	18	602-603
Teaching materials: planetary fluid dynamics (19.67) course and lecture notes 1961	18	604
Teaching materials: planetary fluid dynamics (19.67) course and lecture notes 1963 Spring	18	605

Massachusetts Institute of Technology Materials

Teaching materials: planetary fluid dynamics (19.67) course and lecture notes 1965 Spring	18	606
Teaching materials: planetary fluid dynamics (19.67) course and lecture notes 1965 Fall	18	607
Teaching materials: planetary fluid dynamics (19.67) course and lecture notes 1966 Fall	18	608
Teaching materials: planetary fluid dynamics (19.67) course and lecture notes 1971	18	609-611
Teaching materials: planetary fluid dynamics (19.67) course and lecture notes 1972 Spring	Boxes 18-19	612-614
Teaching materials: planetary fluid dynamics (19.67), early set undated	19	615-617
Teaching materials: planetary fluid dynamics (19.67) course and lecture notes undated	19	618-621
Teaching materials: student notes 1962 Spring	19	622
Teaching materials: baroclinic and barotropic instability student notes 1963	19	623
Teaching materials: dynamics of tropical atmospheres and oceans student notes 1967	19	624

Massachusetts Institute of Technology Materials

Teaching materials: oceanic circulations student notes 1960-1963	19	625
Teaching materials: planetary fluid dynamics student notes 1966 Fall	19	626
Teaching materials: student papers 1961	19	627
General note		
This folder is restricted for 75 years.		
Teaching materials: student papers 1964, 1967	19	628
General note		
This folder is restricted for 75 years.		
Teaching materials: student papers 1967-1971	19	629
General note		
This folder is restricted for 75 years.		
Teaching materials: student papers 1975	19	630
General note		
This folder is restricted for 75 years.		
Teaching materials: student papers 1976-1977	19	631
General note		

Writings and Lectures

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Teaching materials: student papers 1977-1978	19	632-633
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General note

This folder is restricted for 75 years.

Teaching materials: student papers undated	19	634
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General note

This folder is restricted for 75 years.

Woods Hole Oceanographic Institution 1954-1980	19	635
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Series 4. Writings and Lectures 1940-1981**Scope and contents note**

Series 4 consists mainly of articles written by Charney, and lectures he delivered to professional meetings. Some research data, photographs, and correspondence relating to his publications and presentations are included. Arranged chronologically.

Throughout his career, Charney was a prolific and inventive researcher. His writings provide rich documentation of his great influence on the science of meteorology. Of particular interest is Charney's 1947 manuscript "Dynamics of Long Waves in a Baroclinic Westerly Current." This paper contained the first description of the process of baroclinic instability and formed the foundation for all modern dynamical meteorology and the modern theory of the general circulation of the atmosphere (box 18, folders 640-641). Also of note are the 1967 and 1968 manuscript versions of his 1969 paper "The intertropical convergence zone and the Hadley circulation of the atmosphere." Included with the manuscripts are meteorological calculations, research notes, and test data (box 22, folders 781-782).

Writings and Lectures

	Box	Folder
"Curve Spaces in N-Dimensional Coordinate Manifolds", manuscript 1940	19	636
"A Derivation of the Long-Wave Radiative Flux from a Homogeneously Stratified Layer", article in <i>Handbook on Meteorology</i> , McGraw-Hill. correspondence 1944-1945	19	637
"Dynamics of Long-Waves," lecture 1947 April 23	19	638
"Rossby's Theory of the General Circulation," lecture 1947 November 14	19	639
"The Dynamics of Long-Waves in a Baroclinic Westerly Current," thesis manuscript; reprint, <i>Journal of Meteorology</i> October 1947 1946, 1947	19	640-641
"Numerical Forecasting," lecture - New York University 1948 December	27	642
General note		
This folder is oversized.		
"On Numerical Weather Prediction by Dynamical Methods," manuscript 1948	19	643
"On the Scale of Atmospheric Motions," manuscript; reprint, <i>Geofysisiska Publikasjoner</i> 1948	19	644
"Report on a Program for Numerical Weather Prediction," lecture - American Meteorological Society, New York 1949 January 25 to January 28	27	645

Writings and Lectures

General note**This folder is oversized.**

"A Numerical Method for Predicting the Perturbation of the Middle Latitude Westerlies," manuscript 1949 April	20	646
"On the Physical Basis for Numerical Prediction of Large-Scale Motions in the Atmosphere," manuscript 1949	20	647
"Progress in Dynamic Meteorology," lecture - thirtieth anniversary meeting of the American Meteorology Society, St. Louis, Missouri 1950 January 3 to January 6	20	648
"Dynamics of Tropical Depressions," lecture - Woods Hole Oceanographic Institution-MIT seminar 1950 May 9	20	649
"Numerical Forecasting," lecture - University of California at Los Angeles 1950 April 11	20	650
"The Numerical Integration of the Barotropic Vorticity Equation," manuscript 1950	20	651
Reply to "Atmospheric Signal Velocity" by R.S. Scorer, reprint <i>Journal of Meteorology</i> 1951 February	20	652
"Theory of Long-Waves in the Atmosphere," lecture - New York University Institute of Mathematics and Applied Mechanics 1951 May 14	20	653
Untitled lecture, New York Academy of Science 1951 May 22	20	654

Writings and Lectures

"The Dynamic Stability in the Maintenance of the Westerlies," lecture - Ninth General Assembly of the International Union of Geodesy and Geophysics, Brussels 1951 August 21 to September 1	20	655
"On Baroclinic Instability and the Maintenance of the Kinetic Energy of the Westerlies," manuscript; reprint, Association de Meteorologie 1951 August	20	656
"Theory of Stability in Fluid Motion," lecture - University of Chicago 1951 summer	20	657
"Dynamic Forecasting by Numerical Process" 1951	20	658
Series of four lectures on Recent Progress in Numerical Forecasting and the Formulation of Dynamic Models of the Atmosphere - Institute for Advanced Study, Princeton 1952 June 24 to July 2	27	659
General note		
This folder is oversized.		
"The Numerical Forecasting Program in Princeton," lecture - University of Stockholm, Institute of Meteorology 1952 October	20	660
"Numerical Integration of the Quasi-Geostrophic Equations for Barotropic and Simple Baroclinic Flows" (with N. A. Phillips), manuscript 1953 January	20	661-662
"Numerical Forecasting," lectures - Meteorological group at the Institute for Advanced Study 1953 January	20	663

Writings and Lectures

"Numerical Weather Prediction," lecture - Institute for Advanced Study 1953 March 9	20	664
Lectures and notes 1953	20	665
"Numerical Prediction of Cyclogenesis," manuscript; reprint, <i>Proceedings of the National Academy of Sciences</i> 1954 February	20	666
"The Institute's Meteorology Project," lecture 1954 March 9	20	667
Untitled lecture - delivered before the Section of Meteorology at the American Geophysical Union, American Meteorological Society, Washington, DC 1954 May 3	20	668
"Some Remarks on Present and Future Uses of High-Speed Computers in Meteorology," lecture - NSF/UCLA Conference on the Significance and Possibilities of High-Speed Computing in Meteorology and Oceanography 1954 May 13 to May 15	20	669
"The Basis of Numerical Weather Prediction," lecture - workshop on numerical weather prediction, Washington, DC 1954 June 2	20	670
"Waves and Currents in Atmosphere and Ocean," lecture - oceanographic convocation, Woods Hole, Massachusetts 1954 June 22 to June 24	20	671
Woods Hole Oceanographic Institution lectures 1954 June 28 to July 1954	20	672
University of Chicago lectures 1954 August 4 to August 13	20	673

Writings and Lectures

Untitled lecture, New York University 1955 January 14	20	674
Untitled lecture, RCA Colloquium 1955 January 31	20	675
"A New Method of Dynamical Weather Prediction," lecture - Geophysics Research Directorate, Boston, Massachusetts 1955 March 17	20	676
"The Dynamics of the Gulf Stream," lecture - Institute for Advanced Study Physics seminar 1955 March 29	20	677
"Numerical Methods in Dynamical Meteorology," lecture - National Academy of Sciences 1955 April 27	20	678
"Mathematical Problems in Numerical Weather Prediction," lecture - New York University 1955 May 3	20	679
"Application of Dynamical Methods to Weather Prediction," lecture - MIT 1955 July 7	20	680
"Numerical Prediction and the General Circulation," lecture - Institute for Advanced Study, Study Group on the General Circulation of the Atmosphere 1955 October 26 to October 28	20	681
"Some Aspects of Planetary Fluid Mechanics," lecture - Columbia University Physics Colloquium 1955 November 11	20	682
"The Gulf Stream as an Inertial Boundary Layer," manuscript; reprint, <i>Proceedings of the National Academy of Sciences</i> 1955 October	20	683

Writings and Lectures

"The Gulf Stream as an Inertial Boundary Layer," research 1954 summer	20	684
"The Gulf Stream as an Inertial Boundary Layer," research 1954-1955	20	685
"The Gulf Stream as an Inertial Boundary Layer," research undated	20	686
"Numerical Methods in Dynamical Meteorology," reprint, <i>Proceedings of the National Academy of Sciences</i> 1955 November	20	687
"Non-Geostrophic Methods of Numerical Prediction," manuscript approximately 1955	20	688
"A Numerical Model of Thermal Convection in the Atmosphere," manuscript 1955	20	689
"The Use of the Primitive Equations of Motion in Numerical Prediction," manuscript; research notes; reprint, <i>Tellus</i> 1955	20	690
"Planetary Fluid Mechanics and Weather Prediction," lecture - Illinois University 1956 January 10	20	691
"Some Basic Problems in Dynamic Meteorology," lecture - Conference on Theoretical Geophysics, Washington, DC 1956 February 1 to February 3	20	692
"Planetary Fluid Dynamics and Weather Computation," lecture - Rensselaer Polytechnic Institute 1956 February 21	21	693

Writings and Lectures

"Hurricanes," lecture - MIT; Institute for Advanced Study 1956 March 1 and March 6	21	694
"Current State of Numerical Weather Prediction," lecture 145th national meeting of the American Meteorological Society 1956 June 12 to June 14	21	695
"Numerical Weather Prediction," lecture - Bell Telephone Laboratories 1956 August 15	21	696
"The Gulf Stream as an Inertial Boundary Layer," lecture - MIT 1956 October 8	21	697
"The Prediction of General Quasi-Geostrophic Motion" (with B. Gilchrist and F. Schuman), reprint, <i>Journal of Meteorology</i> 1956 October	21	698
"Continuum Mechanics," lecture - MIT 1956 November 27	21	699
"The Generation of Oceanic Currents by Wind," manuscript 1956	21	700
"A Theory of the Mean Zonal Circulation of the Atmosphere as a Combined Effect of Forced Meridional Convection and Horizontal Turbulent Transfer," lecture - University of Chicago 1957 February 7	21	701
"Non-linear Theory of General Circulation," lecture - MIT 1957 February	21	702
"Dynamics of the Gulf-Stream," lecture - University of Oslo 1957 April 24	21	703

Writings and Lectures

"General Circulation of the Atmosphere," lecture - University of Oslo 1957 April 26	21	704
"The Dynamics of the Gulf Stream," lecture - Imperial College of Science and Technology, London 1957 May 22	21	705
"Theory of the General Circulation of the Atmosphere," lecture - Symposium on Planetary Atmospheres and Convection in Rotating Fluids, London 1957 May 23 to May 24	21	706
Untitled lecture, International Meteorological Institute Conference on Numerical Forecasting, Stockholm, Sweden 1957 June 3 to June 8	21	707
"General Circulation," lecture - Rossby Institute 1957 July 9	21	708
"The Present and Future of Numerical Weather Prediction," lecture - Eleventh General Assembly of the International Union of Geodesy and Geophysics, Toronto, Canada 1957 September 3 to September 14	21	709-710
"Numerical Weather Prediction," lecture - NAS Meteorology Committee 1957 September 24	21	711
"The Dynamics of Hurricanes," lecture - Geophysics Research Directorate Seminar 1957 November 14	21	712
"The Work of the Dynamical Weather Prediction Project," lecture - MIT-AMS seminar 1958 March 24	21	713
"The Dynamics of a Mature Hurricane," manuscript 1958 March	21	714

Writings and Lectures

"Program and Plans of the Dynamical Prediction Project at MIT," lecture - Conference on Numerical Weather Prediction, Washington, DC 1958 May 1 to May 3	21	715
"Numerical Weather Prediction Research," lecture - MIT Corporation 1958 December 1	21	716
"Experiments in Weather Modification with Numerical Prediction Models, lecture - 175th National Meeting of AMS 1959 March 24-27	21	717
"Meteorological Hydrodynamics and Numerical Weather Prediction," lecture - Harvard-MIT Physics Colloquium 1959 April 23	21	718
"Hydrodynamics of the Atmosphere and Numerical Weather Prediction," lecture - NAS Symposium on Physics, Chemistry and Biology in the Atmosphere 1959 April 27	21	719
Untitled lecture - Theoretical Division of the National Aeronautics and Space Administration 1959 June 23	21	720
Untitled lecture, Scripps Institution 1959 August	21	721
"Hydrodynamics of the Atmosphere and Numerical Weather Prediction-- A Synthesis," reprint, <i>Proceedings of the National Academy of Sciences</i> 1959 December	21	722
"On the General Circulation of the Atmosphere," reprint and notes 1959	21	723

Writings and Lectures

"Propagation of Perturbation Energy Produced by Flow Over Mountains from the Lower Atmosphere with the Upper Atmosphere," lecture - 187th AMS meeting, Eugene, Oregon 1960 June 14 to June 16	21	724
"Numerical Weather Prediction--The Scientific Future," lecture - International Symposium on Numerical Weather Prediction, Tokyo, Japan 1960 November 7 to November 13	21	725
"Integration of the Primitive and Balance Equations," manuscript; photocopy of the Proceedings of the International Symposium on Numerical Weather Prediction, Tokyo, Japan 1960 November 7 to November 13	21	726
Untitled lecture, UCLA 1960 December 5	21	727
"Numerical Prediction and the General Circulation," reprint, <i>Dynamics of Climate</i> 1960	21	728
"Non-linear Theory of a Wind-Driven Homogeneous Layer Near the Equator," photocopy - <i>Deep-Sea Research</i> 1960	21	729
"Propagation of Energy of Planetary Scale from the Lower to Upper Atmosphere," lecture - MIT Applied Mathematics and Mechanics colloquium 1961 February 13	21	730
"Betwixt the Polar Night Jet and the Gulf Stream," lecture - MIT-WHOI seminar 1961 April 14	21	731

Writings and Lectures

"Comments on the Dynamics of Climate," lecture - Travelers Research Center Seminar Series, Hartford, Connecticut 1961 October 5	21	732
"Long-Range Weather Forecasting," lecture - The American Chemical Society 1961 October 26	21	733
Institute Space Studies lectures 1961 October to December	21	734
"On an Analogy Between Baroclinic Stability and the Stability of Two-Dimensional Parallel Flow," lecture - Harvard-MIT-Woods Hole Aeophysical Fluid Dynamics Seminar 1961 November 17	21	735
"On the Stability of Internal Baroclinic Jets in a Rotating Fluid," lecture - MIT Applied Mathematics and Mechanics colloquium 1961 November 20	21	736
"Propagation of Planetary-Scale Disturbances from the Lower Into the Upper Atmosphere" (with P. Drazin), manuscript; reprint, <i>Journal of Geophysical Research</i> 1961	21	737-738
"Propagation of Planetary-Scale," research notes 1960, undated	21	739
"Dynamics of Large-Scale Atmospheric Motions," lecture - AMS-American Physical Society Symposium on Geophysical Fluid Dynamics, New York City 1962 January 26	21	740
"Numerical Weather Prediction as an N-Vortex Problem in Three Dimensions," lecture - Fourth Numerical Weather Prediction Conference, Los Angeles 1962 January 31 to February 3	21	741

Writings and Lectures

"Some Topics in the Dynamics of Planetary Atmosphere," lecture Johns Hopkins University, Applied Science Laboratory 1962 March 9	21	742
"Numerical Experiments in Atmospheric Hydrodynamics," lecture American Mathematical Society symposium, Chicago 1962 April 3	21	743
"Some Problems in the Dynamics of the Upper Atmosphere," lecture - MIT Department of Aeronautics and Astronautics 1962 April 26	21	744
Untitled lecture - General Precision, Inc., Science Advisory Group 1962 May 8	21	745
Untitled lecture - MIT visiting committee 1962 May 14	21	746
Untitled lecture - Harvard-MIT-WHOI seminar 1962 May 18	21	747
Remarks by Jule G. Charney, speech - Weather Bureau/Stretch Dedication 1962 November 7	21	748
"Meteorology and Planetary Fluid Dynamics," lecture - New England Regional Conference on Science, Technology and Space, MIT 1962 November 13 to November 14	21	749
"On the Stability of Internal Baroclinic Jets in a Rotating Atmosphere" (with M. E. Stern), manuscript 1962	21	750
"The Formation of Tropical Depressions," lecture - Numerical Weather Prediction Symposium, Oslo, Norway 1963 March 11 to March 16	21	751

Writings and Lectures

"The Genesis of Hurricanes," lecture - University of Chicago 1963 March 26	21	752
"The Generation of Tropical Cyclones," lecture - Woods Hole Oceanographic Institution 1963 April 26	21	753
"Dynamics of Large-Scale Motion in the Tropics," lecture - Third Technical Conference on Hurricanes and Tropical Meteorology, Mexico City 1963 June 6 to June 12	21	754
"Scientific Objectives of a Global Observation Program," lecture - Travelers Research Center, Hartford, Connecticut 1963 November 7	21	755
"A Note on Large-Scale Motions in the Tropics," manuscript; reprints from <i>Geofisica Internacional</i> , 1963 and <i>Journal of the Atmospheric Sciences</i> 1963 November	21	756
Remarks delivered by Jule Charney at the IBM Scientific Computing Symposium, Large-scale Problems in Physics, Yorktown Heights, New York 1963 December 9 to December 11	21	757
"On the Trapping of Unstable Planetary Waves in the Atmosphere," manuscript; photocopy - <i>Journal of Geophysical Research</i> 1963 December 15	21	758
"Numerical Experiments in Atmospheric Hydrodynamics," reprint - Proceedings of the Symposia on Applied Mathematics 1963	21	759

Writings and Lectures

"On the Genesis of Tropical Depressions," manuscript, drafts, research notes 1957-1963	21	760-761
"Numerical Weather Analysis and Prediction," lecture - Stanford University 1964 January 1	21	762
"Scientific Requirements and Uses for a Global Observation System," lecture - AMS Symposium on Progress and Major Problems in Meteorology, Los Angeles 1964 January 31	21	763
"Global Data Requirements for Long-Range Prediction," lecture - WMO-IUGG Symposium on Research and Development Aspects of Long-range Forecasting, Boulder, Colorado 1964 June 29 to July 4	21	764
"Some Aspects of the General Circulation in the Tropics," lecture - New York University 1964 November 6	21	765
"A World Weather System and Its Uses," lecture - Geophysics Corporation of America, Bedford, Massachusetts 1964 November 16	21	766
"Scientific Needs for a Global Observation System," lecture - AMS, Washington, DC 1964 December 16	21	767
"On the Growth of the Hurricane Depression" (with A. Eliassen), reprints - <i>Journal of the Atmospheric Sciences</i> ; <i>Geofisica Internacional</i> 1964 January	21	768
Untitled lecture, Interagency Commission on International Meteorology Programs 1965 January 6	21	769

Writings and Lectures

"Energy Cascades in Quasi -Geostrophic Flow," lecture - Geophysical Fluid Dynamics Seminar, Woods Hole, Massachusetts 1965 March 6	21	770
"Numerical Experiments in Atmospheric Hydrodynamics and Long-Range Prediction," lecture - MIT COMPASS seminar 1965 April 13	21	771
"Stability, Energy, Cascades and Fronts," lecture - UCLA 1965 May 5	21	771.2
"Appreciation of Jacob Bjerknes," speech - UCLA 1965 May 7	21	771.3
"Scientific Opportunities, Problems and Requirements," lecture - International Cooperation Year meeting on international meteorology, Washington, DC 1965 June 16	22	772.1
"A Global Observation Project," lecture and reprint - International Symposium on Dynamics of Large-Scale Processes in the Atmosphere, Moscow, USSR 1965 June 23 to June 30	22	772.2
Comments delivered at the White House Conference on International Cooperation, panel on meteorology, Washington, DC 1965 November 28 to December 1	22	773
Untitled lecture, Washington, DC 1966 February 15	22	774
Harvard lecture series 1966 February to May	22	775
"Some Remaining Problems in Numerical Weather Prediction," lecture - Travelers Research Center seminar series "Advances in Numerical Weather Prediction," Hartford, Connecticut 1966 June 2	22	776

Writings and Lectures

"Meteorology--Past, Present and Future," lecture - MIT Sloan Fellows 1966 November 10	22	777
"Quasi-Geostrophic Energy Flow in Fourier and Physical Space," lectures - UCLA 1967 February 14 to February 23	22	778
"On the Structure of a Wind-Driven Inertial Equatorial Current" (with S. Spiegel), manuscript 1967 March 20	22	779
"General Circulation in the Tropics," lecture - Fifth Technical Conference on Hurricanes and Tropical Meteorology, Caracas, Venezuela 1967 November 20 to November 28	22	780
"The Intertropical Convergence Zone and the Hadley Circulation of the Atmosphere," manuscripts 1967 and 1968	22	781-782
"The Intertropical Convergence Zone and the Hadley Circulation of the Atmosphere," diagrams undated	22	783
"The Intertropical Convergence Zone and the Hadley Circulation of the Atmosphere," equations for various ITC-Hadley models undated	22	784
"The Intertropical Convergence Zone and the Hadley Circulation of the Atmosphere," ITC stability calculation undated	22	785
"The Intertropical Convergence Zone and the Hadley Circulation of the Atmosphere," notes undated	22	786

Writings and Lectures

"The Intertropical Convergence Zone and the Hadley Circulation of the Atmosphere," planetary boundary layers at low latitudes in ITZ model undated	22	787
"The Intertropical Convergence Zone and the Hadley Circulation of the Atmosphere," test data undated	22	788
"Global Atmospheric Research Program," lecture--48th Annual Meeting of the American Meteorological Society, San Francisco, California 1968 January 29 to February 1	22	789
"General Circulation of the Atmosphere at Low Latitudes," lecture - space studies laboratory, Valley Forge Space Technology Center 1968 March 1	22	790
"Intertropical Convergence Zone," lecture - Geophysical Fluid Dynamics Laboratory 1968 April 11	22	791
"What Determines the Thickness....," lecture - MIT sack lunch seminar 1968 November 11	22	792
"The Predictability of a Flow Which Possesses Many Scales of Motion," lecture - WMO/IUGG symposium on weather prediction, Tokyo, Japan (photographs) 1968 December	22	793
"What Determines the Depth of the Planetary Boundary Layer in a Neutral Atmosphere?" manuscript 1968	22	794

Writings and Lectures

"Princeton--Twenty Years After," keynote address - GARP symposium and dedication of the Geophysical Fluid Dynamics Laboratory at Princeton University 1969 January 24 to January 25	22	795
"A Further Note on Large-Scale Motions in the Tropics," manuscript and reprint - <i>Journal of Atmospheric Sciences</i> 1969 January	22	796
"Evolution of the Theory of the Global Atmospheric Circulation," lecture - Franklin Institute 1969 February 19	22	797
"Use of Incomplete Historical Data to Infer the Present State of the Atmosphere" (with M. Hamlem and R. Jastrow), reprint, <i>Journal of the Atmospheric Sciences</i> 1969 September	22	798
"What Determines the Depth of the Planetary Boundary Layer in a Neutral Atmosphere," manuscript; Russian language reprint 1969	22	799
"Global Atmospheric Research Program," lecture - Oregon State physics colloquium 1970 April 23 to April 24	22	800
"Observability, Predictability, Acronymity and Satellites," lecture - New York University public lecture series on "Meteorological Measurements from Satellites" 1970 May 11	22	801
"The Spectrum of Geostrophic Turbulence," lecture - geophysical fluid dynamics seminar, MIT 1971 February 5	22	802
"Fluid Dynamic Aspects of the Global Atmospheric Research Program," lecture - Brown University 1971 February 26	22	803

Writings and Lectures

"Geostrophic Dynamics: Cyclones, Fronts, Turbulence and Predictability," lecture - College of Engineering and Center for Applied Mathematics at Cornell University 1971 May 13 to May 14	22	804
"Some Aspects of the ITC, Its Disturbances and Its Interactions with the Oceans," lecture - Woods Hole Oceanographic Institution 1971 June 22	22	805
"The Global Atmospheric Research Program--Now and in the Future," lecture - CDC-7600, dedication at the National Center for Atmospheric Research 1971 August 10	22	806
"Geostrophic Turbulence," manuscript; reprint, <i>Journal of the Atmospheric Sciences</i> 1971 September	22	807
"Geostrophic Turbulence," lecture - State College of New York 1971 November 11	22	808
"A Dynamical Theory of the Formation of Cloud Bands in Tropical Oceans," lecture - Seventh Technical Conference on Hurricanes and Tropical Meteorology, Barbados 1971 December 6 to December 9	22	809
"Tropical Cyclogenesis and the Formation of the Intertropical Convergence Zone," reprint, American Mathematical Society 1971	22	810
"Structure of Wind-driven Equatorial Currents in Homogeneous Oceans," research notes approximately 1971	22	811

Writings and Lectures

"The Impact of Computers on Meteorology," lecture - First European Conference on Computational Physics, "The Impact of Computers on Physics," Geneva, Switzerland 1972 April 10 to April 14	22	812
"Atmospheric Dynamics," lecture - symposium on atmospheric science, American Physical Society, Washington, DC 1972 April 24 to April 27	22	813
"The Applied Physical Sciences," paper presented at the Conference on the Computer and the Development of Science and Learning, Institute for Advanced Study 1972 June 6 to June 8	22	814
"Some Further Considerations on the Scales of Atmospheric Motions," lecture - UCLA 1972 July 17	22	815
"Geostrophic Turbulence," lecture - Norske Geophysisk Forenning, Nesbyen, Norway 1972 October 6	22	816
"Geostrophic Turbulence," lecture - DAMPT seminar 1972 October 13	22	817
"Geostrophic Turbulence," lecture, Bristol University 1972 November 13	22	818
"A Poor Man's View of the Mean Circulation of the Lower Atmosphere," lecture - Clarendon Laboratory, Oxford, England 1972 November 15	22	819
"CISK, Movable CISK and Related Matters," lecture - Imperial College, London 1972 December 13	22	820
"Tropical Convection," lecture - DAMPT, GFD group 1972 December	22	821

Writings and Lectures

"Impacts of Computers on Meteorology," reprint, <i>Computer Physics Communication</i> 1972	22	822
"Geostrophic Turbulence," lecture - University of Oslo 1973 January 17	22	823
"Inertial Instability of Asymmetric Flow," lecture - University of Oslo 1973 January 18	22	824
"How Predictable Is Weather?" lecture - Cambridge Philosophical Society 1973 January 29	22	825
"Two-Dimensional Turbulence," lecture DAMPT, Cambridge University 1973 January 29	22	826
"Movable CISK," reprint, <i>Journal of Atmospheric Sciences</i> 1973 January	22	827
"Impact of Computers on Meteorology and Oceanography," lecture - Weizmann Institute 1973 March 19	22	828
"The Dynamics of Deserts," lecture - University of Tel Aviv Environmental Science Department and Israel Meteorology Office 1973 May 10	22	829
"Prediction of Turbulent Motion," lecture - Texas A&M University 1973 November 9	22	830
Reply, reprint, <i>Journal of Atmospheric Sciences</i> 1974 April	22	831

Writings and Lectures

"Weather, Climate and Hydrodynamic Stability," the John Von Neumann Lecture - Society for Industrial and Applied Mathematics 1974 June 25	22	832-833
"Drought in the Sahara: A Bio-Geophysical Feedback Mechanism," manuscript 1974	23	834
"Dynamics of Deserts and Drought in the Sahel," manuscript; reprint, GARP Publications Series, No. 16 1974	23	835
"Drought: A Biophysical Feedback Mechanism," lecture - meeting on weather-food interactions, MIT 1975 May 9 to May 11	23	836-837
"Dynamic and Equilibrium Problems in Climatology," lecture - International Institute for Applied Systems Analysis, Schloss Laxenburg, Austria 1975 July 21	23	838
"Evidence of Baroclinic Instability," lecture - Harvard University Seminar 1975 October 16	23	839
"Biogeophysical Feedback Mechanisms in Arid Lands," lecture - Symposium on Arid Zone Development, American Academy of Arts and Sciences, Boston, Massachusetts 1975 October 23 to October 25	23	840
"Planetary Fluid Dynamics," photocopy - <i>Dynamic Meteorology</i> (ed. P. Morel), D. Reidel Publishing Co. 1975	23	841
"Drought in the Sahara: Insufficient Biogeophysical Feedback?" (with P. Stone, W. Quirk), reprint, <i>Science</i> 1976 January	23	842

Writings and Lectures

"The Dynamics of Desert and Desert Margins," Andrew Thompson lecture - Toronto, Canada 1977 March 3	23	843
"Hydrodynamic Instability, Weather and Climate or the Prevalence of Instability in the Atmosphere," lecture 1977 March 4	23	844
"Atmospheric Motion: Theories and Applications," lecture - Lowell Institute Lecture Series 1977 March 24	23	845
"A Comparative Study of the Effects of Albedo Change on Drought in Semi-Arid Regions" (with W. Quirk, S. Chow, J. Kornfield), reprint, <i>Journal of the Atmospheric Sciences</i> 1977 September	23	846
"Predictability of Monsoon Circulations," lecture - Joint International Union of Theoretical and Applied Mechanics and the International Union of Geodesy and Geophysics International Symposium on Monsoon Dynamics, New Delhi, India 1977 December 5 to December 9	23	847
"A Study of the Dynamics of the ITCZ in a Symmetric Atmosphere- Ocean Model" (with E. Kalnay, E. Schneider, J. Shukla), paper presented at Joint IUTAM/IUGG Symposium on Monsoon Dynamics, New Delhi, India 1977 December 5 to December 9	23	848
"Biogeophysical Feedback Mechanism in Arid Lands," photocopy of chapter from <i>Arid Zone Development</i> , Ballinger Publishing Company 1977	23	849
"Symmetric and Quasisymmetric Models of Ocean Circulation," lecture approximately 1977	23	850

Writings and Lectures

"The Factors Determining the Nature of the ITCZ and Monsoon Circulations in Interactive Axisymmetric Atmosphere-Ocean Models" (with E. Rivas, E. Schneider, J. Shukla), manuscript 1977	23	851
Seminar on long-period, large-scale variability and predictability, lecture notes, UCLA 1978 spring	23	852
"Resonant Instability and Self-Excited Oscillation of Topographically Forced Planetary Wave Systems," lecture - Scripps Institution 1978 June 2	23	853
Untitled lecture, E.G.S., Strasbourg, Germany 1978 August 29	23	854
"Rossby Waves and Stability Revisited," lecture, Conferences on Atmospheric and Oceanic Waves and Stability; Meteorology of the Upper Atmosphere, Boston, Massachusetts 1978 October 25	23	855
"Multiple Flow Equilibria in the Atmosphere and Blocking" (with J. DeVore), reprint, <i>Journal of the Atmospheric Sciences</i> 1979 July	23	856
"Form-Drag Instability, Multiple Equilibria and Propagating Planetary Waves in Baroclinic, Orographically Forced Planetary Wave Systems" (with D. Straus), reprint - <i>Journal of the Atmospheric Sciences</i> 1980 June	23	857
"The Spectroscopy of Atmospheric Motions," lecture - Center for Earth and Planetary Physics Colloquium, Harvard University 1981 March 18	23	858
"Comparison of a Barotropic Blocking Theory with Observations" (with J. Shukla, K. Mo), reprint, <i>Journal of Atmospheric Science</i> 1981 March	23	859

Research Materials

"Predictability of Monsoons" (with J. Shukla), reprint, <i>Monsoon Dynamics</i> (Cambridge University Press) 1977, 1981	23	860
"The Applied Physical Sciences" (with W. Munk), manuscript undated	23	861
"Formation of Tropical Depressions," manuscript undated	23	862
"Future of Numerical Modeling," lecture undated	23	863
"A Numerical Model of Thermal Convection in the Atmosphere" (with Y. Ogura) undated	23	864
"On Numerical Weather Prediction," manuscript undated	23	865
"On the Absence of an Energy Cascade in Quasi-Geostrophic Motions of the Atmosphere and Oceans," manuscript and research notes undated	23	866
"Some Remarks on Numerical Forecasting," lecture undated	23	867
Untitled lecture undated	23	868
Untitled manuscript undated	23	869
Untitled manuscript undated	23	870

Series 5. Research Materials 1949-1977

Scope and contents note

Research Materials

Series 5 is research files assembled by Charney consisting of notes, calculations, correspondence, manuscripts, reprints, and diagrams. Arranged alphabetically by topic or title.

The material in this series has been kept to preserve a record of Charney's research methods. Most of the research materials, especially from his Princeton years, was maintained in folders in a filing cabinet. This material consisted primarily of calculation and notes. Later, Charney organized his research material by topics in green boxes (known as Princeton files). Older material from diverse projects was brought together as Charney typically gathered correspondence with colleagues, reprints by himself and others, computations, drafts of articles, and data. Manuscripts and correspondence about the new article was then filed with the older records.

The majority of the undated research files are apparently associated with work undertaken by Charney at Princeton's Institute for Advanced Studies. Included are papers relating to Charney's collaboration with John von Neumann to solve meteorological equations by electronic computer (for example, see "Meteorological Noise, 1949," box 25, folder 1007).

An insight into Charney's intellectual processes can be gathered from the papers associated with "Dynamics of deserts" (box 24, folders 926-927). While on sabbatical leave at the Weizmann Institute in Israel in 1973, Charney began to develop a dynamical theory of deserts. He suggested that the borders of some deserts could be shifted by human activity and the drought at the southern edge of the Sahara Desert (the Sahel) could have been caused by overgrazing. Material relating to his desert research includes reports, correspondence, simulation experiment data, manuscripts, lecture notes, and reprints by researchers other than Charney. His investigations led to numerous publications and lectures during the period 1973 to 1979 (see Writings and Lectures Series).

"Dynamics of deserts," a Princeton file, contains all the materials Charney originally gathered including the reprints by himself and others. Most reprints not authored by Charney have been removed from "Hurricanes" (box 24, folders 981-988), and Charney's manuscript "The dynamics of a mature hurricane" has been removed and placed in the Writings and Lectures Series (box 21, folder 714). Two other files, "The intertropical convergence zone and the Hadley circulation of the atmosphere" (box 22, folders 781-782) and "Predictability of monsoons" (box 27, folders 1045-1946) have had the majority of unannotated reprints removed.

	Box	Folder
Absolutely stable computational method undated	23	871

Research Materials

Adjustment of unbalanced current undated	23	872
Advective-baroclinic model undated	23	873
Analysis of solution of primitive equations for single-layer atmosphere undated	23	874
Anderson's (Charley) publication undated	23	875
Another invariant integral in the non-linear string problem undated	23	876
Applications of Riemann's method to second and third order barotropic equations undated	27	877
General note		
This folder is oversized.		
Approximation of vertical velocities in a baroclinic wave undated	23	878
Available entropy undated	23	879
Balance equation model 1960-1964	23	880
Balance equations 1955-1956	23	881
Balance equations 1971-1977	23	882

Research Materials

Balance equations in general circulation undated	23	883
Balance equations, Properties of undated	23	884
Baroclinic pilot model undated	27	885
General note		
This folder is oversized.		
Baroclinic stability undated	23	886
Baroclinic waves, $u=V_0 + \text{##}$ undated	23	887
Baroclinic waves $W\#O$ undated	23	888
Barotropic-baroclinic instability 1960, undated	23	889
Barotropic, baroclinic instability of the Gulf Stream 1961	23	890
Barotropic model, Roundoff errors in undated	23	891
Barotropic-perturbation theory for flow of jet over mountain undated	23	892
Barotropic pilot model effect of end conditions undated	23	893
Barotropic waves of finite amplitude undated	23	894

Research Materials

Barotropic waves in two translating layers undated	23	895
Boundary conditions for vorticity equation (letter from John Von Neumann) 1950 March 22	23	896
Boundary value problem for Navier-Stokes equation and Numerical integration at the boundary of the oceans undated	23	897
Burger's method applied to two-layer atmosphere undated	23	898
Calculation of parameters of 2-dimensional baroclinic model undated	24	899
Calculations for Hide parameters altered 1954, undated	24	900
Collitz condition in five-layer model undated	24	901
Computation of equivalent barotropic model undated	24	902
Computation of influence function undated	27	903
General note		
This folder is oversized.		
Computation of # (#) 1960	24	904
Computational stability for vorticity equation undated	24	905
Computing schemes for general equation undated	27	906

Research Materials

General note**This folder is oversized.**

Confluent hypergeometric function; solution of frequency equation for baroclinic waves undated	24	907
Consistent formulation of quasi-geostrophic equations applicable to planetary motions - vertical propagation undated	24	908
Constants for current relaxation calculations undated	24	909
Convergence of Liebmann Process for elliptic equations with mixed terms undated	24	910
Convergence of relaxation procedures; relaxation method undated	24	911
Cromwell current 1965 - 1967, undated	24	912
Cromwell current, Original work on undated	24	913
Curves and phase and group velocity undated	27	914

General note**This folder is oversized.**

Derivation of linearized simplified equations undated	24	915
Derivation of non-linear baroclinic equation in p undated	27	916

Research Materials

General note**This folder is oversized.**

Derivation of two-layer model from primitive equations 1955, undated	24	917
Deserts, Early work on 1973	24	918-919
Determination of initial winds from temperature and its time derivations 1969, undated	24	920
Determination of u, v and # from observations to satisfy balance equation undated	24	921
Difficulty in using primitive equations undated	24	922
Dimensionality of atmospheric motions undated	24	923
Displacement of hurricanes undated	24	924
Dynamic stability and maintenance of the Westerlies 1949, undated	27	925

General note**This folder is oversized.**

"Dynamics of Deserts," Chicago lecture 1975 February 7	24	926
"Dynamics of Deserts," convective boundary layer, reprints 1960-1967	24	927

Research Materials

"Dynamics of Deserts," Cornejo (?) calculations of meridional circulation undated	24	928
"Dynamics of Deserts," correspondence and reprints 1975, undated	24	929
"Dynamics of Deserts," Symons Memorial Lecture 1974	24	930
"Dynamics of Deserts," early diagrams for article undated	24	931
"Dynamics of Deserts," notes for JAS desert article undated	24	932
"Dynamics of Deserts," North Africa dynamics undated	24	933
"Dynamics of Deserts," North Africa-Mediterranean experiment, winter undated	24	934
"Dynamics of Deserts," Old visual material on GISS desert calculations undated	24	935
"Dynamics of Deserts," satellite radiation measurements 1974	24	936
"Dynamics of Deserts," University of California at Los Angeles, lecture 1976 August	24	937
Effect in Gulf Stream of slope of continental slope undated	24	938
Effect of Gravity Motions undated	27	939

General note

Research Materials

This folder is oversized.

Effect of heat transfer into intermediate water 1979	24	940
Effect of inertial instability on generation of shocks, frontogenesis undated	24	941
Effect of variable emissivity undated	24	942
Ekman layer in wave motion 1968 September 30	24	943
Elimination of noodling 1955, undated	24	944
Empirical law for velocity distribution in atmosphere undated	24	945
Energy estimates for forecasts with the cut-off influence function undated	24	946
Energy integral for sound filter undated	24	947
Ergodic character of atmospheric flow; Continuation of motion (?) from small (?) (indecipherable) undated	24	948
Evaluation of infinite function by method of stationary phase undated	24	949
Exact one-dimensional barotropic equation undated	24	950
Five-level model (Shuman) undated	24	951

Research Materials

Five-level p integration with Q-carrying history, program for Gambo-Shuman undated	24	952
Fixed points, limit cycles and climate undated	24	953
Forces on vortices undated	24	954
Forces on vortices in three dimensions undated	24	955
Fourier analysis of pressure at 45° latitude; energy spectrum undated	24	956
Fourier method for solving barotropic equations undated	24	957
Frankel's criterion for periodic boundary conditions undated	24	958
Friction in a stable atmosphere 1968, undated	24	959
Frictionally and thermally driven circulations of various kinds 1967, undated	24	960
Frontal stability 1953, undated	24	961
Fronts 1964	24	962
General baroclinic model, Program for (basic considerations) 1951, undated	24	963
General circulation undated	24	964

Research Materials

General circulation undated	24	965
General quasi-geostrophic equation in isentropic coordinates, Program for 1953	24	966
General quasi-geostrophic model and equation; Preservation (?) of (indecipherable) of equation undated	24	967
General solution for baroclinic waves undated	24	968
Generation of noise in a single-layer ocean undated	24	969
Geostrophic adjustment in wind currents in stratified ocean-work with (George) Veronis undated	24	970
Geostrophic approximation undated	24	971
Geostrophic approximation as power series expansion undated	24	972
GOS plan, Notes for 1964, undated	24	973
Gravitational waves undated	27	974
General note		
This folder is oversized.		
Group velocities undated	27	975

Research Materials

General note**This folder is oversized.**

Halem-Spinelli work undated	24	976
Heating computations undated	24	977
Higher geostrophic approximations--stability theory undated	24	978
Hough's solution for tides of second kind in equation undated	24	979
Hunt - Estimates for one-dimensional barotropic forecast undated	24	980
Hurricanes: calculations for stationary hurricanes undated	24	981
Hurricanes: early work on hurricanes 1955, undated	24	982
Hurricane boundary layer, notes undated	24	983
Hurricane graphs undated	24	984
Hurricanes: iterative solution of elliptical-hyperbolic system undated	24	985
Hurricanes, notes 1963, undated	24	986
Hurricanes: Non-steady hurricanes, notes 1958, undated	24	987

Research Materials

Hurricanes: steady-rate hurricane motion equation 1962	24	988
Hurricanes: implicit integration method - von Neumann undated	24	989
Incorporation of heat sources in barotropic atmosphere undated	24	990
Iterative process for solving hydrodynamical equations undated	24	991
Inertial instability 1973, undated	24	992
Inertial waves in barotropic atmosphere undated	25	993
Influence region for tendencies--empirical undated	25	994
Integration of Lagrangian equations 1955, undated	25	995
Integration of primitive equations undated	25	996
Integration of primitive equations for barotropic models undated	25	997
Interaction between perturbation and mean flow undated	25	998
Jet in rotating two-dimensional fluid undated	25	999
Kibel, Ilya A. undated	25	1000
Knauss expedition to Indian Ocean 1962 July 21 to September 2	25	1001

Research Materials

Kuo's paper on atmospheric vortices undated	25	1002
"Laboratory studies in geophysical fluid dynamics," by R. Hide, typewritten essay 1964	25	1003
Large-scale flow near equator 1961, undated	25	1004
Lateral signal velocity undated	27	1005
General note		
This folder is oversized.		
Limitations on group velocities by finiteness of earth undated	25	1006
Meteorological noise 1949	25	1007
Meteorological noise 1960-1972	25	1008
Method of slowing gravitational waves without changing large-scale motions in baroclinic atmosphere undated	25	1009
Method of solution of Poisson's equation for possible use for general quasi-geostrophic equation undated	25	1010
Miscellaneous ideas and outlines for papers (old) undated	27	1011

General note

Research Materials

This folder is oversized.

Miscellaneous research notes 1962 to 1967, undated	25	1012
Miscellaneous research notes 1980, undated	25	1013
Miscellaneous research notes undated	25	1014
Motion of jets undated	25	1015
Motion of sunspots 1964	25	1016
Movable CISK 1974, undated	25	1017
Multiple equilibria with real topography 1979	25	1018
Non-linear general circulation model undated	25	1019
Numerical evaluation of one-dimensional influence function undated	25	1020
Numerical schemes for solving vorticity equation undated	25	1021
Numerical solution of equation for equivalent barotropic atmosphere undated	27	1022
General note		
This folder is oversized.		

Research Materials

Numerical solution of primitive equations undated	25	1023
Objective analysis undated	25	1024
Ocean-atmosphere coupling 1970-1976, undated	25	1025
Ocean circulation calculations undated	25	1026
Ocean transients undated	25	1027
Ocean vortices undated	25	1028
Oceanography, Miscellaneous ideas on 1955, undated	25	1029
Oceans and tropical meteorology geostrophic calculations 1964, undated	25	1030
Order of magnitude of meteorological quantities undated	25	1032
One-dimensional model of atmosphere-solid earth interaction undated	25	1031
Oscillations of a rotating two-layer ocean undated	25	1033
Oseen and similarity solutions; rigid versus free surfaces (original folder untitled) undated	25	1034
p## conversion in balance equation model undated	25	1035

Research Materials

Phillips - Divergence, vorticity and balance equation on a stereographic projection undated	25	1036
Physical stability computations undated	25	1037
Platzman method applied to baroclinic model undated	27	1038
General note This folder is oversized.		
Platzman's solution of finite differentials, barotropic equation undated	25	1039
Positive definite character of matrix in $2+(n-1 \div n)$ dimensional model undated	25	1040
Possibility of using the primitive equations in the baroclinic case undated	25	1041
A possible two-level model 1957 October 21	25	1042
Predictability calculations 1964	25	1043-1044
Predictability of monsoons: correspondence, reprints 1974-1978	25	1045-1046
"Preliminary report on the prognostic value of barotropic models in forecasting of 500 mb height changes," by staff members of the Institute of Meteorology, University of Stockholm undated	25	1047
Proof that $S\#(1\ddot{i}_c^{1/2}PF)\#^2_p$ undated	27	1048

Research Materials

General note**This folder is oversized.**

Propagating condensation front 1951, undated	25	1049
Propagation of momentum and gravity waves in ocean and atmosphere undated	25	1050
Quasi-geostrophic flow with condensation undated	25	1051
Radiometric measurements 1963-1964	25	1052
Rossby--general circulation undated	25	1053
Relaxation of ENIAC-von Neumann undated	25	1054
Sea-breeze and mountain and valley winds undated	25	1055
Second order geostropic approximation undated	25	1056
Seychelles Islands 1964-1975	25	1057
Shear advective baroclinic stability undated	25	1058
Signature of tendency equation with second geostropic approximation undated	25	1059
Similarity and scale in planetary motion undated	25	1060

Research Materials

Simple derivation of change in circulation due to advection of mean vorticity in baroclinic fluid undated	25	1061
Simplified tendency calculations with two-level models undated	25	1062
Smoothed topography (Smagorinsky) undated	25	1063
Solberg's lecture undated	25	1064
Solution of linear systems and equations - von Neumann paper	25	1065
Solution of the simplified barotropic equation for a small time interval undated	27	1066
General note This folder is oversized.		
Source-sink flow in cylinders undated	25	1067
Source-sink flow in rotating spherical annulus undated	25	1068
Smagorinsky predictability calculation 1964, undated	25	1069
Speed of gravity waves in medium with $U=U(\#)$ undated	27	1070
General note This folder is oversized.		

Research Materials

Stability criterion by energy methods undated	25	1071
Stability of asymmetric flow with negative absolute vorticity 1960, undated	25	1072
Stability of Couette flow for three-dimensional disturbances undated	25	1073
Stability of equatorial jet 1973, undated	25	1074
Stability of gulf stream 1961, undated	25	1075
Stability of shear flow in a rotating compressible system undated	25	1076
Stability of stratosphere 1959 to 1960, undated	26	1077
Stability of three-layer model undated	26	1078
Storm of November 1950	26	1079
Symmetric circulation undated	26	1080
Symmetric instability 1964-1977	26	1081
Theory of atmospheric conduction undated	26	1082
Thermodynamics and radiation charts undated	26	1083

Research Materials

Three-dimensional forecast problem (preliminary) undated	26	1084
Transient motions in bounded oceans undated	26	1085
Troposphere-stratosphere interaction undated	26	1086
Turbulent heat transfer undated	26	1087
Turbulent mixing and the Richardson number undated	26	1088
Turning of vortex tubes and non-geostrophic advection of-# undated	26	1089
Two and one half dimensional manuscript, Notes and calculations for undated	27	1090
General note		
This folder is oversized.		
Two and one half dimensional model undated	26	1091
Two and one half dimensional model stability undated	26	1092
Two-level models for long-range prediction undated	26	1093
Two-level models with mountains undated	26	1094
Uniqueness of vorticity undated	26	1095

Research Materials

Untitled 1962, undated	26	1096
Untitled 1963, undated	26	1097
Upper atmosphere perturbations produced by trapped particles 1960, undated	26	1098
Variable grid 1964	26	1099
Varying zonal current undated	26	1100
Verifications for 2 and 2½ dimensional forecasts undated	26	1101
(indecipherable) of vertical differences 1950, undated	26	1102
Vertical propagation in a baroclinic atmosphere undated	26	1103
Vertical propagation of heat and momentum undated	26	1104
Vertical velocities and pressure tendencies undated	26	1105
Vortex forces in curved 2-D flow undated	26	1106
Is vorticity the only invariant in two-dimensional incompressible motion undated	26	1107
Waves in barotropic fluid--horizontal shear undated	26	1108

Articles by Others

Waves of finite lateral extent undated	27	1109
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General note**This folder is oversized.**

Work on journal manuscript undated	26	1110
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Zonal stratosphere circulation and Berson westerlies (easterlies?) undated	26	1111
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Folder heading indecipherable undated	26	1112
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Series 6. Articles by Others 1921-1981**Scope and contents note**

Series 6 includes reprints, lectures, and unpublished manuscripts about atmospheric sciences sent to Charney by the authors. It is arranged alphabetically by author's last name. Papers are mostly in English with a number in Russian and a few in French, German and Chinese. Authors of articles include important meteorologists and climatologists such as Vilhelm Bjerknes, John Sawyer, Arnt Elliasen, Kirill Kondratiev, and Hubert Lamb.

Box

Adem, Julian 1960	29
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Alexander, R.C. 1967	29
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Aranson, Geirmundur 1966 May	29
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Articles by Others

Barricelli, Nils Aall 1943-1967	29
Berkofsky, Louis 1955	29
Berson, F.A. (Felician, Andrzej) 1949-1950	30
Bjerknes, Jacob 1935-1957	29
Bjerknes, Vilhelm 1954	29
Blinova, E.N. 1953-1956	29
Bolin, Bert 1952-1955	29
Chen-Chao, Koo 1957	29
Danielsen, Edwin 1975	29
Davis, L.G. 1968 April 28 to May 1	29
Dedecker, P. 1950	
	Box
Defant, A. 1939	29
Dobryshman, E.M. 1963	29

Articles by Others

Eagleson, Peter S. 1978	29
Eliassen, Arnt 1962-1968	29
Elliot, Robert 1946	29
Elsasser, Walter 1949	29
Estoque, Mariano, A. 1951	29
Flohn, Hermann 1950-1956	29
Fofonoff, N.P. 1975 May 29	29
Fong, Peter 1977-1978	29
Frenkiel, F.N. 1948	29
Gadd, Alan J. 1975	30
Gambo, Kanzaburo 1961	30
Gandin, L.S. 1965	29
Gray, William 1972	29
Hayes, F.R. undated	30

Articles by Others

Hide, Raymond 1967	29
Hoiland, Einar 1939-1942	29
Holmboe, Jorgen 1962	29
Hovmoller, Ernest undated	29
Jih-Ping, Chao 1957	29
Jonas, P.R. 1979	29
Kiebel, I.A. 1955	29
Kondratiev, K. Ya. (Kirill Yakovlevich) 1969	29
Koschmieder, E.L. 1968	29
Kotschin, N. 1932	29
Kraus, E.B. 1961	29
Lamb, H.H. (Hubert Horace) 1977	29
Lilley, Edward R. 1972	29
Lorenz, Edward 1975-1977	29

Articles by Others

Malkus, J. 1963	29
Marchuk, G.I. (Gury Ivanovich) 1964-1968	29
Margules, Max 1970	29
Masuda, Y. 1960	29
Mintz, Yale 1974	29
Miyakoda, Kikuro 1974	29
Monin, A.S. (Andrei Sergeevich) 1952-1974	29
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Nemchinov, S.V. undated	29
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Priestley, C.H.B. (Charles Henry Brian) 1966	29
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Rossby, C.G. 1939-1958	29
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Woods, J.D. 1972	31
Wurtele, M.G. 1960	31
Yoshida, Kozo 1956	31
Yung-San, Chen	31
Zilitinkevitch, Sergej 1968	29
Mathematical equations undated	31