

border. In fact more than half of all new refining capacity at present being planned or built in Europe is located at inland centres. In addition to the refineries in the Ruhr area, served already by two pipelines from Rotterdam and Wilhelmshaven respectively, five new plants will be constructed near Karlsruhe and Strasbourg close to the main terminals of the new pipeline from Lavera, near Marseilles, to be opened in January of next year, while a Swiss refinery at Aigle will receive crude oil by pipeline from Genoa.

Typical of some recent installations are the first major petroleum refinery to be built in Austria—the Oesterreichische Mineralverwaltungen A.G. plant at Schwechat near Vienna—with a 250,000 tons per year Platformer; the new B.P. refinery at Dinslaken in the Ruhr with a high severity Platformer of 500,000 tons annual capacity, from which a proportion of the aromatics are passed to Erdölchemie at Dormagen to be steam-cracked and used as petrochemical raw

materials; the Esso-Rotterdam refinery which includes a Powerformer, and the Shell refinery at Godorf near Cologne with a Platformer. At the Gelsenberg Benzin refinery at Gelsenkirchen-Horst a third Platforming unit has been put on stream, together with a U.O.P. Udex unit for the separation of high purity benzene from the reformat.

The general trend to be discerned in this vigorously growing European industry is towards flexibility of refinery operation—the possibility to produce high-purity aromatics according to market needs while still satisfying the increasing demand for automobile fuels of higher octane ratings. Platinum reforming processes constitute one of the most versatile tools available to the refiner, and by their more severe operation, by the development of improved platinum catalysts and by continual modification and improvement of the processes by the licensors will obviously go on playing a key role in the overall economics of European petroleum refining.

## Complex Platinum Compounds and Virus Activity

### A POSSIBLE MEANS OF ATTACK ON CANCER TUMOURS

Among the many researches being undertaken into the likely causes and possible treatments of cancer, evidence has been accumulating to indicate that viruses may be involved in many types of the disease. Viruses contain proteins, nucleic acids and polypeptide linkages and therefore present obvious possibilities as co-ordinating agents for certain metal ions, with the further possibility that complex inorganic compounds might be used successfully in destroying or reducing their disease-producing activity.

At the meeting of the American Chemical Society held in Washington, D.C., in March a valuable step forward in this direction was reported by Dawn Francis, Dr Stanley Kirchner and Dr J. C. Bergman of the Department of Chemistry, Wayne State University, Detroit, working in collaboration with Dr Yung-Kang Wei of the National Research Council, Ottawa. Because it would be impossible to introduce a metal ion into a living system with the expectation that

it would by-pass normal proteins and await complexing by co-ordination sites in the virus, these workers proposed to introduce metal ions as co-ordination complexes of intermediate stability; in this way it was hoped that they would be stable enough to escape reaction with normal proteins but not so stable as to resist attack by virus proteins.

Some complex inorganic compounds are known to be carcinostatic, among them 6-mercaptapurine, and the preparations made and tested in this research included this biologically active compound and its complexes with platinum and palladium. In tests with cancer tumours in mice, these latter two compounds proved to be extremely active, showing in fact a much greater activity than that of 6-mercaptapurine itself. These results certainly lend support to the hypothesis put forward, but further closely controlled tests with 6-mercaptapurine on both complexed and uncomplexed forms are now being conducted.