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FOR RELEASE APRIL 10 — 11:00 A.M.

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AN ENVIRONMENTAL HAZARD REPORT

From Congressman William F. Ryan

The Perilous Plastics: Fact Sheet on Polychlorinated Biphenyls (PCBs)

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Polychlorinated Biphenyls (PCBs) are chemical compounds manufactured in the United States by the Monsanto Company under the trade name AROCLOR. PCBs and their residues are extremely toxic to fish, birds, animals and humans. They have a direct action on the skin, producing a severe form of acne. They may produce a variety of effects ranging from nausea and loss of weight to increased respiration, lowered red blood cell count and inhibition of carbohydrate metabolism. More serious effects are those on the kidneys. The principal effect, however, is on the liver (possibly leading to atrophy, followed by death).

As PCBs are not soluble in water, they are (like DDT) very persistent in the environment. This insolubility factor makes PCBs capable of being widely distributed over the earth via air currents. (Upon being ingested by animals or humans, they are soluble in fat.)

PCBs, especially those of high chlorine content, resist biological breakdown. Once released, they are a long-term hazard.

A Mystery Pollutant

PCBs have recently been identified[1/] as the mystery pollutant, similar to DDT and sometimes mistaken for it, found in analyses of pesticide residues.

Soren Jensen and Gunnar Widmark, Swedish scientists, reported in 1966 that these chlorine-containing compounds were PCBs. Jensen and Widmark had found PCBs in fish and sea birds, in conifer needles, and in some samples of human fat.

Monte Kirven, of the San Diego Natural History Museum, in studying DDT compounds present in the eggs of Peregrine falcons, found this same

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1/ Environment, Jan.-Feb., 1970, More Letters in the Wind, by Dr. Robert Risebrough and Virginia Brodine, pp. 16-27.

unknown compound. Persisting, he found the Swedish papers and, with further laboratory work, identified the trouble-maker as PCBs.

Distribution in the Environment

PCBs have found in widely distributed samples of marine birds, the fish on which marine birds prey, freshwater fish and terrestrial birds. But, by far the most frightening hazard is the effect of PCBs on human beings.

PCBs may be taken into the body by direct action upon the skin or as a vapor taken through the respiratory tract. The effect on the skin is chloracne. The early symptoms are pimples and dark pigmentation; later, more serious eruptions. Persons who have been continuously exposed to PCBs may suffer nausea, vomiting, loss of weight, edema and abdominal pain. The most severe effects are jaundice and atrophy of the liver. Experiments with laboratory animals confirm the high toxicity of PCBs when injected, fed, or applied to the skin.2/

PCBs have been detected in citrus peels and in citrus fruits. The probable source of this contamination is the biphenyl-impregnated wrapping. (Fruit pulp: 0.01 to 0.90 ppm; peel: 1.0 to 475 ppm; whole fruits: .2 to 121 ppm). Humans can ingest PCBs in such contaminated foods; or, it may be possible that they could absorb these compounds through the skin from the handling or friction-wearing of the wrappings.

The uses of biphenyls recommended by the Monsanto Company (see excerpts from the Monsanto Company's Technical Bulletin O/PL-306) are so varied and comprehensive that hardly anyone can escape contact with them. Besides wrapping for fruits, they are used in the coatings of bottles, smudge-resistant paper, fire-resistant and fire-retardant compounds, photothermographic copy sheets, decorative sparkling plastics, asphalt, adhesives, ink, paraffin, resins, rubber, paints, pesticides, sealing compounds, aluminum foil, cellophane, polyester film, paper, and olive-drab canvas for tents, tarpaulins, etc., etc.

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How do PCBs enter the Ecological System?

It is possible that, in the manufacture of PCBs, vapors or particles are released to the environment. In answer to questions about stack control, Monsanto merely states that "extensive efforts are in practice...to prevent PCB losses to the environment..." 3/

In public statements, Monsanto claims that PCBs are being used in closed systems, such as in hydraulic fluids and it also admits to "several applications" where PCBs are made part of a solid material. We know that hydraulic oil escapes to the environment. There is also the danger from friction-contact with plastic food wrappings and from the wear and weathering of the solid materials, producing PCBs in the form of tiny particles or vaporous matter.

Most containers, such as plastic wrappings, bottles, etc., must eventually be destroyed, either in home or municipal incinerators. At the high temperatures, necessary to burn municipal wastes, PCBs may be released to the atmosphere as vapors and fumes, which would be highly toxic. The burning would produce oxides of PCBs, more toxic than the unoxidized.