

PROPOSAL OF
A PROGRAM FOR INVESTIGATING THE NATURE OF THE SUSPENDED MATTER PRESENT
IN THE ATMOSPHERE OF LOS ANGELES

Because of the great distance between Los Angeles and the Kettering Laboratory, the program described in this proposal is designed so that the portion which relates to sampling will be carried out by competent personnel residing in the Los Angeles area*. The samples will then be shipped to Cincinnati for analysis. The choice of methods and equipment, and the selection and instruction of personnel, will be the responsibility of the Laboratory. The investigation has been designed so that the diurnal variations in the lead content of the air can be shown along with the daily average concentration of a number of other materials which may be present in the suspended matter.

Part 1. Two A.I.S.I. Automatic Smoke Samplers are to be employed to collect air-borne dust at two stations, continuously, for a period of one hundred days. The samplers will be operated so that information can be obtained for periods of either 1 or 2 hours duration during the 24 hour sampling periods. The spots which will be obtained (2400 or 4800) will be evaluated as Coh units by measuring the reduction of the transmission of light through the spots. (Hemeon, W.C.L., Haines, G. F., Jr., and Ide, H. M.: Determination of Haze and Smoke Concentrations by Filter Paper Samplers, Air Repair, August, 1954.) The Coh values will give

* It is believed that these services can be obtained without cost to the Kettering Laboratory or to the Foundation as a contribution of technical personnel of Ethyl Corporation in the Los Angeles area. Should this turn out not to be feasible, additional expenditures for this purpose may be required.

an index of cleanliness (or pollution) which will be comparative for the various stations of the community. Twelve-hundred of the total number of spots will then be cut from the paper tapes and analyzed for their content of lead. Results will be recorded as micrograms of lead per cubic meter of air. The spots to be analyzed will be selected to correlate with weather conditions and other pertinent factors. Although spots representing periods of collection of 1 hour duration will give a more continuous record of the variation of the lead content of the air, the analytical accuracy would be better with a larger sample such as would be provided with a spot corresponding to a two hour sampling period. The volumes of air samples would be 0.42 M^3 in 1 hour and 0.84 M^3 in 2. It is recommended that the period of collection be 2 hours.

Part 2. At the same time and at the same stations at which the A.I.S.I. samplers are set up, there will be collected suspended matter from the air for periods of 24-hours (or two 12 hour samples) by means of two high volume samplers. The collecting media will be specially fired, filler-free, glass fibre filter webs. The dust collected on 200 filters will be analyzed as comprehensively as possible in order to determine the quantities of particulate matter per cubic meter of air, the concentrations of certain elements like arsenic, lead, beryllium, copper, vanadium, etc., the total quantity of organic matter, and a number of anionic constituents such as sulfate, nitrate, fluoride and chloride. Some samples will be pooled in order to determine the average quantity of 3,4 benzpyrene.

Cost of the Program

Part 1.

Purchase of 2 A.I.S.I. automatic samplers and the
analysis of 1200 spots for lead.....\$10,000

Part 2.

Comprehensive analysis of 200 filter samples plus
purchase of equipment..... 15,500

For collecting samples, tabulating data, writing
of reports, travel, shipping of samples, utility
service, etc. (100 day basis)..... 5,000

Total cost of project \$30,500

It is believed, that if prompt action is taken on this proposal, the necessary equipment can be obtained in time to commence the program not later than August 15, 1954. The selection of personnel may be more difficult, but it is believed that this matter can also be arranged promptly.

This program is sufficiently flexible so that changes can be made in it as the data accumulate for review. Any changes made will be subject to agreement between members of the Laboratory and the Foundation. The estimated cost of the project is the maximum if the program as outlined is carried to completion. Increases or reductions in cost of the work, in accordance with alterations agreed upon, will be based primarily on the numbers of samples to be analyzed, at the rate of \$7.50 per analysis for samples collected under Part 1 and \$75 per sample under Part 2. Expenditures for equipment or for services not contemplated in the present proposal, will, of course, be added.

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