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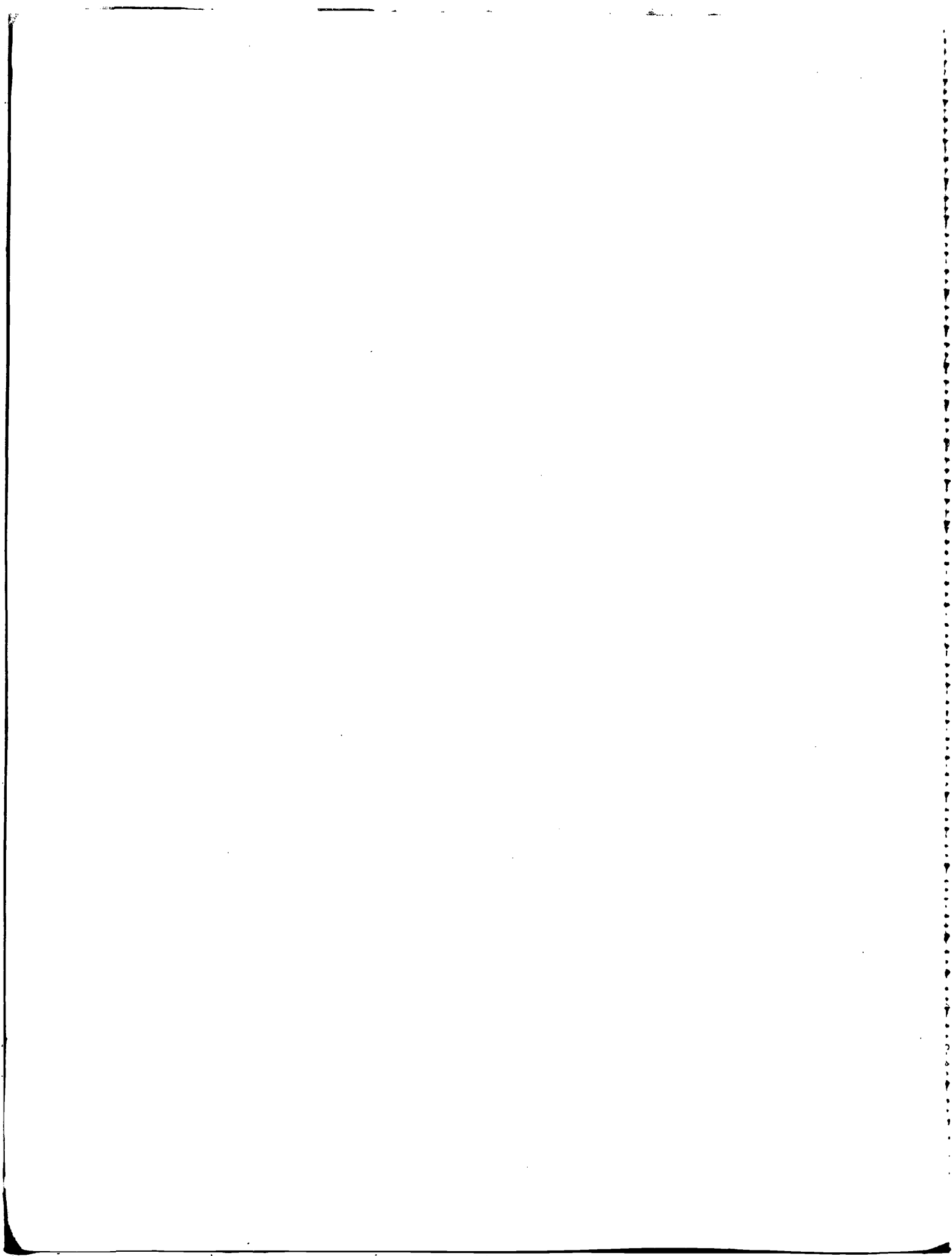
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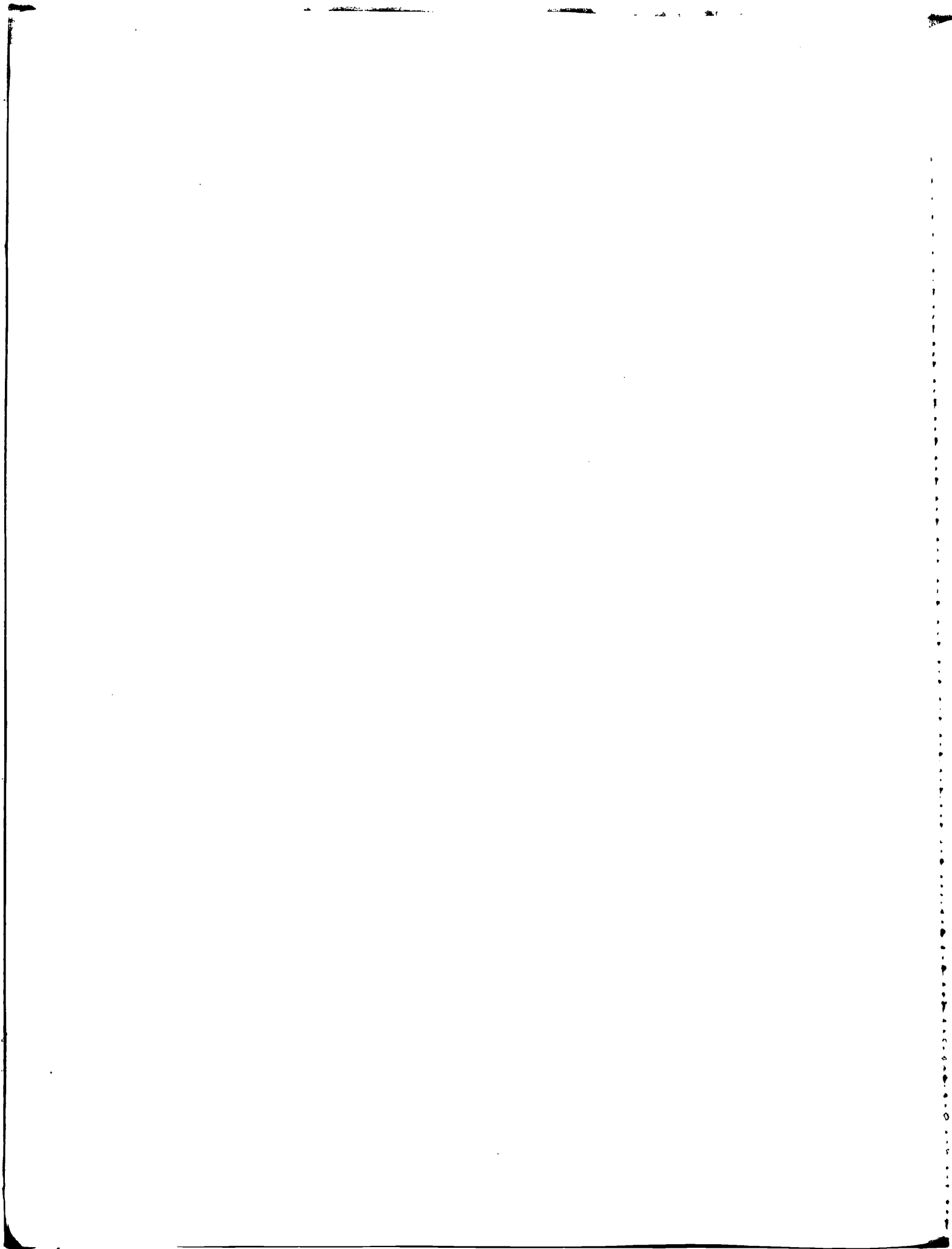
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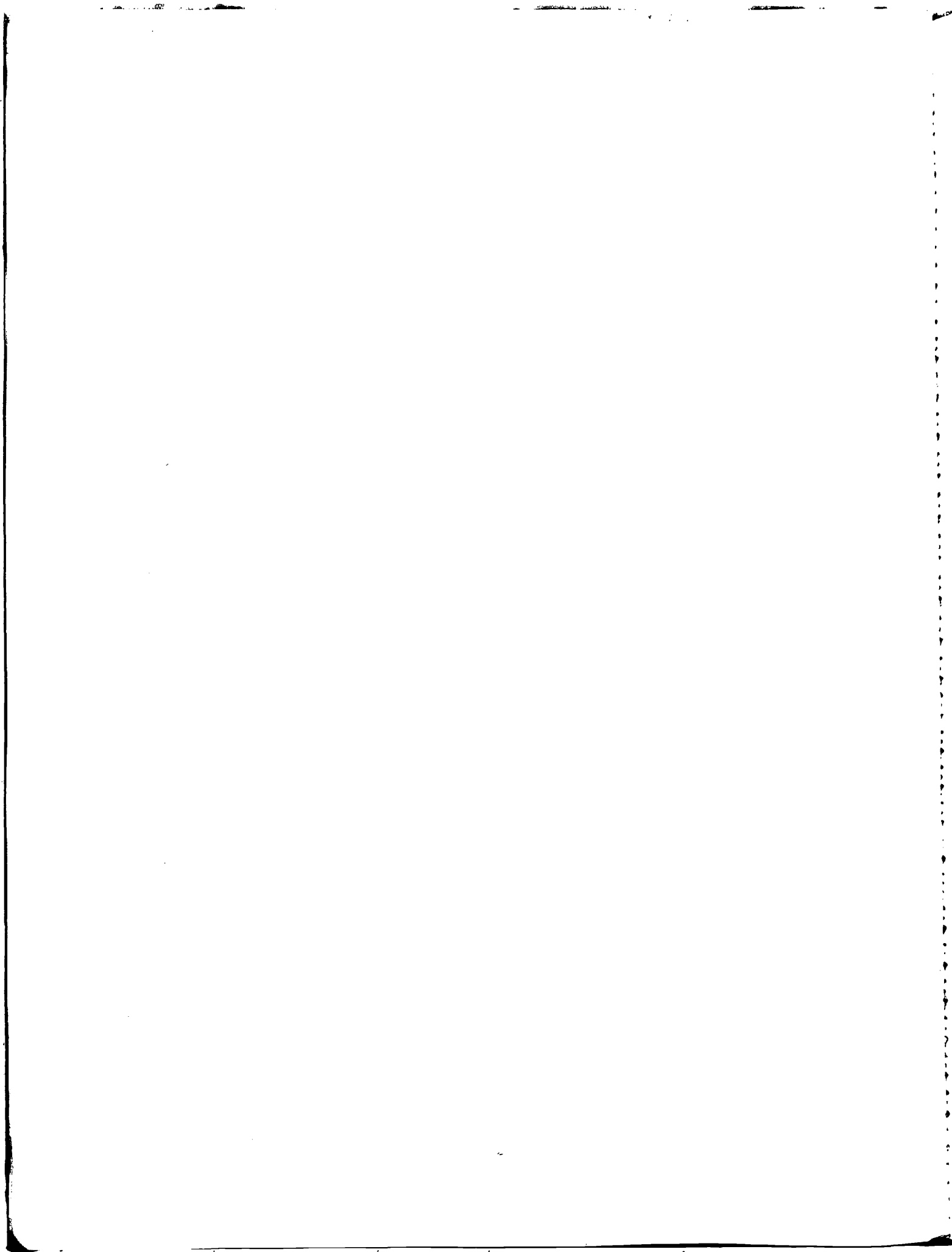
to

Julius Shiskin

1912 - 1978

Commissioner of the Bureau of Labor Statistics; former Chief Statistician, Office of Management and Budget; and former Assistant Director and Chief Economic Statistician, Bureau of the Census.

While at the Census Bureau, he developed the "X-11" program that permitted seasonal adjustment of time series data on a large scale with relative ease and accuracy.



PREFACE

Significant progress has been made in seasonal adjustment techniques over the past 25 years. Earlier efforts at the National Bureau of Economic Research and by others in deseasonalizing data were severely hampered by an inability to easily analyze and process large volumes of data. Pioneering efforts by the Bureau of the Census in utilizing computer technology provided the needed breakthrough to permit development and application of complex seasonal adjustment and analysis models in national statistical programs.

Continuing growth and widespread use of seasonal analysis techniques, and the dominant employment for this purpose for more than 20 years of the Census Bureau's X-11 computer programs, led to the conclusion that it was time to consider new approaches that might enhance the accuracy and usefulness of seasonally adjusted data. As a result of their experience in this field, it was appropriate in light of this objective that the National Bureau of Economic Research and the Bureau of the Census cosponsor a conference on Seasonal Analysis of Economic Time Series. The conference was held September 9-10, 1976, in Arlington, Va. In addition to discussions of methodology and practical applications, the conference permitted an exchange of ideas among those with extensive experience in the field.

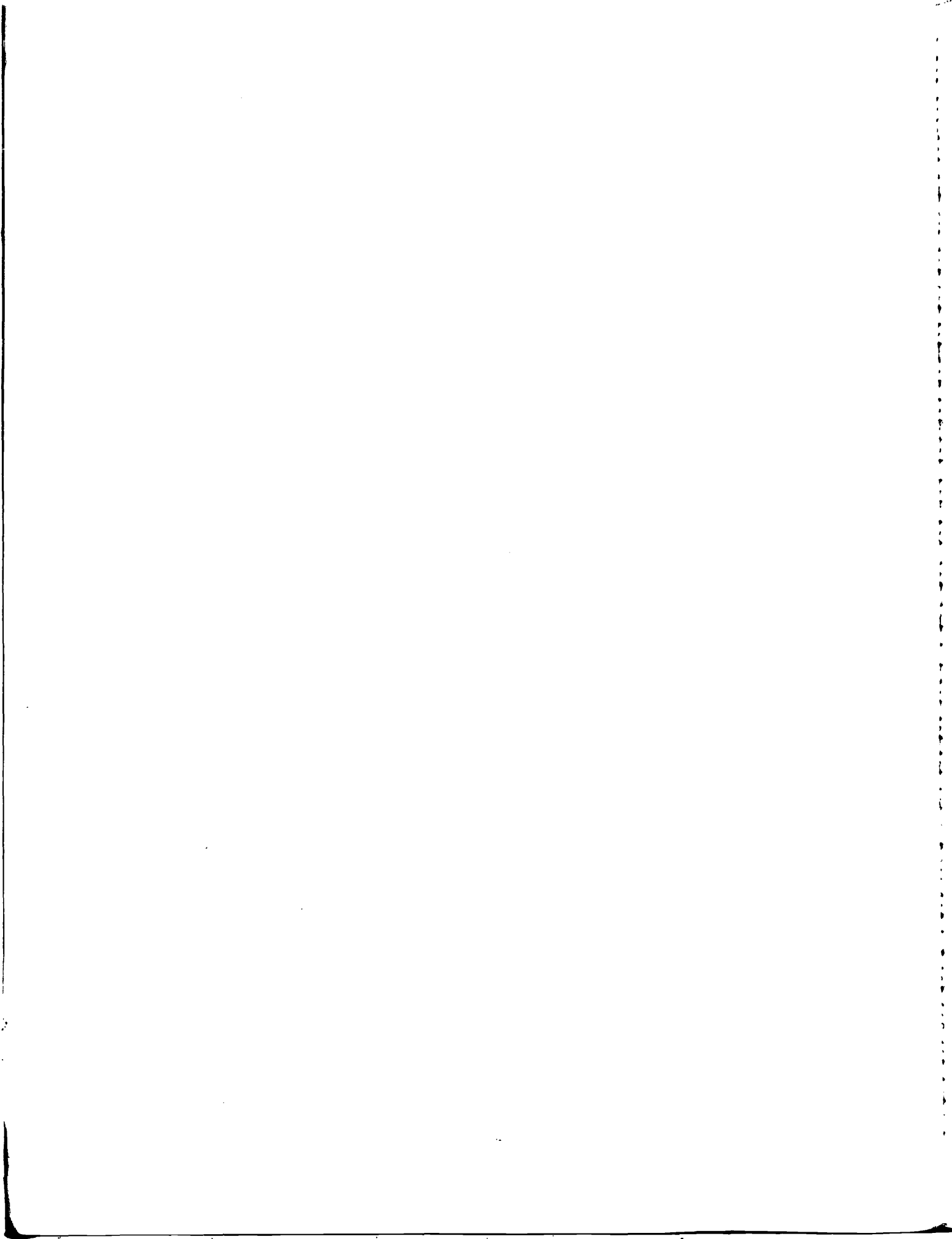
This volume contains the conference papers and discussions of the papers by recognized experts. We are indebted to the authors and discussants for the high quality of papers presented and to the contribution they made to time series analysis.

The conference benefited from a Steering Committee composed of—

Arnold Zellner, Chairman	University of Chicago
Elmer Biles	Bureau of the Census
William S. Cleveland	Bell Laboratories
Robert F. Engle	University of California
A. L. Finkner	Bureau of the Census
Gary Fromm	National Bureau of Economic Research
W. Bruce Gabbittas	E.I. DuPont de Nemours and Company
C.W.J. Granger	University of California
E. Philip Howrey	University of Michigan
Shirley Kallek	Bureau of the Census
Michael C. Lovell	Wesleyan University
Charles R. Nelson	University of Washington
Julius Shiskin	Bureau of Labor Statistics
George C. Tiao	University of Wisconsin
Donald G. Watts	Queens University

Particular thanks to **Gary Fromm**, who worked with the Bureau in shaping the format of the conference, and to **Arnold Zellner**, who served as chairman of the Conference Steering Committee and was the technical editor for this volume. To all who participated in the conference and others who assisted the project, the Bureau of the Census is extremely grateful.

Shirley Kallek
Associate Director for Economic Fields
Bureau of the Census



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OPENING STATEMENT

The present volume reports the proceedings of the Conference on the Seasonal Analysis of Economic Time Series held in Washington, D.C., Sept. 9-10, 1976, under the sponsorship of the National Bureau of Economic Research and the Bureau of the Census. Included in the volume are papers and prepared discussions presented at the conference. In addition, a written version of Julius Shiskin's keynote address, several contributed comments, and authors' responses to discussants' points are incorporated in the volume. The volume's papers were selected by the Conference Steering Committee in late 1975 on the basis of abstracts that authors submitted and were prepared specially for the conference. In some cases, initial versions of papers presented at the conference have been revised for this volume to reflect the results of interactions among authors, discussants, and others attending the conference.

The main objectives of the conference were to provide greater understanding of current and new methods of seasonal analysis and adjustment and to attempt to determine how procedures currently in use could be improved. Given these objectives, the Conference Steering Committee structured the program to begin with a consideration of the objectives and philosophy of seasonal analysis and adjustment and then to proceed to a review of seasonal adjustment procedures in use. From this topic, the program incorporated papers dealing with suggested improvements to procedures in use, new modes of seasonal analysis and adjustment, seasonality and econometric modeling, and aggregation problems. After reading the contributions in the present volume, the reader can decide for himself the extent to which the objectives of the conference have been realized.

Shirley Kallek and Gary Fromm played a key role in originating the idea of holding a conference on seasonal analysis and in arranging the Census Bureau's financing of the conference. Elmer Biles and his staff at the Census Bureau provided invaluable assistance with arrangements for the conference. Shirley Black of the H.G.B. Alexander Research Foundation, University of Chicago, was extremely helpful in dealing with the voluminous correspondence connected with the conference and in preparing the manuscript for publication. Finally, the contributions of members of the Steering Committee, authors, discussants, and other participants that made for a most constructive and useful conference meeting are deeply appreciated.

Arnold Zellner
University of Chicago



**Criteria and
Framework
of Seasonal
Analysis**