Vacuum pipes of lead must be of unusual thickness and great weight to prevent collapsing. Iron and steel pipe with lead lining is extensively used, the lead protecting the iron or steel, but the latter also prevents bulging of the lead when the necessary pressure is applied to move the liquids thus transported. These difficulties have been overcome in large part by reinforcing lead with iron or steel gauze in much the same manner that glass is reinforced by wire netting. Wire netting of various sizes of mesh is given a coating of lead or lead-antimony, as described in another paper, and is imbedded in sheet lead of a thickness about one quarter greater than desired, this is then rolled while cold. Reinforced lead in sheets 5 ft. × 6 ins., have been made. They may be bent or cut as desired. Joints have been burned together or finished without leaving any iron exposed. Skeleton frameworks of metal lined with reinforced lead sheeting serve as tanks and other containers without sagging. Eight-inch pipe made of one quarter inch thick reinforced lead withstood a pressure of eight times that of an eight-inch pipe made of seven eighths inch thick lead before collapsing.

Utilization of asphaltic base acid sludge from petroleum: CHAS. BASKERVILLE. Instead of cooking the asphaltic base residue with the mixed sulphuric acid to carbonization and then burning the mass mixed with coal as fuel, the present practise, the cooking is carried on at a much lower temperature and for much shorter time. The acid mass separates into three layers, lighter residues being on top, and the heavy sulphuric acid being at the bottom. These are drawn off, leaving the middle portion of asphaltic material containing 15–25 per cent. of sulphuric acid. The proper amount of dry slaked lime is thoroughly mixed with this asphaltic base in a suitable mill. The heat of neutralization is sufficient to fuse the asphalt, which mixed with the calcium sulphate produced, flows into suitable containers, and solidifies on cooling. The mass, which contains 20 to 40 per cent. of calcium sulphate, may be melted and applied where desired, as in the common practise. Time tests have demonstrated the value of the material thus produced for waterproofing (wood and concrete), roofing, road material and as a protective covering for metals. The process is covered by U. S. Patent 1,231,985.

Equilibrium studies on the Bucher process: JOHN B. FERGUSON and P. D. V. MANNING. A quantitative study of the deleterious effects of carbon monoxide in the furnace gases upon the cyanide conversion at two temperatures, 946° and 1,000° C. The experimental methods employed and results obtained will be presented.

Design for electrically heated bomb for ammonia synthesis (lantern): R. O. E. DAVIS and H. BRYAN. The bomb consists of a nickel-chromium-iron alloy of sufficient strength to withstand several hundred atmospheres pressure. It is electrically heated by a specially devised heater. The method of insulating the walls is shown as are also the method of introducing the catalyst container, and the electric leads.

Purification of compressed gases in testing catalysts for ammonia synthesis (lantern): R. O. E. DAVIS. The method used in removal of moisture, carbon monoxide, carbon dioxide and oxygen is described and the type of purification chamber used is shown. It is pointed out how necessary it is to have very pure gas in the tests.

Preparation of nitrogen and hydrogen mixture by decomposition of ammonia (lantern): R. O. E. DAVIS and L. B. OLMSTEAD. A mixture of hydrogen and nitrogen in the proportion of three to one is obtained by decomposing liquid ammonia. This is accomplished by passing the ammonia over heated iron shavings and steel wool. The decomposition is almost complete with the apparatus described, furnishing about 1.3 cu. ft. of gas per minute.

Explosion of gases used in ammonia synthesis: R. O. E. DAVIS. A description is given of an explosion which occurred in a cotton filter used to remove oil and water spray from mixed nitrogen and hydrogen at a hundred atmospheres pressure.

Some chemical needs of the vegetable oil industry: DAVID WESSON.

CHARLES L. PARSONS,
Secretary

(To be continued)

SCIENCE

A Weekly Journal devoted to the Advancement of Science, publishing the official notices and proceedings of the American Association for the Advancement of Science

Published every Friday by

THE SCIENCE PRESS

LANCASTER, PA. GARRISON, N. Y.
NEW YORK, N. Y.

Entered in the post-office at Lancaster, Pa., as second class matter