SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

Agenda

1. Call to order
2. Notification of filing of Articles
3. Adoption of By-Laws
4. Election of directors to vacancies
5. Election of officers of the Board of Trustees
6. Election of officers of the Corporation
7. Authorization of President to appoint Committees on
   (a) Finance
   (b) Selection of Managing Director
   (c) Housing of Foundation staff
8. Notification of Committee appointments
9. Consideration of a Policy Statement from the Foundation to the public
10. Other matters
11. Adjournment

McCone, ch
Banks
Carter
Ortmayer
Roach

Call, ch
Allen
Ladd
Buchanan

Braunschweig, ch
Nagler
Winnett
Mudd
Shelton

Tentative Draft - November 23, 1953

PURPOSE OF THE SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

An independent, nonprofit corporation has been established for the following purposes:

1. To cooperate with, and to assist in coordinating the efforts of, governmental agencies, educational institutions, specialized research groups, and medical, legal, and other technologists, so that every phase of air pollution shall be the object of careful study and constructive, remedial action.

2. To provide for the conduct of research on those phases of the problem not already undertaken or completed by other agencies.

3. To inform the public periodically concerning the nature and extent of air pollution, progress made in its elimination, and obstacles to such elimination.

ORGANIZATION OF THE FOUNDATION

The Board of Trustees of the Foundation is composed of the following persons:

Fred D. Fagg, Jr., President, University of Southern California, President of the Foundation
Stephen Royce, President and Manager, Huntington Hotel, Pasadena, Vice-President of the Foundation
James Shelton, President, Security First National Bank, Treasurer of the Foundation
Raymond B. Allen, Chancellor, University of California at Los Angeles
F. Marion Banks, President, Southern California Gas Company
Arnold O. Beckman, Pres. Arnold O. Beckman, Inc.
Walter Braunschweiger, Executive Vice-President, Bank of America
Asa V. Call, President, Pacific Mutual Life Insurance Company
Edward W. Carter, President, Broadway Department Stores, Inc.
Lee DuBridge, President, California Institute of Technology
Roy M. Hagen, President, California Consumers Corporation
John A. McCone, President, Joshua Hendy Corporation
Harvey Mudd, President, Cyprus Mines Corporation
William C. Mullendore, President, Southern California Edison Company
Fred Ortman, Chairman of the Board and President, Gladding McBean Company
Alden G. Roach, President, Consolidated Western Steel Division
Reese H. Taylor, President, Union Oil Company of California
P. G. Winnett, President, Bullock's, Inc.

This policy-making group of citizens from the Southern California community includes representatives from a number of industrial enterprises which are possibly contributors in some degree to the air pollution. The principal reason for their membership on the Board, in addition to their recognized standing in the community, is to make certain that they will be parties to all facts and evidence brought to light on the problem, so that they, and their colleagues in like enterprises, can continue to devote their best efforts toward the abatement of air pollution.

A Managing Director and a limited staff of experts will conduct the day-to-day activities of the Foundation, under the general supervision of the Board of Trustees.

ASSUMPTIONS MADE BY THE FOUNDATION

1. That the problem of air pollution is one of the most serious confronting the people of Southern California; therefore, it is worthy of and calls for the best efforts of everyone concerned; as well as the expenditure of whatever funds are needed for its solution,

2. That the air pollution problem is not new--either in Southern California or in other large metropolitan areas of the United States.

3. That the Southern California geographical and meteorological features contribute materially to the problem.

4. That every additional person, or industrial enterprise, locating in this area potentially adds to the problem.

5. That much excellent work has been done by governmental and private agencies to reduce air pollution, and by the press to keep the public informed.

6. That further information must be obtained and additional action taken before the air pollution problem can be brought under proper control.

7. That there is no quick or easy solution to the problem--no matter what funds should be spent immediately, and no matter what laws should be invoked. There is an understandable tendency to oversimplify this problem and to insist that its obvious seriousness and urgency somehow must expedite its solution.

8. That the control of emission of particular dusts, dirts, fumes, ashes, and the like, may not alone solve the problem. (Some of these pollutants, which are harmless, or of minor importance, in themselves undergo photochemical reactions in a manner not understood completely at present.)

9. That the public should be informed, and wishes very much to be informed, on all significant phases of the problem.

10. That while the solution of the Southern California air pollution problem, probably by its very nature, is long-range, short-range steps, which will further alleviate it can be, and should be, taken whenever the facts have been determined with certainty and the proper policy decisions have been made.

WHAT THE FOUNDATION PROPOSES TO DO

1. To assemble a competent technical staff to organize and direct a broad program of cooperation, research, and public information.

2. To determine, record, and publish what has been accomplished to date by all agencies ~~in the Southern California area~~ dealing with ~~this~~ the So Cal problem.

3. To determine what remains to be done and to employ experts--through the device of research or service contracts--who will provide information and advice for the shaping of future policies and action.

4. To collect information as to what other municipal areas have done, and are doing, under similar circumstances.

5. To provide and maintain a library of ~~all~~ materials pertinent to the subject of air pollution.

6. To consult with, exchange information with, and to suggest to governmental and private agencies those research activities, enforcement methods, or other matters, which have not yet been conducted or tried and which seem to offer promise of air pollution abatement--so that the efforts of all groups and individuals may be coordinated properly.

7. To publish current information--by the most appropriate means--on all phases of air pollution and its abatement.

WHAT THE FOUNDATION DOES NOT PROPOSE TO DO

It will not

1. To duplicate services already rendered by governmental or private agencies.

2. To conduct research activities directly--unless it appears clear that no existing agency can conduct them as advantageously.

3. To expend funds entrusted to it for the constructing or equipping of Foundation laboratories that will duplicate facilities already available.

4. To hold public hearings for the purpose of receiving complaints, or in any way to substitute for governmental agencies now charged with responsibility for certain phases of the air pollution problem.

5. To offer any immediate or ready solution for a very complicated, long-range problem.

HOW THE WORK OF THE FOUNDATION MAY BE ASSISTED

Those who believe that the proposed activities of this independent Foundation can be of help to the people of Southern California may assist in its work by making contributions payable to the SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION and addressed to its temporary quarters at Suite 1300, 621 South Hope Street, Los Angeles 17.

Contributions from governmental organizations, business or industrial enterprises, and from private citizens, will be welcomed by those endeavoring to develop and conduct its program.

A WORD OF CAUTION AND AN INVITATION

The smog-free skies of an earlier day in California can not be brought back immediately by any endeavor--however resolute the attempt--or through any quick expenditure of funds or energy.

The pollution of So Cal air can be reduced ~~Clear air and pleasant living conditions can be restored~~ over a reasonable time by diligent and honest fact finding and by wise and effective action.

To those ends the Foundation is devoted, and it bespeaks the friendly counsel and understanding and the financial support of all those who would join in achieving the same objectives.

Southern California Air Pollution Foundation

Recognizing the fact that the problem of air pollution is one of the most serious confronting the people of this area, the Southern California Air Pollution Foundation has been formed by a policy-making group of citizens pledged to devote their best efforts to abate contamination of the atmosphere.

The smog problem is not new in Southern California or in any other large metropolitan area of the world; witness what happened last Friday in New York City and last year in London.

Conquering of smog is a long-range problem, but immediate steps to alleviate air pollution can and should be taken when indicated.

The Foundation purposely has chosen as its trustees representatives from a number of industries which are possible contributors to local air pollution in some degree.

The Foundation will assemble a competent technical staff to organize and direct a broad problem of cooperation, research and public information. It will not duplicate work already being done by governmental or private agencies.

Financial support will be welcomed from all levels of government, business and industry and private citizens. These funds will be spent carefully to determine everything that has been done anywhere on the air pollution problem, to decide what should be tried next in the way of scientific research or enforcement, and to encourage the taking of these steps wherever they may lead. The Foundation also intends to keep everyone informed at all times of what is being, can be and should be done to rid our skies of smog.

-30-

11/23/53

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

Agenda

December 14, 1953

1. Minutes of Meeting of November 23, 1953
2. Election of Assistant Secretary
3. Report of Committees
   a. Finance
   b. Personnel
   c. Housing
4. Resolution concerning disbursement of funds and signing of checks, etc.
5. Report on County Medical Association nomination of doctors.
6. Report on Governor's meeting on December 5th.
7. Authorization of appointment of Committee on Research.
8. Consideration of first publication.

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

Minutes of Special Meeting
of Board of Trustees

December 14, 1953

A special meeting of the Board of Trustees of the Southern California Air Pollution Foundation was held on the 14th day of December, 1953, at 2:00 o'clock in the afternoon in Room 1 of the California Club, 538 South Flower Street, Los Angeles, California.

Trustees:

Raymond B. Allen
F. Marion Banks
Arnold O. Beckman
Edward W. Carter
Lee A. DuBridge
Fred D. Fagg, Jr.
John A. McCone
Harvey S. Mudd
William C. Mullendore
Fred B. Ortman
Alden G. Roach
Reese H. Taylor
P. G. Winnett

were present.

Trustees:

Walter J. Braunschweiger
Asa V. Call
Roy M. Hagen
Stephen W. Royce
James E. Shelton

were absent.

Dr. Fred D. Fagg, Jr., the President, presided and the Secretary of the Foundation recorded the minutes of the meeting.

There were no objections to the minutes of the Trustees' meeting held on November 23, 1953, and they were ordered approved.

The Chairman stated that it would be desirable to elect an Assistant Secretary of the Foundation. Mr. Earl G. Bolton was introduced

to the Trustees. Upon motion made, seconded and unanimously carried, Mr. Bolton was elected Assistant Secretary of the Foundation effective at the close of this meeting.

The Chairman then called upon Mr. John A. McCone, Chairman of the Committee on Finance, to make a report. Mr. McCone stated that the Committee had established a quota of $900,000. Mr. McCone and the members of his Committee reported that steps are being taken to achieve the quota.

The Chairman reported on the Governors' Conference on Air Pollution which was held in Los Angeles on December 5, 1953, at which conference the Chairman had summarized the objectives of this Foundation. The Trustees then discussed the relationship between the Foundation and the Los Angeles County Air Pollution Control District.

The meeting proceeded to a discussion of research activities to be conducted by the Foundation. It was the consensus of the Trustees that the Chairman should appoint a Committee on Research. Upon motion made, seconded and unanimously carried, it was

> RESOLVED, that the President is hereby authorized to establish a Committee on Research to consist of as many of the Trustees as is considered appropriate by the President; and
>
> RESOLVED FURTHER, that the President is also hereby authorized to select the members of said Committee.

It was stated to the meeting that it would be necessary to authorize the opening of a bank account and to provide for the withdrawal of funds from the account of the Foundation. Upon motion made, seconded and unanimously carried, it was

> RESOLVED, that this corporation open an account or accounts with SECURITY-FIRST NATIONAL BANK OF LOS ANGELES, and that until such authority is revoked by Sealed Notification to said Bank of such action by the Board of Trustees of this corporation, one from each of the following two groups:

Group 1	Group 2
President	Treasurer
Managing Director	Assistant Treasurer

be and they are authorized to execute checks and other items on behalf of this corporation.

RESOLVED FURTHER, that this corporation hereby agrees to the conditions printed in the Pass Book issued in connection with its account with the Security-First National Bank of Los Angeles, and to the By-Laws and rules of said Bank, as to all deposits and withdrawals made on said account and as to other transactions with said Bank.

There being no further business before it, the meeting adjourned.

/S/ Leroy Garrett
Secretary

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

Minutes of Special Meeting of Board of Trustees

February 1, 1954

A special meeting of the Board of Trustees of the SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION was held on the 1st day of February, 1954, at 12:00 o'clock noon in Room 7 of the California Club, 538 South Flower Street, Los Angeles 17, California.

The following Trustees were present:

Arnold O. Beckman
Fred D. Fagg, Jr.
Harvey S. Mudd
William C. Mullendore
Fred B. Ortman
Stephen W. Royce
James E. Shelton

Mr. Earl G. Bolton, Assistant Secretary of the Foundation, also attended.

The following Trustees were absent:

Raymond B. Allen
F. Marion Banks
Walter J. Braunschweiger
Asa V. Call
Edward W. Carter
Lee A. DuBridge
John A. McCone
Roy M. Hagen
Alden G. Roach
Reese H. Taylor
P. G. Winnett

Mr. F. A. McCanlies attended on behalf of Mr. F. Marion Banks; Messrs. Ralph Seeley and Howard Barr attended on behalf of Mr. Alden G. Roach; and Mr. John D. Burton attended on behalf of Mr. John A. McCone.

Dr. Fred D. Fagg, Jr., the President, presided and the Secretary of the Foundation recorded the minutes.

The Campaign Progress Report as of February 1, 1954, indicates:

An annual quota of $938,000;
Paid in - $361,250;
Pledged - $5,000.

The Chairman reported that through the efforts of the Committee on Housing the Foundation's Staff, office space in the Wm. Garland Building had been donated by Mr. John Garland. The offices of the Foundation will soon move to the new address. The President was instructed to express to Mr. Garland the appreciation of the members of the Board.

The Chairman announced the appointment of a Committee on Research to consist of:

Dr. Lee A. DuBridge, Chairman
Raymond B. Allen
Arnold O. Beckman
Harvey S. Mudd
Alden G. Roach

In the absence of Mr. Asa V. Call (Chairman of the Committee on Selection of a Managing Director) Mr. Arnold O. Beckman, a member of the Committee, reported that a number of candidates had been considered. After consideration, the Committee unanimously recommended that Dr. Lauren Blakely Hitchcock be engaged as the chief executive officer of this Foundation. It was stated that Dr. Hitchcock could be engaged for a term of five years at a salary at the rate of $50,000 annually, payable semi-monthly, with a separation payment to Dr. Hitchcock of $50,000 if the Foundation should elect to terminate his employment within the five year period.

Mr. Beckman stated that the discussions with Dr. Hitchcock indicated that it would be desirable to amend the By-Laws of the Foundation so that the chief executive officer would have the title of "President" rather than "Managing Director." On motion made, seconded and unanimously carried, it was

RESOLVED, that the By-Laws of the Foundation be amended in the following respects:

(A) Sections 6, 7, 8 and 9 of Article II are hereby amended to read as follows:

"6. Officers of the Board. The officers of the Board shall be a Chairman, a Vice-Chairman, and a Treasurer, who shall be chosen by the Board from among the Trustees to serve at the pleasure of the Board. The Treasurer shall also serve as the Treasurer of the Foundation.

"7. Chairman of the Board. The Chairman of the Board shall preside at all meetings and shall have the usual powers of a presiding officer.

"8. Vice-Chairman. The Vice-Chairman, in the absence or disability of the Chairman, shall perform the duties of the Chairman.

"9. Treasurer. The Treasurer shall be the principal fiscal officer of the Foundation. He shall supervise and study its financial activities and affairs and shall make recommendations to the Board and to the Chairman of the Board."

(B) Section 3 of Article III is hereby amended to read as follows:

"3. Special Meetings. At the direction of the Board, or of the Chairman of the Board, or of the President, or of any three Trustees, special meetings may be held at any time and place on notice sent to the Trustees, not less than 96 hours prior to the time of such meeting if mailed, and not less than 48 hours prior to the time of such meeting if telegraphed or personally delivered."

(C) Article IV of the By-Laws is hereby amended as follows:

"Article IV

"OFFICERS, EMPLOYEES AND AGENTS

"1. Appointment and Removal. The Board shall have the power to appoint and remove at its pleasure all officers, employees and agents of the Board and of the Foundation, to prescribe their duties, to fix their compensation, and to require any of them to furnish a satisfactory surety bond.

"2. Officers. In addition to the Treasurer of the Foundation, whose duties are prescribed in Section 9 of Article II, the officers of the Foundation shall be a President, a Vice-President, a Secretary, an Assistant Secretary, an Assistant Treasurer, and such other officers as the Board may appoint.

"3. Qualifications. One person may hold two or more offices except that the offices of President and Secretary may not be held by the same person.

"4. President. The President shall be the chief executive officer of the Foundation. He shall carry out the orders and resolutions of the Board, and report directly to the Board. Subject to the control of the Board, he shall have general charge of all matters of administration and supervision of all arrangements for research or other work undertaken by the Foundation or with its funds. He shall submit to the Board plans and suggestions for the work of the Foundation and shall conduct its general correspondence, including correspondence with applicants for grants. Subject to the approval of the Board, he may appoint and supervise all employees and agents of the Foundation, fix their compensation and duties, and require any of them to furnish a satisfactory surety bond.

"5. Vice-President. The Vice-President shall assist the President and shall act as President in the absence or disability of the President.

"6. Secretary. The Secretary shall record the transactions of the Board and shall, at the direction of the Board, or of the Chairman of the Board, or of the President, or of any three Trustees, send to the Trustees notices of special meetings of the Board. He shall have custody of the corporate seal and of all correspondence, documents and other papers relating to the affairs of the Foundation, except those in the custody of the President or of the Treasurer or Assistant Treasurer. The Secretary shall record the Articles of Incorporation and the By-Laws in a book which shall be kept in the principal office of the Foundation.

"7. Assistant Secretary. The Assistant Secretary shall assist the Secretary and shall act as Secretary in the absence or disability of the Secretary.

"8. Assistant Treasurer. The Assistant Treasurer shall assist the Treasurer. Under the supervision of the Treasurer, the Assistant Treasurer shall:

"(i) keep accurate books and records of all the business transactions of the Foundation, including accounts of its assets, liabilities, receipts and disbursements;

"(ii) receive and deposit in the name of the Foundation, with such depositaries as may be designated by the Board, all money, securities, and other valuables held by the Foundation;

"(iii) disburse funds as ordered by the Board; and

"(iv) render to the Trustees annually and upon request at any time a full accounting of the financial transactions of the Foundation.

"9. Other Officers. Other officers shall have such titles, powers and duties as may be prescribed by the Board."

Dr. Fred D. Fagg submitted his resignation as President of the Foundation and Mr. Stephen W. Royce submitted his resignation as Vice-President of the Foundation, effective immediately. Upon motion made, seconded and unanimously carried, it was

RESOLVED, that the resignations of Dr. Fred D. Fagg, Jr., as President, and Mr. Stephen W. Royce, as Vice-President of this Foundation be accepted, effective immediately.

Upon motion duly made, seconded and unanimously carried, Dr. Fred D. Fagg, Jr. was elected Chairman of the Board and Mr. Stephen W. Royce was elected Vice-Chairman of the Board, effective immediately.

Dr. Hitchcock was then invited to the meeting and was introduced to the Trustees.

Upon motion made, seconded and unanimously carried, it was

RESOLVED, that Dr. Lauren Blakely Hitchcock be and he is hereby elected President of this Foundation, effective immediately; and

RESOLVED FURTHER, that the Chairman of the Board or the Vice-Chairman of the Board, be and each is hereby authorized and empowered to enter into an employment contract with Dr. Lauren Blakely Hitchcock upon such terms and conditions as they may approve, but with a provision that the contract may be terminated by the Foundation by paying $50,000 as separation compensation.

It was stated to the Trustees that it would be desirable to authorize Dr. Hitchcock to sign on the Foundation's bank account. Upon motion made, seconded and unanimously carried, it was

RESOLVED, that this corporation open an account or accounts with SECURITY-FIRST NATIONAL BANK OF LOS ANGELES, and that until such authority is revoked by Sealed Notification to said Bank of such action by the Board of Trustees of this corporation, one from each of the following two groups:

Group 1	Group 2
Chairman of the Board	Treasurer
President	Assistant Treasurer

be and they are authorized to execute checks and other items on behalf of this corporation;

RESOLVED FURTHER, that this corporation hereby agrees to the conditions printed in the Pass Book issued in connection with its account with the Security-First National Bank of Los Angeles, and

to the By-Laws and rules of said bank, as to all deposits and withdrawals made on said account and as to other transactions with said Bank; and

RESOLVED FURTHER, that this supersedes all prior authorizations.

Mr. Arnold O. Beckman reported briefly on the Governor's Conference held during January in Los Angeles.

There being no further business before the meeting it adjourned.

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Secretary

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION
117 West Ninth St.
Los Angeles 15,

Thursday, Feb. 11, 1954.

AGENDA
RESEARCH COMMITTEE MEETING

12:15 p.m. California Club

Preliminary Discussion

1. Confirmation and extension of presently available data and/or indications re "Behavior of Petroleum Hydro-Carbons (including partially burned and/or oxidized derivatives thereof) Under Atmospheric Influences."

2. Airometric Survey of Los Angeles Basin, comprising a synchronized combination of:

   a. Tracer survey (meteorology pattern)

   b. Oxidant Measurements (chemical index)

   c. Motion Picture (visibility)

Personnel Committee (Technical)

(see page 2 of Agenda dated Feb. 9th)

Written re [illegible] minutes

MEMORANDUM OF RESEARCH COMMITTEE MEETING - S. C. A. P. F.

Present: Chairman DuBridge, Beckman, Fagg (ex-officio), Hitchcock

Meeting held at California Club during lunch, Thursday, February 11th.

Hitchcock offered for preliminary discussion a possible research project which might be entitled "Airometric Survey of the Los Angeles Basin". After talking with Haagen-Smit, Jenkins, Zarem and others, as well as reading several hundred pages of reports and reprints, it seemed fairly clear that one aspect of the smog problem which needed much more thorough investigation is the more or less hourly incidence of oxidant index taken simultaneously at a number of strategic points, coordinated with a photographic record of visibility, and further coordinated with information on air currents. The latter phase of the investigation might be carried on by use of tracer techniques described in a proposal submitted by the Ralph M. Parsons Engineering Company.

The first two phases (oxidant index and photographic record) would probably require the purchase of certain equipment, while the air current study with tracers might be handled on a contract basis with Parsons.

It was the sense of the discussion that Hitchcock write up the first two phases as Research Proposal No. 1. and submit it to Chairman DuBridge. This was done the same day.

The air current proposal by Parsons was to be further investigated and reported back to the Committee by Hitchcock.

Gordon Larson's approval of Research Proposal No. 1. was thought desirable and Hitchcock has obtained this. Meanwhile, the question of procedure with respect to securing County support is awaiting discussion betweenn Fagg, DuBridge, Beckman, Call and Hitchcock.

A second research proposal was also discussed in a preliminary way. This had to do with pursuing our understanding of certain photo chemical hydrocarbon reactions under existing atmospheric conditions. Upon the suggestion of Beckman, it was decided to invite informed, interested parties (specifically a small group to include Haagen-Smit, Jenkins, Larson, and a couple of S. R. I. men) to sit down around a table together, discuss and summarize our present knowledge, with a view to drawing up an agenda for a future meeting, at which we would invite some authorities on various aspects of the chemical problems involved to sit as a jury of visiting experts. Such men as Kistiakowsky, Farrington Daniels, R. C. Fuson of Illinois, Sydney Benson of U. S. C., and possibly others. With the advice of such a group, we would hope to pin-point additional experimental work needed, in the hope of thoroughly proving or disproving the role of hydrocarbons in producing eye-irritating smog.

The preliminary meeting to prepare the agenda is now scheduled for Friday, February 26th.

Consensus was that both proposals seemed to be in the right direction and to the point.

L. B. Hitchcock

cc: L. A. DuBridge
A. O. Beckman
R. B. Allen
A. G. Roach
F. D. Fagg, Jr.

704 S Spring

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

Agenda

March 3, 1954

1. Minutes of Meeting of February 1, 1954

2. Consideration of Resolutions:

   a. To bring Foundation employees under provisions of Social Security Act;

   b. To establish position of Business Manager; Wetherbee

   c. To provide that the fiscal year shall run from January 1 through December 31; OK

   d. To appoint Lybrand, Ross Bros. and Montgomery as auditors of Foundation accounts; O.K.

   e. To establish a revolving fund bank account in the amount of $500 ($1000) which can be drawn upon by any one of the four persons now authorized to sign on the regular Foundation account;

   f. To establish time for regular meeting of Board.

3. Introduction by Dr. Hitchcock of new personnel. Roger Faith

4. Election of Assistant Treasurer.

5. Consideration of Committee Invitation from Board of Supervisors.

6. Report of Committees

7. Other Business

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

Minutes of Special Meeting of Board of Trustees

March 3, 1954

A special meeting of the Board of Trustees of the SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION was held on the 3rd day of March, 1954, at 3:30 o'clock in the afternoon in the Directors' Room of Pacific Mutual Life Insurance Company, Sixth Floor, Pacific Mutual Building, Los Angeles 14, California.

The following Trustees were present:

Arnold O. Beckman
Asa V. Call
Edward W. Carter
Lee A. DuBridge
Fred D. Fagg, Jr.
Roy M. Hagen
Fred B. Ortman
Stephen W. Royce
P. G. Winnett

Also present were: Dr. Lauren B. Hitchcock, President; Leroy A. Garrett, Secretary; Mr. Earl C. Bolton, Assistant Secretary; Mr. Robert S. Weatherly; Dr. Lewis H. Rogers; Dr. W. L. Faith; Mr. Ralph Seeley who attended the meeting on behalf of Mr. Alden G. Roach, and Mr. John D. Burton, Executive Secretary of the Finance Committee, who attended at the request of Mr. Edward W. Carter.

The following Trustees were absent:

Raymond B. Allen
F. M. Banks
Walter J. Braunschweiger
John A. McCone
Harvey S. Mudd
William C. Mullendore
Alden G. Roach
James E. Shelton
Reese H. Taylor

Dr. Fagg, Chairman of the Board, presided and the Secretary of the Foundation recorded the minutes.

The minutes of the Trustees' meeting held on February 1, 1954, having been circulated among the Trustees, were approved.

Dr. Fagg stated that as this corporation is a non-profit corporation and is exempt from federal income tax under section 101(6) of the Internal Revenue Code, it would be necessary for the corporation (in order to have its employees covered by the Federal Insurance Contributions Act) to file a certificate waiving exemption from the employer tax, after first obtaining the consent of at least two-thirds of the employees to the filing of the certificate. Employees who do not so consent would not be covered, but any employees engaged after the certificate is filed would be covered on a compulsory basis. After discussion, upon motion made, seconded and unanimously carried, it was

> RESOLVED, that the officers of this corporation be and they are hereby authorized to do any and all acts required to cover employees who elect coverage under the Federal Insurance Contributions Act.

Dr. Fagg stated that it would be in order to adopt a fiscal year for the corporation. Upon motion made, seconded and unanimously carried, it was

> RESOLVED, that the fiscal year of this corporation be the calendar year, that is, from January 1st through December 31st of each year.

The attention of the Trustees was called to the desirability of establishing a Revolving Fund Bank Account, with a maximum balance of $1,000, checks and other items to be signed by only one officer of the corporation. Upon motion made, seconded and unanimously

Revolving Fund Bank Account

RESOLVED, that this corporation open an account or accounts with SECURITY-FIRST NATIONAL BANK OF LOS ANGELES, and that until such authority is revoked by Sealed Notification to said Bank of such action by the Board of Trustees of this corporation, Fred D. Fagg, Jr., Chairman of the Board, Lauren B. Hitchcock, President, James E. Shelton, Treasurer, or Robert S. Weatherly, Assistant Treasurer of this corporation, be and they are authorized, ANY ONE ACTING ALONE, to execute checks and other items for and on behalf of this corporation with respect to its Revolving Fund Bank Account;

RESOLVED FURTHER, that this corporation hereby agrees to the conditions printed in the Pass Book issued in connection with its account with the Security-First National Bank of Los Angeles, and to the By-Laws and rules of said Bank, as to all deposits and withdrawals made on said Revolving Fund Bank Account, and as to other transactions with said bank.

Dr. Hitchcock made a brief report to the meeting of the activities of the Foundation and introduced the following new staff members:

Dr. Lewis H. Rogers	Senior Chemist
Dr. W. L. Faith	Chemical Engineer

The desirability of creating the post of Business Manager was brought to the attention of the meeting. Upon motion made, seconded and unanimously carried, it was

RESOLVED, that the post of Business Manager be and it is hereby created, effective immediately,

The Chairman stated that the post of Assistant Treasurer and Business Manager of the Foundation should be filled. Upon motion made, seconded and unanimously carried, it was

RESOLVED, that Robert S. Weatherly be and he hereby is elected Assistant Treasurer and Business Manager of Southern California Air Pollution Foundation, effective immediately, at a salary at the rate of $5,000 annually.

The Campaign Progress Report as of March 1, 1954, indicates:

Annual quota of $938,000
Paid in $381,465

A copy of the list of contributors to the Foundation was distributed to each of the Trustees.

The Chairman reported that Mr. Harvey S. Mudd had asked to be replaced as a member of the Research Committee, since he will be abroad for some time. Accordingly, the Chairman had appointed Mr. F. M. Banks to the Research Committee in the place of Mr. Mudd.

Dr. Fagg announced that a Committee to Nominate New Trustees had been appointed, comprised of:

William C. Mullendore, Chairman
Asa V. Call
Roy M. Hagen
Fred B. Ortman
Reese H. Taylor

The President reported that the officers had executed a lease, dated February 19, 1954, with Mildred Browning Green for office space at the Financial Center Building, 704 South Spring Street, Los Angeles, for a term of one year commencing March 16, 1954, at a monthly rental of $547.75. Upon motion made, seconded and unanimously carried, it was

> RESOLVED, that the action of the officers of the Foundation in executing, on behalf of the Foundation, a lease for office space, said lease bearing the date February 19, 1954, and being for the term of one year commencing March 16, 1954, with Mildred Browning Green, Lessor, be and the same is hereby authorized and ratified.

There being no further business before the meeting, it adjourned.

/s/ Leroy A. Garrett
Secretary

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

AGENDA
RESEARCH COMMITTEE

Friday, April 16, 1954.
11:30 a.m. Office of Dr. DuBridge

Expected Attendance: L. A. DuBridge (Chairman)
F. M. Banks, A. O. Beckman, W. L. Faith, L. B. Hitchcock

I. Report on formulation of certain research projects, for discussion and possible approval:

Project I. **Hydrocarbon reactions in L. A. atmosphere.**

Evaluation of existing data and report.
Placing of research contracts to confirm and extend data.

Project II. **Micrometeorology of L. A. Basin**

Report summarizing available data

Project III. **Aerometric Survey of L. A. Basin.**

- **to confirm and extend findings of Project II.**
- **to permit more definite conclusions to be drawn as to origens, movement, and identity of pollutants, by using these devices:**

(1) Air sampling stations equipped with automatic recording analyzers to show "oxidant" values; SO_2; samples of NO_2 and H_2S to be collected from laboratory analysis; rubber-cracking and spinach may be used; to be operated continuously from about July 15 - November 1.

(2) Measurement of visibility:

(a) - by photometric technics over certain ranges
(b) - by microwave from central transmitter scanning entire basin, with perhaps 4 to 6 recording stations
(c) - observation by a few cameras

(3) Movement of pollutants, to be observed by a few air-tracer studies on selected days, minimum of 60 sampling stations per source; possibly taking samples near or in inversion layer by helicopter.

(4) Subjective observations of eye-irritation to be noted by polling groups in vicinity of recorder stations

(5) Complete Weather Bureau data for APCD's 52 stations

(6) Correlation of interpretation of data

Procurement of automatic recorders for oxidant; for SO_2; phenolphthalein vs. KI; Arthur D. Little, Inc.

Project IV. Design of test procedure for evaluation of auto exhaust as smog producing; for evaluation of corrective devices → ✓ Contract

II. Report on County support of our research projects

III. Report on State support of our research projects △

Smog Scramble Spans Nation

REPRINTED FROM CHEMICAL AND ENGINEERING NEWS *the newsmagazine of the chemical world*

Vol. 32, pp. 1108–1113, March 22, 1954

Smog Scramble Spans Nation

Tons of "hot air" have been generated and released over public annoyance No. 1

Scientists at least have succeeded in pinning down specific causes, and in some types have achieved high rate of control

AIR POLLUTION is receiving more attention than ever before. Residents and politicians clamor for a pure, clean, and healthful atmosphere. Some cities, to be sure, have effected very satisfactory control; others have been much less successful in coping with this problem that follows rising population and industrialization.

The problem is far from easy to solve. Contaminants, their sources, climatic conditions, surrounding terrain—all make control an enigma peculiar to each area. Even the experts cannot agree as to what all the pollutants are, whether they are hazardous, and, if so, in what amounts. For many communities it is no longer just a question of smoke, soot, fly ash, and smell from the stock yards. Temperature inversions, photochemical reactions, and hydrocarbon peroxides are new words which have entered the everyday language and indicate the complexity of the situation.

People become vitally concerned when reminded of several severe air pollution attacks . . . the Meuse Valley disaster in Belgium of 1930, when a heavy smog caused 60 deaths . . . the Donora, Pa., incident of 1948, when 6000 were made ill and 20 died . . . the Poza Rica, Mexico, disaster, with 320 hospitalized and 20 dead . . . the sensational London killer fog of 1952, which chalked up 4000 deaths. These, however, are the dramatic exceptions, and many a citizen is able to work up more ire over the day-to-day manifestations—eye and throat irritations, poor visibility, and vegetation and paint damage.

Civic, legislative, industrial, and private groups are looking into the problem. Many communities are taking concrete steps toward solution, either through legislation or persuasion. Industry is making great effort in many regions to become a better neighbor. In addition to installation of control equipment and resulting reduction in air pollution, industry is supporting research to determine its effect on pollution. In many cases, it is making conscientious effort to make satisfactory settlements with those who have suffered economic losses.

Situation in the East

Many eastern cities have good records in reducing air pollution—Pittsburgh, Cleveland, and Cincinnati, to name a few. But last November the most serious smog in years blanketed the area from New England to Virginia. Called "smaze," the pollution was haze (of nonlocal character, New

rkers say) plus smoke and other al polluters—but humidity remained w until late in the week. Then a mbination of smoke, haze, and fog roduced a soup that caused widepread irritation, more annoying than langerous. New York officials who normally claim that smog there "won't burn your eyes" experienced an epidemic of scratchy throats and irritated eyes—and women in Philadelphia and other areas resorted to war-surplus gas capes for protection.

In New York, Consolidated Edison Co. uses approximately one third of all the fuel and one half of all the coal. The company has been an active advocate of control, and with work completed, under way, and projected, has put over $28 million into control equipment. Marked improvement in all plants is a result.

Some experts think that New York is doing only 50% as satisfactory a job as it might. Here, as in other areas, politics often hampers control. The Department of Air Pollution Control depends on politicians for appropriations as well as enabling legislation. Ironically, one of the biggest polluters in the area is the city itself. Board of Transportation plants, which generate power for the subway system, pour out clouds of black smoke. Officials have frankly explained that their equipment is old. Until recently, no money has been available for installation of smoke equipment. Apartment-house oil burners, which in recent years have increased greatly, use No. 6 fuel oil, a heavy, black viscous fuel which gives off considerable smoke.

And—as San Francisco blames East Bay Oakland when the Golden Gate City's usually clean fog becomes contaminated—New York says that a strong contributing factor is effluent of manufacturing area of New Jersey, which prevailing westerlies carry into New York. Several years ago, an Interstate Sanitation Commission was set up for a joint study. The advisory commission was doomed to failure as New Jersey never did divvy up its $30,000 portion.

In New York City, some say that smog will never be eliminated until money is spent on the same scale as for other public health problems. The Department of Air Pollution has 30 inspectors, a chemical staff of four, a meteorologist, and seven technicians. Inspectors can inspect and issue summonses and warnings. Lab staff checks various pollution indexes, investigates pollution problems requiring technical knowledge, acts as experts in court cases, and does some research.

Three general indexes of air pollution used are soot fall (varying from 30 to 150 tons per month per square mile), and levels of carbon monoxide (0.04–0.2 p.p.m.), and sulfur dioxide (in "smaze" of last November, sulfur dioxide level was 0.86 p.p.m.). Consistently high levels of sulfur dioxide corrode buildings and monuments, marble and limestone being severely attacked.

Typical of the many companies doing an outstanding job is Du Pont. It considers pollution abatement of major importance and long ago decided that it should have continuous study of the type applied to safety and fire prevention. As of last October, Du Pont expenditures on air and water pollution control totaled $35 million. Last year, 59% was for air pollution control—first time it exceeded that for industrial waste.

Employee of New York City Department of Air Pollution Control adjusts a Greenburg-Smith Impinger to check an odor complaint. Instrument checks amount of dust in the air and any specific gaseous pollutant which can be absorbed by use of various solutions in the tube. Complaint concerned electroplating plant, said to be venting fumes and annoying neighbors, who especially feared cyanide vapors. Tubes contained a 1% solution of sodium hydroxide

Cities of the Midwest

In Chicago, where concern is chiefly with dust fall, tests show that 1953 was the "cleanest" year on record. Average monthly dust fall was 53.61 tons per square mile (83.6 tons in 1936).

The Department of Air Pollution Control has actively advocated that control could be established only through cooperation of residential, commercial, and industrial contributors, recently pointing out that apartments and large heating plants are responsible for 43% of Chicago's smoke as contrasted with 3% some 20 years ago.

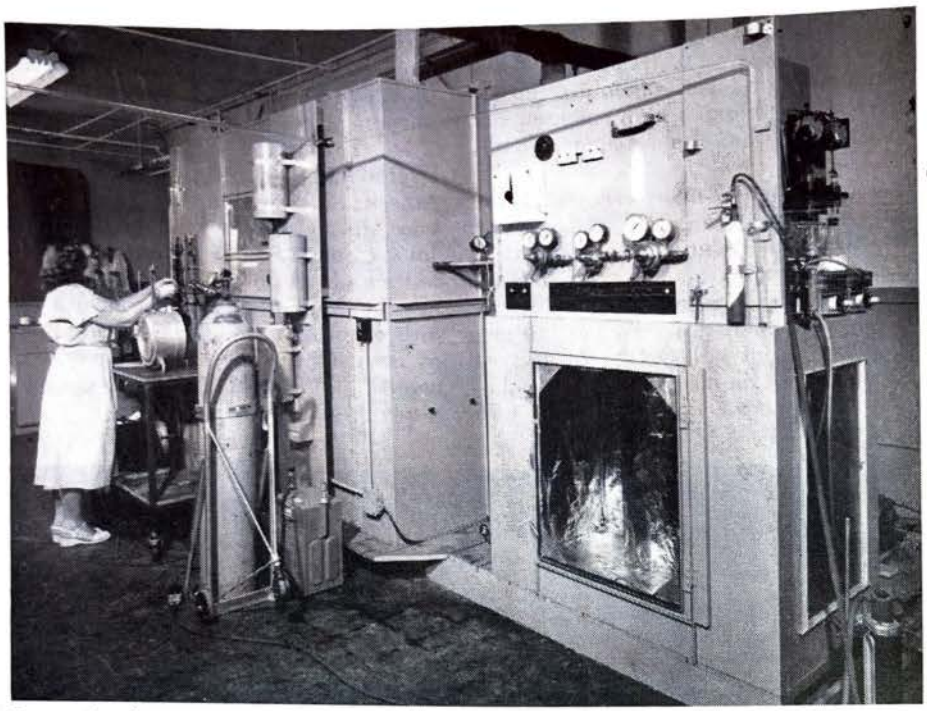
Armour Research Foundation measures and analyzes Chicago's dust fall each month. Armour is also making statistical studies of data from the control board to establish relative importance of various sources. Too, ARF acts as consultant for planning and zoning commission. American Petroleum Institute sponsors studies at ARF to improve methods of ozone analysis. API is also providing for study of petroleum combustion products in air.

In the Detroit-Windsor area—third largest manufacturing region in North America—a program has been under way since 1949 by the International Joint Commission to determine the influence of air pollutants on community health. Studies of existing health records covering mortality are being made on both sides of the Detroit River, with control studies being carried out in a nearby, nonindustrial city.

A new voluntary organization, Detroit-Windsor Regional Association of Air Pollution Control Officials, acts as a forum where ideas can be discussed and disseminated. In Detroit, group responsible for control includes three engineers, two chemists, and 17 inspectors. This group attempts to identify sources of pollution and determine effects on vegetation, corrosion, soiling, visibility, and health.

The Gulf Coast

In 1951, a petition bearing 5000 signatures from a group of citizens who lived in a small community called Greens Bayou, near Houston, Tex., was directed to the Texas State Department of Health. The petition asked relief from severe fumigations occurring in vicinity—an area in which one doctor had stated that whenever the wind blew from the east, he could expect to have an average of 20 patients with bronchial inflammation, where ordinarily he had three or four. The state agency decided it would be better to



Smog chamber at Stanford Research Institute, where air research has been going on since 1947. Chambers are fumigating 10 weeds commonly found in U. S. with six common pollutants (SO_2, H_2S, NO_2, HF, Cl_2, and SO_3) to establish smog damage "standards"

start air pollution abatement before it became more serious.

Rapid industrialization of the Gulf Coast area occurred during World War II, with larger industries locating along the Houston Ship Channel. Feeling it a part of their patriotic duty, residents contended with plants with poor effluent control, but after the war was over, demanded a stop to poor plant operation and are pressing for immediate control measures.

Along the channel, the problem is one which embraces everything in the book. Organic contaminants include hydrocarbons, combustion products from flares, pits, and incinerators. There are considerable losses from gasoline storage tanks. In Houston, there is a fair amount of exhaust fumes from automobiles and buses. Sulfur dioxide and hydrogen sulfide, chlorine, nitric oxides, fluorides, metal fumes, and paper mill wastes are among inorganic contaminants. Paint damage to houses and automobiles occurs occasionally — industrial dusts have been known to pit automobile finishes after four hours of exposure. North side of the channel has been affected to some extent—there has been damage to trees and vegetation, and florists have moved out of the immediate area. Tonnage-wise, area has been said to throw more chemicals into the air than any other industrial locality in U. S. and Canada.

In Houston, the Chamber of Commerce has an industrial pollution committee (an eight-year-old advisory group with 90% of its work in ship channel area outside corporate limits of city). A Community Council Air Pollution Committee, sponsored by the United Fund, was organized in 1952 and has been active in conducting an educational campaign, interviewing alleged industrial offenders, and supporting the establishment of a third group, the Stream and Air Pollution Control Section of the Harris County Health Unit. The last group is the actual control unit, the only such unit in Texas. Staff consists of a director, stream pollution engineer, two field engineering assistants, a chemist, a biologist, and a secretary—budget for this year is $45,000.

Principle on which the abatement problem is being attacked is that each plant should reduce its individual pollution to some extent even though its pollution is relatively minor compared to other plants. All are expected to "tighten up" operation procedures, make use of collection devices, and refrain from unnecessary release of contaminating materials. In Harris County, it has been decided that instead of fixing a definite concentration of noxious contaminants in stacks, only that amount which does not materially affect residents in close proximity to plant is allowed.

In January 1953 a survey indicated 50% of the plants along the ship channel were actively engaged in solving their particular problems. About 41% were still just talking, and only 9% actually did not intend to do anything. A later report indicates that about 75% are now actively doing something, the increase in interest being a probable result of forming the Harris County unit.

Gulf Coast area in general has received nature's help in solving air pollution problems. The terrain is essentially flat, wind predominantly prevailing according to seasonal variation. Temperature inversions occur about 180 days out of the year and extend over an area from below Corpus Christi, Tex., to Lake Charles, La., and as far inland as San Antonio. From a meteorological standpoint the Gulf Coast area presents an entirely different picture from the classical conditions of Los Angeles, Denver, and other communities. For the most part ideal conditions prevent a build-up of concentrations. Otherwise the general area would be in very bad shape.

Southern States

Quick look-ins at other parts of the South show that in Tennessee there is no official agency responsible for air pollution on a state level. The five industrial areas, however, all have some form of pollution control, with Kingsport having a modern atmospheric pollution ordinance similar to that of St. Louis.

In South Carolina, there are no state laws specifically dealing with air pollution. Columbia has had a smoke abatement officer for one year; Charleston has an industrial hygienist whose concerns include air pollution.

Birmingham, Ala., has a smoke abatement ordinance which was adopted in 1945. Last year there were 2700 complaints, most of which were minor, caused by small businesses, apartment buildings, locomotives. Industries in the area are reported to be cooperating fully and backed enactment of the ordinance.

The Smog of Los Angeles

As one wag has commented, "If we could harness all the hot air generated over our smog, we probably could blow all the stuff into Death Valley and save millions." The area has been the scene of many a bitter charge and countercharge, with "acrimation" rising and falling with the lachrymation of its inhabitants. The 1200-square-mile Los Angeles basin, bounded on two sides by high mountains, victim of frequent temperature inversions and too feeble winds, and growing at a rate of 190,000 people per year, enjoys the dubious distinction of being the nation's severest air pollution sufferer. Complicating Los Angeles' problem is the high oxidant content of its atmosphere, most of which has been identified as ozone. On Jan. 30, 1954, oxidant concentration was 80 p.p.h.m. as contrasted with a high of 20 p.p.h.m. for Detroit.

The Los Angeles County Air Pollution Control District operates under a 1947 state act (first such state act of its type) which provides for county control of air pollution. The Los An-

Kem-Tech Laboratory, Baton Rouge, sends truck out to make pollution surveys with equipment which includes polarized light microscope, pH meters, a 3000-watt generator, spectrophotometer, dry test meters, meteorological instruments

geles district, in addition to being the first organized, is noteworthy in that it is the first to attempt quantitative regulation of contaminants in addition to smoke, soot, and fly ash. First emphasis was placed on stopping sulfur dioxide effluents; today, SO_2 content of the air has been reduced over 50%, with 350 tons now being collected daily at refineries. Miscellaneous industries have reduced dusts, fumes, and general aerosol contaminants by an estimated 70 tons per day. The petroleum industry has reduced hydrocarbon evaporation by 380 tons per day. It also is covering large storage tanks, still has about half of its tanks to cover.

The bill to L. A. industry for this: $20 million since 1948 for control equipment alone, plus uncounted millions for improved designs for new installations to stop pollution before start-up. Yet control, as any weepy-eyed Angeleno can tell, is not complete.

The internal combustion engine exhaust is one of the major remaining sources of uncontrolled pollution, the district believes, and it points out there will be days of eye irritation, especially in the downtown area, until the sprawling county's 2 million autos, buses, and trucks no longer spew forth an estimated 900 to 1200 tons of hydrocarbons each day. Various catalytic devices, attached to exhausts or built into combustion chambers, have been suggested or tested, and the Automobile Manufacturers Association has had a task force of experts in the area cooperating in research. Despite claims, no device has as yet been approved.

Hydrocarbon vapors from the area's burgeoning refineries (700,000-barrel-per-day capacity, presently being expanded by about one third) are the second major remaining pollution source. The oil industry has made the largest single contribution to control, with an estimated $17 million to be spent by 1955.

Backyard incineration (L. A. has no public collection of combustible refuse, households collectively dispose of some 6000 tons daily) has got to go, say control officials of what they term the third major uncontrolled smog source. Here again, controversy. It is said that incinerators contribute 100 tons of smoke particles per day. Stanford Research Institute estimated in 1950, after three years of study, that backyard incinerators contributed about 570 tons per day of aldehydes, ammonia, nitrogen oxides, acids, organics, solids, and sulfur oxides (based on an estimated "charge" of 4000 tons/day).

Sulfur dioxide content of atmosphere is continuously monitored by L. A. pollution control officials. Since inception of Air Pollution Control District, SO_2 content of air has been reduced 50%

Say incinerator defenders: The contribution is more like 3% of total smog; the fleet of trucks necessary to collect all the rubbish would put more pollution in the air than collection would stop. Furthermore, runs the counter-argument, hydrocarbons (which, according to the Haagen-Smit theory, are the real, major culprits in L. A.) have not been detected in incinerator effluents. It is significant to note, however, that a medical researcher has said these same incinerator effluents have caused skin cancer in mice, as have Diesel and gasoline exhausts and natural and artificial smog.

Latest entrant for air pollution abatement sweepstakes in Los Angeles, which probably has more official, quasi-official, and private organizations, or committees per smog particle than any other area, is the Southern California Air Pollution Foundation. Sparked by Pacific Mutual Life Insurance President Asa Call last autumn, some 140 southern California business and university leaders banded together to incorporate a foundation of 19 trustees to attack the area's smog problem.

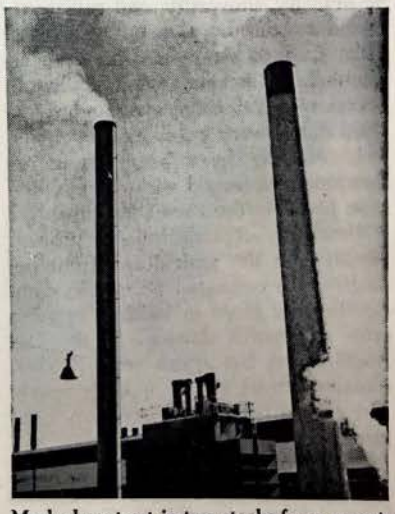
SCAPF has remained quietly out of hassles, made its first public move when it hired Lauren B. Hitchcock as president (C&EN, Feb. 15, page 565). SCAPF plans to do no research itself but will act as a focal point for information, help coordinate research activities of other groups—government, university, and industry—and financially support research on smog not already undertaken.

This will take time and money—Hitchcock says he expects the budget to be about $1 million annually. The entire cross-section of southern California community life—industry, businessmen and associations, civic organizations, private individuals—is contributing funds. Government—federal, state, and local—will probably not be able to contribute directly to the foundation because of legal complications, but will finance approved projects recommended by the foundation.

Effect on Health

"No one," says California Department of Public Health Deputy Director Malcolm H. Merrill, "can undergo the symptoms of irritation to the eyes and respiratory system that accompany exposure to periods of severe smog in the Los Angeles area without becoming convinced that it violates a broad concept of public health as related to environmental sanitation."

Dr. Merrill, queried by C&EN as to health problems associated with smog, notes the real question is: Are effects of smog on health severe enough for public health agencies to use police



Marked contrast in two stacks from operating open hearth furnace—the electrical precipitator in center is removing solid matter from gases going to stack on right

power to correct air pollution in urban areas?

This question, he points out, is only now beginning to be answered. Laboratory tests (animals and men) with relatively high concentrations can give clues to acute effects of short-time exposure; studies of two population groups (as in the Detroit-Windsor study) can show long-range effects.

Dr. Merrill feels that smog chemistry is sufficiently well understood that large scale efforts along both these lines would be justified. Work on vegetation has made much progress, but physiological effects of smog inhalation by man is almost untouched.

Determination that smog has an identifiable adverse effect on health will be most effective in stimulating corrective action.

John W. Mehl, Paul Kotin, and Hugh A. Edmondson, University of Southern California school of medicine, have been working for some time on biological effects of air pollution under USPHS grants. While their experiments are admittedly inconclusive—and are being continued—the specter of cancer looms. Extracts from natural and artificial smog, Diesel and gasoline engine exhausts, residential incinerator soots, and air-blown-asphalt plant effluents reportedly can cause skin cancer on mice.

While many loose ends remain, this much seems certain: many polycyclic hydrocarbons, including known carcinogenic hydrocarbons—pyrene, benzpyrene, benzperylene, anthanthrene—have been found in types of smog listed in the foregoing. Major questions still unanswered: Will these pollutants cause lung cancer? (Inhalation studies are being started by the USC men.) Are the pollutants in sufficient concentration in smog to cause cancer?

Largely as a result of concerted effort by industry, university, and private research organizations, a fair catalog of plant damage symptoms has been assembled. Knowing what pollutant causes which damage gives industry a good start toward installing proper control. Notable have been results on fluoride damage and control by aluminum plants in the Pacific Northwest.

University of California is pushing research on the agricultural front because of an estimated $3 million damage to state crops in 1953. Vegetable crop and citrus damage in the Los Angeles area has grown yearly; today, romaine lettuce, endive, spinach, celery, and garden beets are particularly hard pressed there.

As a result of a cooperative study among UC, L.A. County Air Pollution Control District, and Caltech, findings on the role of hydrocarbons in the air were announced by Gordon P. Larson, director of the district, and A. J. Haagen-Smit, Caltech: Reaction products of unsaturated hydrocarbons and ozone are primarily responsible for the natural damage observed.

Typical of work being done for agriculture is that centered at Riverside: effects on plant enzyme systems, photosynthesis, respiration, and permeability; effects of ozonated olefins on citrus; plant screening to secure varieties resistant to oxidized hydrocarbons; protection techniques.

In connection with this latter aspect, John Middleton (Riverside plant pathologist) and coworkers have found in laboratory experiments that certain dithiocarbamates, when sprayed or dusted on plants, offer a measure of smog protection. How long the protection lasts under field conditions, what the protection mechanism might be, just how growers might utilize the technique awaits results from field experiments which Middleton hopes to start soon. Important potential of the method: the proposed compounds are already used by growers for fungus control, could conceivably do two jobs and not require additional chemicals or applications.

Smog control in the San Francisco Bay area, with the exception of one county which has acted on the 1947 state law, is still on a "voluntary" basis, with considerable divergence of opinion as to the efficiency of "voluntary" *vs.* stringent control. Voluntary control, claims proponent San Francisco Bay Area Council (C&EN, Feb. 15, page 668), a civic organization, would be between 60 and 85% effective if given a chance. Not so, counter some health officials. In one county (Alameda, the most industrial of the nine bay area counties), officials note that only 10 of 100 industrial polluters surveyed in 1952 had installed control devices 1953. (Meanwhile, Bay Area Cou has employed Patrick J. Moran, for chemical warfare expert, to direct program.)

Therefore, some advocate establis ment of regional, cooperative contr under present state law. Others belie the best solution would be for speci state formation of a regional authorit

That solution, however, is not jus around the corner. The Californi Legislature's next regular session is no until 1955, and it is highly unlikely air pollution will be on a special session's agenda.

Air Pollution in Oregon

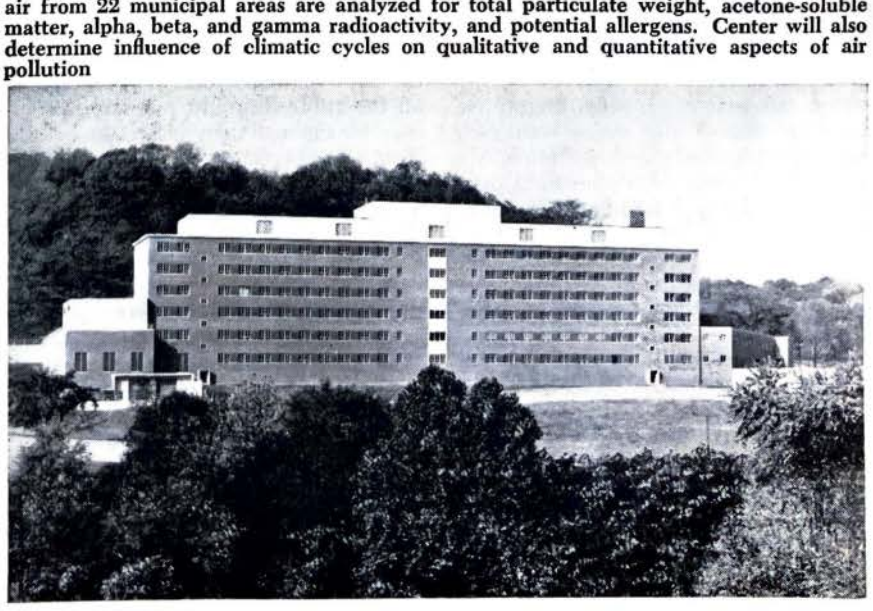
In August 1951, the Oregon air pollution control act became effective, making Oregon the nation's first (and still only) state to have a state organization specifically for air pollution control. Fluorine effluents from aluminum reduction at Troutdale, Ore., and Vancouver, Wash., plus excessive dust and smoke, mainly from lumbering activities, were most pressing problems, although small areas were bothered by fumes or aerosols from a variety of operations, such as chemical, paint, manufactured gas, and kraft pulp plants.

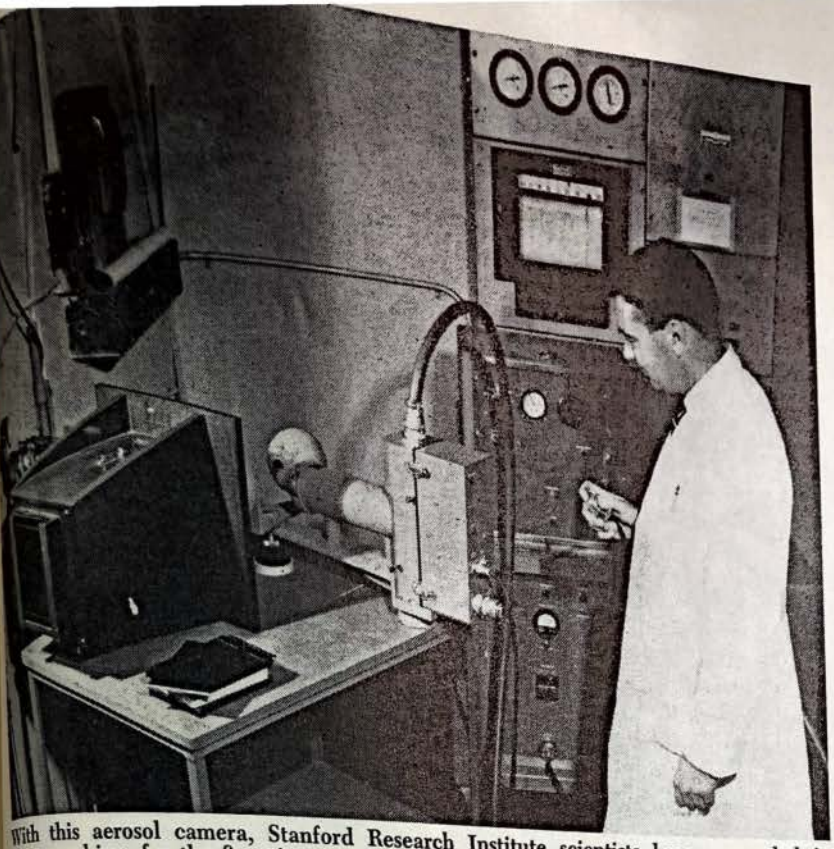
The air pollution authority has confined itself to determinig air pollution levels—mostly of particulate matter—investigating complaints, making local surveys requested by city councils, and attempting to prevent new pollution sources from being established.

Washington's Problem

Like Oregon, Washington air pollution has consisted mainly of smoke, fly ash, and fluorides. However, growing

U. S. Public Health Service Sanitary Engineering Center, Cincinnati, where samples of air from 22 municipal areas are analyzed for total particulate weight, acetone-soluble matter, alpha, beta, and gamma radioactivity, and potential allergens. Center will also determine influence of climatic cycles on qualitative and quantitative aspects of air pollution





With this aerosol camera, Stanford Research Institute scientists have succeeded in photographing, for the first time, aerosols in flight (C&EN July 27, 1953, page 3074)

electrochemical, thermochemical, and chemical processing industries point toward further pollution unless controlled. Air pollution control at the state level is currently covered only by the usual type of general nuisance legislation. An act, passed by the last session of the legislature, set up an air pollution unit within the State Pollution Authority (water), but no funds were appropriated. Tacoma currently has the only effective air pollution ordinance in the state.

During the past 10 years, observed damage has been mainly foliar burn to sensitive plants by hydrogen fluoride and sulfur dioxide. The major known sources of fluorides and sulfides have spent well over $15 million to control these pollutants during the past four to six years.

In the Pacific Northwest, the aluminum reduction industry has been the perennial whipping boy and sufferer of many a damage suit because of fluorides, but now, thanks to a concerted cleanup campaign, it apparently has its fluoride problem licked. Latest evidence comes from a final report by Oregon State College and State College of Washington researchers released last month on Alcoa's Sauvie Island plant.

Alcoa spent about $1.5 million at Vancouver for fluorine control; Reynolds, $2.5 million at Troutdale, Ore.; Kaiser will have spent about $7.5 million when its program is completed this fall at Mead, Wash. (Kaiser's Tacoma plant had fluoride controls already installed when Kaiser purchased it.)

Among the most active groups studying smog is Stanford Research Institute. One of the lesser known air pollution problems SRI is working on is Alaska fogs. Water, ordinarily a desirable atmospheric constituent, can become a source of man-made air pollution. In parts of Alaska where temperatures drop below −30° F., water as steam becomes a potent source of visibility-reducing ice fogs. These ice fogs are sufficiently dense to prevent aircraft operation. Exact nature of the fogs has been studied for the past three winters.

London Fog

With memory of the death of 4000 persons as a result of the "killer fog" in London in December 1952 still fresh in their minds, Londoners are justified in becoming excited when heavy fogs are predicted. There, much of the blame is placed on smoke from domestic coal burners. In July 1953, a Committee on Air Pollution was appointed "to examine nature, causes and effects of air pollution and efficacy of present preventive measures; to consider what further preventive measures are practicable; and to make recommendations." In an interim report presented last December, committee states most serious immediate problem in air pollution is combustion of fuel. Chief pollutants are smoke, sulfur dioxide, carbon monoxide, and grit. The domestic fire was reported biggest single smoke producer. In ratio to coal burned, it was said to produce twice as much smoke as industry and discharge it at a lower level.

In some areas in the U. S., concentration of sulfur dioxide has been reduced greatly with no apparent decrease in eye-irritating smog. In the interim report, however, there is a clear correlation between pollution by smoke and sulfur dioxide and the daily death rate in Greater London during the fog of 1952. Data also indicate a continuing abnormal death rate in London during the two and a half months following the "smog."

The committee advocates conversion of bituminous coal into coke, gas, and electricity, and substitution of smokeless fuels for domestic purposes. It recommends replacement of old fashioned domestic grates by improved appliances. Greater use of central, smokelessly fired boilers for blocks of buildings is proposed. In industry, promotion of greater fuel efficiency is needed. Furnaces fired by pulverized fuel or operated by forced draft need more efficient grit-arresting facilities. Coal should be cleaned at the coal fields of shale and some of the sulfur compounds. Research and development work on practicable methods of removing sulfur dioxide from flue gases is urged.

A ban on open fires in Britain would save from 10 to 15 million tons of coal a year. Installation of stoves to replace fireplaces at government expense has been proposed as economically sound. Some communities are already offering subsidies to householders who will make the switch.

However—came late 1953—thick fogs threatening a repetition of the disastrous one of a year before rolled into London and sent its populace rushing to buy smog masks. Gauze masks, distributed gratis by Britain's socialized medicine program, were also in use.

Participation by Associations

Chemical professional organizations have also become involved in the fight to restore pure air. The Manufacturing Chemists' Association sponsored establishment of an Air Pollution Abatement Committee in 1949. The committee considers detection and measurement of air contaminants; factors affecting dispersion of solids, vapors, allowable concentrations from standpoint of toxicity, nuisance, and odor; and control methods and methods of treatment. It holds regularly scheduled meetings and annual conferences. Forthcoming conference next month (April) in Houston is expected to attract largest group of air pollution experts ever assembled.

The American Chemical Society established an air pollution committee at its council meeting in April 1952. This group considers physiological, biological, and nuisance effects of smog as well as effect on paints and other protective coatings. Several symposia have been held at the Society's national meetings. American Society of Mechanical Engineers and other groups also have committees studying the problem.

Printed in U. S. A.

APR 21 1954

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

Minutes Research Committee Meeting, Friday, April 16, 1954.

11:30 - 12:10 Office of Dr. DuBridge, Cal. Tech.

Attending - DuBridge, Banks, Beckman, Faith and Hitchcock

Agenda submitted and discussed copy attached. It was explained that in their present embryonic form only approval in principle was being requested, for these projects, as an indication as to whether the Committee felt that we were on the right track. Unanimous approval was given to the program as outlined.

Specific comments with respect to certain of these projects:

Project III, Item 1: Dr. Beckman says that automatic recorders are available for both NO_2 and H_2S. Rubicon Instruments Co. in Philadelphia has the H_2S recorder and the name of the company making NO_2 recorders Jack Bishop will know. Humble Oil Company has used. (Dr. H. D. Wylde is research director, an old friend of L. B. H.) W. L. Faith commented that according to John Middleton at Riverside the pinto bean also develops silver leaf and is a preferred test plant to spinach.

With respect to Project III, Item 2(b) the microwave spectrographic analysis of atmospheric pollutants is not of course properly under the heading of "measurement of visibility"; the technic is interesting, but probably not near enough ready to be able to use this year. DuBridge feels it might be worth considering for use later on.

Project III, Item 3: DuBridge and Beckman emphasized the importance of using gas tracers rather than solids in order to more accurately follow movements of air masses and avoid dangers of settling out of particulate tracers.

Project III, Item 4: DuBridge and others urged the use of a few citizens around each recorder station and using the same ones every time.

They expressed approval of the use of Arthur D. Little Inc. to attempt to solve the argument between phenolphthalein and KI as oxidant-measuring solution.

Project IV. W. L. Faith enlarged upon preliminary thoughts directed at evaluation of corrective devices for auto exhausts. Considerable discussion concerning comparative philosophies of direct even though empirical methods designed to demonstrate production of smog by auto exhausts, as in chambers of some sort, vs. more involved elucidation of the chemical reactions. DuBridge seemed to favor deeper probing of chemistry; Faith favored doing both simultaneously. Consensus seemed to be to continue study, and, as Faith recommends, accumulating and evaluating all presently available information. There is much confusion in the present picture.

Item II. Report on arrangements with County by which its support for our projects is assured, was received with approval.

Item III. L. B. H. indicated a possible route by which State support might be received via U. C. L. A. or U. C. R. projects or perhaps at other U. C. campuses. Consensus was that this might take quite a while and that the Foundation might have to anticipate eventual receipt of funds from such source.

DuBridge suggested addition of Project V., to deal with investigation of chemical reactions taking place in the L. A. atmosphere more broadly than comprehended in Project I (which has primarily to do with reactions of hydrocarbons and their oxidation derivatives). DuBridge suggests for example that there might be possible catalysts present in the atmosphere (as metallic oxides or others of which NO_2 might be one example); if so, catalysts found to be contributing directly to smog formation might be removed and thus find a relatively simple and direct method of blocking the smog reactions. (This is interesting in view of Dr. Littman's somewhat similar thoughts expressed at our second hydrocarbon conference some weeks ago). Other reactants than hydrocarbons or other organics might also be found responsible for smog formation. Careful consideration should be given to formulating specific projects under this general heading.

L. B. Hitchcock

LBH:mek
cc: Dr. DuBridge
Dr. Allen
Dr. Beckman
Mr. Banks
Mr. Roach
Dr. Fagg

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

RESEARCH COMMITTEE MEETING

MAY 25, 1954.

TRUSTEES

L. A. DuBridge, Chairman
Raymond B. Allen
F. M. Banks
Ralph W. Seely (for Alden G. Roach)
Stephen W. Royce (ex officio)

FOUNDATION

L. B. Hitchcock
W. L. Faith
M. Neiburger
N. A. Renzetti

(AGENDA)

1. Minutes of April 16, 1954.

2. Project Proposals - Recommended for approval:

PROJECT NO. SCAPF	TITLE
	Program 10 - Meteorological Aspects of the Air Pollution Problem in the Los Angeles Basin
10-54-1	Meteorology Report – Report complete
10-54-2	Air Tracer Survey – Contract approved ($41,000) LRCo.
10-54-3	Meteorological Conferences – $500
10-54-4	Pre-War Visibility – $1000
	Program 20 - Chemical Aspects of the Air Pollution Problem in the Los Angeles Basin
20-54-1	Smog Forming Reactions – Analyze [illegible] {substitution [illegible]} 126,000 /yr.
20-54-2	Hydrocarbon Conferences
20-54-3	Ozone Conferences
20-54-4	Organic Halides Determinations – 5[illegible]
20-54-5	Lead Determinations – 5[illegible]

PROJECT NO. SCAPF	TITLE
	Program 30 - Study of Combustion Products
30-54-1	Auto Exhaust Conference
30-54-2	Combustion Products (See UCLA Proposal)
30-54-3	Composition of Auto Exhaust
30-54-4	Composition of Diesel Exhaust
30-54-5	Composition of Incinerator Gases
	Program 40 - Aerometric Survey of the Los Angeles Basin Summer And Fall, 1954
40-54-1	Oxidant Recorders
40-54-2	Oxidant Survey (see County Proposal)
40-54-3	Solar Intensity and Wave-lengths
40-54-4	Visibility Measurements
40-54-5	Measurements of Various Contaminants (NO_2, SO_2, O3, etc.; Millipore sampling)
40-54-6	Photographic Records
40-54-7	Eye Irritation Survey
40-54-8	Plant Damage Survey
40-54-9	Supplementary Observations Aloft
40-54-10	Supplementary Observations Outside Basin
	Program 50 - Statistics of the Los Angeles Basin
50-54-1	Basic Statistics, Current (1953 –)
	Program 60 - Physical Measurements
60-54-1	Survey of Micro-Wave Techniques

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

PROJECT PROPOSAL

The Effect of Products of Combustion on Smog Formation

Purpose:

(1) To reproduce smog manifestations (such as reduced visibility, eye irritation, plant damage, rubber cracking, and ozone formation) under controlled conditions similar to those extant in the Los Angeles atmosphere.

(2) If reproduction can be accomplished by addition of 'realistic' concentrations of automobile and diesel exhaust gases, incinerator effluents, industrial effluents or combinations of these, to use the equipment devised to test the effectiveness of various control devices in alleviating smog formation.

Method of Approach:

The test unit will consist of two greenhouses in series, the first to serve as a reaction chamber and the second as an exposure chamber for plants and personnel. The necessary auxiliary equipment for controls, for mixing and moving air, for irradiation of the controlled atmosphere, and for measuring the various smog manifestations must also be provided.

The unit will be calibrated by attempting to reproduce smog manifestations by some or all of the following reactions:

Add to purified air:

1. Hexene and ozone
2. Hexene and nitrogen oxides, irradiated
3. Auto exhaust and ozone
4. Auto exhaust and nitrogen oxides, irradiated
5. Similar experiments with incinerator gases

The exact course of the study beyond this point will be dictated by the results obtained. Several profitable lines of investigation may materialize, but the program must be correlated with similar studies at SRI and at Riverside to avoid unnecessary duplication.

It is hoped that preliminary work will demonstrate that the addition of realistic concentrations of a common combustion effluent, such as exhaust gas or incinerator stack gases, to a realistic atmosphere will be the difference between 'smog' and 'no smog'. If so, the unit may be used for a study of the effect of design changes in combustion equipment on smog formation.

PROJECT PROPOSAL
The Effect of Products of Combustion on Smog Formation

Probable Measurements Required:

Plant damage, human eye irritation, rubber cracking, visibility, chemical analyses, oxidant, hydrocarbon, aldehydes, oxides of nitrogen, CO, CO_2, particulate matter, lead, and others as required.

Probable Operating Personnel:

1. Someone who can grow plants and measure damage.
2. Engine and incinerator operator.
3. One or two to operate analytical instruments and carry out chemical analyses.
4. Someone to set up and operate eye irritation panel.
5. Maintenance and cleaning personnel (part-time).

May 20, 1954.
WLF:g

Proposal for Study to Check Accuracy of Wind Trajectories by Use of Fluorescent Tracers

I Background

The probable trajectory of air reaching a particular place where effects of pollution are measured, or leaving a source from which pollution emanates, can be determined by analysis of the wind field. At present there are approximately 55 stations in the L.A. area at which surface wind observations are made. These enable the construction of such trajectories with a good degree of reproducibility. There are two reasons why these trajectories might not give a true picture of the movement of pollutants in this area.

Firstly, the wind measurements reported are winds averaged over one minute each hour. They do not give a measure of the variability of the instantaneous wind, or of the variability of the mean wind with time through the hour. This variability may be regarded as turbulent fluctuations, which have the effect of producing turbulent diffusion. The end point of the trajectory evaluated from the measured winds would lie somewhere within the cloud of pollution produced by the turbulent diffusion, but without some indication of the degree of diffusion we have no way of telling to what extent it is representative of the position of the cloud as a whole.

Secondly, the winds at upper levels (but still below the inversion) are known to vary somewhat, both in direction and speed, from the winds near the ground. (See "Summary Report on Meteorology of the Los Angeles Basin with Particular Respect to the "Smog" Problem", pp 33-42). Thus if the pollutants are carried by convection and turbulent mixing to higher levels, they may be carried along trajectories considerably different from those of the surface air, and then mixed downward to reach the ground in positions they would not have reached by surface air transport and lateral diffusion.

To test whether the surface wind trajectories are sufficiently representative of the movement of pollutants for conclusions regarding sources to be based on them, it is proposed that a series of experiments using fluorescent powder (zinc cadmium sulphate) as a tracer element be conducted.

II Proposed Procedure

A. Tracer sampling.

Twenty-five sampling stations will be located at approximately two-mile intervals along a semicircle fifteen miles in radius centered in the Torrance-Wilmington area. On five different days during the period July 15-September 15, 1954 tracer material will be released for one hour (say 0330-0430 PST) in positions near the center. Sampling will begin about three hours ahead of the estimated time (usually 1300) for the cloud of tracer material to reach the sampling network, and will be continued for three hours afterward. (In the first test we may take the samples over a longer period to test the correctness of the premise that a six hour sampling period is adequate.) The filters at the sampling points will be changed every hour.

The release will be made at the rate of 20 grams/minute, or 1200 grams during the hour, each gram containing $3 \cdot 10^{10}$ particles, modal size less than two microns, maximum size five microns. The cloud emitted will thus contain $3.6 \cdot 10^{13}$ particles. If at 15 miles two-thirds are contained in a cylinder 4 miles in diameter 1500 feet deep (from ground to base of the inversion), the concentration within this cylinder will average about two per liter, so that with a sampling rate of 10 liters per minute at least two of the sampling stations will have counts greater than 1000 particles. These counts will occur on one or two hourly filters at each station.

B. Tracer Analysis

For each test day a total of 150 (possibly 250 for first test) filters will be exposed. Allowing an average of 30 minutes per filter, it will take two microscopists two weeks to make the counts for each test day. The counts will be represented on a chart with distance along the circumference of the sampling circle as abscissa, and time as ordinate, and isopleths of consentration will be drawn.

Regarding the time as corresponding to distance along wind with the wind speed as the conversion factor, the approximate dimensions of the cloud as it passed the sampling network will be determined. This will be laid out on a map of the area for easier visualization.

C. Meteorological Data.

The network of 55 surface wind reporting stations will be re-examined, to see whether gaps exist which should be filled, and to make sure that all of them will be operative during the test period. An attempt will be made to augment the upper air wind network, so that upper winds are available at more points and more frequently during the test period. Further, the character of the turbulence will be studied by collecting the records at stations in the area having recording anemometers.

D. Analysis of the Meteorological Data.

The wind reports for each hour during the periods of the tests will be entered on charts, and streamlines and isovels carefully analyzed therefrom. Using these, the trajectory of the surface air from the source will be computed. Using the available data for the wind variability, an estimate of the cloud width and concentration at the sampling distance will be computed. These computations will be made before the tracer data is available, so as to render impossible any influence of the latter on the former.

E. Combined Analysis.

The results of the two types of data will be compared. If there are disagreements, these will be studied to see whether improvement of the wind observation procedure may make it possible to use it, perhaps through use of the upper wind data, or whether it must be abandoned and reliance placed only on tracer tests to study the movement of pollutants in the area.

In addition to checking on the validity of the wind trajectory technique, the tracer data will have value in giving information on the turbulent diffusivity over the area, and the transport of pollutants from the particular sources used, in the particular meteorological situations under which the tests are made.

III Estimated Cost.

A. Tracer sampling.

The Ralph M. Parsons Company have rendered a proposal for a small-scale tracer test, in which they would manufacture or procure the equipment for purchase by the Foundation, and carry out the sampling program except for provision of sampler operators, said personnel to be furnished by the Air Pollution Control District. The proposal was for one test involving sixty sampling stations. Applying the unit costs quoted by them to the presently proposed program, involving reduction in number of stations and expansion of number of tests, the following represents a rough estimate of costs.

Equipment

25 samplers @ $250	$ 6,250
Disperser @ 200	200
Filters, tracer, etc	500
Miscellaneous chemicals	100
2 Microscopes & illuminators @ 500	1,000
Laboratory Facilities	1,000
	9,050

Services

Project supervision	$ 5,700
Test planning	1,500
Test supervision	3,250
Dispersal	1,350
Filter handling & counting	4,500
Data presentation	2,500
	20,800

Total estimated cost of tracer sampling 29,850

B. Meteorological and combined analysis

The analysis of the meteorological data and its checking against the tracer data can be carried out by SCAPF personnel assisted by temporary employees as needed, or under contract with an organization having competent meteorologists experienced in this problem. It is recommended that for the summer data collection and preliminary analysis program the Foundation engage Dr. James G. Edinger, Assistant Professor of Meteorology at U.C.L.A., either as an independent contractor or an employee. For the final analysis of the data it is suggested that the Foundation enter into a contract with U.C.L.A. to be conducted in the Meteorology Department under Dr. Edinger's supervision. The following represents a rough estimate of costs.

1. Summer Program (3 months)

Supervising meteorologist	$ 2,100	
Assistant meteorologist	1,500	
Observers for special upper winds observations	600	
General assistance	1,000	
Materials and reports	800	
		6,000

2. Final analysis program (6 months)

Graduate research assistant	3,000	
General assistance	1,500	
Materials and reports	1,500	
Overhead and retirement	1,500	
		7,500

Total estimated cost of meteorological and combined analysis	13,500
Total estimated cost of complete project	43,350

SCAPP-10-54-2

Proposal for Study to Check Accuracy of Wind Trajectory Studies by Use of Fluorescent Tracers

Summary

I. Background

Air trajectories derived from surface wind observation present a readily available tool for study of pollution sources. Before reliance can be placed on the results, it is necessary to check whether the movement of pollutants is actually that represented by the computed trajectories. The use of fluorescent tracers provides a method for such a test.

II. Proposed procedure

Tracer material will be released for one hour on each of five mornings in the Wilmington-Torrance area. Air samples will be taken hourly using millipore filters at twenty-five stations spaced at two mile intervals along a semicircle of radius 15 miles around the source. Wind data will be used to compute the expected trajectory of the material, and the probable spread of the cloud due to turbulent diffusion, and these computations will be compared with the result of the tracer sampling.

III. Estimated cost

A. Tracer sampling

Equipment	$ 9,050	
Services	20,800	
		29,850

B. Meteorological and combined analysis

Summer program	6,000	
Final analysis program	7,500	
		13,500

Total estimated cost of project 43,350

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

JUN 5- 1954

RESEARCH COMMITTEE MEETING

May 25, 1954.

Summary of Notes

The meeting was attended by:

Dr. L. A. DuBridge
Dr. R. B. Allen
Mr. F. M. Banks
Mr. S. W. Royce (ex-officio)
Dr. L. B. Hitchcock
Dr. W. L. Faith
Dr. M. Neiburger
Dr. N. A. Renzetti
Mr. E. M. Liston

Dr. Hitchcock reported on the Foundation's project proposals (See outline distributed at meeting; copy attached.) The four projects of Program 10 are scheduled for completion in 1954:

10-54-1 The Foundation intends to print approximately 250 copies of the Neiburger report to be distributed to the contributors, Trustees, and other interested parties. This report was prepared during April and distributed to the Advisory Meteorology group for the conference, May 17-18. Dr. DuBridge suggested that it be sent to the local libraries. Total cost estimated - $2500. Moved, seconded, unanimously approved (MSUA)

10-54-2 Dr. Neiburger passed out his mimeographed project description and briefly discussed the tracer study. He stressed that its main purpose is to confirm the wind trajectories, not to indict any particular source. Total cost estimated -$50,000, including Parsons Co. contract.

Mr. Royce moved to accept the Parson's proposal.

Dr. DuBridge called for a vote and there was unanimous approval for the Foundation to proceed immediately with this program on the assumption of ratification by the Board of Trustees (MSUA).

10-54-3 (Meteorological Conferences)
Dr. Hitchcock reported on the Meteorological Conferences which took place on May 17 and 18, with a report, at a cost of approximately $500 (MSUA).

10-54-4 (Pre-War Visibility)

The Foundation will try to establish a datum for visibility from old weather records (1940). The cost was estimated at $1,000. Dr. Allen moved the question (MSUA)

20-54-1 (Smog Forming Reactions)

Dr. Faith said that the main purpose of this program will be to identify classes of compounds that are responsible for eye irritation, reduced visibility, and plant damage. Some work has been done on this subject by LACAPCD and SRI but never at realistic concentrations. This work will consist mainly of determining the smog-forming ability of ozonized or irradiated LA air after various pollutants have been removed by scrubbing. It will take five men about a year at a cost of approximately $126,000, only half of which would be spent during 1954.

Dr. DuBridge asked what the budgetary condition was before approving Project 20-54-1. Dr. Hitchcock replied that through December 1954, it looks like:

Planned Projects	$525,500
County & State (?)	427,500
Balance for SCAPF	$ 98,000
Operating Expense	$200,000
SCAPF Needs	$298,000
Treasury	$446,000
Not Ear-Marked	$148,000

Breakdown of possible County and State support:

Project 10-54-2	$ 50,000	County
Program 40	$252,000	County
One-half of Project 30-54-2	$125,000	State?
	$427,500	

Dr. Hitchcock pointed out that the Foundation must have County and State support in order to carry out this program.

Dr. Allen - July 1, 1955 is the first possible time for getting direct State appropriations now.

Dr. Hitchcock - Is it possible to get an "advance" from the State?

Dr. Allen - Both the State and the University have emergency funds, but it would be difficult to get money from them. The Shaw Committee of the State Legislature is very interested in this problem; we may be able to get good support from them.

Dr. Hitchcock - Smog from auto exhaust is a problem of State-wide interest.

The program presented today will cost approximately $750,000 to June 30, 1955, with an estimated $552,000 which may come from the State and County.

Dr. DuBridge - The real chance for getting money from the State is to get some present appropriation diverted to us.

Dr. Hitchcock - If we can get a number of groups such as UCLA, Cal Tech, etc., to officially back the program, it will make it easier for Asa Call to make his contacts.

Mr. Banks - Does the figure for the treasury include the $200,000 from the oil industry?

Dr. Hitchcock - yes.

Dr. Allen - Which are the most important projects?

Dr. Hitchcock - The most important thing we do now is to make use of the smog season and do Program 40. SRI is a good organization. We are optomistic about Littman's work on gaseous pollutants. SRI deserves our support to expand their efforts through Project 20-54-1. Dr. DuBridge asked to review the rest of the Research Program before voting.

20-54-2 (Hydrocarbon Conferences)

The Hydrocarbon Conferences brought out a lot of good information and only cost us about $200 (MSUA). Dr. Haagen-Smit has been retained as a consultant.

20-54-3 (Ozone Conferences)

This conference was attended by Biggs and Crabtree of Bell Telephone Laboratories - cost was approximately $500(MSUA).

20-54-4, 5

The Organic Halides and Lead Determination Program can, if necessary be deferred. The cost will be approximately $5,000 each.

30-54-1 (Auto Exhaust Conference)

This conference is to be held on August 19, 20, 21 at a cost estimated at $2,000.

30-54-2, 3, 4, 5 (Combustion Products)

Dr. Faith - The purpose of this program is to look at the obvious uncontrolled contaminants now on the assumption that all contaminants contribute to smog. All experiments up to this time have been done at too high concentrations. We need to duplicate the LA atmosphere in a 3,000 cu. ft. reaction chamber and then feed this air into a duplicate exposure chamber. The people at UC at Riverside can help us on the plant damage aspects of the tests. Plant testing is one of the partially objective tests for smog.

Dr. Allen suggested that the Foundation consult a pharmacologist to see if some sensitive biological tissue is available. Probably, it would be too involved and take too long.

Mr. Royce - What does Dr. Haagen-Smit think about the idea of large "greenhouses"?

Dr. Faith - He likes it. There is no other way of accomplishing the necessary experiments.

Dr. Hitchcock - These experiments would confirm and extend the work of Haagen-Smit, Middleton, Littman, etc.

Dr. Allen believes that Program 30 should be worked up immediately to the point of financing. We might be able to get some of the equipment from auto manufacturers.

Dr. DuBridge - What about the automobile companies doing some of this work?

Dr. Faith - They are just beginning to get under way.

Mr. Royce - It will take them five years to do it.

Dr. DuBridge - What about Program 40?

Dr. Hitchcock - This program is needed this summer:

40-54-1 (Oxidant Recorders)

The oxidant recorders have been ordered from Beckman Instrument Company at a cost of $45,000. They are the same type of instrument as that used by SRI.

40-54-2 (Oxidant Survey)

This survey will be accomplished at ten or eleven stations throughout the Basin. This Project and 40-54-1 have been proposed to the County for a total cost of $77,000.

40-54-3 (Solar Intensity and Wave Lengths)

This project might cost $2,000.

40-54-4 (Visibility Measurements)

This project might cost $20,000.

40-54-5 (Measurements of Various Contaminants)

NO_2 and SO_2, will be measured while getting oxidant values ($50,000).

40-54-6 (Photographic Records)

Leighton? ($10,000)

40-54-7 (Eye Irritation Survey)

This will be done by telephone calls to various parts of the city ($1,000).

40-54-8 (Plant Damage Survey)

The Foundation is considering putting test plants at Pasadena, UCLA, USC, and Watts ($40,000).

40-54-9 (Observations Aloft)

Some observations should be taken near in and above the inversion layer ($50,000).

Total for Program 40 - $252,500. Projects should not be sent to County until after June 8, 1954.

Mr. Royce and Dr. Allen like Program 40.

Dr. DuBridge - The Committee approves the Program subject to funding.

Program 40 should receive priority because of the time considerations. There are no problems on Program 10.

The Foundation should proceed with discussions with UCLA on 30-54-2 pending the budget allocation.

The $246,000 estimated balance in the treasury as of December 31, 1954, should be used to support programs 10 and 20, remembering that SRI would only get one-half of the total commitment this year.

The Committee, in summary, approved the entire Research Program as submitted, from a scientific standpoint, and decided to leave it to Dr. Hitchcock to proceed with such of these (not already authorized) as in his judgement deserved priority, within the limits of available funds.

It was understood that the present Research Program is only the beginning; that there are subjects not even touched as yet, for the future. The Committee feels that the scientific staff has done well to formulate a program of such high caliber and that this is just the reason for which the Foundation was set up.

E. M. Liston

LBH:EML:mek

cc: L. A. DuBridge
R. B. Allen
A. O. Beckman
F. M. Banks
Alden G. Roach
F. D. Fagg, Jr.
S. W. Royce
W. L. Faith
M. Neiburger
N. A. Renzetti
L. H. Rogers
L. A. Garrett
B. Leiper
LBH File

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

RESEARCH COMMITTEE MEETING

May 25, 1954

TRUSTEES

L. A. DuBridge, Chairman
Raymond B. Allen
F. M. Banks
Ralph W. Seely (for Alden G. Roach)
Stephen W. Royce (ex officio)

FOUNDATION

L. B. Hitchcock
W. L. Faith
M. Neiburger
N. A. Renzetti

AGENDA

1. Minutes of April 16, 1954

2. Project Proposals - Recommended for approval:

PROJECT NO. SCAPF	TITLE
	Program 10 - Meteorological Aspects of the Air Pollution Problem in the Los Angeles Basin
10-54-1	Meteorology Report
10-54-2	Air Tracer Survey
10-54-3	Meteorological Conferences
10-54-4	Pre-War Visibility
	Program 20 - Chemical Aspects of the Air Pollution Problem in the Los Angeles Basin
20-54-1	Smog Forming Reactions
20-54-2	Hydrocarbon Conferences
20-54-3	Ozone Conferences
20-54-4	Organic Halides Determinations
20-54-5	Lead Determinations

PROJECT NO. SCAPF	TITLE
	Program 30 - Study of Combustion Products
30-54-1	Auto Exhaust Conference
30-54-2	Combustion Products (See UCLA Proposal)
30-54-3	Composition of Auto Exhaust
30-54-4	Composition of Diesel Exhaust
30-54-5	Composition of Incinerator Gases
	Program 40 - Aerometric Survey of the Los Angeles Basin Summer and Fall, 1954
40-54-1	Oxidant Recorders
40-54-2	Oxidant Survey (see County Proposal)
40-54-3	Solar Intensity and Wave Lengths
40-54-4	Visibility Measurements
40-54-5	Measurements of Various Contaminants (NO_2, SO_2, O_3, etc.; Millipore sampling)
40-54-6	Photographic Records
40-54-7	Eye Irritation Survey
40-54-8	Plant Damage Survey
40-54-9	Supplementary Observations Aloft
40-54-10	Supplementary Observations Outside Basin
	Program 50 - Statistics of the Los Angeles Basin
50-54-1	Basic Statistics, Current (1953 -)
	Program 60 - Physical Measurements
60-54-1	Survey of Microwave Techniques

From the desk of
L. B. HITCHCOCK

JUN 21 1954

Please refer to your copy of my letter to Ed Carter dated May 28.

attached

L. B. H.

NIA AIR POLLUTION FOUNDATION
4 SOUTH SPRING STREET
ANGELES 14, CALIFORNIA
Tel.: MAdison 6-9441

JUNE 18, 1954

LAUREN B. HITCHCOCK
President and Managing Director

idge, President,
itute of Technology
1201 East California
Pasadena, California

Dear Dr. DuBridge:

Confirming our telephone conversation, there will be a meeting of the Board of Trustees held at the Foundation, on Tuesday, June 29, at 2:30 p.m.

The meeting is being called for the express purpose of receiving the report of the Research Committee of the Board and in our opinion it will be the most important meeting the Board will have had up to this time.

The meeting will be approximately two hours in length. Parking facilities are available at 644 South Main Street and your tickets will be validated by the Foundation.

Will you kindly complete the enclosed postcard and return it to me.

Your presence is earnestly requested.

Sincerely yours,

L. B. Hitchcock

LBH:njd
Enclosure

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

704 SOUTH SPRING STREET
LOS ANGELES 14, CALIFORNIA
Tel.: MAdison 6-9441

JUNE 18, 1954

LAUREN B. HITCHCOCK
President and Managing Director

Dr. Lee A. DuBridge, President,
California Institute of Technology
1201 East California
Pasadena, California

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Your presence is earnestly requested.

Sincerely yours,

L. B. Hitchcock

L. B. Hitchcock

LBH:njd
Enclosure

JUN 1 - 1954

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

704 SOUTH SPRING STREET
LOS ANGELES 14, CALIFORNIA
Tel.: MAdison 6-9441

LAUREN B. HITCHCOCK
President and Managing Director

May 28, 1954.

COPY

Mr. Edward W. Carter,
Chairman Finance Committee,
Southern California Air Pollution Foundation,
c/o Broadway-Hale Stores, Inc.,
401 South Broadway,
Los Angeles 13, California.

Subject: Financial Picture

Dear Ed:

In accordance with our telephone conversation yesterday, I am enclosing a breakdown of our financial picture as it may be presently estimated in the light of our research program.

The Research Committee met May 25, and after consideration of each of the projects proposed, in accordance with exhibit "A" herewith, voted unanimous approval as to the worthwhileness of the technical work and authorized me to proceed with such of these as seem most urgent and for which there were sufficient funds available. Specific authorization was voted to commit $50,000 on Project 10-54-2 and $126,000 on Project 20-54-1; only about one-half of the latter amount would be obligated during calendar year 1954. The purchase of twelve oxidant recorders - totaling $45,000 from Beckman Instruments is authorized under Project 40-54-1, but we expect to be reimbursed for this by the County.

Since the research projects referred to herein, for the most part will run for twelve months, beginning in the near future, and we cannot wisely make more than a very rough guess as to research commitments beyond that time, we have tried to show in exhibit "A" our best estimate as to actual funds required through December 31, 1954, and the additional funds required on these projects through June 30, 1955. As shown on exhibit "A", our total funds required through 1954 may amount to about $696,000, while during the first half of 1955 they look like about $363,000.

Exhibit "B" indicates that if we assume no additional funds are received, nor any County support this year, we would incur a deficit by December 31, 1954, of $249,385. I shall not, however, incur any deficit, so we must either hold up our research program or find more money.

If the County comes through as has been suggested, the work we feel that could properly support totals over $300,000. As shown in line 8 of exhibit "B", if all this were received from the County, we could expect a small balance at the end of the year of $56,000, even if no additional funds were received in the meantime from other sources.

With respect to next year, I think we should plan to step up our research activity by about fifty percent for the year, making total requirements, including operating expenses for calendar year 1955 something like $989,000. If we are able to secure State support in connection with Project 30-54-2 as presently proposed, $250,000 might conceivably be forthcoming after July 1, 1955, from this source. In that case, our net requirements for 1955 might be as little as $739,000.

In summary, this means that we now have a research program approved as to its general purposes by our Research Committee, but which we cannot proceed with now except in part, without further financial help.

Entirely aside from the financial picture, I would think that the Board of Trustees would like to meet in the near future for the purpose of hearing about our research program as it has now been developed.

Sincerely yours,

Original signed by

L. B. Hitchcock

L. B. Hitchcock

LBH:mek
Enclosures:

cc: Dr. F. D. Fagg, Jr.
Dr. Lee A DuBridge
Dr. Raymond B. Allen
Mr. James E. Shelton
Mr. F. M. Banks'
Mr. Alden M. Roach
Dr. Arnold O. Beckman

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

EXHIBIT "A"

Research Programs and Funds Required
(Estimated)

		Funds Required Thru 12/31/54	Funds Required 1/1/55--6/30/55
Program 10: Meteorological Aspects of the Air Pollution Problem in the Los Angeles Basin			
10-54-1	Meteorology Report	$ 2,500*	--
10-54-2	Air Tracer Survey	50,000*	--
10-54-3	Meteorological Conferences	500*	--
10-54-4	Pre-War Visibility	1,000	--
	Sub-total	$ 54,000	--
Program 20: Chemical Aspects of the Air Pollution Problem in the Los Angeles Basin			
20-54-1	Smog Forming Reactions	$ 63,000*	$ 63,000*
20-54-2	Hydrocarbon Conferences	200*	--
20-54-3	Ozone Conferences	500*	--
20-54-4	Organic Halides Determinations	--	5,000
20-54-5	Lead Determinations	--	5,000
	Sub-total	$ 63,700	$ 73,000
Program 30: Study of Combustion Products			
30-54-1	Auto Exhaust Conference	$ 2,000*	--
30-54-2	Combustion Products	100,000**	$ 150,000**
30-54-3	Composition of Auto Exhaust	10,000	20,000
30-54-4	Composition of Diesel Exhaust	5,000	15,000
30-54-5	Composition of Incinerator Gases	5,000	5,000
	Sub-total	$ 122,000	$ 190,000
Program 40: Aerometric Survey of the Los Angeles Basin, Summer and Fall, 1954			
40-54-1	Oxidant Recorders	$ 45,000*	--
40-54-2	Oxidant Survey (see County Proposal)	27,500*	--
40-54-3	Solar Intensity and Wave Lengths	2,000	--
40-54-4	Visibility Measurements	20,000	--
40-54-5	Measurements of Various Contaminants (NO_2, SO_2, O_3, etc., Millipore Sampling)	50,000	--
40-54-6	Photographic Records	10,000	--
40-54-7	Eye Irritation Survey	1,000	--
40-54-8	Plant Damage Survey	40,000	--
40-54-9	Supplementary Observations Aloft	50,000	--
40-54-10	Supplementary Observations Outside Basin	10,000	--
	Sub-total	$ 255,500	--

NOTE: Assumption is that the county will support all of this program via contacts with us.

* Already paid, or committed for payment within the period
** Possibility of state financing via UCLA Fiscal 1955-56

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

EXHIBIT "A" (Continued)

	Funds Required Thru 12/31/54	1/1/55--6/30/55
Program 50: Statistics of the Los Angeles Basin		
50-54-1 Basic Statistics, Current (1953 -)	$ 1,000	--
Program 60: Physical Measurements		
60-54-1 Survey of Microwave Techniques	--	--

SUMMARY

Program 10, Meteorological Aspects of the Air Pollution Problem in the Los Angeles Basin.	$ 54,000	--
Program 20, Chemical Aspects of the Air Pollution Problem in the Los Angeles Basin.	63,700	$ 73,000
Program 30, Study of Combustion Products.	122,000	190,000
Program 40, Aerometric Survey of the Los Angeles Basin, Summer and Fall, 1954	255,500	--
Program 50, Statistics of the Los Angeles Basin	1,000	--
Program 60, Physical Measurements	--	--
Total, Research.	$ 496,200	$ 263,000
All Other Operating Expenses.	200,000	100,000
Grand Total, Funds. . .	$ 696,200	$ 363,000

May 28, 1954
LBH:g

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

EXHIBIT "B"

Financial Summary
(Estimated)

(1)	Total funds needed by 12/31/54		$ 696,200
(2)	Funds on hand or pledged as of 5/31/54		446,815
(3)	Possible County support:		
(4)	10-54-2	$ 50,000	
(5)	Program 40 (total).	255,500	
(6)		$ 305,500	305,500
(7)	Deficit 12/31/54, assuming no additional funds nor county support (line 1 less line 2)		(249,385)
(8)	Balance 12/31/54, assuming no additional funds, but full county support (line 2 + line 6 less line 1)		56,115
(9)	Estimated funds needed 1/1/55--6/30/55	$ 363,000	
(10)	Estimated funds needed 7/1/55--12/31/55	626,000	
(11)	Total, calendar 1955		989,000
(12)	Possible State support (?)		250,000
(13)	Net, 1955.		$ 739,000

May 28, 1954
LBH:g

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

Minutes of Special Meeting of Board of Trustees

June 29, 1954

Pursuant to notice duly given, a special meeting of the Board of Trustees of the SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION was held on the 29th day of June, 1954, at 2:30 o'clock in the afternoon in the Offices of the Foundation, Eighth Floor, Financial Center Building, Los Angeles 14, California.

The following Trustees were present:

Raymond B. Allen
Arnold O. Beckman
Walter Braunschweiger
Lee A. DuBridge
Fred D. Fagg, Jr.
Roy M. Hagen
Harvey S. Mudd
William C. Mullendore
Stephen W. Royce
James E. Shelton

Also present were: Dr. Lauren B. Hitchcock, President, Dr. W. L. Faith, Deputy Director; Mr. Earl C. Bolton, Assistant Secretary; and Mr. Howard Barr who attended the meeting on behalf of Mr. Alden G. Roach.

The following Trustees were absent:

F. M. Banks
Asa V. Call
Edward W. Carter
John A. McCone
Fred B. Ortman
Alden G. Roach
Reese H. Taylor
P. G. Winnett

Dr. Fagg, Chairman of the Board, presided and the Assistant Secretary of the Foundation recorded the minutes.

The minutes of the Trustees' meeting held on March 3, 1954, having been circulated among the Trustees, were approved.

Dr. Fagg stated that it would be desirable to expand the size of the Board of Trustees in order to include additional members who can contribute materially to the work of the Foundation. On motion made, seconded and unanimously carried, it was

RESOLVED, That the By-Laws of the Foundation be amended in the following respects:

(A) Sections 1 and 3 of Article II are hereby amended to read as follows:

> "1. Powers and Number. The powers of the Foundation shall be exercised, its property controlled and its affairs conducted by a Board of Trustees, consisting of 23 Trustees."

> "3. Election and Term of Office. As soon as practicable the Trustees shall elect a full Board, which shall be divided by lot into one group of seven, whose terms shall expire at the annual meeting of 1954, and two groups of eight whose terms shall expire, respectively, at the annual meetings of 1955 and 1956. At each annual meeting, commencing in 1954, the Board shall elect a number of Trustees equal to the number whose terms are expiring, and each Trustee so elected shall serve until the annual meeting of the third succeeding year, and thereafter until the election of his successor."

(B) Section 5 of Article III is hereby amended to read as follows:

> "5. Quorum. Eight Trustees shall constitute a quorum for the transaction of business at any meeting of the Board. If a quorum is once present, business may continue to be transacted by a majority of those present at a meeting notwithstanding the withdrawal of enough members to leave less than a quorum."

Upon motion duly made, seconded and unanimously carried Dr. Charles F. Kettering of Dayton, Ohio and Dr. J. Philip Sampson of Los Angeles, California were elected members of the Board of Trustees.

Dr. DuBridge and Dr. Faith reported on the work of the Research

Committee since the last Trustees' meeting:

Dr. Faith reported on the work of the Finance Committee since the last Trustees' meeting, and all Trustees noted the need for additional financing of the Foundation projects during the next period of years. At least one million dollars for the calendar year 1955 is considered to be a minimum for the Foundation activities.

It was stated to the Trustees that it would be desirable to authorize Dr. Faith to sign on the Foundation's bank account. Upon motion made, seconded and unanimously carried, it was

RESOLVED, That this corporation open an account or accounts with SECURITY-FIRST NATIONAL BANK OF LOS ANGELES, and that until such authority is revoked by Sealed Notification to said Bank of such action by the Board of Trustees of this corporation, one from each of the following two groups:

Group 1	Group 2
Chairman of the Board	Treasurer
President	Assistant Treasurer
Deputy Director	Deputy Director

be and they are authorized to execute checks and other items on behalf of this corporation; PROVIDED, however, that the two signatures thus required must be the signatures of two separate individuals;

RESOLVED FURTHER, That this corporation hereby agrees to the conditions printed in the Pass Book issued in connection with its account with the Security - First National Bank of Los Angeles, and to the By-Laws and rules of said Bank, as to all deposits and withdrawals made on said account and as to other transactions with said Bank; and

RESOLVED FURTHER, That this supersedes all prior authorizations.

Dr. Faith stated that research data is needed as to the effect of smog on plant life and that the University of California at Riverside is best equipped to conduct the necessary investigations. Dr. Faith further states that this research will be undertaken by the said University upon receipt of a grant of $8,900 from the Foundation. Upon motion made, seconded and unanimously carried, it was

RESOLVED, That the sum of $8,900 be made available by the Foundation to the University of California at Riverside with which the said University will conduct investigations into the effect of air pollution on plant life.

Dr. Fagg called the attention of the Trustees to the work of Mr. Harold W. Kennedy, County Counsel of Los Angeles, who recently submitted a thesis entitled "The Legal Phases of Air Pollution in Southern California" in partial fulfillment of the degree of Master of Science in Public Administration at the University of Southern California. The Trustees noted with great interest the work of this legal scholar and his contribution to the problem of air pollution in this area. The President was authorized to convey this information to Mr. Kennedy.

There being no further business before the meeting it adjourned.

/s/ Earl C. Bolton
Assistant Secretary

Mr. DuBridge

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION
RESEARCH COMMITTEE MEETING

Wednesday, September 22, 1954
Room 432, L. A. A. C., 12 Noon

Members

Dr. Lee A. DuBridge (Chairman), Dr. Raymond B. Allen, Mr. F. M. Banks, Dr. Arnold O. Beckman, ~~Mr. Alden G. Roach~~, S. Ryce

Foundation

Dr. W. L. Faith, Dr. L. B. Hitchcock, Dr. M. Neiburger, Dr. N. A. Renzetti, Dr. L. H. Rogers

AGENDA

1. Minutes of May 25, 1954.

2. Research Program; Financial Summary

3. Active Research Projects (Approved); Current Status

4. Research Projects (Approved), not yet active, we are seeking to place:

   SCAPF Project No. 30-54-2, Combustion Products (Greenhouse)

   SCAPF Project No. 30-54-5, Composition of Incinerator Gases

5. Research Proposals: Discussion

   a. C^{13}/C^{12}

   b. NO_2 - NH_3

   c. Auto Exhaust Sampling in Los Angeles (total organics)

   d. Auto Exhaust: Process Conditions for Catalytic Converter

   e. SCAPF Project No. 40-54-5, 8, Measurement of Aldehydes

   f. Radiometric Survey

   g. Continuous Photoelectric Automatic Ozone Recorder

6. Proposed Remedies Indirectly Related to Research; Discussion

   - State or County Auto Inspection

   - Increased Public Transportation, Especially Non-Pollutant

7. State Financial Support

8. Other Business

LBH:mek
Attachments:
Financial Status, Research Program
Research Projects; status list

Date September 17, 1954

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

LIST OF RESEARCH PROJECTS

PROGRAM 10 --- METEOROLOGICAL ASPECTS OF THE AIR POLLUTION PROBLEM IN THE LOS ANGELES BASIN

SCAPF Project No.	Title	Staff Member	Contractor	Estimated Cost	Cost to Date	Status
10-54-1	Meteorology Report	Neiburger	Neiburger & Edinger	$ 2,650.	$ 2,929.50	Completed
10-54-2.1	Air Tracer Survey (Sampling)	Neiburger	R.M. Parsons (Samplers)	$ 24,577. 7,500.	$ 11,326.82 7,800.00	Active
10-54-2.2	Air Tracer Survey-Upper Winds	Neiburger	James T. Kadowaki & observers	$ 2,000.	$ 2,077.28	Active
10-54-2.3	Air Tracer Survey Meteorology Analyses	Neiburger	Wilson K. Vance, III	$ 2,050.	$ 825.50	Active
10-54-3	Meteorological Conferences 5/17-18/54	Liston Neiburger	Frenkiel Hewson et al	$ 500.	$ 889.41	Completed
10-54-4	Trend in Visibility 1930-1954	Neiburger	Hilleary	$ 2,000.	$ 43.55	Active
10-54-5	Temperature Inversion Studies	Hitchcock	A.D. Little	$ 10,000.	$ 20.44	Active

Date September 17, 1954

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

LIST OF RESEARCH PROJECTS

PROGRAM 20---CHEMICAL ASPECTS OF THE AIR POLLUTION PROBLEM IN THE LOS ANGELES BASIN

SCAPF Project No.	Title	Staff Member	Contractor	Estimated Cost	Cost to Date	Status
20-54-1	Smog Forming Reactions	Rogers	Stanford Research Institute	$126,000.	$ 14,244.56	Active
20-54-2	Hydrocarbon Conferences 2/26 - 3/5 '54	Liston Rogers	Bray, Blacet et al	$ 200.	66.49	Completed
20-54-3	Ozone Conferences 5/13-14/54	Liston Rogers	Biggs Crabtree et al	$ 750.	914.41	Completed
20-54-4	Organic Halide Determinations	Rogers		$ 5,000.		Tabled
20-54-5	Lead Determinations	Rogers		$ 5,000.		Replaced by 40-54-5.7

Date September 17, 1954

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

LIST OF RESEARCH PROJECTS

PROGRAM 20 --- CHEMICAL ASPECTS OF THE AIR POLLUTION PROBLEM IN THE LOS ANGELES BASIN

SCAPF Project No.	Title	Staff Member	Contractor	Estimated Cost	Cost to Date	Status
20-54-6	Mass Spectrometer Analyses (Conference)	Rogers	Nat'l Bureau of Standards (non-contractor)	$ 750.	$ 726.16	Inactive
20-54-7	Review of Literature	Rogers	James Crabtree	$ 2,000.		Cancelled
20-54-8	Study of CO Procedures	Rogers	Mines Safety* Appliances			Proposal
20-54-9	Application of Long Path Gas Absorption Cell	Rogers	Truesdail	$ 5,000.		Active
20-54-10	Photo Chemical Reaction of HC & NO_2	Rogers	Armour Research Foundation ●	$12,500?		Active

● No Contract yet

Date September 17, 1954

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

LIST OF RESEARCH PROJECTS

PROGRAM 30---STUDY OF COMBUSTION PRODUCTS

SCAPF Project No.	Title	Staff Member	Contractor	Estimated Cost	Cost to Date	Status
30-54-1	Auto Exhaust Conference 8/19-21/54	Faith		$ 2,000.	$1,225.90	Active
30-54-2	Combustion Products	Faith		$250,000.		Inactive
30-54-3	Composition of Auto Exhaust	Faith	Midwest Research Institute	$ 37,850.	$6,057.66	Active
30-54-4	Composition of Diesel Exhaust	Faith		$ 20,000.		Cancelled
30-54-5	Composition of Incinerator Gases	Faith		$ 10,000.		Proposal

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

LIST OF RESEARCH PROJECTS

PROGRAM 40- AEROMETRIC SURVEY OF THE LOS ANGELES BASIN, SUMMER & FALL, 1954

SCAPF Project No	Title	Staff Member	Contractor	Estimated Cost	Cost to Date	Status
40-54-1	Procurement of Oxidant Recorders	Rogers	Beckman	$ 45,360. (*)	$ 47,442.25	Completed
40-54-2.1	Oxidant Survey - Operation of the Recorders	Rogers	R.M.Parsons	$ 24,260.	10,022.42	Active
40-54-2.11	Oxidant Survey - Operation of Recorder in Santa Barbara	Renzetti	North American Weather Consultants **	300.	10.11	Active
40-54-2.19	Oxidant Survey Aloft	Rogers	Truesdail	5,000.	1,343.76	Active
40-54-2.2	Literature Survey of KI vs Phenolphthalein	Rogers	A.D.Little	2,500.	2,953.32	Active
40-54-3	Solar Radiation Survey	Renzetti	Weather Bureau, Mt. Wilson, U.C.Riverside, UCLA; **	2,000.		Active

(*) Exclude del'y chgs & sales tax
** Verbal Contract

Date September 17, 1954

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

LIST OF RESEARCH PROJECTS

PROGRAM 40 — AEROMETRIC SURVEY OF THE LOS ANGELES BASIN, SUMMER & FALL, 1954

SCAPF Project No.	Title	Staff Member	Contractor	Estimated Cost	Cost to Date	Status
40-54-4.1	Operation of Transmissometers	Renzetti	R.M.Parsons	$ 18,500.	$ 3,351.50	Active
40-54-4.2	Procurement of Loofah Instrument	Renzetti	Mikron Instruments, Inc.	$ 1,400.	$ 1,404.00	Completed
40-54-4.3	Loofah Observations	Renzetti	R.M.Parsons	$ 2,500.		Active
40-54-5.1	Measurements - HC	Rogers	Truesdail	$ 24,000.	$ 11,982.94	Active
40-54-5.2	Procurement of Infrared Spectrophotometer	Rogers	Perkin-Elmer Corporation	$ 16,100. (*)	$ 16,080.66	Completed
40-54-5.3	Measurements of NO_2	Rogers	A.L. Chaney	$ 15,000.	$ 4,247.87	Active

(*) Incl. del'y. chgs. & sales tax

Date September 17, 1954

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

LIST OF RESEARCH PROJECTS

PROGRAM 40 — AEROMETRIC SURVEY OF THE LOS ANGELES BASIN, SUMMER & FALL, 1954

SCAPF Project No.	Title	Staff Member	Contractor	Estimated Cost	Cost to Date	Status
40-54-5.39	Measurements of NO_2 Aloft	Rogers	A.L. Chaney	$ 2,000.		Active
40-54-5.4	Measurements of CO	Rogers	Truesdail	$ 5,000.	$ 523.60	Active
40-54-5.5	Measurements of SO_2	Rogers	R.M.Parsons	$ 8,000.	$ 200.57	Active
40-54-5.7	Determination of Lead & Other Particulates	Rogers	Kettering Labs. (Cholak)	$ 30,500.	$1,721.96	Active
40-54-5.8	Measurement of Aldehydes	Rogers	Truesdail	$ 4,000.		Active
40-54-7.1	Eye Irritation Survey	Hitchcock	Merrifield	$ 5,000.	$ 788.39	Active
40-54-8.1	Plant Damage Studies	Faith	UC-Riverside (Middleton)	$ 11,000.	$10,374.20	Active

Date September 17, 1954

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

LIST OF RESEARCH PROJECTS

PROGRAM 40 --- AEROMETRIC SURVEY OF THE LOS ANGELES BASIN, SUMMER & FALL, 1954

SCAPF Project No.	Title	Staff Member	Contractor	Estimated Cost	Cost to Date	Status
40-54-9.2	Temperature & Humidity Aloft	Neiburger		$ 1,000.	$ 96.78	Active
40-54-11.1	Correlation & Interpretation of Results of Aerometric Survey	Renzetti	SRI	$ 30,000.	$1,914.13	Active
40-54-12	Comparison of Oxidant Determination in Flasks with Oxidant Recorder	Rogers	Truesdail	$ 1,500.	$1,082.80	Completed

Date September 17, 1954

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

LIST OF RESEARCH PROJECTS

PROGRAM 50 — STATISTICS OF THE LOS ANGELES BASIN

SCAPF Project No.	Title	Staff Member	Contractor	Estimated Cost	Cost to Date	Status
50-54-1	Basic Statistics Current (1953-)	Hitchcock	Goedhard Ballard	$ 3,000.	$ 2,265.52	Active
50-54-2	Refinery Emissions	Hitchcock	Southwest Research Institute	$ 7,500.	$ 5,065.52	Active

Date September 17, 1954

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

LIST OF RESEARCH PROJECTS

PROGRAM 60 --- PHYSICAL MEASUREMENTS

SCAPF Project No.	Title	Staff Member	Contractor	Estimated Cost	Cost to Date	Status
60-54-1	Survey of Microwave Techniques	Renzetti				Proposal
60-54-2	Study of Carbon Components in L. A. Atmosphere	Renzetti	Prof. Harrison Brown - Dept. of Geology Cal Tech	$ 15,000.		Proposal
60-54-3	Solar Radiation By Wave Lengths	Renzetti				Proposal

Date September 17, 1954

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

LIST OF RESEARCH PROJECTS

PROGRAM 70 --- DISPOSAL OF REFUSE

SCAPF Project No.	Title	Staff Member	Contractor	Estimated Cost	Cost to Date	Status
70-54-1	Conference on Incineration & Rubbish Disposal 12/2-3/54	Hitchcock		$ 2,000.		Active

Date September 17, 1954

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

CONTRACTS WITH LOS ANGELES COUNTY BOARD OF SUPERVISORS

SCAPF Project No.	Title	Date Submitted	Date Approved	Date Contract Received	Amount
10-54-2	Air Tracer Survey	6/15/54	6/29/54	7/29/54	$ 50,000.
40-54-2	Oxidant Survey	5/15/54	6/29/54	7/29/54	77,360.
40-54-4	Density & Movements of Aerosol Masses	8/4/54	8/11/54	9/8/54	40,000.
40-54-5	Measurements of Nitrogen Dioxide	6/18/54	6/29/54	7/29/54	16,500.
40-54-7	Eye Irritants in L. A. Atmosphere	8/4/54	8/11/54	9/8/54	10,000.
40-54-8	Plant Damage Survey	6/15/54	6/29/54	7/29/54	10,000.
40-54-9	Dispersion of Contaminants in Inversion Layer	8/4/54	8/11/54	9/8/54	50,000.
40-54-11	Correlation & Interpretation of Results of Aerometric Survey	8/3/54	8/11/54	9/8/54	50,000.
					$303,860.

Date September 17, 1954

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

CONTRACTS WITH CITY OF LOS ANGELES

SCAPF Project No.	Title	Date Submitted	Date Approved	Date Contract Received	Amount
40-54-5.6	Additional Measurements of NO_2 & SO_2 (Dept. of Water & Power)	7/15/54			

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

RESEARCH PROGRAMS AND FUNDS REQUIRED
(Revised September 17, 1954)
(Estimated)

		9/17/54 Actual Cost	9/17-12/31 Estimate	Total 1954	First Half 1955
Program 10: Meteorological Aspects of the Air Pollution Problem in the Los Angeles Basin					
10-54-1	Meteorology Report	$ 2,929.50	--	$ 2,929.50	--
10-54-2.1	Air Tracer Survey (Sampling)	19,126.82	$ 12,950.18	32,077.00	--
10-54-2.2	Air Tracer Survey-Upper Winds	2,077.28	422.72	2,500.00	--
10-54-2.3	Air Tracer Survey Meteorology Analysis	825.50	1,224.50	2,050.00	--
10-54-3	Meteorological Conferences (5/17-18/54)	889.41	--	889.41	--
10-54-4	Trend in Visibility 1930-1954	43.55	1,956.45	2,000.00	--
10-54-5	Temperature Inversion Studies	20.44	5,979.56	6,000.00	$ 4,000.00
Program 20: Chemical Aspects of the Air Pollution Problem in the Los Angeles Basin					
20-54-1	Smog Forming Reactions	14,224.56	45,775.44	60,000.00	66,000.00
20-54-2	Hydrocarbon Conferences (2/26-3/5/54)	66.49	--	66.49	--
20-54-3	Ozone Conferences (5/13-14/54)	914.41	--	914.41	--
20-54-6	Mass Spectrometer Analyses (Conference)	726.16	--	726.16	--
20-54-8	Study of CO Procedures	--	--	--	--
20-54-9	Application of Long Path Gas Absorption Cell	--	2,000.00	2,000.00	3,000.00
20-54-10	Photochemical Reaction of HC & NO_2	--	7,500.00	7,500.00	5,000.00
Program 30: Study of Combustion Products					
30-54-1	Auto Exhaust Conference (8/19-21/54)	1,225.90	400.00	1,625.90	--
30-54-2	Combustion Products	--	--	--	75,000.00
30-54-3	Composition of Auto Exhaust	6,057.66	20,000.00	26,057.66	17,850.00
30-54-5	Composition of Incinerator Gases	--	2,000.00	2,000.00	10,000.00

		9/17/54 Actual Cost	9/17-12/31 Estimate	Total 1954	First Half 1955
Program 40: Aerometric Survey of the Los Angeles Basin, Summer & Fall, 1954					
40-54-1	Procurement of Oxidant Recorders	$ 47,442.25	$ 75.09	$ 47,517.34	—
40-54-2.1	Oxidant Survey-Operation of the Recorders	10,022.42	19,977.58	30,000.00	—
40-54-2.11	Oxidant Survey-Operation of Recorder in Santa Barbara	10.11	289.89	300.00	—
40-54-2.19	Oxidant Survey Aloft	1,343.76	3,656.24	5,000.00	—
40-54-2.2	Literature Survey of KI vs Phenolphthalein	2,953.32	—	2,953.32	—
40-54-3	Solar Radiation Survey	—	2,000.00	2,000.00	—
40-54-4.1	Operation of Transmissometers	3,290.82	15,209.18	18,500.00	—
40-54-4.2	Procurement of Loofah Instrument	1,404.00	—	1,404.00	—
40-54-4.3	Loofah Observations	60.68	1,939.32	2,000.00	—
40-54-5.1	Measurements - HC	11,982.94	6,017.06	18,000.00	—
40-54-5.2	Procurement of Infrared Spectrophotometer	16,080.66	—	16,080.66	—
40-54-5.3	Measurements of NO_2	4,247.87	10,752.13	15,000.00	—
40-54-5.39	Measurements of NO_2 Aloft	—	2,000.00	2,000.00	—
40-54-5.4	Measurements of CO	523.60	1,476.40	2,000.00	—
40-54-5.5	Measurements of SO_2	200.57	7,799.43	8,000.00	—
40-54-5.7	Determination of Lead and Other Particulates	1,721.96	28,778.04	30,500.00	—
40-54-5.8	Measurements of Aldehydes	—	4,000.00	4,000.00	—
40-54-7.1	Eye Irritation Survey	788.39	4,211.61	5,000.00	—
40-54-8.1	Plant Damage Studies	10,374.20	—	10,374.20	—
40-54-9.2	Temperature & Humidity Aloft	96.78	903.22	1,000.00	—
40-54-11.1	Correlation & Interpretation of Results of Aerometric Survey	1,914.13	28,085.87	30,000.00	$ 20,000.00
40-54-12	Comparison of Oxidant Determination in Flasks with Oxidant Recorder	1,082.80	—	1,082.80	—

		9/17/54 Actual Cost	9/17-12/31 Estimate	Total 1954	First Half 1955
Program 50: Statistics of the Los Angeles Basin					
50-54-1	Basic Statistics Current (1953-)	$ 2,265.52	$ 734.48	$ 3,000.00	$ 2,000.00
50-54-2	Refinery Emissions	5,065.52	2,434.48	7,500.00	--
Program 60: Physical Measurements					
60-54-1	Survey of Microwave Techniques	--	--	--	--
60-54-2	Study of Carbon Components in L. A. Atmosphere	--	--	--	--
60-54-3	Solar Radiation by Wave Lengths	--	2,000.00	2,000.00	--
Program 70: Disposal of Refuse					
70-54-1	Conference on Incineration & Rubbish Disposal (12/2-3/54)	--	2,000.00	2,000.00	--
TOTAL		$171,999.98	$244,548.87	$416,548.85	$202,850.00

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

MINUTES OF
RESEARCH COMMITTEE OF THE BOARD OF TRUSTEES
September 22, 1954
Room 432, Los Angeles Athletic Club

The meeting was attended by:

L. A. duBridge (Chairman)
R. B. Allen
F. M. Banks
A. O. Beckman
S. W. Royce (ex officio)
L. B. Hitchcock
W. L. Faith
M. Neiburger
N. A. Renzetti
L. H. Rogers

The meeting convened at 12 noon at the call of the Chairman. Minutes of the meeting of May 25, 1954 were approved.

1. A financial summary was presented (Exhibit A) and small balance estimated by December 31 was noted. This summary makes provision for all present commitments. Additional research commitments during the balance of calendar 1954 would have to be made very carefully, if at all, in view of the condition of the treasury. Payments by the County on research contracts require the submission by the Foundation of numerous monthly reports.

2. Several research proposals were discussed, which it is desirable to undertake as soon as funds are available. Leading this list is Project No. 30-54-2, to study the smog-forming characteristics of auto exhaust in large-scale reaction chambers, using effects on plants, eye irritation, and visibility among the various testing devices. It was agreed that this is an important project. Without the sort of conclusive evidence that might come from this work, the auto industry may be reluctant to make a real effort to correct auto exhaust. Essentially applied research, it would probably be difficult to get this kind of work done in a University. It was agreed that the undertaking of this project should not be made contingent upon securing special State funds, or otherwise tied to a particular source of money. There would be certain advantages in placing the project outside this immediate area, perhaps at Midwest Research Institute or other industrial research centers.

3. Financial support from the State of California should be sought for the broad purposes of the Foundation, without commitment to spend at any particular institution. Dr. Allen indicated that the support of the University of California could be expected in seeking special appropriation by the Legislature.

Reports on Status of Active Projects

4. Dr. Neiburger reported on the air tracer project which is continuing actively with the assistance of The Parsons Company as contractor, and the assistance of District personnel to man sampling stations. Five dispersals have been made so far, beginning August 4, each under different meteorological conditions. Preliminary results indicate some anomalies, but it is too soon to have any conclusions. Professor Perkins, air tracer expert from Stanford University, who was among our original advisors on this project, is being recalled for further consultations. Any further air tracer tests will be made only after full review of the experience to date. Valuable data have been obtained and the problem is one of interpretation.

5. Project 10-54-4 is directed at a study of the trend in visibility since 1930 as between fog and smog to establish the contribution of fogs and clouds of natural origin so that the smog problem may be viewed in proper perspective. This is a comparatively inexpensive project, using Weather Bureau records available to us.

6. Dr. Rogers reported on Project 20-54-1, placed with Stanford Research Institute. The first three months have been devoted largely to preparing facilities in conjunction with the SRI Laboratory in Pasadena. General plan of work is to carry to conclusion several years' work of Dr. Littman, in which he is narrowing down the smog-forming components of air by successive removal of compounds or groups of compounds, and ascertaining the effect of each removal upon the residual smog-forming potential of the air. Pollutants are believed to be present 24 hours a day, but in a quiescent state at night so that unless artificially irradiated, do not give manifestations of smog. One basic advantage of this approach is that we use actual Los Angeles air instead of synthetic. Neither is it clear that irradiation of night air always produces smog manifestations. Plant damage due to ozone can be distinguished from smog damage.

7. In Project 20-54-9 we are seeking to develop a technique which will enable us to examine actual Los Angeles air pumped directly into our infrared spectrophotometer. This would avoid the possible disadvantages of collecting a sample, using freeze-out techniques and other treatment before introducing sample into apparatus. In order to get sufficient sample in the spectrophotometer, which has an equivalent 1 meter path at atmospheric pressure, we wish to compress to 10 atmospheres, giving the equivalent of 10 meters. We think we

we have located a pump lubricated with silicone oil which infrared experts believe will not contaminate our sample. If this research is successful, it may give us a quick and more direct method of analysis for various trace pollutants. Used presently only for hydrocarbons, we may also be able to detect CO, aldehydes, etc.

8. Our recent auto exhaust conference, carried out as a project under our Program 30 (Combustion), proved very successful. We have 375 pages of transcript to be summarized in a final report, which may be limited to Trustees and Conferrees. Dr. Faith, General Chairman of this conference, said the principal benefit had been that the automobile and petroleum people were now cognizant of the situation that auto exhaust contains significant quantities of hydrocarbons and other substances which require their attention. Leaders in the automotive industry actually stated in the conference that "auto exhaust is the largest single source of hydrocarbons in the Los Angeles atmosphere!". Conservatively estimated at 7% of the total fuel supplied to the car, it may be readily calculated to total some 1400 tons per 24 hours for the Los Angeles Basin.

9. Dr. Faith reported on Project 30-54-3, pertaining to the auto exhaust research project at Midwest Research Institute. Analysis of auto exhaust will be made under various conditions by freezing-out or separating physically or chemically. Effect of these various fractions will be studied by testing on pinto beans. Dr. Faith is visiting MRI next week to check on the progress of this project.

10. A comparable research on the composition of diesel exhaust has been tabled because only 5% of the fuel used in this area is diesel fuel and present indications are that diesel emissions, although obvious in individual cases, do not rank high among our present principal sources of significant pollution. The broader and related problem of using propane fuel in motor vehicles deserves further study.

Aerometric Survey - Program 40

11. This is our principal research program at this time. Dr. Rogers reported that we have 12 oxidant recorders in operation, ten at our stations over the Basin, operated by The Parsons Company, one at the District, and one at Santa Barbara for control. These instruments operate continuously, except for occasional breakdowns. Initial operating difficulties are being overcome. Present indications are that the instruments will be satisfactory and that extensive information on the oxidant concentration in our atmosphere will result.

12. Sampling of the atmosphere aloft from blimps limits our altitude to 3500 feet. The Navy has been most cooperative but difficulty has been experienced with Goodyear. We are getting some interesting results. Methods of analysis for nitrogen dioxide appear to be reliable; data indicate random variation in concentration over the Basin.

13. Arthur D. Little, Inc. investigated the alternative oxidant testing re-agents (buffered KI vs phenolphthalein), and reported that either could be used, but that consensus slightly favored the former. Exactly what the oxidant value measures is still unknown, but it appears to give a useful empirical number related to "smog intensity".

14. Dr. Renzetti reported on Project 40-54-4.1 on visibility measurements, that we were using automatic recording transmissometers borrowed from the Los Angeles Airport and they apparently were performing successfully. We are also experimenting with a "Loofah" type, depending upon light-scattering, which gives spot readings and extends a technique developed by a former Cal Tech graduate student.

15. Dr. Rogers reported on Project 40-54-5.1 that hydrocarbon sampling appears to be proceeding satisfactorily at the downtown station and at the Cal Tech station for a total of 12 samples per day.

16. In general, with respect to our Aerometric Survey, voluminous data is being obtained in comparison with any previous survey, although much remains to be desired and what we are doing presently represents a compromise. Time has not permitted this year to develop and secure needed methods and instruments. We hope to profit by this survey and to conduct a more conclusive survey next year. Reduction of this considerable mass of data is being aided by a special contract with Stanford Research Institute which will use some of its statistical experts and machines. Conclusions will probably not be available until February or March.

Recommended New Research Projects

17. 20-54-10. Confirmatory study by Armour Research Foundation of recent research of Dr. Haagen-Smit, in which he has established concentration limits for hydrocarbons and NO_2 within which ozone formation occurs, has begun. The far-reaching importance of this research requires early and independent confirmation. Dr. Haagen-Smit has agreed and Dr. Arnold Miller of ARF is currently visiting with Dr. Haagen-Smit and will shortly submit a proposal which may not exceed $10,000. The Committee voted approval, subject to available funds.

18. Dr. Hitchcock reported on Project 50-54-2, in which the Southwest Research Institute has made a study of refinery emissions in this area to see whether this audit may confirm losses reported by the petroleum industry. This independent check has been conducted with the approval of WOGA. Our report may be forthcoming in another month. This should help to clear the air on what has been a controversial subject.

19. Project No. 60-54-2. Dr. Renzetti said that API was still trying to place a study of C^{14}, which we do not wish to duplicate. We are interested in studying the ratio of C^{13}/C^{12} in our atmosphere as a means of identifying sources of carbon compounds. Cal Tech is preparing a proposal. Research Committee approval will not be sought until the proposal is available.

20. Project No. 60-54-3. Dr. Renzetti is making tentative arrangements with Ralph Stair of the Bureau of Standards in Washington under which Dr. Stair would spend about five weeks in Los Angeles and measure incident radiant energy as a function of wavelength from the ultraviolet to 2.6 in the infrared. Runs would be made daily for about 30 days. Variations in radiant energy may have a bearing on smog manifestations. The Committee voted approval of this proposal.

21. Project No. 60-54-4. Dr. Renzetti presented a recommendation under which we may develop a more specific ozone determination as a result of this exploratory project. Stair and Regener have worked on this method. We are seeking to borrow equipment now in the custody of the Army at Rock Island Arsenal in Illinois. Dr. Beckman suggested that we contact Oliver Wulf at Cal Tech who has done similar work with the Weather Bureau. Research Committee approval was granted.

General

22. Efforts to secure State funds for the Foundation should be delayed until after the elections in November. It will probably be necessary to work through the Legislature and Assembly.

23. We are holding a Conference on Incineration and Rubbish Disposal at the Huntington-Sheraton Hotel, December 2-3, 1954, for purposes similar to the auto exhaust conference, namely to get a group of well-known authorities together and bring us all up-to-date on the latest techniques and economics on this subject, and to spotlight available or most needed remedies.

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

24. With respect to the basic plan of the Foundation to conduct its research through contracts, or otherwise, in existing facilities of others, is fully understood, but has some drawbacks. Coordination of diverse research groups is more difficult than if we had our own organization, so that both supervision and overhead costs are higher. On the other hand, the Foundation avoids incurring obligations with respect to capital investment, personnel and equipment. These could be restrictive in a broad research program which as presently viewed is quite likely to change direction and emphasis rapidly as compared to other research undertakings of a more conventional nature. Consideration of some intermediate plan, possibly combining limited leased facilities and research contracts, may be worthwhile.

25. Item No. 6 on the Agenda omitted due to time.

26. The next meeting of the Research Committee is being scheduled for 12 Noon, Wednesday, November 3, Room 1216, Southern California Gas Company, 810 South Flower Street, as guests of Mr. Banks.

LBH:mek
Distribution:

L. A. DuBridge
R. B. Allen
O. A. Beckman
F. M. Banks
Alden G. Roach
F. D. Fagg, Jr.
S. W. Royce
W. L. Faith
M. Neiburger
N. A. Renzetti
L. H. Rogers
B. Leiper
R. S. Weatherly
LBH:file
L. A. Garrett

EXHIBIT "A"

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION
September 22, 1954

ESTIMATED INCOME AND EXPENDITURES FOR THE PERIOD 2/1/54 TO 12/31/54

Income:

To Date		$491,159.00	
Expected before 12/31/54:			
L. A. County	$151,930.00		
Pacific Tel & Tel.	5,000.00		
Others	15,000.00		
L. A. City	20,000.00		
		191,930.00	
Total Income			$683,089.00

Expense:

Operating Expense		$214,000.00	
Equipment		35,000.00	
Research:			
Paid as of 9/17/54	$172,000.00		
Anticipated	244,550.00		
		416,550.00	
Total Expense			665,550.00
Estimated Surplus for 1954			$17,539.00

(Some contributors who paid in 1953 may renew in 1954, even though funds would be for calendar 1955)

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

BOARD OF TRUSTEES MEETING
AGENDA

Wednesday, October 6, 1954
Room 4, 2nd Floor,
California Club
2:00 P.M.

1. Minutes of Meeting of June 29, 1954.
2. Report of the President on First Eight Months' Progress.
3. Committee Reports
   a. Research (see attached exhibits)
   b. Finance (see attached exhibits)
4. Foundation's Position Regarding:
   a. Motor Vehicle Maintenance
   b. Public Transportation
5. Support of:
   a. State of California
   b. Rockefeller Foundation
6. Principal New Research Projects:
   a. Investigation of Auto Exhaust re Smog-Forming Potentialities
   b. Combustion of Auto Exhaust
   c. Incinerator Emissions
7. Annual Meeting Monday, December 13, 3:00 P.M. at office of the Corporation.

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

Minutes of Special Meeting of Board of Trustees

October 6, 1954

Pursuant to notice duly given, a special meeting of the Board of Trustees of the SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION was held on the 6th day of October, 1954, at 2:00 o'clock in the afternoon in Room 1 of the California Club, 538 South Flower Street, Los Angeles 17, California.

The following Trustees were present:

Raymond B. Allen
Arnold O. Beckman
Walter Braunschweiger
Asa V. Call
Edward W. Carter
Lee A. DuBridge
Fred D. Fagg, Jr.
John A. McCone
William C. Mullendore
Fred B. Ortman
Dr. J. Philip Sampson
P. G. Winnett

Also present were: Dr. Lauren B. Hitchcock, President, Dr. W. L. Faith, Deputy Director; Mr. Earl C. Bolton, Assistant Secretary; and Mr. Ralph Seeley who attended the meeting on behalf of Mr. Alden G. Roach.

The following Trustees were absent:

F. M. Banks
Roy M. Hagen
Charles F. Kettering
Harvey S. Mudd
Alden G. Roach
Stephen W. Royce
James E. Shelton
Reese H. Taylor

Dr. Fagg, Chairman of the Board, presided and the Assistant Secretary of the Foundation recorded the minutes.

The minutes of the Trustees' meeting held on June 29, 1954, having been circulated among the Trustees, were approved.

Dr. Hitchcock reported on the progress made by the Foundation during the first eight months of its operation, and he indicated that progress has been made toward the fulfillment of each of the seven basic purposes set forth in the Foundation's Statement of Policy.

Dr. DuBridge, Chairman of the Research Committee, stated that that committee has examined the Foundation's research plan, consisting of seven basic programs and approximately 30 active projects. Dr. DuBridge finds that the Foundation is embarked upon a sound research plan and that this plan is being well managed.

Dr. Faith elaborated on one phase of the Foundation's research by giving an explanation of some of the results achieved under Program 40, the Aerometric Survey of the Los Angeles Basin.

Mr. Carter, Chairman of the Finance Committee, gave the following summary estimate of income and expenditures for the period February 1, 1954 to December 31, 1954:

Income	$683,089
Expense	667,500
Balance	$ 15,589

Mr. Carter reported that as of the time of this meeting the Finance Committee has found all assets and cash of the Foundation to be accounted for. He recommended that the Foundation retain a competent firm of auditors to undertake a periodic audit of the Foundation's accounts and make recommendations as to ways in which the handling of Foundation assets and cash might be improved. Upon motion made, seconded and unanimously carried, it was

> RESOLVED, that the firm of Price Waterhouse be retained to audit the accounts of the Foundation.

Dr. Fagg expressed the thanks of the Board to Mr. John A. McCone and to Mr. Carter for the manner in which they have served as Chairmen of the Finance Committee.

Mr. Call recommended that a meeting be convened in November similar to that held prior to the organization of the Foundation and similar to the one called last May. Mr. Call suggested that a report be made at that time to business leaders and to donors of the Foundation. A date of November 17th was tentatively selected for the convening of such a meeting.

Dr. Hitchcock asked for an informal expression by the Board as to whether or not the Foundation should at this time take any action with respect to such questions as motor vehicle maintenance, incineration operation, or expanded public transportation. Concensus was that the Foundation should not, until sufficient evidence is available to permit an identification of the major and minor sources of air pollution.

There being no further business before the meeting it was adjourned.

/s/ Earl C. Bolton
Assistant Secretary

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SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

RESEARCH COMMITTEE MEETING

Wednesday, November 3, 1954
Room 1216, Southern California Gas Company
810 South Flower Street
12 NOON

Members

Dr. Lee A. DuBridge (Chairman), Dr. Raymond B. Allen
Mr. F. M. Banks, Dr. Arnold O. Beckman, Mr. Alden G. Roach

Foundation

Dr. W. L. Faith, Dr. L. B. Hitchcock, Dr. M. Neiburger, Dr. N. A. Renzetti, Dr. L. H. Rogers

AGENDA

1. Minutes of September 22, 1954

2. Continuation in 1955 of Certain Research Projects Already Approved; Approval of Certain Increases

3. Approval of New Research Projects Recommended for 1954 and 1955

4. Approval of List of Research Projects for Supervisor Legg

LBH:mek
Attachments:
1. List of Current Research Projects to be Continued and/or Extended
2. List of Recommended New Projects
3. Aerometric Survey; Details for 1955
4. Letter from Professor John Middleton, University of California, Riverside

Attachment No. 1

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

Summary of Continuing and New Research Projects for 1954 and 1955

The following is a list of projects which have been reviewed and approved at previous Research Committee meetings and are continuing into 1955 with estimated fund requirements for calendar 1955:

A. SCAPF 10-54-5 — $ 5,000
Inversion Modification Studies — Arthur D. Little, Inc.

Analysis of various atmospheric parameters, such as incident solar radiation and speculations concerning possibilities of affecting motion of pollutants through inversion layer.

B. SCAPF 20-54-1 — (To July 1, 1955) $ 66,000
(Recommended Extension to Dec. 31, 1955) $ 60,000
Smog Forming Reactions — Stanford Research Institute

Selective removal of classes of compounds from Los Angeles atmosphere followed by exposure to plants, etc.

C. SCAPF 20-54-10 — $ 30,000
Photochemical Studies — Armour Research Foundation

Study reaction products in irradiation of hydrocarbons in presence of other pollutants such as nitrogen dioxide, carbon monoxide, aldehydes.

D. SCAPF 30-54-2 — $250,000
Combustion Products — University of California, Riverside

Large chamber tests of various pollutants as smog-formers.

E. SCAPF 30-54-3 — $ 17,850
(Recommended extention) $ 20,000
Composition of Auto Exhaust — Midwest Research Institute

The current contract with Midwest Research Institute should be finished by July 1, at a 1955 expenditure of $17,850. In all probability, the project will have to be continued and extended. The last six months of 1955 is estimated at $20,000.

F. SCAPF 30-54-5 — $ 25,000
Composition of Incinerator Gases — Battelle Memorial Institute

Analysis and identification of gases from typical Los Angeles incinerator with Los Angeles type wastes burned therein.

G. SCAPF 40-54-11 — $ 25,000
Correlation and Interpretation of Results of Aerometric Survey — Stanford Research Institute

Data reduction, analysis and statistical evaluation of data from Aerometric Survey of 1954.

H. SCAPF 60-54-2 $ 15,000

Study of Carbon Isotopes in Los Angeles Atmosphere

Department of Geology
Calif. Institute of Technology

Analysis of the isotopic composition of carbon in various carbon compounds in the atmosphere on smoggy as well as non-smoggy days.

I. SCAPF 20-54-7 $ 2,000

(Recommended extension) $ 5,000

Review of Literature on Photochemical Reactions in Polluted Atmospheres

P. A. Leighton

Total Funds, Projects already approved	$435,850
Recommended Extensions	$ 85,000
TOTAL	$520,850

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Attachment No. 2

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

Recommended New Projects for 1955

The following new proposed projects we hope to initiate in November or December of 1954 and in calendar 1955:

1. SCAPF 10-55-1 — $ 30,000
Air Tracer Survey

Additional air tracer runs during smog season 1955 to verify wind trajectories.

2. SCAPF 10-55-2 — $ 2,000
Trend in Visibility

Analyses of Weather Bureau Records for stations at Burbank and Los Angeles International Airport for past years.

3. SCAPF 10-55-3 — $ 25,000

Development of Machine Methods for Computing Wind Trajectories

Survey of methods and equipments which can be brought to bear on computation of wind trajectories by high speed computing machines.

4. SCAPF 20-55-2 — $ 10,000
Nature of Reactants with Neutral Buffered Potassium Iodide and Phenolphthalin

Study and resolve differences in oxidant determinations by two methods and determine whether differences are due to greater sensitivity of phenolphthalin to organic peroxides or other organic oxygen compounds.

5. SCAPF 20-55-5 — $ 50,000
Mass Spectrometer Studies

To extend and complete studies initiated by Martin Shepherd of Bureau of Standards using the mass spectrometer as the basic tool.

6. SCAPF 20-55-6 — $ 2,500
Development of An Automatic Nitrogen Dioxide Instrument

To fill the need for nitrogen dioxide sampling for the Aerometric Survey for 1955.

7. SCAPF 20-55-7 — $ 10,000
Development of Infrared Techniques

For the monitoring and analysis of the atmosphere for various trace constituents.

8. SCAPF 20-55-8 $ 10,000
Application of Non-Dispersive Infrared Analyzer for Hydrocarbons

To determine the capabilities of this technique in the atmosphere with a long path cell.

9. SCAPF 20-54-9 $ 5,000
Application of Non-Dispersive Infrared Analyzer for Carbon Monoxide

Direct determination of carbon monoxide and recording on recording potentiometer.

10. SCAPF 20-55-10 $ 2,000
Feasibility Study for Automatic Continuous Measurement of Olefins, Acids and Aldehydes

Evaluate literature and report on possible procedures.

11. SCAPF 30-55-1 $ 60,000
Oxidation of Exhaust Gases

Basic data for design of exhaust device will be gathered. This is a "crash" program to aid designers. Probably Armour Research Foundation and one other.

12. SCAPF 30-55-2 $ 50,000
Evaluation of Exhaust Control Devices

A survey of methods available, testing of promising devices, and development work where necessary. Possibly Southwest Research Institute.

13. SCAPF 40-54-14 $ 25,000
Aerometric Survey, Winter-Spring 1954-1955

It is the purpose of this project to sample the Los Angeles atmosphere at two stations continuously during significant changes in meteorological conditions brought on by the winter and spring seasons, as well as man-made changes; i.e., increased fuel combustion, changes in backyard burning, completion of refinery controls.

14. SCAPF 40 - 55 $566,550
Aerometric Survey Summer-Fall 1955.

To sample the Los Angeles atmosphere for constituents deemed important to an understanding of smog and to provide guide lines for laboratory research. A network of 14 sampling stations in the Basin plus Santa Barbara and UC, Riverside.

(See Attachment No. 3)

15. SCAPF 60-54-1 $ 33,000
Use of Microwave Spectra for Identification of Smog Constituents

W. D. Hershberger, UCLA. Laboratory and field investigations.

16. SCAPF 60-54-4 $ 20,000
Continuous Measurement of Atmospheric Ozone by Spectrographic Method

Extension and more precise determination of ozone concentration in smog by Borman Engineering Company.

17. SCAPF 60-54-5 $ 2,500
Paramagnetic Resonance Studies

Detection and identification of free radical in smog reactions, laboratory investigations to explore possibility of detection of free radicals in hydrocarbon-air irradiation experiments.

If successful, additional for research phase $ 25,000

18. SCAPF 60-54-6 $ 35,000
Nuclear Magnetic Resonance

To explore this technique to identify hydrocarbon components in air samples.

19. SCAPF 50-55-1 $ 50,000
Area Distribution of Sources of Air Pollutants

Analysis of significant sources of various pollutants. Determination of amount and rate of emission of same.

20. SCAPF 60-55-7 $ 30,000
Measurement, Composition and Mechanism of Formation of Aerosols

21. SCAPF 60-55-8 $ 25,000
Absorption Spectra of Gaseous Atmospheric Pollutants

Literature survey compilation and additional laboratory investigations as necessary to assemble definitive data.

Total Funds, New Projects $1,068,050

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Attachment 3

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

PROPOSAL

Program SCAPF 40-55

Aerometric Survey - Summer, Fall, 1955

Objective: It is the purpose of this program to sample the Los Angeles atmosphere throughout the Basin along typical wind trajectories for constituents deemed important to an understanding of the smog problem and to provide guide lines for profitable lines of research in the laboratory.

Procedure and Discussion: The basic network of 1954 is to be expanded by four (4) more sampling stations namely:

(15) Manhattan Beach - El Segundo

(16) Figueroa and Manchester Blvd.

(17) Van Nuys

(18) Pomona

Concentrations of various constituents to be measured at each station as well as certain phenomena such as eye irritation, visibility and plant damage.

In addition, it is proposed to strengthen the network of lower and upper wind stations as well as obtain better information on temperature and pressure aloft for inversion layer studies namely:

A) 2 Captive Balloons Stations @ Cal Tech and Vernon

B) Surface Wind stations at Compton, Cal Tech, Rivera, Azusa

C) Upper wind Balloon Station @ Cal Tech, L.A. High School, L. A. Airport, Vernon, Downey

In addition, it is proposed to sample aloft for various constituents by either blimp flights or balloons.

Estimated Cost $566,550

SUMMARY OF CAPITAL EQUIPMENT COST FOR AEROMETRIC SURVEY - 1955

Constituent or Phenomenon	Cost to Equipment Each	Number Needed	Total Cost
Oxidant*	$ 5,000.00	4	$ 20,000.00
NO_2	2,000.00	14	28,000.00
CO	3,500.00	14	49,000.00
SO_2	4,000.00	7	28,000.00
Plants	----------	--	-------
Eye Irritation	----------	--	-------
Wind Instruments	2,000.00	4	8,000.00
Hygrothermographs	300.00	8	2,400.00
Visual Range	4,400.00	6	26,400.00
H. V. S.	150.00	5	750.00
Solar Radiation	1,000.00	1	1,000.00
Captive Balloon Stations	750.00	2	1,500.00
Upper Wind Stations	700.00	5	3,500.00
Blimp	5,000.00	1	5,000.00
Mobile Labs	1,500.00	1	1,500.00
			$175,050.00

* Modified to include measurement of oxidant precursor.

SUMMARY OF OPERATING COSTS (ESTIMATE)

AEROMETRIC SURVEY S-F 1955 (4 mos.)

Constituent or Phenomenon	Number of Stations	Total Cost
Oxidant	14	(a)
NO_2	14	(b)
CO	14	(c)
HC, Aldehydes	14	$126,000.00
SO_2	7	(d)
Plants	14	20,000.00
Eye Irritation	14	7,000.00
Wind Instruments	4	(e)
Hygrothermograph	14	(f)
Visual Range	6	(g)
Hemeon, H.V.S.	2, 7	30,000.00
Solar Radiation	6	3,000.00
Captive Balloon Station	2	8,500.00
Upper Wind	5	27,000.00
Blimp (40 days)	1	10,000.00
Mobile Labs (40 days)	1	10,000.00
Total of ---------- a,b,c,d,e,f,g,		100,000.00
Analysis	All	50,000.00
		$391,500.00

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION Attachment 3

ANALYSIS OF COST FOR (1) RADIOSONDE STATION

Capital Equipment	$ 2,500.00
Four (4) sounding per day - cost of instruments gas balloon at $250.00 per day	7,500.00/month
Four men @ $325.00 per month	1,300.00/month
Miscellaneous Supplies	500.00/month
One man data reduction, relief	325.00/month
	$ 9,625.00/month
Four Months	38,500.00
Grand Total	$ 41,000.00

ANALYSIS OF COST FOR TWO CAPTIVE BALLOON STATIONS

*Capital Equipment	$ 1,500.00
Winches @ $500 each (2)	1,000.00
Manpower as in radiosonde station	1,625.00/month
Miscellaneous Supplies	200.00/month
	$ 1,825.00/month
Four Months	7,300.00
Grand Total	$ 9,800.00

* 7' Balloon with 50 # nylon cord
or 5' x 10' Kytoon with 100# nylon cord

ANALYSIS OF COST OF UPPER WIND STATIONS

Stations: Cal Tech, Vernon, L. A. High,
L. A. Airport, Downey

Tail Method, Single Theodolite
2 men/Station/Shift

Capital Equipment 5 theodolites @ $700.00	=	$ 3,500.00
Manpower 2 shifts/station	=	6,625.00/month
Balloons, helium etc.	=	250.00/month
		$ 6,875.00/month
Four months	=	$ 27,500.00
Grand Total		$ 31,000.00

lk: October 30, 1954

Attachment No. 4

UNIVERSITY OF CALIFORNIA
AGRICULTURAL EXPERIMENT STATION

CITRUS EXPERIMENT STATION
DEPARTMENT OF PLANT PATHOLOGY
RIVERSIDE, CALIFORNIA

October 27, 1954

Dr. W. L. Faith
Southern California Air
Pollution Foundation
704 South Spring Street
Los Angeles, California

Dear Larry:

Pursuant to our telephone conversation of October 25, I present the following for your consideration and assistance towards the purchase of an infra-red spectrophotometer.

Our research facilities at Riverside permit fumigation with diverse, air borne contaminants known to exist in the Los Angeles and San Francisco Basins. Although our project is primarily directed towards knowledge regarding the specific identity of phytotoxicants and their effects upon plants we are also obliged to study the reaction of plants for the purpose of learning more about the nature of the air borne constituents present.

Our facilities permit controlled fumigation with oxidants of various kinds and hydrocarbons. We have been in the habit of measuring oxidant level, aldehydes, formaldehyde, oxides of nitrogen and sulfur dioxide. Despite knowledge of the presence of these materials we have yet no facility available for the measurement of some of the reaction products and the hydrocarbons themselves. Towards this end, we have been able to secure funds which would provide money for three-quarters of an instrument. This is not quite enough of a working tool for this purpose.

My request to you for aid in this area is made with the knowledge that the results of our study, using the IR, will ultimately benefit you in providing specific information on the absorption spectra of various known generated air contaminants compared with natural contaminants.

The acquisition of this instrument will also permit the development of a better appreciation of the air pollution problem by the Division of Physical Sciences on the Riverside Campus. There are several chemists in Dr. Conway Pierce's division that would very much like to become associated with the air pollution program. They can best use their talents in a study of photo-chemical systems, and organic, air borne entities. I feel quite

confident that through the employment of this instrument by our research group and the members of the Division of Physical Sciences, that we shall learn more about the problem than we have so far. This information on the spectrograms secured by the IR would be made available to you and may provide you with a basis for evaluating data already available in certain theaters of activity.

A four thousand dollar ($4,000) grant-in-aid would permit the purchase of this equipment.

With very best wishes, I remain,

Sincerely yours,

John T. Middleton

John T. Middleton, Chairman
Air Pollution Research

JTM:mg

280

281

Attachment No. 5

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

Classification of Research Projects by Broad Purposes

Combustion Products

30-54-2	Combustion Products	$250,000
30-54-3	Composition of Auto Exhaust	37,850
30-54-5	Composition of Incinerator Gases	25,000
30-55-1	Oxidation of Exhaust Gases	60,000
30-55-2	Evaluation of Exhaust Control Devices	50,000
	All 30	422,850

Studies of Los Angeles Basin (Environment)

10-55-1	Air Tracer Survey	30,000
10-55-2	Trend in Visibility	2,000
40-54-11	Correlation and Interpretation of Results Aerometric Survey	25,000
40-54-14	Aerometric Survey, Winter-Spring 1954-55	25,000
40-55	Aerometric Survey, Summer-Fall 1955	566,550
50-55-1	Area Distribution of Sources of Air Pollutants	50,000
	10 $ 32,000	
	40 616,550	
	50 50,000	
		698,550

Methods of Measurement

20-55-5	Mass Spectrometer Studies	$ 50,000
20-55-6	Development of An Automatic NO_2 Instrument	2,500
20-55-7	Development of Infrared Techniques	10,000
20-55-8	Application of Non-Dispersive Infrared Analyzer for Hydrocarbons	10,000
20-55-9	Application of Non-Dispersive Infrared Analyzer for Carbon Monoxide	5,000
20-55-10	Feasibility Study for Automatic Continuous Measurement of Olefins, Acids & Aldehydes	2,000
60-54-1	Use of Microwave Spectra for Identification of Smog Constituents	33,000
60-54-4	Continuous Measurements of Atmospheric Ozone by Spectrographic Method	20,000
60-54-5	Paramagnetic Resonance Studies	27,500
60-55-6	Nuclear Magnetic Resonance	35,000

20	$ 79,500	
60	115,500	$ 195,000

Fundamental Physics, Meteorology & Chemistry

10-54-5	Inversion Modification Studies	$ 5,000
10-55-3	Development of Machine Methods for Computing Wind Trajectories	25,000
20-54-1	Smog Forming Reactions	126,000
20-54-7	Review of Literature on Photochemical Reactions in Polluted Atmospheres	7,000
20-54-10	Photochemical Studies	30,000
20-55-2	Nature of Reactants with Neutral Buffered Potassium Iodide & Phenolphthalin	10,000
60-54-2	Study of Carbon Isotopes in Los Angeles Atmosphere	15,000
60-55-7	Measurement Composition & Mechanism of Formation of Aerosols	30,000
60-55-8	Absorption Spectra of Gaseous Atmospheric Pollutants	25,000

10	$ 30,000	
20	173,000	
60	70,000	$ 273,000

RECAP

10	$ 62,000
20	252,500
30	422,850
40	616,550
50	50,000
60	185,500
	$1,589,400

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

(a California non-profit corporation)

STATEMENT OF NET ASSETS AT OCTOBER 31, 1954

Cash in bank and on hand	$ 65,890.61
U.S. Treasury 90 day bills, due December 30 1954, at cost	99,751.00
Advances to employees	1,216.71
Deposit with airline	425.00
Scientific equipment, office equipment and automobile - at nominal amounts	3.00
	$167,286.32
Less - Withholding from employees for taxes, etc.	2,564.77
Net assets at October 31 1954	$164,721.55

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION
(a California non-profit corporation)

STATEMENT OF INCOME AND EXPENDITURES
FROM INCEPTION IN NOVEMBER 1953 TO OCTOBER 31 1954

INCOME:		
Contributions received (including $30,000 representing 1955 contributions)		$501,640.00
County contracts		74,619.99
Interest income		729.02
		$576,989.01
EXPENDITURES (initial expenditure made in February 1954):		
Research program -		
Services and purchases under contracts and agreements	$215,600.32	
Research staff salaries (including Managing Director)	78,298.40	
Scientific equipment purchased for general use	18,904.97	
Other	4,941.56	
		$317,745.25
General and administrative:		
Salaries (including Director of Public Information)	$ 27,207.36	
Travel	18,107.68	
Rent	4,683.18	
Office supplies and expense	9,184.84	
Telephone, telegraph, insurance, taxes and other	7,561.31	
Public information expense	8,088.05	
Office equipment purchased	13,581.81	
Automobile purchased	2,567.68	
Fund raising expenses	3,540.30	
		$ 94,522.21
		$412,267.46
EXCESS OF INCOME OVER EXPENDITURES FOR THE PERIOD		$164,721.55

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION
MINUTES OF
RESEARCH COMMITTEE OF THE BOARD OF TRUSTEES

Held in Room 1216, Southern California Gas Company
November 3, 1954

- - - - -

The meeting was attended by:

L.A. duBridge (Chairman)
R.B. Allen
F.M. Banks
A.O. Beckman
F.A. McCanlies
L.B. Hitchcock
W.L.Faith
M. Neiburger
N.A. Renzetti
L.H. Rogers

- - - - -

The 1955 Research Budget was submitted in preliminary form as shown in the several attachments hereto.* As in any research program, there is unavoidable uncertainty with respect both to content of projects and costs. Allowing for flexibility, a total figure of nearly $1,600,000 is a fair measure of the size of the job which we now believe should be undertaken.

Some of these projects would, of course, lead to others in 1956. We have not attempted to forecast whether the 1956 Program will be bigger or smaller. The proposed program is quite well integrated.

Dr. Beckman recommended that our program include research and development work on remedies to a somewhat greater extent. Extended discussion indicated that more emphasis should be given to modified auto fuels, evaluation of auto exhaust control devices, cooperation with others who are working on corrective devices, including modified carburetors, use of LPG etc. Cooperation with transit experts on economic studies might help in improving public transportation as another source of air pollution control. It was agreed that the staff would endeavor to make progress on some of these investigations and report at the next meeting of the committee.

Mr. Banks spoke on the need for molding public opinion. Consensus was that there is a very real need for a more informed public. It was agreed to take this up at the next meeting of the Board of Trustees.

With respect to possible help from the State via the University of California, Dr. Allen summarized the University of California's proposals submitted to the Governor recently as follows:

1. Evaluation of Microwave as a Means for Studying Composition of, Formation of, and Location of Smog $35,500

*Distributed at Research Committee Meeting

RESEARCH COMMITTEE

2. Investigation of Systems for Removal of Atmospheric Pollutants from Internal Combustion Engine Exhaust $23,500
3. Study of Removal of Atmospheric Contamination from Small Volumes $17,900
4. Study of Air Pollution Control in the Incineration of Refuse $26,600
5. Design of a Test Facility for Study of Air Pollution Effects $11,800
6. A Study Relating to the Dispersion of an Atmospheric Inversion Layer $39,000

Total of $159,300 (including $15,000 administrative overhead)

It was agreed that to conduct the $1,600,000 program, would require some modest increases in our personnel.

It appears quite unlikely that the State can make any direct appropriation to the Foundation, but it might be made available through the County and/or through the University.

The request from the Board of Supervisors for a research program was discussed. It was suggested that perhaps the County could support the entire Aerometric Survey for 1955, plus the "stop-gap" projects.

The Committee approved a grant of $4,000 to the University of California at Riverside to aid in their air pollution research.

Upon suggestion of Dr. duBridge, it was agreed that the Research Committee and the Trustees should be more fully informed with respect to our program and that a statement of our analysis of the general problem should be prepared. It was thought that a two-hour session might be arranged, perhaps late in the afternoon sometime in the middle of January, at which this discussion could be presented by the staff.

The Research Program as presented was accepted and will be recommended to the Board of Trustees for 1955.

LBH:mha
11/19/54

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

704 SOUTH SPRING STREET
LOS ANGELES 14, CALIFORNIA
Tel.: MAdison 6-9441

LAUREN B. HITCHCOCK
President and Managing Director

October 18, 1954

Dr. Lee A. DuBridge, President
California Institute of Technology
1201 East California
Pasadena, California

changed to Nov. 16

Dear Dr. DuBridge:

On Wednesday Noon, November 17th, the Southern California Air Pollution Foundation will report on its first year's activities to the contributors to our program and friends, and the purpose of this letter is to invite you to be with us on that occasion in the Pacific Ballroom of the Hotel Statler. We shall gather at 12:15 and plan to start the luncheon by 12:30.

Dr. Lauren B. Hitchcock, President of the Foundation, will inform those present of the accomplishments made during the first year, and outline the research program contemplated in the months ahead.

We hope we can count on you for the meeting. The enclosed postcard, returned to the office of the Foundation before November 12, will help us complete the arrangements. Tickets for the luncheon can be obtained at the door for $4.00, which includes tax and tip.

Most Cordially yours,

Fred D. Fagg

Fred D. Fagg, Jr.

Enclosure

P.S. A Board of Trustees Meeting will be held in the Washington Room immediately following the luncheon.

OCT 28 1954

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

704 SOUTH SPRING STREET
LOS ANGELES 14, CALIFORNIA
Tel.: MAdison 6-9441

LAUREN B. HITCHCOCK
President and Managing Director

October 27, 1954

Dr. Lee A. DuBridge, President
California Institute of Technology
1201 East California
Pasadena, California

TO ALL TRUSTEES, CONTRIBUTORS, AND FRIENDS OF THE FOUNDATION

Dear Dr. DuBridge:

To cooperate with the Los Angeles Chamber of Commerce in order that its luncheon on November 17 for the Scandinavian Airlines might be a complete success, the Foundation is moving its First Year's Progress Report luncheon to the preceding day, Tuesday, November 16, 1954, 12:15 p.m.

This has necessitated a change in our location to the French Room of the Ambassador Hotel.

It will be appreciated if the enclosed postcard is returned to the Foundation by November 10 to help us complete the arrangements.

Very truly yours,

L. B. Hitchcock

L. B. Hitchcock

LBH:mek
Enclosure

P.S. Board Meeting will follow immediately after luncheon. You will be advised of the suite number the day of the luncheon.

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

704 SOUTH SPRING STREET
LOS ANGELES 14, CALIFORNIA
Tel.: MAdison 6-9441

LAUREN B. HITCHCOCK
President and Managing Director

October 27, 1954

Dr. Lee A. DuBridge, President
California Institute of Technology
1201 E. California
Pasadena, California

Dear Dr. DuBridge:

The Foundation luncheon in the French Room of the Ambassador Hotel on Tuesday, November 16 at 12:15 p.m. will summarize our progress in 1954 and outline our program for 1955.

Renewal of principal contributors will be reported by the Finance Committee and the 1955 budget estimated.

Dr. Fagg has suggested that this would be a good time for you to bring one or two of your civic-minded friends who are interested in the work of this Foundation. Please let us have their names in advance and indicate whether you wish to pay for their tickets.

Sincerely yours,

L. B. Hitchcock

LBH:mha

L.B. Hitchcock

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

BOARD OF TRUSTEES MEETING

AGENDA

Tuesday, November 16, 1954
Suite - Inquire at Desk
Hotel Ambassador
2:00 P. M.

1. Minutes of Meeting of October 6, 1954
2. Resolution Substituting This Meeting in Lieu of Annual Meeting Called for in By-Laws. (Only for this year)
3. Report of Nominating Committee
4. Election of Trustees
5. Election of Officers
6. Appointment of Finance Chairman
7. Report of Research Committee
8. Report of Finance Committee (Banks)
9. President's Report
10. Distribution of Auditors' Report to All Contributors?

mek
11/11/54

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

Special Meeting of Board of Trustees
(being the Annual Meeting)
November 16, 1954

A special meeting of the Board of Trustees (being the Annual Meeting) of the SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION was held on the 16th day of November, 1954, at 3:00 o'clock in the afternoon in Room 119H of the Ambassador Hotel, 3400 Wilshire Blvd., Los Angeles, California, pursuant to notice duly given.

The following Trustees were present:

F. M. Banks
Arnold O. Beckman
Asa V. Call
Lee A. DuBridge
Fred D. Fagg, Jr.
Roy M. Hagen
William C. Mullendore
Stephen W. Royce
Dr. J. Philip Sampson

Also present were: Dr. Lauren B. Hitchcock, President; Dr. W. L. Faith, Deputy Director; Mr. Earl C. Bolton, Assistant Secretary; Mr. Robert S. Weatherly, Assistant Treasurer; and Mr. W. F. Sherman of the Automobile Manufacturers Association who attended the meeting for Mr. Charles F. Kettering.

The following Trustees were absent:

Raymond B. Allen
Walter Braunschweiger
Edward W. Carter
Charles F. Kettering
John A. McCone
Harvey S. Mudd
Fred B. Ortman
Alden G. Roach
James E. Shelton
Reese H. Taylor
P. G. Winnett

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

Dr. Fagg, Chairman of the Board, presided and the Assistant Secretary of the Foundation recorded the minutes.

The Chairman stated that as a convenience to the Trustees this meeting had been called as the Annual Meeting, approximately one month earlier than provided in the By-Laws. Upon motion made, seconded and unanimously carried, it was

> RESOLVED, that this meeting shall be in lieu of the 1954 Annual Meeting provided for in Article III, Section 1 of the By-Laws of this corporation, provided that a written consent and waiver is obtained from each absent Trustee; and
>
> RESOLVED FURTHER, that in 1955 the Annual Meeting shall be held in accordance with the provisions of Article III, Section 1 of the By-Laws.

The minutes of the Trustees' Meeting held on October 6, 1954, having been circulated among the Trustees, were approved.

Mr. Felix Chappellet of the Western Oil and Gas Association requested permission to address the Board. Upon being recognized by the Chairman he presented the Foundation with a check for $200,000 as a contribution of the Western Oil and Gas Association. The Chairman, on behalf of the Foundation, expressed appreciation to Mr. Chappellet and to the Association for this contribution.

The meeting proceeded to the election of Trustees to replace those whose terms expire in 1954. On recommendation of the Nominating Committee, composed of Mr. Call, Mr. Carter and Mr. Shelton, and on motion made, seconded and unanimously carried, there were elected as Trustees, for a term to expire at the Annual Meeting in 1957:

Raymond B. Allen
Arnold O. Beckman
Edward W. Carter
William C. Mullendore
Fred B. Ortman
Reese H. Taylor

The meeting proceeded to the election of officers of the Board of Trustees. On recommendation of the Nominating Committee, upon motion made, seconded and unanimously carried, the following persons were elected to the respective office opposite their names:

Name	Office
Raymond B. Allen	Chairman
Arnold O. Beckman	Vice Chairman
James E. Shelton	Treasurer
Leroy A. Garrett	Secretary
Robert S. Weatherly	Assistant Treasurer

(office of Assistant Secretary is vacant)

Mr. F. M. Banks, on behalf of the Finance Committee, presented a report of the Foundation's finances in 1954, as follows:

Funds Received

Private	$ 479,140
County of Los Angeles	152,000
Interest	729
City of Los Angeles	2,500
Total Funds Received	$ 634,369

Expenditures

Research	$ 444,447	
Research Salaries	99,298	
Operating	116,222	(approximately $20,000 non-recurring)
Total Expenditures	$ 659,967	

Upon motion made, seconded and unanimously carried, the report of the Finance Committee was approved.

Mr. Banks further reported that Price Waterhouse & Co. had completed an audit of the Foundation's accounts and found them to be in order.

Dr. DuBridge, Chairman of the Research Committee, submitted, on behalf of that Committee, the Cliassification of Research Projects, a copy of which is attached to these minutes. Upon motion made,

seconded and unanimously carried, it was

RESOLVED, that the Classification of Research Projects submitted by the Research Committee be and it is hereby adopted as the Research Plan of this Foundation, subject to obtaining the necessary funds.

Dr. Hitchcock reported that to date previous donors of the Foundation have renewed their contributions in the amount of $281,000.

Dr. Hitchcock reported that together with his Staff he appeared before the Board of Supervisors of the County of Los Angeles the morning of November 16, 1954. The Board of Supervisors had requested their appearance to report progress in the study of air pollution to date and to answer certain questions. He stated that relations with the Board of Supervisors are excellent and that the continued cooperation of the County of Los Angeles seems likely.

Mr. Banks suggested that the time seems appropriate for an intensification of the public relations program of the Foundation. Upon motion made, seconded and unanimously carried, it was

RESOLVED, that the Chairman be and he is hereby authorized to appoint a Committee on Public Information to assist the Public Information Officer and other representatives of the Foundation in the Public Relations and Public Information efforts of the Foundation.

Upon motion made, seconded and unanimously carried, it was

RESOLVED, that the President's Report given at the luncheon meeting of civic, business and educational leaders on the 16th day of November, 1954, just prior to this meeting, at the Ambassador Hotel, shall be published and appropriately distributed.

Upon motion made, seconded and unanimously carried, it was

RESOLVED, that the retiring officers be accorded the appreciation of the Board for their services to the Foundation during its first year of operation.

There being no further business before the meeting, it adjourned.

/s/ Earl C. Bolton
Assistant Secretary

mek

Attachment No. 2

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

Recommended New Projects for 1955

The following new proposed projects we hope to initiate in November or December of 1954 and in calendar 1955:

1. SCAPF 10-55-1 — $ 30,000
Air Tracer Survey

Additional air tracer runs during smog season 1955 to verify wind trajectories.

2. SCAPF 10-55-2 — $ 2,000
Trend in Visibility

Analyses of Weather Bureau Records for stations at Burbank and Los Angeles International Airport for past years.

3. SCAPF 10-55-3 — $ 25,000

Development of Machine Methods for Computing Wind Trajectories

Survey of methods and equipments which can be brought to bear on computation of wind trajectories by high speed computing machines.

4. SCAPF 20-55-2 — $ 10,000
Nature of Reactants with Neutral Buffered Potassium Iodide and Phenolphthalin

Study and resolve differences in oxidant determinations by two methods and determine whether differences are due to greater sensitivity of phenolphthalin to organic peroxides or other organic oxygen compounds.

5. SCAPF 20-55-5 — $ 50,000
Mass Spectrometer Studies

To extend and complete studies initiated by Martin Shepherd of Bureau of Standards using the mass spectrometer as the basic tool.

6. SCAPF 20-55-6 — $ 2,500
Development of An Automatic Nitrogen Dioxide Instrument

To fill the need for nitrogen dioxide sampling for the Aerometric Survey for 1955.

7. SCAPF 20-55-7 — $ 10,000
Development of Infrared Techniques

For the monitoring and analysis of the atmosphere for various trace constituents.

8. SCAPF 20-55-8 $ 10,000
Application of Non-Dispersive Infrared Analyzer for Hydrocarbons

To determine the capabilities of this technique in the atmosphere with a long path cell.

9. SCAPF 20-54-9 $ 5,000
Application of Non-Dispersive Infrared Analyzer for Carbon Monoxide

Direct determination of carbon monoxide and recording on recording potentiometer.

10. SCAPF 20-55-10 $ 2,000
Feasibility Study for Automatic Continuous Measurement of Olefins, Acids and Aldehydes

Evaluate literature and report on possible procedures.

11. SCAPF 30-55-1 $ 60,000
Oxidation of Exhaust Gases

Basic data for design of exhaust device will be gathered. This is a "crash" program to aid designers. Probably Armour Research Foundation and one other.

12. SCAPF 30-55-2 $ 50,000
Evaluation of Exhaust Control Devices

A survey of methods available, testing of promising devices, and development work where necessary. Possibly Southwest Research Institute.

13. SCAPF 40-54-14 $ 25,000
Aerometric Survey, Winter-Spring 1954-1955

It is the purpose of this project to sample the Los Angeles atmosphere at two stations continuously during significant changes in meteorological conditions brought on by the winter and spring seasons, as well as man-made changes; i.e., increased fuel combustion, changes in back-yard burning, completion of refinery controls.

14. SCAPF 40 - 55 $566,550
Aerometric Survey Summer-Fall 1955.

To sample the Los Angeles atmosphere for constituents deemed important to an understanding of smog and to provide guide lines for laboratory research. A network of 14 sampling stations in the Basin plus Santa Barbara and UC, Riverside.

(See Attachment No. 3)

15. SCAPF 60-54-1 $ 33,000
Use of Microwave Spectra for Identification of Smog Constituents

W. D. Hershberger, UCLA. Laboratory and field investigations.

16. SCAPF 60-54-4 $ 20,000
Continuous Measurement of Atmospheric Ozone by Spectrographic Method

Extension and more precise determination of ozone concentration in smog by Borman Engineering Company.

17. SCAPF 60-54-5 $ 2,500
Paramagnetic Resonance Studies

Detection and identification of free radical in smog reactions, laboratory investigations to explore possibility of detection of free radicals in hydrocarbon-air irradiation experiments.

If successful, additional for research phase $ 25,000

18. SCAPF 60-54-6 $ 35,000
Nuclear Magnetic Resonance

To explore this technique to identify hydrocarbon components in air samples.

19. SCAPF 50-55-1 $ 50,000
Area Distribution of Sources of Air Pollutants

Analysis of significant sources of various pollutants. Determination of amount and rate of emission of same.

20. SCAPF 60-55-7 $ 30,000
Measurement, Composition and Mechanism of Formation of Aerosols

21. SCAPF 60-55-8 $ 25,000
Absorption Spectra of Gaseous Atmospheric Pollutants

Literature survey compilation and additional laboratory investigations as necessary to assemble definitive data.

Total Funds, New Projects $1,068,050

mek
10/30/54

Attachment No. 1

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

Summary of Continuing and New Research Projects for 1954 and 1955

The following is a list of projects which have been reviewed and approved at previous Research Committee meetings and are continuing into 1955 with estimated fund requirements for calendar 1955:

A. SCAPF 10-54-5 — $ 5,000
Inversion Modification Studies — Arthur D. Little, Inc.

Analysis of various atmospheric parameters, such as incident solar radiation and speculations concerning possibilities of affecting motion of pollutants through inversion layer.

B. SCAPF 20-54-1 — (To July 1, 1955) $ 66,000
(Recommended Extension to Dec. 31, 1955) $ 60,000
Smog Forming Reactions — Stanford Research Institute

Selective removal of classes of compounds from Los Angeles atmosphere followed by exposure to plants, etc.

C. SCAPF 20-54-10 — $ 30,000
Photochemical Studies — Armour Research Foundation

Study reaction products in irradiation of hydrocarbons in presence of other pollutants such as nitrogen dioxide, carbon monoxide, aldehydes.

D. SCAPF 30-54-2 — $250,000
Combustion Products — University of California, Riverside

Large chamber tests of various pollutants as smog-formers.

E. SCAPF 30-54-3 — $ 17,850
(Recommended extention) $ 20,000
Composition of Auto Exhaust — Midwest Research Institute

The current contract with Midwest Research Institute should be finished by July 1, at a 1955 expenditure of $17,850. In all probability, the project will have to be continued and extended. The last six months of 1955 is estimated at $20,000.

F. SCAPF 30-54-5 — $ 25,000
Composition of Incinerator Gases — Battelle Memorial Institute

Analysis and identification of gases from typical Los Angeles incinerator with Los Angeles type wastes burned therein.

G. SCAPF 40-54-11 — $ 25,000
Correlation and Interpretation of Results of Aerometric Survey — Stanford Research Institute

Data reduction, analysis and statistical evaluation of data from Aerometric Survey of 1954.

H. SCAPF 60-54-2 $ 15,000

Study of Carbon Isotopes in Los Angeles Atmosphere — Department of Geology, Calif. Institute of Technology

Analysis of the isotopic composition of carbon in various carbon compounds in the atmosphere on smoggy as well as non-smoggy days.

I. SCAPF 20-54-7 $ 2,000

(Recommended extension) $ 5,000

Review of Literature on Photochemical Reactions in Polluted Atmospheres — P. A. Leighton

Total Funds, Projects already approved	$435,850
Recommended Extensions	$ 85,000
TOTAL	$520,850

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10/30/54

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION
704 South Spring Street,
Los Angeles 14, California

(The Board of Trustees at its Annual Meeting November 16, 1954, requested that copies of this report be sent promptly to all friends and supporters of the Foundation. The report will be published later in more complete form for wider distribution.)

PRESIDENT'S REPORT

November 16, 1954

(Meeting at the Hotel Ambassador)

To the Trustees and Supporters of the Foundation:

This meeting marks a milestone. One year ago, almost to the day, most of you met in this hotel and organized the Southern California Air Pollution Foundation. On November 18, 1953 the Foundation was officially incorporated under the laws of California as a non-profit research organization. I reported for duty on February 1 and started immediately to find permanent quarters for the Foundation and to select four top-notch scientists to work with me as a scientific team. In this we had the invaluable help of our Trustees. On March 15 we were at work at 704 South Spring Street and by the end of May we had largely completed our small but high-quality organization.

PROGRESS ON STATED OBJECTIVES

In its original Statement of Policy, issued in November 1953, the Trustees listed its seven intentions, aimed at expediting the solution of the smog problem. Number one was "to assemble a competent technical staff to organize and direct a broad program of cooperation, research and public information." I would now like to present to you the key men on our staff:

Dr. W. L. Faith, Deputy Director and Chief Engineer
Dr. M. Neiburger, Senior Meteorologist
Dr. N. A. Renzetti, Senior Physicist
Dr. L. H. Rogers, Senior Chemist
Mr. Burt Leiper, Public Information Officer
Mr. Robert S. Weatherly, Business Manager

Their competent and able work is our single most valuable resource. Assisting them we have the minimum possible office force, but one which makes up for its lack in numbers in earnestness, hard work and ability. This organization is fired with enthusiasm for its job and I will match their working hours and productivity against any organization represented here today. We even solved the coffee-break problem by buying our own percolator. Morale in this organization is one hundred percent.

Early this year we began to seek the cooperation and counsel of others in this area and nation-wide who were in a position to help us. They have always responded wholeheartedly. Among these sources of voluntary assistance

is the National Bureau of Standards, the Bureau of Mines, faculties of Universities here and elsewhere, as well as various scientific societies. They have helped and stand ready to assist us when we will need more help and know how to use it.

Without waiting for completion of our scientific team, we got underway immediately in evaluating work of others and in beginning to formulate our research plans.

We are fully aware of the need for an accurate, impartial and objective program of public information. We have deliberately refrained from announcing any conclusions during these past months although we have been under much pressure to do so by certain segments of the public, because we have needed time to determine the facts. With the excellent cooperation of the press, radio and TV, we have reported to the public our activities and adoption of research programs. We believe we are now close to the time when we can help in a sound public information program. We are pledged to report to you and to the public and to the government, our findings, promptly.

The second purpose of this Foundation is "to determine, record and publish what has been accomplished to date by all agencies dealing with the Southern California problem." We have evaluated and summarized most, if not all, of the available data bearing on our entire air pollution problem. This will be published as rapidly as possible. In June, we published our first scientific report, summarizing available data on the Meteorology of the Los Angeles Basin by Neiburger and Edinger. 250 copies of this report were distributed to contributors, interested scientists over the country, and libraries, and the edition is now exhausted. We assembled conferences of experts on hydrocarbon chemistry, on ozone formation, on meteorology, resulting in summaries which are guiding us in our research plans. There is no quicker way to get up-to-date on these various scientific subjects than to have the experts tell you first-hand. Published literature often lags by two or three years and would take many months for us to read individually.

Our second technical report deals with a complete analysis of all available information bearing on combustion products of air pollution. It is now in press and will be available shortly.

Much has been published from many sources dealing with our problem. A good deal of it leads to a consistent picture but unfortunately there is some fundamental and serious disagreement. We have research projects actively underway to resolve these differences, and we are making progress in summarizing and publishing our findings.

The third stated purpose of the Foundation is "to determine what remains to be done and to employ experts--through the device of research or service contracts--who will provide information and advice for the shaping of future policies and action". Much additional information is needed. I refer you to the condensed outlines of our research program attached hereto, which I shall discuss shortly.

Six different programs total over 30 active projects which, by the end of December, will have cost the Foundation about one half million dollars.

These projects have been placed at Stanford Research Institute, Midwest Research Institute at Kansas City, Missouri, Southwest Research Institute at San Antonio, Texas, Armour Research Foundation, Chicago, Illinois, University of California, Arthur D. Little, Inc., Cambridge, Mass., Battelle Memorial Institute, Columbus, Ohio and others. Local laboratories such as those of Truesdail and of Chaney are carrying out substantial assignments. Faculty personnel from Cal Tech, USC, UCLA, and Stanford University are working for us. As I am sure you know, we have no laboratories of our own, but place all our work at existing competent laboratories.

This entire program is aimed at providing facts on which we can base recommendations for remedial action. We must find the answers to such questions as, "What is smog?" "What is the contribution of the automobile exhaust - of incinerators - of industry?" "What practical remedies are there?"

The fourth purpose of the Foundation is "to collect information as to what other municipal areas have done and are doing under similar circumstances." By personal visits to or studies of, New York, Pittsburgh, St. Louis, Chicago, San Francisco, and Louisville, we have learned something of their individual approaches to their local problems. By and large they are still in the smoke phase--that is, dealing with particular matter to a large extent from incineration and rubbish disposal, currently regarded by some of these other cities as their Number One problem. Invisible, gaseous smog we believe is the coming primary national problem, as it appears to be Los Angeles' already. Because of our environment here, we believe we have a much more advanced and more serious air pollution problem; that little as we know so far, we know much more about it than these other cities.

Our fifth objective is "to provide and maintain a library of materials pertinent to the subject of air pollution." This has been done. We are building up a carefully selected collection of pertinent literature with emphasis on current scientific papers, both local and world-wide. We rely on our libraries in the community for many standard references and books, but there is a much larger literature on air pollution than you might realize and it is growing rapidly. This is an indispensable resource in evaluating man's present knowledge and spotlighting needed research.

Our sixth purpose is "to consult with, exchange information with, and to suggest to governmental and private agencies those research activities, enforcement methods, or other matters which have not yet been conducted or tried, and which seem to offer promise of air pollution abatement, so that the efforts of all groups and individuals may be coordinated properly." This is going on almost continuously. We work closely with the Air Pollution Control District and with university and other research centers. We held a three-day conference with nation-wide representatives of the automotive industry in August and we have a two-day conference with similar experts in the field of rubbish disposal and incineration scheduled here for December 2 and 3. Through such meetings we obtain a valuable exchange of information.

We have conferred frequently with the Board of Supervisors during the year, especially in connection with research projects now being undertaken by the Foundation for the County. We participated in conferences called by Governor Knight and Senator Kuchel late in October.

We were called on the other day by the Board of Supervisors to submit our recommendations for what we considered an essential research program. In presenting this program to them, totalling over 2 million dollars, we have perhaps one of the best examples of coordination with governmental agencies.

Naturally most of our coordination effort, as in other matters, lies ahead of us.

The seventh assigned duty is "to publish current information by the most appropriate means on all phases of air pollution and its abatement." I have already discussed this activity.

WHAT WE ARE FINDING OUT

Now I want to try to tell you some of the things we have found out so far, particularly as they help to define the problem, and show you how our current program leads into the larger program for 1955. Please remember that our current projects were only started this summer, and for the most part are still going ahead actively and increasing in number. All I can give you now is a progress report.

The first problem which confronted us was to decide what the outer limits of our Los Angeles atmosphere were--that is, just what is the land area and amount of air over it which is critically affected. At the start we found that it was loosely described as the City of Los Angeles, or Los Angeles County, or a basin of 1100 or 1200 square miles in extent. Careful meteorological study indicates that the critical area is about 1630 square miles and the critical atmospheric volume one which exists under low temperature inversion layers ranging from surface inversions to perhaps 2,000 feet. We chose as a typical height to the base of this inversion layer an altitude of 1,200 feet. At this level we examined the surrounding mountains and established certain boundaries. The result is the area shown in this outline map. Actually this is a scale model of the atmosphere of the Los Angeles Basin in which one inch equals a mile--held edgewise the thickness of this board presents the thickness of our air under the inversion lid. This helps to visualize the extremely thin sandwich of air between ground level and inversion layer in which we live, and helps to understand why we have so much relatively stagnant air and poor ventilation.

ACTIVITIES IN OUR "AIR CHAMBER"

In studies recently completed for us by two members of the University of Southern California faculty, Ballard and Goedhard, the current population in this Basin is estimated at 5,030,000. Of the 1,630 square miles total in the Basin. 1145 are in Los Angeles County and 485 in Orange County, or exactly one-third of the total area in these two counties, in which resides about 98% of the total population of both counties.

Within this limited air chamber we have currently a total of 2,361,000 motor vehicles, according to our investigators Ballard and Goedhard, burning a total of 4,680,000 gallons of gasoline per day or 14,040 tons. There is no accurate information on the number of domestic incinerators nor of the amount of rubbish burned in them, but exhaustive research by them suggests as a rough

guess about 1,500,000 such incinerators burning about 5,000 tons per day.

IMPERFECT COMBUSTION

Within this same area we have tremendous industrial activity. We have installed through-put capacity for refining about 39,000,000 tons of crude oil per year. We have capacity for steel production of 2 and 1/4 million tons per year as the largest steel producing area west of Chicago. We have the generation of power for industry and for our homes for which we have a choice of two hydrocarbon fuels, natural gas and fuel oil. In our automobiles we have a third hydrocarbon fuel we call gasoline. All told the 5,000,000 and their industry in this restricted air chamber burn over 50,000 tons of fuels and rubbish every 24 hours. This in itself would not be serious, but unfortunately all of these combustion processes are imperfect, some more so than others. Preliminary indications are that over 3,000 tons per day of unburned fuel or partially burned fuel plus oxides of nitrogen and sulfur result from our combustion processes, excluding carbon dioxide, carbon monoxide, dust particles and soot. Carbon monoxide is probably in excess of 6,000 tons per day.

These pollutants have many sources scattered over our Basin. They come from automobiles, incinerators and industry, with industry contributing about one-third. All available research work of others indicates that on the average 7% of gasoline supplied to motor vehicles comes out of the exhaust pipe unburned with additional quantities escaping from carburetors and crankcases. Based on the normal consumption of gasoline in the Los Angeles Basin, it is a matter of simple arithmetic to calculate that this source contributes about 1,000 tons per day of hydrocarbons, plus organic acids and aldehydes, plus about 300 tons of oxides of nitrogen and sulfur. This is not a matter of opinion. The automotive industry recognizes the automobile as the largest single source of hydrocarbons in our atmosphere. Competent scientific evidence is mounting to show that automobile exhaust gases in the concentrations found in our atmosphere are capable of forming ozone and may be considered as a definite source of smog.

Further confirmatory work appears to be needed before there is substantial agreement by all concerned on the cause-and-effect relationship between these various pollutants and the formation of smog. This research is one important part of our program.

AEROMETRIC SURVEY

Now, I would like to tell you briefly about a few of the most important projects on our research program. As you will see from the attached Tables, the biggest single program this year and next is the Aerometric Survey. This is an intensive analysis of our atmospheric environment, including analyses of the air for contaminants at various locations and a correlation of air composition with known manifestations of smog, i.e. eye irritation, plant damage, reduced visibility and high oxidant content. In addition to ten stations in the Basin are one in Santa Barbara for control purposes, and one in Riverside, California, about 50 miles inland. The current survey of four months began in August and will end November 30. We are measuring up to ten variables, but due to limitations of money and man-power, have not been able to do all measurements at all stations this year. Table 5 lists the measurements and numbers of stations at which they are being made in the current survey.

We are also sampling the air at various heights above some of the stations. With the cooperation of the U. S. Navy, we have done sampling from a Navy blimp.

AIR TRACER SURVEY

In order to follow the movement of polluted air masses, it is of course essential to have complete meteorological data. Accordingly, through the cooperation of the District, we have records from 52 wind stations throughout the Basin. In order to verify our method of calculating wind trajectories, we have been carrying on a program of air tracer tests in which fluorescent particles are released in one corner of the Basin and the movement of air charted by collecting and counting these particles on a system of filters, located on a 25-mile arc with a radius of about 13 miles. Six air tracer runs have been made this summer. Present indications are that the accuracy of calculated wind trajectories can be improved by having more wind observations aloft.

REFINERY EMISSIONS

You will note that we have now discussed or explained briefly all of the projects in Table II except the refinery emissions audit. This has just been completed and I am glad to be able to make this first report to you today. It became obvious to us some months ago that one of the most controversial and possibly significant sources of pollution in this Basin was the emissions of hydrocarbons from refineries. We made up our minds that an absolutely independent audit should be made. A nationwide search by the Foundation resulted in the choice of the Southwest Research Institute of San Antonio, Texas, as a competent and impartial auditor. Under the direction of Dr. Judson Swearingen, a recognized authority, but who has never been in the employ of any petroleum company, a personal and physical check of all hydrocarbon losses was made in all of the major refineries in this Basin and in typical small independent refineries. Hundreds of samples were collected by Southwest Research Institute and analyzed under their supervision. Capacities of storage tanks and characteristics of other equipment were determined independently by them. We believe our survey has been more thorough than those made by the petroleum refineries themselves. The findings of the Southwest Research Institute may be summarized as follows:

The total hydrocarbon emission to the atmosphere in the Los Angeles Basin is estimated at 251 tons per day. The difference between this figure and the 224 tons per day reported by the Western Oil and Gas Association is believed to be within the range of error to be expected in these types of estimates. The olefin losses of amylenes and heavier are placed at 16.4 tons per day compared to 12.2 tons per day reported by the Association. This audited value for olefins was based on the best available average annual composition of motor gasoline produced and marketed in Los Angeles County, as of August 1954 an analysis which was not available in comparable form in March of this year.

The audit covered nine major and eleven independent oil companies in Los Angeles County and included personal inspection of oil fields producing 52% of the County's annual oil production, refineries possessing 95% of the

County's refining capacity, and all bulk and marine terminals. Examination of plant records, interviews with technical personnel, inspection of facilities, and collection and analysis of samples were performed and the calculated results are believed as accurate as can be obtained without very extensive and elaborate studies.

IDENTIFICATION OF SMOG FORMERS

In Table III you will note a project entitled briefly "Smog-Forming Reactions" which will probably total $60,000 by the end of December and for which we propose $126,000 for next year. In this project, smoggy air is being tested by various means to measure its effects, then one pollutant after another is removed successively, and after each removal the smog effects are measured again. It appears possible in this way to eliminate many pollutants so far as effects of eye irritation, plant damage, or ozone formation are concerned. We know, for example, that ozone formation and eye irritation occur entirely in the daytime, yet, it is possible at times to take polluted air at night, irradiate it with artificial sunlight and produce smog. Elimination of pollutants is proceeding and we hope eventually to be able to identify the substance or substances directly responsible. This should do much to enable us to diagnose and prescribe remedies. Naturally it is most exacting and painstaking work and requires highly trained scientists and expensive equipment.

Further down the list you will notice "Photochemical Reactions". Here is another example of the independent confirmation which we believe is needed to demonstrate conclusively ozone formation from auto exhaust, as well as from hydrocarbons. Composition of auto exhaust needs more study and especially incinerator gases. The auto exhaust project is underway at Midwest Research Institute and the project on incinerator gases has recently been placed at the Battelle Memorial Institute. Much as I should like to do so, time does not permit me to go into the other projects in detail today.

"PILOT PLANT" STUDIES OF THE BASIN ATMOSPHERE

Table IV sets forth a large part of our program for 1955. Leading the list is a study of the smog-forming potentials of various pollution sources, especially combustion products. One would like to experiment with the entire Los Angeles Basin but this is impossible as we can't control the weather. In a large chamber of special construction, perhaps as big as an airplane hangar, we could supply auto exhaust at one time, backyard incinerator smoke at another, hydrocarbons at another, and then a mixture of two or more of these pollutants. We could control the temperature, humidity, concentration of pollutants, the amount of light, etc. We could find accurate answers on such question as, "Does auto exhaust actually form smog?" or, "What would be the effect of closing down the refineries, or stopping all incinerators, or keeping all cars off the road?" Two years with this operation, whatever the cost, would be time and money saved in trying futile experiments on the whole Basin itself. This program seems to us to be appropriate for the University of California with perhaps the main installation at Riverside and the help of experts on the faculties at other campuses. These findings would increase our understanding of air pollution not only in the Los Angeles Basin, but in the Bay area, in San Diego, and other cities.

NEED FOR BETTER TOOLS

A group of the projects you will see have to do with the development of various methods and instruments for measurement. So far in all air pollution work, we have been working with tools comparable to the axe and sledge hammer of pioneer days. We have selected carefully a list of the greatest needs for scientific tools. They compare to the band-saws, turret lathes, precision machine tools, and other modern tools essential to building in this modern world. We, too, are trying to build something very important and are seriously handicapped. Scientists everywhere are aware of this vital need. This sort of work could be done in the laboratories of various universities in California.

CONTROLLING AUTO EXHAUST

Mid-way down the list are two projects directed at the development of auto exhaust control methods. First, we feel that the oxidation process requires testing of various catalysts for efficiency, operating life under prolonged operation, maximum temperatures, and accordingly the metals and types of construction indicated. All these basic things are still unknown. At the same time a number of devices have already been proposed by some pioneers and even though designed and built without the benefit of fundamental data, it is possible some of these devices could help in the meantime. A set-up is needed to thoroughly test them under all road and traffic conditions.

We feel the Aerometric Survey should be continued on a reduced monitoring basis through the winter and spring months and then start next July on an expanded basis. We must learn more about our atmospheric environment.

Naturally, there is a great deal of interest in what will result from our Aerometric Survey from 1954, still going on. We will have over 100,000 measurements by the end of this month and the scientific evaluation of these results will take several months. The Air Pollution Control District is supporting this Aerometric Survey financially and making available to us the data from their measurements made at the same time in the Basin this summer. We will put all of this together in our final report which will be submitted to the District. I know you would like to know right now what we have been finding and the best I can do is to let you see a few samples. We selected what seemed to be the two worst days this summer, namely September 24 and October 14 to show you how certain pollutants ran up with eye irritation when the inversion layer was low. Please bear in mind that because of the time we are showing only a few pollutants at two stations. To show you the data for all ten stations throughout the summer would take at least one full day. Furthermore, until we get all the data together, we cannot draw any conclusions.

The first chart* compares certain measurements made at our downtown station on the fourth floor of a building on the corner of Sixth and Spring streets. High values for oxidant, eye irritation and plant damage are noted for both September 24 and October 14. The plant damage was somewhat less. It is possible that plants are damaged by different substances than those causing eye irritation. Note the very low height of the inversion layer on both dates. For comparison a pleasant day is shown at the right on October 25, when the inversion height was over 6,000 feet, eye irritation and plant damage

*Not included in this manuscript

are practically absent, but interestingly enough, oxidant value is still measurable, but below normal eye irritation levels.

On the second chart* similar measurements are reported for the same dates at the Pasadena station. Here will be noted that substantially the same high values were measured for oxidant, eye irritation and plant damage, but on October 25, which was rated as a pleasant day downtown, oxidant value was more than twice the downtown value and there was some eye irritation.

Altogether over one hundred thousand measurements will have been made when we bring this study to an end for the current season on December 1. So far, during the survey, hydrocarbons have varied from nearly zero up to 1.6 ppm downtown, and up to 0.4 ppm in Pasadena. Carbon monoxide seems to reach a peak normally about 8:00 a.m. downtown, and it has reached as high as 30 ppm. Aldehydes (an oxidation product of hydrocarbon) as well as nitrogen dioxide, both of which are also products of most combustion processes, have reached concentrations of 0.7 ppm downtown.

Again this survey is establishing more fully the extreme variation in smog intensity as measured by these various means from point to point over the Basin. For example, we have obtained severe plant damage at our Rivera and our Bassett stations on days when the plant damage downtown was very slight. Nor do we yet see a correlation between oxidant value and plant damage which some have expected, although this could of course develop after all the data has been carefully digested.

LARGE PROGRAM FOR 1955

This is the biggest 12 months' research program ever drawn up for the Los Angeles air pollution problem. On the basis of presently-known facts and their relationship to the unknown, it could be three times as big. It is a large figure in comparison to the rate at which air pollution research has been going on here so far. We believe the state of our knowledge is just beginning to reach the point where we can realistically assess the magnitude of our problem. It is our sincere conviction that the seriousness and the emergency of this problem deserves an attack on this scale.

We believe the listed projects are all-important.

Our total research program for 1955 is estimated at close to $1,600,000, which with our operating expenses adds up to over $1,800,000. With the studies of stop-gap procedures recommended by us to the Board of Supervisors this morning, an over-all program of $2,214,000 has been presented.

It is, of course, obvious that a program of this size will be possible only if supported largely by the County and the State. This Foundation will continue to do all it possibly can with funds it can derive from private sources and it is expected that the Foundation will seek $750,000 from its own supporters. We assume that Los Angeles County and the State of California, with the Foundation, will find ways and means of carrying out this very necessary program.

Management is always confronted in any pioneering development with the tough question, "How much research?" If you do too little in the hope of saving

*Not included in this manuscript

time and money, you get no answer, or the wrong answer. If you do too much, you can go broke. We face the same problem. After taking into account all the work that has been done to date, we find large areas of ignorance and no quick or significant remedies. We can readily give you a six million dollar program, all of which looks interesting; but we have selected what seemed to us the essential projects, those which are most likely to produce useful answers. We have done our best to strike a balance between expediency and the purely academic, between too little and too much.

SUMMARY OF OUR PRESENT VIEW

To summarize, we are organized in the first four months and underway with a research program in the second four months. While not yet in a position to announce conclusions, we have evaluated available information to the point where we feel we are beginning to see the over-all problem in good perspective. For instance, that our air pollution has two primary aspects, gross pollution by many substances, and under certain conditions, transient eye-irritants, plant-damaging compounds, etc. The two may or may not be closely connected. The reduction of one may not necessarily reduce the other. Together they constitute what is popularly called smog but most commonly identified by eye irritation, reduced visibility, and odor. Gross air pollution may not be physiologically harmful, but we assume it is. Further, it is beginning to look to us as if the contribution of pollution from industry, substantial as it is, is about half the contribution of the public through its automobiles and incinerators, that further identification and diagnosis of these still very qualitative estimates is essential - that the solution will require development of practical, workable remedies, because we can't prohibit essential activities until there are workable and acceptable alternatives - that there is every reason to believe these remedies can be developed - that it is going to take concentrated effort of industry, government and private agencies on a scale more comparable to wartime effort than the typical peacetime civic welfare movements - and - that this Foundation, unique in the air pollution field, is in an excellent position to catalyze this effort, contributing only so much of its own research as will stimulate and guide those who have the basic responsibility and the large resources.

CAN SMOG GET WORSE?

In closing, let your minds return to this image of the Los Angeles Basin and its restricted air chamber. Today its 1600 square miles, already teeming with over 5 milliom inhabitants, hundreds of industries, 2,361,000 motor vehicles, perhaps one and one-half million incinerators, burning improperly over 50,000 tons per day of various materials, has a certain pollution level which at times reacts to eye-irritating smog, of an intensity with which you are familiar regardless of how we measure it or define it scientifically. Look ahead two years - four years - or even six years -- in 1960 the Ballard-Goedhard reports which are now being prepared for publication estimate that we will have a Basin population of 6,200,000 people, nearly three million motor vehicles burning 18,000 tons of gasoline a day. 1,860,000 incinerators burning 6,200 tons of rubbish per day -- but why go on? Despite the fine work of the Air Pollution Control District in eliminating over 900 tons per day of pollutants so far, the astonishing growth of this Basin may swell our pollution faster than we can reduce it and hence smog may get worse. How much worse does it have

to get? How intolerable does our atmosphere have to get before enough people say "this is the limit--I've had enough!" Is this community going to wait until that time comes (if it has not come already) to stop wrangling and criticizing each other and unite behind a well-organized, large-scale attack on this problem?

CURE OR KILL?

We of the Foundation staff say to you that the research program we have submitted is irreducible, that anything less is temporizing, that this community necessity is above politics or any private interest, that if we start an all-out effort now, we may hope to have tolerable air in five years and relief perhaps sooner. We must lose no time; we cannot in a battle "research" out the last percent of uncertainty; but we must know what we are doing, for we can kill the patient by one too many untested "cures". Industry is our livelihood -- whether you and I work in a factory or supply industry with services like insurance, food, clothing, entertainment or shelter. Our industry is our productivity; our problem is to find out how to restore tolerable air and <u>improve</u> our productivity.

COST OF OTHER NECESSITIES

From time immemorial one thing man has always had plenty of the world over is air. "Free as air" has been a household word. In the Los Angeles Basin where for natural reasons, so far as we know completely beyond man's control, our air supply is limited -- at times severely. Air is no longer free here and there is not enough of it. Consider for a moment our other indispensable human necessities here: Water, one of our most valued resources which we almost take for granted, represents an investment for the Los Angeles Basin of somewhere around $750,000,000. There is no great clamor over whether or not we should have potable water, and we shall probably have to have more of it. Take sanitary sewage disposal. Would we contemplate for a moment going back to the days of mediaeval London where refuse of all sorts was thrown in the streets? In the Los Angeles Basin we have invested perhaps 250 to 300 million dollars in our sewage system. Our highway system in Los Angeles Basin represents an investment of several billion dollars. Our harbor cost us 97 million dollars. How much is tolerable air worth to you people in this Los Angeles Basin? We don't know what the cost will be yet, but we strongly suspect it will be more like some of these other indispensable services which you already enjoy. We recommend the attack for the next 12 months on the 2 million dollar scale. This is one cent a week for every person in the Los Angeles Basin. How badly do you want tolerable air?

We in the Foundation are here because we believe this job can be done. But a five-man scientific team, even if they were all Nobel prize winners, can't do it alone. The Air Pollution Control District can't do it alone. Government can't do it alone. Citizens' Committees can't do it alone. It requires a concerted, all-out, united effort. The problem is still with you because only now has its magnitude even been faintly understood, because many hoped for short cuts, because there are still faint hearts in the community, and all this spells failure. We ask your help -- we ask for your united support -- and we tell you this problem <u>can</u> be licked. You have our recommendations. The solution IS possible -- but not on a part-time basis!

We in the Foundation feel still greater enthusiasm and hope than when we started. We are tackling in a pioneering phase one of the biggest social problems man has yet encountered - one which requires all the scientific knowledge and technology man has, plus new knowledge. The work of this Foundation and of all of you in this community is already being watched by the nation and other countries as a most hopeful approach to the threatening general problem. We believe tolerable air has a value like potable water, like sanitary sewage disposal, like the harbor -- that your investment in our program will pay equally valuable dividends.

November 16, 1954

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

OUTLINE OF RESEARCH PROGRAM

TABLE I

Research Programs (Summary)

	1954 (6 mos)	1955
Meteorology	$46,800	$ 62,000
Chemical Research	71,400	252,500
Combustion Products	32,800	422,850
Aerometric Survey	253,000	616,550
Sources of Pollution	10,500	50,000
Physical Research	2,000	185,000
Total	$416,500	$1,589,400

TABLE II

Projects Completed in 1954

Meteorology Report	$ 3,000
Air Tracer Survey	36,760
Conferences:	
Meteorology	890
Hydrocarbons, Ozone, Mass Spec.	2,000
Vehicle Combustion Products	2,800
Refuse Disposal & Air Pollution	3,000
Aerometric Survey	225,000
Refinery Emissions (Audit)	8,000
Total	$281,450

TABLE III

Projects Started in 1954, Continuing in 1955

Inversion Modification	$ 6,000	$ 4,000
Smog-Forming Reactions	60,000	126,000
Infrared Absorption, Long Path	2,000	3,000
Photochemical Reactions	7,500	30,000
Composition of Auto Exhaust	26,000	37,850
Composition of Incinerator Gases	2,000	25,000
Interpretation of Aerometric Survey	30,000	25,000
Sources of Pollutants	4,000	50,000
Spectral Radiometry	7,000	20,000
Total	$144,500	$320,850

TABLE IV

Projects Proposed to Start in 1955

Combustion Products (UC-Riverside)	$ 250,000
Carbon Isotopes	15,000
Review & Summary - Photochemical Reactions	7,000
Air Tracer Survey	30,000
Trend in Visibility	2,000
Development of Machine Methods for Computing Wind Trajectories	25,000
Nature of Reactants with Neutral Buffered Potassium Iodide & Phenolphthalin	10,000
Mass Spectrometer Studies	50,000
Development of an Automatic Nitrogen Dioxide Instrument	2,500
Development of Infrared Techniques	10,000
Application of Non-Dispersive Infrared Analyzer for Hydrocarbons	10,000
Application of Non-Dispersive Infrared Analyzer for CO	5,000
Feasibility Study for Automatic Continuous Measurement of Olefins, Acids and Aldehydes	2,000
Oxidation of Exhaust Gases	60,000
Evaluation of Exhaust Control Devices	50,000
Aerometric Survey, Winter-Spring 1954-1955	25,000
Aerometric Survey, Summer-Fall 1955	566,550
Use of Microwave Spectra for Identification of Smog Constituents	33,000
Continuous Measurement of Atmospheric Ozone by Spectrographic Method	20,000
Paramagnetic Resonance Studies	2,500
If successful, additional for research phase	25,000
Nuclear Magnetic Resonance	35,000
Area Distribution of Sources of Air Pollutants	50,000
Measurement, Composition & Mechanism of Formation of Aerosols	30,000
Absorption Spectra of Gaseous Atmospheric Pollutants	25,000
Total	$1,340,550

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION
LUNCHEON, AMBASSADOR HOTEL, NOVEMBER 16th, 12:00 NOON
FRENCH ROOM

Guests

Table No.	
10	Anable, S. J. Lever Brothers Co.
7	Banks, F. M. So. Calif. Gas Co.
20	Barr, Howard Col.-Geneva Steel Div. & Cons. Western Steel Div., U. S. Steel
20	Baumen, E. F. Prudential Life Ins. Co.
4	Belding, Don Foote, Cone & Belding
8	Best, Quinton Consol. Rock Prod. Co.
5	Boggs, George L. Ford Motor Co.
17	Bolton, Earl Univ. of So. Calif.
8	Bowron, Fletcher City News Service
11	Brower, Horace Occidental Life Ins. Co.
19	Brunmark, W. J. The May Company
8	Bryan, Fred School of Medicine, UCLA
12	Burton, John D.
11	Bush, Albert Univ. of Calif. at L. A.
4	Call, Asa V. Pacific Mutual Life Ins. Co.

Table No.	
10	Chace, Burton W. Board of Supervisors
16	Chapin, Bob S.C.A.P.F.
2	Chappellet, Felix W.O.G.A.
8	Clark, Henry L. General Motors Corp.
11	Coons, Robert B. Am. Potash & Chemical Corp.
9	Cooper, Walter Ford Motor Co.
17	Corrin, Philip Bullock's, Inc.
3	Coulter, R. S. Bethlehem Steel Corp.
18	Curtis, W. B. General Petroleum Corp.
11	Day, C. A. Richfield Oil Corp.
8	Day, David E. Richfield Oil Corp.
12	Detoy, Charles L. A. Chamber of Commerce
8	DuBridge, Lee A. Calif. Inst. of Technology
1	Fagg, Fred D., Jr. Univ. of So. Calif.
4	Faith, W. L. S.C.A.P.F.

Table No.	
16	Fernhout, D. W. Bechtel Corp.
9	Fisher, Charles E. Norris-Thermadore
9	Fluor, J. R. Fluor Corporation
3	Fredericks, John Pacific Clay Products
11	Freeman, D. R. North American Aviation, Inc.
18	Garrett, Leroy Musick, Peeler & Garrett
17	Goedhard, Neil S.C.A.P.F.
12	Goodhart, Gordon School of Medicine, U.S.C.
6	Griffith, Stephen M. Griffith Company
17	Griswold, S. Smith Los Angeles County
7	Haagen-Smit, A. J. S.C.A.P.F.
4	Hadden, R. J. Pacific Tel. & Tel. Co.
9	Hagen, Roy M. Calif. Consumers Corp.
17	Hallawell, R. E. Southern Pacific Electric Co.
18	Harvey, Paul Shell Oil Company
5	Haugh, Jesse L. Metropolitan Coach Lines
2	Herbert, George F. City of Los Angeles

Table No.	
2	Hitchcock, L. B. S.C.A.P.F.
9	Howell, Ray U. S. Spring & Bumper Co.
10	Jordan, Joe Col.-Geneva Steel Div. & Cons. Western Steel Div., U. S. Steel
1	Keith, Willard Cosgrove & Company
18	Kenneally, Bill C. B. S.
7	Kennedy, Harold L. A. County Counsel
6	Kingsbury, H. E. Chrysler Corporation
18	Larrabee, William Radioplane Company
7	Larson, Gordon P. L. A. C. A. P. C. D.
3	Laughlin, J. D. Dept. Water & Power
1	Legg, Herbert C. Board of Supervisors
18	Leiper, Burt S.C.A.P.F.
16	Lewis, D. R. Pacific Electric Railway
3	Lindsay, Charles A. Stauffer Chemical Co.
5	Long, Jackson F. United Air Lines
10	Luboviski, Jerry Union Oil Company
12	Ludwig, J. E.

Table No.	
7	McDonald, Alex W.O.G.A.
2	McKinnon, Clinton D. Daily News
4	McReynolds, James Coulter's
4	Magnin, Rabbi Edgar F. Wilshire Blvd. Temple
12	Magruder, Philip S. General Petroleum Corp.
3	Marsal, O. F. Ford Motor Co.
17	Mason, J. H. Prudential Life Ins. Co.
6	Mathers, H. C. Assoc. Brick Mfgrs. of So. Calif.
16	Matschke, E. W. A. R. Maas Chem. Co.
18	Merriman, Lee M. Pasadena Star - News
17	Middleton, John Univ. of California, Riverside
1	Minckler, R. L. General Petroleum Co.
1	Morris, Samuel B. Dept. Water & Power
8	Morrison, Harry Downtown Business Men's Ass'n
10	Morrison, J. F. Industrial Indemnity Co.
5	Mullendore, William C. So. Calif. Edison Co.
7	Murray, George Tide Water Assoc. Oil Co.

Table No.	
6	Neiburger, Morris S.C.A.P.F.
9	Newton, Charles Calif. Inst. of Technology
5	Northrop, John
11	Norwood, W. F. College of Medical Evangelists
9	O'Brien, George Standard Oil Co. of Calif.
12	Ortman, Fred Gladding McBean & Co.
8	Page, James R.
6	Pinkley, Virgil The Mirror
12	Ramsey, W. M. A. R. Maas Chemical Co.
12	Reese, F. Griffith Company
5	Renzetti, N. A. S.C.A.P.F.
6	Reynolds, Earl Kaiser Steel Corporation
19	Rhoads, H. Hydro-Aire
16	Richardson, Neal Univ. of Calif. at L. A.
2	Ringis, D. A. Chrysler Corporation
16	Rogers, L. H. S.C.A.P.F.
9	Rowan, George R. A. Rowan & Company
1	Rowan, Robert R. A. Rowan & Company

Table No.	
6	Royce, Stephen W. Huntington-Sheraton Hotel
3	Runyon, Fred Pasadena Independent
11	Sampson, J. Philip County Medical Ass'n
16	Scripps, Thomas Ford Motor Company
3	Shelton, James E. Security-First Nat'l Bank
1	Shelton, R. D. Santa Fe Railroad
2	Sherman, W. F. Automobile Mfgrs. Ass'n
7	Small, Francis M. Pacific Mutual Life Ins. Co.
2	Smith, J. M. Farmers Insurance Group
19	Smith, Jack Air Control Research
7	Smock, Jack Young & Rubicam
1	Smull, L. C. Riverside Cement Co.
20	Sonderling, H. Dept. of Water & Power
8	Soracco, L. J. Bethlehem Steel Corp.
21	Sternbach, Joseph Pure Air Committee, Inc.

Table No.	
5	Stewart, W. L., Jr. Union Oil Co. of Calif.
4	Stickney, Edward Los Angeles County
10	Tremblay, R. J. Bethlehem Steel Corporation
4	Twaits, Ford Cyprus Mines Corporation
5	Tweter, Clifford California Bank
11	Warren, Stafford School of Medicine, UCLA
16	Weatherly, R. S. S.C.A.P.F.
6	West, Richard So. Calif. Edison Co.
20	White, J. Gustav Pure Air Committee, Inc.
18	Whitley, Bill C. B. S. - TV
2	Will, Arthur Board of Supervisors
10	Winnett, P. G. Bullock's, Inc.
10.	Woods, T. J. Jos. Schlitz Brewing Co.
17	Wright, Harold W. L. A. Chamber of Commerce
3	Zarem, A. M. Stanford Research Institute

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION
LUNCHEON, AMBASSADOR HOTEL, NOVEMBER 16th, 12:00 NOON
FRENCH ROOM

SEATING ARRANGEMENT

TABLE 1.

F. D. Fagg, Jr.
Willard Keith
Herbert C. Legg
R. L. Minckler
Samuel B. Morris
Robert Rowan
R. D. Shelton
L. C. Smull

TABLE 2.

L. B. Hitchcock
Felix Chappellet
Col. George F. Herbert
Clinton D. McKinnon
D. A. Ringis
W. F. Sherman
J. M. Smith
Arthur J. Will

TABLE 3.

James E. Shelton
R. S. Coulter
John Fredericks
J. D. Laughlin
Charles A. Lindsay
O. F. Marsal
Fred Runyon
A. M. Zarem

TABLE 4.

Asa V. Call
Don Belding
Fletcher Bowron
W. L. Faith
R. J. Hadden
Rabbi Edgar F. Magnin
James McReynolds
Ford Twaits

TABLE 5.

William C. Mullendore
George L. Boggs
Jessie L. Haugh
Jackson F. Long
John Northrop
N. A. Renzetti
W. L. Stewart, Jr.
Clifford Tweter

TABLE 6.

Stephen W. Royce
Stephen M. Griffith
H. E. Kingsbury
H. C. Mathers
M. Neiburger
Virgil Pinkley
Earl Reynolds
Richard West

TABLE 7.

F. M. Banks
A. J. Haagen-Smit
Harold W. Kennedy
Gordon P. Larson
Alex McDonald
George Murray
Francis M. Small
Jack Smock

TABLE 8.

Lee A. DuBridge
Quinton Best
Fred Bryan
Henry L. Clark
David E. Day
Harry Morrison
James R. Page
L. J. Soracco

TABLE 9.

Roy M. Hagen
Walter J. Cooper
Charles E. Fisher
J. R. Fluor
Ray Howell
Charles Newton
George O'Brien
George Rowan

TABLE 10.

P. G. Winnett
S. J. Anable
Burton Chace
Joe Jordan
Jerry Luboviski
J. F. Morrison
R. J. Tremblay
T. J. Woods

TABLE 11.

J. Philip Sampson
Horace Brower
Albert Bush
Robert B. Coons
C. A. Day
D. R. Freeman
W. F. Norwood
Stafford Warren

TABLE 12.

Fred B. Ortman
John D. Burton
Charles Detoy
Gordon Goodhart
J. E. Ludwig
P. S. Magruder
W. M. Ramsey
F. Reese

TABLE 13.

PRESS

TABLE 14.

PRESS

TABLE 15.

PRESS

TABLE 16.

L. H. Rogers
Robert Chapin
D. W. Fernhaut
D. R. Lewis
E. W. Matschke
Neal Richardson
Thomas Scripps
R. S. Weatherly

TABLE 17.

Earl Bolton
Philip Corrin
Neil Goedhard
Smith Griswold
R. E. Hallawell
J. H. Mason
John Middleton
Harold W. Wright

TABLE 18.

B. Leiper
W. B. Curtis
Leroy Garrett
Paul Harvey
Bill Kenneally
William Larrabee
Lee Merriman
Bill Whitley

TABLE 19.

W. J. Brunmark
H. Rhoads
Jack Smith
Joseph Sternbach

TABLE 20.

Howard Barr
E. F. Bauman
H. Sonderling
Gustav White

TABLE 21.

PRESS

k:11/15/54

WU123 DL PD FAX LOS ANGELES CALIF 15 NFT

DR LEE A DUBRIDGE, CALIFORNIA INSTITUTE OF TECHNOLOGY

JAN 15 1954

PASADENA CALIF

NOTICE IS HEREBY GIVEN THAT A SPECIAL MEETING OF SOUTHERN CALIFORNIA AIR POLUTION FOUNDATION TRUSTEES WILL BE HELD AT THE CALIFORNIA CLUB ROOM 1, SECOND FLOOR, 538 SOUTH FLOWER STREET, LOS ANGELES, CALIFORNIA, ON TUESDAY, DECEMBER 21, 1954 AT ELEVEN O'CLOCK IN THE MORNING, TO CONSIDER:

1. CHANGING THE NAME OF THE FOUNDATION;
2. INCREASING THE NUMBER OF TRUSTEES;
3. ELECTING A FINANCE COMMITTEE CHAIRMAN: AND
4. ANY THER BUSINESS THAT COMES BEFORE THE MEETING.

BY DIRECTION OF THE PRESIDENT

LEROY A GARRETT SECRETARY

1 538 21 1954 1 2 3 4

229PM
R123CL

WESTERN UNION TELEGRAM
WESTERN UNION TELEGRAM

JAN 16 1954

LAW OFFICES
MUSICK, PEELER & GARRETT
621 SOUTH HOPE STREET
LOS ANGELES 17
MADISON 9-3322

ELLSWORTH MUSICK
JOSEPH E. PEELER
LEROY A. GARRETT
JOHN M. ROBINSON
MELVIN C. WILSON
HAROLD F. COLLINS
DAVID F. EVANS
JAMES E. LUDLAM
ALBERT MOSHER
E. LEROY TOLLES, JR.
EUGENE T. GARRETT
CHARLES T. MUNGER
JOHN P. POLLOCK
JESSE R. O'MALLEY
BRUCE E. CLARK
MURRAY S. MARVIN
STUART T. PEELER

ASSOCIATE TAX COUNSEL
MILLER & CHEVALIER
1001 CONNECTICUT AVENUE
WASHINGTON 6, D. C.

December 15, 1954

Dr. Lee A. DuBridge
California Institute of Technology
1201 East California Street
Pasadena, California

Dear Dr. DuBridge:

I am enclosing for your consideration the minutes of the meeting of the Board of Trustees of Southern California Air Pollution Foundation held on December 6, 1954.

Since you were not present at the meeting I am also enclosing a waiver of notice, with the request that you sign it and return it to this office.

I trust you have already received telegraphic notice of the meeting to be held Tuesday, December 21, at 11:00 A.M. at the California Club.

Yours very truly,

Leroy A Garrett

Enclosures
LAG:wm

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

M E M O R A N D U M

December 6, 1954

TO: All Trustees and Members of the Staff

FROM: L. B. Hitchcock

SUBJECT: Blewett Article in FORTNIGHT

We have carefully considered the Blewett article and suggest that if anyone in the Foundation is called upon for comment, we confine our statement at this time to the following:

"We have seen no data which indicate that his theories are valid. There is no reason to doubt that Los Angeles air pollution is man-made."

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

Minutes of Special Meeting of Board of Trustees

December 6, 1954

A special meeting of the Board of Trustees of the SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION was held on the 6th day of December, 1954, at 4:00 o'clock in the afternoon in Room 6 of the California Club, 538 South Flower Street, Los Angeles, California, pursuant to notices telegraphed at noon December 4, 1954, to all Trustees.

The following Trustees were present:

Raymond B. Allen
Walter Braunschweiger
Stephen W. Royce
Edward W. Carter
Harvey S. Mudd
William C. Mullendore
James E. Shelton
Fred B. Ortman
P. G. Winnett

Also present were: Lauren B. Hitchcock, President; Robert S. Weatherly, Assistant Treasurer; Howard Barr (representing Alden C. Roach); William L. Stewart, Jr. (representing Reese H. Taylor); and John D. Burton, Secretary, Finance Committee.

Dr. Allen presided and Mr. Weatherly recorded the minutes as Acting Secretary of the meeting.

The following Trustees were absent:

F. M. Banks
Arnold O. Beckman
Asa V. Call
Lee A. DuBridge

Fred D. Fagg, Jr.
Roy M. Hagen
Charles F. Kettering
John A. McCone
Alden G. Roach
J. Philip Sampson
Reese H. Taylor

It was stated that the primary purpose of this special meeting was to discuss fund-raising plans. The President's report and a summary of contributors and pledges received to date were circulated. Mr. Burton summarized the several categories of contributors.

Dr. Hitchcock stated that the Foundation had reached its fund raising goal for 1954 and that all funds received in 1954 would have been expended by the end of December.

It was suggested that each Trustee be assigned to one or more industry committees for fund raising purposes, and the following industry classifications and committee assignments were evolved:

Industry Classification	Committee Assignments
Auto Assembly & Parts	Reese H. Taylor
Aviation	William C. Mullendore
	Alden G. Roach
Banks	John A. McCone
	James E. Shelton
Basic Metals and Can Companies	Alden G. Roach
Building Materials and Cement	Raymond B. Allen
Chemicals and Compounds	Fred B. Ortman
Citrus and Other Growers	Fred B. Ortman
Clay and Pottery Products	Fred B. Ortman
Construction (Eng. & Gen.)	Walter Braunschweiger
Electrical Products	F. M. Banks
Electronics & Equipment	Arnold O. Beckman
Food Processing	Roy M. Hagen
Rubber Manufacturing	Walter Braunschweiger
General Manufacturing & Textiles	

Industry Classification	Committee Assignments
Hotels	Stephen W. Royce
Insurance	Asa V. Call
Meat Packing	Roy M. Hagen
	Walter Braunschweiger
Motion Pictures	Fred D. Fagg, Jr.
	John A. McCone
Oil Companies	Reese H. Taylor
Race Tracks	P. G. Winnett
Radio, TV, and Newspapers	Edward W. Carter
Real Estate	Raymond B. Allen
Retail	P. G. Winnett
Transportation	Walter Braunschweiger
Utilities	William C. Mullendore
	F. M. Banks

Mr. Mullendore requested of Dr. Hitchcock his views on the Blewett article in FORTNIGHT magazine. Dr. Hitchcock explained that the Foundation's technical staff had interviewed Mr. Blewett several months ago, and had decided that his theories were not scientifically sound. Dr. Hitchcock distributed copies of a brief statement expressing the views of the Foundation on the article.

It was recommended that at the next meeting of the Board an appropriate resolution be adopted to increase the number of Trustees from twenty-three to thirty-five. Garner A. Beckett, Willard W. Keith, Charles Detoy and Ford J. Twaits were proposed as candidates for election to the increased Board. It was the sense of the meeting that the Foundation had wisely restricted its members to a small group during the first year, but now that its position was clear, a broader industrial representation would be appropriate.

There being no further business before the meeting, it adjourned.

Acting Secretary

SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION

Minutes of Special Meeting of Board of Trustees
December 21, 1954

Pursuant to notice duly given, a special meeting of the Board of Trustees of the SOUTHERN CALIFORNIA AIR POLLUTION FOUNDATION was held on the 21st day of December, 1954, at 11:00 o'clock in the morning in Room 1 of the California Club, 538 South Flower Street, Los Angeles 17, California.

The following Trustees were present:

Raymond B. Allen
Marion Banks
Arnold O. Beckman
Walter Braunschweiger
Asa V. Call
Lee A. DuBridge
Fred D. Fagg, Jr.
Roy M. Hagen
John A. McCone
William C. Mullendore
Fred B. Ortman
Stephen W. Royce
Dr. J. Philip Sampson
James E. Shelton
Reese H. Taylor

Also present were: Dr. Lauren B. Hitchcock, President; Dr. W. L. Faith, Deputy Director; John M. Robinson, representing Leroy A. Garrett, Secretary; and Mr. Earl C. Bolton, Assistant Secretary.

The following Trustees were absent:

Edward W. Carter
Charles F. Kettering
Harvey S. Mudd
Alden G. Roach
P. G. Winnett

Dr. Allen, Chairman of the Board, presided and Mr. Earl C. Bolton recorded the minutes. The minutes of the Trustees meeting of November 16th, having been circulated among the Trustees were approved.

The meeting proceeded to the election of an Assistant Secretary of the Board of Trustees. On recommendation of the Nominating Committee and upon motion made, seconded and unanimously carried, Mr. Earl C. Bolton was elected to the office of Assistant Secretary of the Foundation.

It was the consensus that the work of the Foundation is becoming of increased value to other cities of the nation faced with an air pollution problem. Therefore, it is to be anticipated that support and financial assistance may be expected from such areas. Hence, it has been recommended that the words "Southern California" be dropped from the name of the Foundation. Upon motion made, seconded and unanimously carried, it was

RESOLVED, that Article FIRST of the Articles of Incorporation of Southern California Air Pollution Foundation be amended to read as follows:

"FIRST: The name of this corporation is AIR POLLUTION FOUNDATION."

It was the consensus that as the Foundation's work is expanded other areas of the nation might profitably be represented on the Board of Trustees and additional Trustees should be appointed from this area. On motion made, seconded and unanimously carried, it was

RESOLVED, that the By-Laws of the Foundation be amended in the following respects:

(A) Sections 1 and 3 of Article II are hereby amended to read as follows:

"1. Powers and number. The powers of the Foundation shall be exercised, its property controlled and its affairs conducted by a Board of Trustees consisting of 35 Trustees.

"3. Election and Term of Office. As soon as practicable the Trustees shall elect a full Board which shall be divided into one group of eleven, whose terms shall expire at the annual meeting of 1955, and two groups of twelve, whose terms shall expire, respectively, at the annual meetings of 1956 and 1957. The terms of newly created offices shall be determined by lot. At each annual meeting, commencing in 1955, the Board shall elect a number of Trustees equal to the number whose terms are expiring, and each Trustee so elected shall serve until the annual meeting of the third succeeding year, and thereafter until the election of his successor."

(B) Section 5 of Article III is hereby amended to read as follows:

"5. Quorum. Twelve Trustees shall constitute a quorum for the transaction of business at any meeting of the Board. If a quorum is once present, business may continue to be transacted by a majority of those present at a meeting notwithstanding the withdrawal of enough members to leave less than a quorum."

Because of the increased size of the Board, it was felt desirable to create an Executive Committee with authority to act for the Board. Upon motion made, seconded and unanimously carried, it was

RESOLVED, that the By-Laws of the Foundation be amended by adding to Article II thereof a Section 10 to read as follows:

"10. Executive Committee. The Board shall create an Executive Committee, which shall be composed of nine Trustees. The Board shall fill vacancies in the Executive Committee and may remove and replace members of the Executive Committee at any time. The President shall have the authority to appoint any Trustee to serve as an alternate member of the Executive Committee in the place of a member who is not present at a meeting. A quorum of the Executive Committee shall consist of five of its members or their alternates appointed by the President. The Board may by resolution delegate to the Executive Committee any and all of the powers and authority of the Board in the management of the business and affairs of the Foundation except the power to adopt, amend or repeal By-Laws. The Executive Committee may appoint its own Chairman and may from time to time designate by resolution the time and place for regular meetings. The provisions of these By-Laws concerning notice of meetings of the Board shall apply also to meetings of the Executive Committee."

Upon motion made, seconded and unanimously carried, it was further

RESOLVED, that the Board of Trustees of this Foundation hereby delegates to the Executive Committee all of the powers and authority of the Board in the management of the business and affairs of the Foundation, except the power to adopt, amend or repeal By-Laws.

The Chairman requested the Nominating Committee to be prepared at the next Board meeting to suggest names of persons who might be helpful additions to the Board of Trustees. The Nominating Committee was further directed to suggest the names of those it recommends for membership to the Executive Committee.

Upon motion duly made, seconded and unanimously carried, Mr. A. J. Gock was elected as a member of the Board of Trustees.

The Chairman then announced the appointment of Mr. A. J. Gock as a member of and Chairman of the Committee on Finance.

Mr. Marion Banks, reporting as Chairman of the Committee on Public Relations, explained that the Committee has for several weeks been inquiring into the feasibility and costs of a Public Relations program for the Foundation. The Committee believes that within the next 30 days it will be able to make a definite selection from among the Public Relations firms it has interviewed and examined. The Committee is anxious to proceed without delay to the selection of such a firm and the commencement of a suitable program. Upon motion made, seconded and unanimously carried, it was

RESOLVED, that the Board of Trustees of the Southern California Air Pollution Foundation does hereby approve the methods and objectives of the Public Relations Committee in its procedure on this matter; and

RESOLVED FURTHER, that the Board of Trustees of the Southern California Air Pollution Foundation does hereby authorize the officers of the Foundation, upon the recommendation of the Public Relations Committee, to engage a public relations firm and commence a public relations program on behalf of the Foundation for a twelve-month period at a total maximum cost to the Foundation not to exceed $100,000 but recommends that the first phase of the program be considered on a six-month basis at a cost not to exceed a total maximum of $50,000.

Mr. John D. Burton, Acting Secretary to the Finance Committee, was invited into the meeting at this point and made a report of the fund-raising campaign of the Foundation. This report is contained in the "Summary of Contributors as of December, 1954" and the memorandum from John D. Burton to Dr. Hitchcock on the subject of "Contributions Campaign", copies of which were distributed at this meeting.

There being no further business before the meeting, it was adjourned.

/s/ Earl C. Bolton
Earl C. Bolton
Assistant Secretary

mek 1/11/55