But there are many other valuable manures, lying at our doors, which are at present neglected and which can be applied directly to the soil, or chemically or mechanically prepared for it. Fallen leaves in the forests and on our streets are more valuable than stable manure; the garbage and sewage of the cities and towns are so effective as fertilizers that every municipality should investigate methods for their disposal in this way, instead of carelessly permitting them to be accumulated in dumps, or to be deposited in the rivers and lakes, there to endanger the lives of the citizens of its own and other municipalities; the wastage and offal from the abattoirs, and of the fish, fruit and vegetable canneries are in the same way valuable, whilst the straw and chaff so often burned in our Northwest after the thrashing of the grain, the lawn cuttings of the cities, seaweed, shell marl, peat, sawdust, wood ashes, soft, and probably even hard coal ashes—all have their values in the soil and need only more detailed research on the part of the chemist to indicate the particular plants and particular soils for which they are suited. What is much needed is a farmers' and gardeners' vade mecum which would in brief, popular language, tell them of the special soils and fertilizers best suited to each of the different grains and vegetables, and of the various fruit trees, and the best methods of cultivation in each case.

Fish Valuable for Food.

There are other lines of research in food products. Investigation is greatly needed into the food values of the great numbers of species of fish found on both the Atlantic and the Pacific coasts, which are at present unfamiliar to the public, and not therefore being easily marketable, are not sought for by the fishermen, or, if caught, are thrown away. Probably every fish found in our cold northern seas is edible, and if the fishermen could sell everything they catch, not only would the supply be much greater, but the prices could be correspondingly lowered. Why should haddock and cod, and, to less extent, salmon, halibut, mackerel and smelts almost monopolize the public taste in its too limited demand for fish from the sea? As to fresh-water fish, the great problem is the systematized restocking on a large scale and at frequent intervals, of our lakes and rivers, already so largely depleted. This should be an international matter, in consequence of the vast areas occupied by the Great Lakes, separating there the United States and Canada, and the direct interest both countries have in sustaining the fishing industry. What appears to be needed is co-operation in finding the best methods of rearing the fry, transporting them to their feeding grounds at distant points, and caring for them there during their earlier stages.

Briquetting of Peat.

The problems connected with fuels involve not only an ample supply being available, but the conservation of heat itself, such a large proportion of which, under present methods, is allowed to be dissipated into the atmosphere without any attempt at utilizing it. Peat has from time to time attracted attention with us as a fuel, in consequence of the extensive areas occupied by it in Canada, but thus far, the problems of successfully briquetting it to ensure that it will stand weathering, rough handling, and long transportation, as well as of its adaptability to steam and domestic purposes, and as a coke for smelting, have not been worked out. As peat is largely composed of fibres or tubes filled with water, a new English proposal is to grind the peat to a pulp, mould this pulp into briquettes, and submit these briquettes for a few hours to a drying machine, from which they emerge as hard, densified blocks, ready for steam or domestic purposes, and which can be converted into a charcoal or coke for smelting ores. How far is this a suggestion for economical application to our Canadian peats? The resulting coke represents about 40 per cent. of the densified peat, whilst the valuable by-products include sulphate of ammonia, acetic acid, phenols, alcohol, oils and a gas of which about 14,000 cubic feet can be obtained from a ton of the densified peat.

Conservation of Heat.

The large proportion of the heat derived from our fuels which goes up the chimney, without being utilized, may well be the subject of investigation. Probably two-thirds of the heat from our grate fires is, in this way, absolutely lost, and, in a less degree, this also applies to the furnaces in our houses, offices and factories. In our homes, where ample fires are maintained in these furnaces for at least seven months of the year, there seems no reason why arrangements might not be made, through alterations in the chimney and furnace, for utilizing the same fire for cooking as well as for heating. Further, by having the chimney in the centre of the house, instead of in the cold outside wall, the heat, as it ascended, could be utilized from floor to floor, radiating into at least four rooms on each floor, and utilized also there, for special purposes, as well as for heating. These ideas require careful thinking out, but are quite practicable, and, in our severe winter climate, would not only add to our comfort, and economize fuel elsewhere in each home, but would further utilize heat which is now thoughtlessly wasted.

Substitutes for Gasoline.

Notwithstanding Dr. Rittman's discovery of a process under which the production of gasoline from petroleum can be more than doubled, a pressing transportation problem at present is the scarcity and consequent high price of that motor fuel. In England, compressed gas, held in steel tanks with reducing valves, is being tried as a substitute, but attention here should be centered most on the possibilities of alcohol, the sources for which are so numerous on our American continent. The only satisfactory results obtained by the South African Research Committee were from alcohol derived from the cheap, Natal, sugar cane molasses, by adding a certain proportion of pyridine bases and wood naphtha or benzine. This may convey suggestions to our chemical experts in their investigations with alcohol from waste wood, sawdust, pulp mill liquors, potatoes, corn, and other readily available material. In Sweden and Norway, a sulphate spirit from the pulp mills has already been successfully used. In each country, it is a question of relative cost, as well as of the availability of the raw material.

Chemical Research.

Stimulated largely by the needs of the Allies in the war, many brilliant discoveries have been made in the domains of chemistry and of electro-chemical metallurgy, particularly in explosives and the methods of using them; in the extraction of copper, zinc, and other metals from refractory ores; in the Bessemer process of steel production; in dyestuffs; in anaesthetics; in manufactures of the finer grades of glass; and in scores of other important lines. Many of these discoveries are now being practically applied in the conduct of this great war, in which science is playing such a leading part, but will find their equal value in more peaceful operations when the war clouds have passed by. Chemistry has now found its place in the public mind as one of the most important aids to in-