

particles to generate high voltage direct current. Present efforts are to generate  $\pm 375$  kv. electricity to match the Department's western high voltage d.c. lines now under construction.

For coal firing, the EGD system has the attraction that fly-ash acting as the necessary charged particles, is beneficial, rather than the usual nuisance. EGD generators have no moving parts, and, if suitable materials of construction can be found, it has the promise of being relatively low in capital cost. Reasonably high efficiencies appear to be attainable and cooling water is required. Thus, if it can be successfully developed, EGD has many attractions for the coal industry. It would be particularly useful in the West, where large deposits of coal are located in arid areas at considerable distances from the centers of power consumption. EGD, without a cooling water requirement, could be installed at any mine-mouth and, because of its direct current capability, could produce power for transmission to consumers at reasonable rates.

#### NONENERGY USES FOR COAL

In pursuing additional non-energy uses for coal, the Office of Coal Research has a process under development, by Melpar Inc., for the production of acetylene from anthracite by means of a sodium reaction. If successful, this could provide the basis for a new chemical and plastics industry in the anthracite producing regions. After considerable early experimental difficulties, recent indications are encouraging and process development is now being scaled upward.

Three other projects are underway to develop processes for the electro-treating of coal which could enhance its potential as a source of useful chemicals, including hydrogen and acetylene. Encouraging progress is being made in all three projects, although they are in early stages with much more work to be done. The three processes are:

1. Electrical resistance heating of coal in a fluidized bed, being investigated at Iowa State University.
2. Electric arc processing of coal, the coal forming a consumable electrode, being developed by AVCO Corporation.
3. High-frequency induction heating of coal which is being investigated by Stanford Research Institute.

#### WASTE DISPOSAL

Coal also offers promise as an aid to more efficient disposal of Solid Wastes. Rand Development Corporation, under contract to OCR, is constructing a pilot plant in Cleveland, Ohio, to treat 10,000 gallons per hour of sewage, using coal as a filter and as an adsorbent. After use, the coal and sewage mixture will be tested as a fuel for steam and power generation.

It already has been demonstrated, on a small scale, that coal will effectively remove the common contaminants from sewage; also that it will remove phosphates and hard detergents to a degree far exceeding that of conventional sewage treatment methods. On paper, the economics are favorable. Now the hardware must be developed and the economics proved. Certain problems must be overcome. For example, some coals are considerably more effective than others. Also, the costs and problems of grinding and sizing coal to the most desired 50 x 150 mesh size are greater than anticipated. Recent tests with small quantities of polyelectrolyte or ferric chloride have greatly improved the effectiveness of the process. The pilot plant is scheduled for operation in late July.

#### GEOHERMAL SOURCES OF ENERGY

The earth is a tremendous reservoir of heat, most of which is too deeply buried or too diffuse to consider as economically recoverable energy; but large areas, particularly in regions of volcanic and tectonic activity, have higher than normal concentrations of stored heat that might be economically harnessed as an important new source of energy.

About one million acres of Federal lands in five western States have already been determined as having current potential value for geothermal resources and an additional 86.3 million acres in thirteen western States have been classified as prospectively valuable for geothermal resources.

Current interest in areas of abnormally high geothermal resources is for the electric power which can be generated in these areas by releasing steam from naturally hot spots through drill holes and channelling the steam into turbine