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Lead poisoning tester unveiled at Bell Labs

By TEK TALMONT

MURRAY HILL — Representatives from a dozen electronics, engineering and medical equipment companies had a rare opportunity on Friday — free access to the technical details for assembling a new lead poisoning tester expected to be in great demand by public health officials and some industries.

Five scientists at Bell Labs developed the portable testing device. N. Bruce Hannay, vice president of research and patents, said numerous inquiries had been received since development of the invention was made public last January.

Bell Labs officials decided that since the company did not plan to manufacture the equipment, it would offer the design details to interested companies at no cost.

The design details were outlined at a special symposium here Friday. It was stressed the unit was designed for use in screening possible lead poisoning cases, providing fast referral for further testing of persons with high readings.

In providing the information to potential manufacturers, company officials said they hoped the availability of the lead poisoning testers on the open

market would be speeded, and that their eventual cost would reflect the fact that the design was provided free of any charge.

The researchers responsible for developing the tester see it as an effective means of performing mass primary screenings. Because the unit is portable, it can be put to quick use in schools or urban neighborhood centers.

Since it only takes one minute to get a lead content reading, large numbers can be handled quickly, and at small cost. The researchers say readings on their "hematofluorometer" parallel closely those obtained through the usual method of testing a blood sample by specialists in laboratories. The new test involves use of only a drop of blood and can be performed by a nurse or paramedic.

Another advantage cited by the scientists is the fact that readings reflect a ratio of lead content in blood cells, whereas the more elaborate testing requires measurement of the amount of lead. The quantity of lead then must be compared against the quantity of blood tested to determine whether the level is dangerous.

The researchers said that beside the public health use, the unit could help industries in screening, between the more elaborate testing, of employees who might absorb large lead quantities in the course of their work.

Two chemists in the Biophysics Research Department, Dr. Angelo A. Lamola of Warren and Tetsuo Yamane of Berkeley Heights, made the basic discovery involved in the new tester during studies of electronic properties of large molecules in red blood cells. They

found that a red fluorescence comes from blood containing quantities of zinc protoporphyrin, a substance which increases dramatically when the level of lead in the body increases.

David M. Zuckerman, an electrical engineer, and two physicists, Dr. Josef Eisinger of Asbury and William E. Blumberg of Glen Gardner, combined in developing the method for measuring the intensity of the zinc protoporphyrin.

A glass slide containing a drop of blood is inserted in one unit and exposed to a blue light. This produces a reading on a second unit resembling an oversized digital clock.

Five prototype testing units, assembled by hand at Bell Labs, are being loaned to health authorities for evaluation. One is undergoing trials by the U.S. Department of Health, Education and Welfare at the Center for Disease Control at Atlanta, Ga. Approval by the center is required before the tester can be used in federally-sponsored lead screening programs.

Potential manufacturers were advised Friday they should be able to utilize the design detail to develop their own tester, which would be even more accurate than any of the Bell Labs prototypes. As one researcher put it: "We just bought the parts from a catalog."

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Fluorimeter Detects Lead

Environmental Sciences Associates, Inc., Burlington, Mass., will begin production later this year of a special fluorimeter that will quickly detect from just a drop of blood whether a person has suffered biological damage from a high lead level, according to Alvin V. Block, president.

The fluorimeter will complement ESA's existing instruments which determine the amount of lead in blood directly. When used together, the two instruments will allow an immediate diagnosis of lead poisoning, the company says.

The technique and basic instrument, developed by scientists at Bell Laboratories, measures the red fluorescence of zinc protoporphyrin, a substance in the blood which increases proportionally as the level of lead in the body causes biological damage.

The Center for Disease Control, Department of Health, Education and Welfare, has already accepted this as a screening technique, ESA adds.

The test is said to be low cost, simple and rapid so screening tests may be performed in schools, neighborhood centers or other locations. A drop of blood is placed on a glass slide and inserted into the fluorimeter which measures the light emission or fluorescence of the zinc protoporphyrin in the blood when the sample is irradiated by a beam of blue light.

If the person has suffered biological damage from excessive amounts of absorbed lead, the blood will give off red light of a specific wavelength. The intensity of red fluorescence is indicative of the blood lead level and any corresponding biological damage.

The fluorimeter is expected to complement ESA's existing line of ASV (anodic stripping voltammetry) trace metals analyzers which have been used in childhood lead screening programs and in monitoring industrial workers for lead poisoning as well as other toxic metals.

Synthetic Coal Gas Study Ordered by Mines Bureau

Bureau of Mines has contracted for a study to develop "a practical concept" for the use of synthetic gas produced from coal in iron ore pelletizing plants.

The study, which will be done by Arthur G. McKee & Co., Cleveland, Ohio, engineering and construction firm, will examine the use of low btu gas as a fuel for pellet induction (hardening) and determine the modifications required for converting existing pelletizing systems to the use of coal gas.

The study, now underway and scheduled for completion in April, 1976, will also evaluate the economics of centralized versus decentralized gas production facilities.

EPA Okays

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West Germany and New Zealand. Cyanamid says. A multi-million-dollar facility is already under construction at Hannibal, Mo., for its production. The plant will supply both domestic and international requirements.

Sales of the product are scheduled to

Quebec chlorate plant last year (CMR, 11/25/74, pg. 3).

The company has not revealed capacity, but outsiders estimate the plant at 25,000 tons annually, and this would be increased to about 50,000 tons if the expansion goes through. The initial phase of the project is expected to be complete in January, 1977.

Sodium chlorate finds its major use (about 70 percent) in production of chlorine dioxide, a bleaching agent used in the paper-making process.

Additional uses include production of other chlorates (16 percent), herbicides (7 percent) and miscellaneous applications (7 percent).

Union Carbide

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four Japanese companies to supply it with 100,000 tons of the compound next year.

In 1975, a spokesman confirmed, Carbide ordered 50,000 tons of ethylene oxide from the Japanese. The spokesman also said the company has had talks with its potential suppliers.

The Japanese sources reported final details of the ethylene deal are to be negotiated in October.

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