disease, cancer, arteriosclerosis, and diseases of the newborn.

Trace Elements. The term, trace element, has been applied in the biological sense to those elements that, in extremely small amounts, play a part in the nutrition of plants and animals, said Conrad A. Elvehjem of the University of Wisconsin.

About 20 or so mineral elements occur commonly in foods in trace amounts, or in amounts of less than 0.005%. Of these, seven or eight may be listed as essential to animal life. These include copper, cobalt, fluorine, iodine, iron, manganese, zinc, and perhaps molybdenum, he said. Three of these elements —cobalt, fluorine, and iodine—are probably not essential to plant life.

Cobalt is perhaps the most interesting of all the trace elements, he said, since it is needed in such extremely small amounts and because it functions in living tissues through its presence in vitamin B_{12}. As far as is known today, vitamin B_{12} is the only vitamin that contains a mineral element. In animals suffering from cobalt deficiency, the administration of cobalt allows the adequate synthesis of vitamin B_{12} in the rumen. This vitamin must come from the rumen rather than from the animal's natural food since plant material is practically devoid of vitamin B_{12}.

In biochemical studies, each trace element must be considered separately, Elvehjem said. "No generalization can be made that will take in all the elements."

Soil Requirements. Soil consists mainly of substances that plants do not need and cannot use, said Firman E. Bear of Rutgers University. The value of soil lies mainly in its providing standing room for plants and storage capacity for water, nitrogen, and mineral nutrients required by plants. In recent years, there has been a sizable increase in the use of soil additives. At present, said Dr. Bear, we are using about 50 million tons of liming and fertilizer materials a year—enough to fill a line of 40-ton freight cars four times the distance between New York and San Francisco.

Dr. Bear illustrated the importance of trace elements by describing studies of requirements of the alfalfa plant for molybdenum. Only after a careful redistillation of water in borosilicate glass and a thorough repurification of the best grades of reagent chemicals could deficiency be developed. Then, all that was required to overcome this deficiency was the addition of one part of molybdenum to a billion parts of the culture solution. Yet, a New Jersey farmer who had planted 75 acres of cauliflower on a strongly acid soil failed to get a single head of cauliflower on 45 acres of this crop because of molybdenum deficiency.

McKay Says Ocean May Be Last Food Frontier

WASHINGTON.—"If people throughout the world are to have more adequate diets a large share of the increased food supply must come from the oceans," declared Secretary of the Interior Douglas McKay before the meeting of the National Fisheries Institute held here April 12 to 15. "The fishing industry is fortunate," said McKay, "That its raw materials come from the water. Water ranks high as one of the world's great natural resources. The oceans which cover about three fourths of the earth's surface, may some day become our last great food producing frontier."

Feed Supplements. There were several papers on fish oil and meal as feed supplements. Originally these materials were utilized primarily for their high protein content but recently there has been much additional interest in them as sources of growth factors. The results of some work done in the U. S. Fish and Wildlife Service's Technological Laboratories by Neva Karrich on levels of various known nutritional factors in processed fish meal were presented by Frank T. Piskur. Miss Karrich's studies indicated that the highest levels of niacin, riboflavin and vitamin B_{12} tended to accumulate in the so-called "fish solubles," a by-product of the fish meal industry. Fish meal with the solubles added gave higher levels than either meal or solubles alone.

Another growth factor in the fish solubles which is presently identified as the "fish factor" was discussed by J. R.

Secretary McKay addresses fisheries institute on food potentials of the oceans

J. R. Couch discussing the role of fish factor in nutrition

Couch of Texas Agricultural and Mechanical College who reported that the unidentified factor in fish solubles effected chicken growth more than either antibiotics or vitamins including B_{12}. The "fish factor" apparently increases the efficiency of methionine metabolism and is probably necessary in protein and amino acid metabolism, according to Dr. Couch.

TV in Fishing. Underwater television means the end of the privacy which fish have enjoyed in spawning and other activities of biological interest according to C. P. Idyll, University of Miami Marine Biological Laboratories. He addressed the by-products session of the convention on some new applications of television and its possible interest to the fishing industry. Of more immediate interest to the fisherman was the fact that Dr. Idyll intends to use underwater TV to study the action of nets when catching fish.

American Producers Claim Russians Dumping Potash Here

Russian produced potash is being dumped on American markets at cut rate prices in an attempt to undermine American production. This was the picture revealed by American potash producers who went before a subcommittee of the House agriculture committee last week.

George E. Pettit of American Potash Co. testified that the Russians have no qualms about gouging American buyers when supplies are short. As an example,

he pointed to the fact that when American production was halted in 1950 by a strike, a Russian potash was offered on the East Coast for $51 per ton. (The striking union was the mine, mill, and smelters workers, which was ousted from the CIO as being Communist dominated). Now, however, with American production at a high level, augmented by imports from free enterprise countries, the Russians are selling the same potash for $29.50 a ton.

Pettit testified that East Germany alone exported the equivalent of 55,000 tons of K_2O to the U. S. last year and that the Russians are making desperate efforts to get contracts for this year at their cut rate prices.

Other representatives of the potash and fertilizer industries testified that we now have adequate sources of supply with domestic production and imports from free enterprise countries and that if the dumping practices of the Communists are allowed to continue the tonnage from behind the Iron Curtain may increase.

The potash interests contend that the importation of the Communist product at prices which undercut an efficiently run American industry violates the spirit of existing legislation designed to protect American industry.

Solution of Animal Health Problem Up to Agricultural Industry

NEW YORK.—Livestock diseases cost the nation $2 billion last year, and only 7% of this amount was spent in an effort to stop this loss. We have the necessary know how, money and equipment to eliminate this unnecessary "disease tax," said Mark Welsh at the scientific session of the 13th annual meeting of the Animal Health Institute on April 9. A critical area in the fight against animal disease is the basic research which should be done in the laboratories of the Government and the universities. Dr. Welsh, animal industry consultant to the Lederle Laboratories at Pearl River, declared that industry, which spends 10% of its income on research, is forced by competition to concentrate on applications rather than basic work. He also warned that the use of synthetic materials in clothing and shoes is threatening a valuable market for animal products.

An increase in rate of growth, improvement in efficiency of feed utilization, slight improvement in livability, and a tendency to eliminate small or "runty" animals were given by G. E. Hawley of Chas. Pfizer agricultural department as the main benefits of the use of antibiotics for nutritional purposes. In a paper coauthored with H. G. Luther, Dr. Hawley reported the growth stimulation effect of various antibiotics on specific species of animals. Penicillin was found to be excellent for poultry, causing a 22% faster rate of growth than normal, when added to feed at a level of 2 to 3 grams of sodium penicillin activity per ton of feed. "Terramycin, aureomycin and bacitracin can be observed to give very good response in chick ration, giving an increased growth response in the order of 15%," at a level of 5 grams per ton.

Terramycin and aureomycin were found to be especially effective on swine and calves, while terramycin and especially a combination of terramycin and vitamin B_{12}, results in larger and more valuable pelts in mink. The antibiotics tested were found to have no undesirable effects on the benign microflora of the ruminant animal, and a 3 to 6% saving in feed was observed. "It is probable that the favorable effects of antibiotic supplementation are due at least in part to a slight adjustment in intestinal flora," said Dr. Hawley. Control of a subclinical disease level, and marked increase in water intake may be other contributing factors.

Therapeutic Levels. High level feeding of antibiotics to animals has proved to be a convenient and effective means of medication in the treatment and control of many types of infectious diseases. Blue comb disease in poultry has been successfully treated by the addition of 75 to 100 grams of terramycin hydrochloride activity per ton of finished feed, while 30 grams per ton has been shown to be prophylactic against this disease. When sick animals or birds are off feed, antibiotics can be effectively administered in drinking water. Early chick and poultry mortality has been effectively reduced by the addition of 100 grams of terramycin per ton of feed, when fed for the first two weeks of life. High level water and feed supplementation has been successful in treating shipping fever, scours, and infectious scours of suckling calves, overeating disease of sheep, swine enteritis, vibronic dysentery in swine, and mucoid enteritis.

Chronic respiratory disease, which causes great losses to the poultry industry, shows signs of control by high level terramycin feeding. Terramycin and magnamycin have been most effective in tests, and an injected repository form of terramycin has been formulated which supplies a constant level of efficacious medication for a definite time. The spotted liver and thickened, inflamed air sacs typical of poultry infected with chronic respiratory disease were described in a preceding talk by Henry Van Roekel, head of the department of veterinary science of Massachusetts State University. In a discussion of the symptoms, effects and course of the disease, Dr. Van Roekel said that the great similarity to infectious sinusitus suggested some close relationship between the two diseases.

Vesicular exanthema is endangering the entire hog population of the United States in its expansion from California since 1952, declared F. M. Murdock, executive vice president of the Anchor Serum Co. This disease, which is spread largely by garbage feeding, has appeared in 39 states to date. Although it usually does not result in death, vesicular exanthema seriously cuts the weight of its victims, and complications often result from secondary infections of the open lesions. Since the herds of swine used to produce hog cholera serum are almost exclusively garbage fed, they are fair game for this disease, and the aggravation of an already seriously short hog cholera serum supply would involve serious risk for the entire industry. Laws requiring the precooking of feed garbage, or even outlawing garbage feeding were recommended by Dr. Murdock.

Chlorinated Products of Dioxane Prove Effective Insecticides

Insecticides almost as effective as DDT have been prepared by chlorinating 1,4 dioxane. Relatively mild conditions are required and chlorine atoms can be introduced to obtain several products, including a good-crystallizing octachlorodioxane.

The work on the chlorinated dioxanes was reported by W. Stumpf, University of Heidelberg, at a recent chemical conference in Innsbruck, Austria. The conference was a joint meeting of the Association of Austrian Chemists, the Society of German Chemists, and the Swiss Chemical Society.

All of the chlorinated dioxanes have insecticidal properties. Although the mono- and dichlorodioxanes are sensitive to air and moisture and spontaneously split off hydrochloric acid, the more highly chlorinated products are extremely stable materials.

The most effective are the hepta- and the octachlorodioxanes. Both have a low toxicity against the rat. The dioxane products are said to act more rapidly than either DDT or the gamma isomer of benzene hexachloride.

The mechanism of chlorination differs