U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
CENTER FOR DISEASE CONTROL
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
CINCINNATI, OHIO 45226

HEALTH HAZARD EVALUATION DETERMINATION
REPORT NO. HE 79-29-566

Giorgi Process Inc.
Yonkers, New York

MARCH 1979

I. TOXICITY DETERMINATION

A Health Hazard Evaluation was conducted by representatives of the National Institute for Occupational Safety and Health (NIOSH) on December 27, 1978 and January 31, 1979 at Giorgi Process, Inc., 286 New Main Street, Yonkers, New York 10701, to investigate possible sources of exposure to lead. A review of the materials and processes used does not indicate any significant exposure to lead existed at the time of this evaluation.

II. DISTRIBUTION AND AVAILABILITY OF DETERMINATION REPORT

Copies of this Determination Report are currently available upon request from NIOSH, Division of Technical Services, Information Resources and Dissemination Section, 4676 Columbia Parkway, Cincinnati, Ohio 45226. After 90 days, the report will be available through the National Technical Information Service (NTIS), Springfield, Virginia 22151. Information regarding this report's availability through NTIS can be obtained from the NIOSH Publications Office at the Cincinnati address.

Copies of this report have been sent to:

a) Giorgi Process, Inc., Yonkers, New York
b) U.S. Dept. of Labor, OSHA Region II
c) NIOSH, Region II

III. INTRODUCTION

Section 20 (a) (6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669 (a) (6), authorizes the Secretary of Health, Education, and Welfare, following a written request by any employer or authorized

representative of employees, to determine whether any substance normally found in the places of employment has potentially toxic effects in such concentrations as used or found.

NIOSH received such a request from an authorized representative of the employees at Giorgi Process, Inc.

IV. HEALTH HAZARD EVALUATION

A. Facility and Process Description

The Giorgi Process, Inc. facility is a photographic studio. Photographs are taken, either on location or at the studio. Development of the film and enlargement of the photographs take place in two rooms, each approximately 10x10x10 feet. Eastman Kodak chemicals, paper and film are used. In addition to regular photography, the studio also produces three dimensional photographic studies by adhering photographs to contoured backings which are constructed from wood putty. This operation may be performed in the studio or at home.

A fair amount of tinting (painting) and dyeing of photographs are performed in a basement work area. The basement is approximately 25 feet long, 8 feet high and 12 feet wide. Much of the basement is given over to storage and a rear-work area, while open, is 3 feet wide x 12 feet long with an additional alcove approximately 4 feet wide x 8 feet long. The alcove's window is fitted with an exhaust fan to remove vapors and mists generated when spraying lacquer and other coatings on photographs.

The tinting of photographs is accomplished by brush painting ordinary water colors onto photographs. This process does not involve any physical contact with the colors.

Dyeing of photographs does involve physical contact of the individual with the dyestuffs. The dyer first applies a patented solution (of alcohol and acetone) to his fingers, daubs his fingers into photographic dyes, and then daubs the dyes onto photographs.

All operations are performed intermittently, as work demands. Prior to 1976 or 1977, the dyer taught his photographic dyeing technique at conventions (once or twice per year) and at his studio or other sites (two or three times per month for several years). Three employees work at this facility - the photographer, developer, etc, a receptionist/bookkeeper and a part time helper.

B. Study Methods

1. Environmental

In order to determine possible sources of lead exposure, the requestor

was interviewed to obtain a description of his work practices (which are outlined above) and an inventory of materials used.

Eastman Kodak film, chemicals and photographic paper are used in all photographic processes. These contain no lead. The vinyl or lacquer coatings sprayed on finished photographs contain no lead. Neither does the wood putty used as contour backing on three dimensional photographic studies. There is no contact with the ordinary water colors used to tint photographs.

It was at first believed that the dyeing activity might be the source of possible lead absorption and or ingestion.

A representative of Eastman Kodak's health and safety division stated that their retouching colors contain no lead. A representative of Pylon Products, stated that a small number of their dye powder contain lead in the few parts per million range. Giorgi Process had had two Pylom dye powders (red #73 and yellow #1) most commonly used, and most likely believed to contain lead, analyzed by an independent laboratory. No lead was detected in either color. The limit of detection was 2 parts per million (ppm).

In view of the fact that the dyes contain little, if any, lead and since the quantities of dye used are so small--a few grams of a color will last several years, it is reasonable to assume that the dyeing operation is not the source of any appreciable lead exposure.

2. Medical

The Health Hazard Evaluation requestor, is a 59 year old photographer who consulted his physician in November of 1976, because of intermittent non-specific symptoms of fatigue, and forgetfulness for about a year. His physical examination was essentially negative. A routine blood count and urinalysis were normal. No blood or urine lead determinations were done. However, a hair lead analysis showed 38ppm (laboratory norm 4-11 ppm) followed by another hair lead in a different laboratory in December 1976 showing a level of 76ppm (laboratory norm 0-25ppm). On the basis of the hair lead levels and the non-specific symptoms, a diagnosis of mild lead poisoning was made and he was given a course of chelation with intravenous EDTA from January 3, 1977, to March 9, 1977 in a series of 20 treatments, administered twice a week. Since that time, the requestor has been essentially well although his "memory impairment" persists. His work operations and exposures had been uninterrupted by this episode and have remained essentially the same for many years prior to and since the episode up to the present. (For details, see environmental section).

Chelation therapy began on January 3, 1977; however, a 24 hour urine lead performed on January 4, 1977 did not show significant levels as might be anticipated if the lead body burden were elevated. The urine lead level on January 4, 1977 was 96 micrograms (ug) per 24 hours, volume 2750 cc, equivalent to 35 micrograms per liter of urine (ug/L). At the end of chelation and 2 months after, 2 additonal urine leads were reported as levels within normal limits (63ug/24 hrs. on 3/3/77, volume not given; and 45 ug/24 hrs. on 5/2/77, volume 2500 cc, equivalent to 18ug/L).

The blood leads, 3 and 11 months post-chelation indicated levels within normal limits for unexposed persons (6ug/100 gm on 6/20/77 and 15ug/100gm on 2/15/78). In addition, a blood count done 3 months after chelation was normal with no basophilic stippling found. In the 3 hair lead determinations since chelation, the levels have varied from 24ppm (5/2/77) to 73ppm (6/20/78). All during this time he has not received any chelation and has continued in his work with no change.

From the information provided, it is not possible to confirm the diagnosis of lead intoxication in November 1976 or to evaluate the lead body burden in this case prior to the chelation therapy. Since that time, all laboratory work has been normal except for one hair lead. Experience with analysis of hair as an index of occupational exposure to lead has been relatively limited, but it has been reported that lead in hair can be used to estimate accumulation of lead content in the body.(1) One study has shown that the levels of lead in hair can vary considerably from the root of the hair to areas considerably distal to the root.(1) It has been suggested that the level of lead in the hair at the root is more representative of endogenous origin while that in the more distal areas is more representative of exogenous origin. The hair specimens in this case were taken from the nape of the neck, but no further details are known as to the distance from the root. Based on a study of occupationally exposed workers in four different lead battery and tin can plants in Egypt, a biological threshold limit value for lead in hair has been suggested as an upper limit of 30ppm. (2) Grandjean has reported that a level of 70ppm lead in hair corresponds with a level of 60ug/100ml blood. (1)

In general, the hair lead levels found in this case have ranged both below and above the suggested biological threshold level and there does not appear to be any correlation with any of the blood or urine data which have all been well within range found in unexposed persons.

The upper limits of lead levels classified as normal are 40ug/100gm in blood and 80ug/L in urine (3).

V. RECOMMENDATIONS

In view of the lack of medical evidence of blood or urine findings as well as any significant clinical findings of lead poisoning coupled with the lack of environmental findings for lead, it can be reasonably concluded that there is no lead hazard in this work operation.

Nonetheless, in consideration of good work practices, the following recommendation is made.

Every effort should be made to prevent possible absorption/ingestion of photographic dyes. To this effect, it is suggested that dyes be applied with a cotton swab or that protective finger coverings be used to apply the dyes to photographs. Frequent hand washing should be performed and at all times before eating, smoking, etc.

VI. REFERENCES

1) Grandjean, P.: Lead Concentration in Single Hairs as a Monitor of Occupational Lead Exposure. Int. Arch Occ. Env. Health 42: 69-81, 1978.

2) El-Dokhanny, A and El-Sadik, Y.M. Lead in hair among exposed workers. AIHA Journal, 33:31, 1972.

3) NIOSH/OSHA Draft Technical Standard for Lead, April 6, 1976.

VII AUTHORSHIP - ACKNOWLEDGEMENTS

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