

(conference on November 2 and 3). It will cover water and sewerage treatment and water re-use, water resources, pipes, pipelaying and desalination. Enquiries to International Conference and Exhibitions Ltd., 6 Porter Street, Baker Street, London, W1M 1HZ, England (telephone 01-486 8730; telex 21879 CONFEX).

307. Algeria

Algeria's five year plan was recently passed by the National Assembly. Amongst others it includes: Water resources programme referring to the irrigation of 200,000 ha by 1990 plus the construction of 10 to 11 more dams by 1984, in addition to the nine already in progress; and building materials, ceramics and glassware programme (worth 9 billion dinars over 1980/84) includes the expansion of existing annual capacity by a further 4 billion tonnes of cement, 800,000 tonnes of bricks and tiles, and 200,000 tonnes of plaster, plus the development of pipe and sanitaryware manufacture to meet the needs of the water resources programme.

308. Bahrain

Aluminium plant extension. A £2 million contract for extensions at the Bahrain Aluminium Works including two additional pot lines involving the installation of more than 150 pots, has been won by Cleveland Bridge and Engineering, Middle East (Private) Ltd. Part of this contract is being carried out jointly with Arenco, a local firm.

PART 11 ASBESTOS HEALTH HAZARDS, PRECAUTIONS

313. European plan would reintroduce blue asbestos into Britain

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A proposed amendment to regulations governing the European Economic Community (EEC) could, if passed, result in the resumed import and use of blue (crocidolite) asbestos in Britain.

The Euro-plan, as the draft amendment is called, would make it impossible for EEC member countries to ban blue asbestos and articles containing it - most notably asbestos cement pipes (especially large diameter water supply pipes) as well as acid-resisting seals, gaskets and similar items. Blue asbestos is widely used in continental Europe for these purposes, since it offers a high degree of impermeability and acid resistance.

The substance, considered by British authorities to be more dangerous than the white (chrysotile) or brown (amosite) types, has not been used in Britain for 10 years, following the passage of regulations limiting blue asbestos levels to 0.2 fibres/cc in air. At that time British industry, unable to comply with the regulation, simply stopped using this type of asbestos.

Last year an Asbestos Advisory Committee, appointed by Britain's Health and Safety Commission (HSC),

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Stadium construction. A £9 million contract placed by the Bahrain Ministry of Works and Water for the construction of the Bahrain National Stadium has been won by Jalal Costain WLL.

309. Iraq

Flooring. Contract flooring worth £800,000 is being supplied to Iraq by Marley Floors Ltd., U.K. The client is the State Establishment for Prefabricated Buildings. Some 220,000 m² of fully flexible vinyl flooring will be supplied, together with adhesive, pvc skirting and stair nosing.

310. Libya

Cladding and insulation. H. H. Robertson (UK) Ltd. is supplying £1,250,000 worth of protected metal building cladding and insulation products for use in the construction of a medical stores building in Tripoli.

311. Saudi Arabia

Cladding and insulation. Some £300,000 worth of protected metal building cladding and insulation products are being supplied to Jubail in Saudi Arabia by H. H. Robertson (UK) Ltd. The products have been specified for the North West Water Works Project.

312. UAE

Pumping equipment worth more than £2 million has been ordered from Weier Pumps Ltd. of Scotland, for two water supply projects in the United Arab Emirates.

urged in its report to the government that the existing non-use of blue asbestos be made a statutory ban. The HSC has said that it is still collecting and studying comments on the Committee's report, and has declined to take a stand supporting or opposing the recommendation for the ban.

Both the HSC and British asbestos industry representatives have presented evidence before a government sub-committee studying the Euro-plan. Not surprisingly, the industry opinion contradicts the Advisory Committee's recommendation, calling for effective control rather than an outright ban, on the use of blue asbestos.

314. CPSC Publishes General Order On Asbestos

The long-expected Consumer Product Safety Commission General Order on Asbestos (N&N Nov.) has been cleared by the General Accounting Office and published in *Federal Register* of Dec. 22. Manufacturers and importers of certain asbestos-containing consumer products must comply by Feb. 12, 1981.

General Order requires affected parties to furnish information concerning use of asbestos in products, form in which asbestos is present, purpose served by asbestos, marketing and use patterns of products, identity of possible substitutes for asbestos, and information

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PLAINTIFF'S EXHIBIT

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occurring in potable waters or added during the passage of such waters through asbestos-cement pipes are so small that one would not expect them to induce gut cancer: all epidemiological studies are consistent with this view.

321. The Clinical Significance of Ferruginous Bodies in Sputa

McLarty, J. W.; Greenberg, S. D.; Hurst, G. A.; Spivey, C. G.; Seitzman, L. H.; Hieger, L. R.; Farley, M. L.; Mabry, L. C. *Journal of Occupational Medicine* 22(2): 92-96, February, 1980

The clinical significance of ferruginous bodies in sputa was examined in a study of 674 former asbestos workers. Data from occupational histories and smoking behaviour questionnaires, chest radiographs, spirometric measurements, and counts of ferruginous bodies were obtained as part of a 5-year surveillance programme. Statistical analysis demonstrated that ferruginous bodies found in the sputa were significantly related to radiographic findings of interstitial pulmonary disease and pleural fibrosis and to spirometric findings of restrictive lung disease. Age and cigarette smoking were also found to be related to the presence of ferruginous bodies ($p < 0.02$). (Auth. Abs.)

322. Asbestos body phagocytosis by human free alveolar macrophages

McLemore, T. L.; Mace, M. L. Jr.; Roggli, V.; Marshall, M. V.; Lawrence, E. C.; Wilson, R. K.; Martin, R. R.; Brinkley, B. R.; Greenberg, S. D. (Dep. Cell Biol., Baylor Coll. Med., Houston, TX 77030, USA) *Cancer Lett.*, 9(2), 85-93 (1980) - En;en.

Phagocytosis of asbestos bodies by human free alveolar macrophages (FAMs) was studied by light microscopy and scanning electron microscopy which demonstrated morphological and surface membrane changes in FAMs following phagocytosis of asbestos bodies. FAM viability was evaluated following 24-72-h incubation of cells with asbestos bodies at a final concentration of 250 $\mu\text{g/ml}$. Slight, but significant, cytotoxicity was observed following the initial 24-h culture period. No further cytotoxicity was observed when cells were further incubated for 48-h and 72-h intervals. Asbestos bodies are readily phagocytized by cultured FAMs and are only slightly cytotoxic to these human lung cells.

323. Effects of asbestos, iron, oxide, silica, and carbon black on the microsomal availability of benzo[a]pyrene

Lakowicz, J. R. and Bevan, D. R. - Dept. Biochem., Univ. Minnesota, Navarre, Minn. USA - *Biochemistry (Wash.)* 1979 18/23 (5170-5176)

Particulate matter and polynuclear aromatic hydrocarbons are known to be cocarcinogenic. Using fluorescence spectroscopy, we determined that adsorption of benzo[a]pyrene (BP) to iron oxide, silica, and asbestos (anthophyllite and Canadian chrysotile) results in a

greatly enhanced rate of BP uptake into rat liver microsomes when compared to uptake from aqueous dispersions of BP microcrystals. Simple mixtures of BP microcrystals and particulates do not display enhanced microsomal uptake rates, an observation which indicates that adsorption of BP to the surface of the particle is necessary for enhanced microsomal uptake. BP was not released into microsomes from carbon black. Most importantly, the data indicate that asbestos particles are more effective than silica and iron oxide in enhancing the microsomal availability of BP. These observations suggest that particles, and especially the fibrous mineral particulates, could be cocarcinogenic as a result of their ability to adsorb polynuclear aromatic hydrocarbons and to transport these carcinogens into cells. Except for chrysotile, the particles did not disrupt microsomal integrity as determined by NADPH-dependent lipid peroxidation activity. Binding of the microsomes to the particles did not affect the BP uptake rates. In addition, these BP uptake rates were independent of both the concentrations of microsomes and of particles. These observations are consistent with the mechanism of particle-enhanced transport being an increased rate of BP solubilization from the adsorbed state into the aqueous phase, followed by rapid partitioning of BP into the microsomal membranes.

324. Thickening of pulmonary interlobar fissures: Exposure-response relationship in crocidolite and amosite miners

Solomon A., Irwig L.M., Sluis-Cremer G.K. et al - Nat. Res. Inst. Occupat. Dis. South African Med. Res. Council, Johannesburg SAF - *Br. J. Ind. Med.* 1979 36/3 (195-198)

In a cross-sectional study of all white and mixed-race men employed at South African crocidolite and amosite mines, data on duration of asbestos exposure and radiological findings were available for 1692 men, 94% of the total population. Postero-anterior radiographs were read by three experienced readers. Abnormality was regarded as present if reported by at least two of them. The reading included an assessment of whether interlobar fissures were not visible, were visible but not thickened, or were thickened according to criteria shown in a reference radiograph. Fissures which were visible but not thickened were seen in almost half the men and were not more common in men with longer asbestos exposure. On the other hand, thickened fissures increased in prevalence from about 2% in those who had worked with asbestos for 7 years or less, to 25% in those with more than 15 years' asbestos exposure. Some other asbestos-associated pleural or parenchymal abnormality occurred in 69% of men with thickened fissures. The prevalence of thickened fissures as an isolated abnormality was also related to the duration of asbestos exposure. Because its prevalence is related to duration of exposure, and its recognition is not subject to excessive inter-observer variation, we suggest that thickening of the fissures is a valuable sign in the radiological assessment of workers exposed to asbestos.