reactions of plant components, and on the biological, chemical and engineering processes for turning them into other compounds. The development of oil-seed crops as alternatives to seed crops has received considerable attention.

For some time, the Laboratory has studied major plant constituents such as carbohydrates, protein, starch, lignin and fibres. An example of this work is the definition of the chemical structure of several polysaccharides found in cereal grains and important in baking, milling and fermentation technology. Attention is also being given to minor plant constituents—such as phenols, flavonoids and terpenes, which are known to have fungicidal and germicidal properties. A laboratory has been set up to systematically study extractives from local plants and shrubs.

The engineering and process development group is engaged in research on continuous fermentation processes, pulping processes on wood and straw fibres, and the effects of glyceride structure of fats and oils on the quality of margarines and shortenings. Large-scale processing and pilot-plant-scale operations are carried out. There is also a group working in the field of mycology, which is concerned with the production of new chemicals, antibiotics, alkaloids and amino acids.

Administration.—Administration of the foregoing laboratories is organized as a Division of Administration and Awards, which exists only to serve the scientist. The five service units of this Division are: Awards and Committee Services (Awards, Committees, Publications, Research Journals); Administrative Services (General Services, Purchasing, Personnel); Information Services (Technical Information Service, Library, Public Relations Office, and Liaison Offices in Ottawa, Washington, London, and Paris); Plant Engineering Services; and Legal and Patent Services. The latter group works closely with Canadian Patents and Development Limited (see pp. 118-119). An expert on economic research acts as special assistant to the Assistant Director, Information Services.

Section 2.—Research in the Atomic Energy Field*

The high energy yield from the fission of uranium is the key to the prospect of economic nuclear electric power. The yield is so high that the cost of the raw uranium is a very minor component of the cost of electric power. It will be about 5 p.c. of the total and may be contrasted with 50 p.c. or more paid for coal in some large conventional generating stations. The largest component in the over-all economy of nuclear power systems is reactor plant construction and a minor (10 p.c. to 20 p.c.) component is fuel fabrication.

For a few more years the major atomic energy activity in Canada is likely to be uranium mining and refining for export in support of military uses. A major transition, however, is taking place in which uranium production will give place to engineering and construction of nuclear electric generating stations. This phase will last until nuclear plants are established in such numbers and capacity throughout the world that the market for uranium revives and overtakes its former peak. There is some prospect that the economic advantages of the heavy-water reactors designed in Canada will lead to the adoption of this type in many other countries with the creation of a market for heavy water that could be produced competitively in Canada. The possible export of nuclear generating stations, heavy water, and uranium fuel is appearing as a new near-term prospect on a small but significant scale.

In Canada plans are already taking account of a revolutionary increase in the size of electricity-generating stations. The full-scale 200,000-kw. reactor at present under construction has come to seem small. Steam turbines and conventional stations are now appearing in larger capacities and the prospects of long-distance high-voltage transmission to interconnect centres of load, together with the lower unit power costs that result from operating on a larger scale, cause utilities to plan large generating stations of 2,000,000 kw.

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