months, the Soo cargo volume for 1955 is estimated at from 107 to 110 million net tons, indicating that this year the tonnage competition between the Soo and the Suez will probably be the closest in history.

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Structure of Vitamin B_{12}

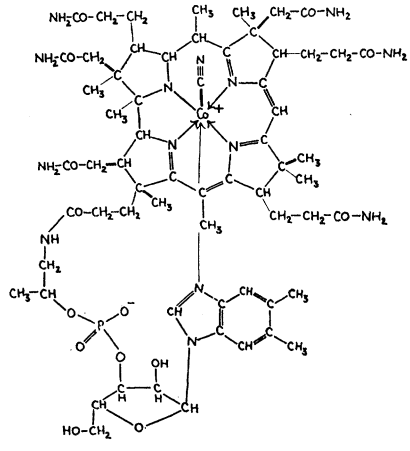
The articles that virtually complete the deciphering of the chemical structure of vitamin B_{12}, first announced in tentative form in 1954, appear in the 20 Aug. issue of *Nature*. The research is reported by the same two groups of biochemists that reported the earlier work. One team of six persons consisted of Dorothy C. Hodgkin, Jenny Pickworth, and J. H. Robertson of Oxford University; K. N. Trueblood and R. J. Prosen of the University of California at Los Angeles; and J. G. White of Princeton University. The other team, also comprised of 6 workers, was made up of R. Bonnett, J. R. Cannon, A. W. Johnson, I. Sutherland, and A. R. Todd, of Cambridge University; and E. L. Smith of the Glaxo Laboratories, Middlesex. Still other groups have aided in the elucidation, in particular the research group at the Merck Laboratories.

The size of these research teams, and their international composition and geographic distribution on opposite sides of the world, speak volumes with regard to the present-day organization of scientific effort. The simultaneous achievement of essentially the same conclusions by diverse methods not only points up the keenness of scientific competition in active biochemical areas, but also affords a vivid example of the way in which scientific knowledge depends on mutual confirmation.

It is by now well known that the essential structure of vitamin B_{12} represents a new type of compound ring structure similar to, and yet significantly different from, the tetrapyrrole ring structure of the porphyrins such as chlorophyll, heme, and the cytochromes. The vitamin B_{12} structure likewise consists of four linked rings each of which is composed of 4 carbon atoms and one nitrogen atom; but each ring has at least one tetra-substituted carbon atom and therefore lacks the typical double-bond structure of the pyrrole ring.

As in the porphyrin structure, the four rings in the vitamin B_{12} molecule are joined by three —C— bridges, but the final, closing linkage that unites rings *A* and *D* is thought to be a direct one. The single cobalt atom of the molecule occupies the center of the tetra-ring structure, like magnesium in chlorophyll and iron in the hemes and cytochromes. It bears a cyanide group; hence the name *cyanocobalomin* is sometimes applied to the vitamin.

Electron density maps and crystallographic data, as well as chemical analysis, now show more detailed features of the attached side chains on the ring. Three acetamide and three propionamide and six methyl groups are attached to the rings and two methyl groups to the carbon bridges. Ring *D* bears another propionic acid side chain, which is combined with a propanolamine residue that forms an ester linkage with the phosphate group of a nucleotide that is also coordinated with the cobalt atom. Both groups agree on the formula $C_{63}H_{90}N_{14}O_{14}PCo$, arranged as shown here.



To work out the details of structure of so complicated a molecule is truly a triumph of scientific ingenuity. It opens the way to greater insight into the metabolic activities of this vitamin that prevents pernicious anemia and which was isolated for the first time only in 1948.—B.G.

News Briefs

■ The Atomic Energy Commission has announced that the Los Alamos Scientific Laboratory will use the Nevada Test Site beginning about 1 Nov. 1955 for a series of experiments to determine the safety of various weapons and experimental devices in the event of accidents such as fires during handling of storage. Laboratory calculations and previous experiments have established a strong probability that such accidents will not cause nuclear detonations, but confirmation through field tests is desired.

There will be detonations of conventional explosive materials. All explosions, even if there should happen to be a nuclear detonation, will be of low explosive force. Because fissionable materials are involved, precautions will be taken; tests will be made only under carefully selected weather conditions. No off-site radioactive fallout problem is anticipated. The explosions may be heard by nearby residents. Because the detonations will take place in daylight, it is improbable that they will be visible off-site.

It is possible that even very low scale detonations such as those planned may release enough radioactive material into the air to affect the very sensitive instruments or processes of certain industries and research institutions. For this reason, the AEC will announce the conclusion of the experiments.

■ Scientists of the U.S. Department of Agriculture's Animal Disease Laboratory on Plum Island, N.Y., report success in growing the virus of foot-and-mouth disease in cultures of swine or bovine kidney cells. This accomplishment, by H. L. Bachrach, W. R. Hess, and J. J. Callis of the laboratory staff, makes possible the use of practical tissue-culture techniques in (i) diagnosis of the disease and identification of the type of virus present; (ii) determination of concentrations of the viruses and antibodies produced in animals; and (iii) large-scale production of the virus for fundamental studies and vaccine investigations.

Foot-and-mouth disease virus has been grown experimentally in other types of cultures by investigators in the Netherlands, but the methods used were not adapted to the measurement of virus and antibody concentrations. The method developed at Plum Island, which has also been independently achieved at a research laboratory in England, permits the rapid enumeration of viruses and antibodies. This work is also the first in which kidney cells from hogs and cattle have been used for routine production of virus in the quantities needed for research purposes. The method is similar to that employed for growing human polio virus for the manufacture of vaccine.

Announcement of work at the Plum Island Laboratory is the first report of research conducted inside the United States on foot-and-mouth disease, a potential major threat to the nation's swine, beef, and dairy herds. Before establishment of this laboratory, no research on foot-and-mouth disease virus was permitted in this country.

■ Robert J. Hasterlik, associate director of Argonne Cancer Research Hospital and a participant in the Geneva nuclear conference, recently reported his impressions of Soviet biology to a meeting of University of Chicago alumni. Emphasizing that contacts with the Soviet biologists who attended the conference might