3-hydroxymethylene-tetrahydro- γ -pyrone-2-carboxylic acid.

In Part 2 of the article Dr. J. H. Birkinshaw, Mr. A. Bracken, Dr. S. E. Michael and Prof. H. Raistrick describe in considerable detail the biochemical and chemical properties of patulin. Pure patulin is a colourless substance which crystallizes in compact prisms or plates. It has been isolated from two strains of *P. patulum*, one obtained from Holland and one obtained from condenser water.

In Part 3 of the article Dr. W. E. Gye describes how he received a sample of patulin from Prof. Raistrick for chemotherapeutic tests on cancer. Being in the second stage of a common cold, Dr. Gye douched his nasal passages with a watery solution of patulin. Within an hour his nasal passages were cleared; the douches were repeated twice with weaker solutions; a night of undisturbed sleep followed and next morning he was quite well and back at work. A later trial failed to cure the early stages of another cold, and Dr. Gye suggests that patulin may not act on the virus stage; the secondary stage of infection with Gram-positive and Gram-negative organisms was, however, completely prevented. Later he found that solutions of 1:20,000 of patulin were painless (the earlier solutions of at least 1:1,000 tried by Gye caused some pain) and colleagues and friends of Dr. Gye's tried these. One of them reported that patulin did not reduce the temperature nor shorten the duration of influenza; but it did prevent the nasal symptoms which often obscure the diagnosis of this disease. Only one of these volunteers reported no effect at all. The results obtained by the others suggested that trials under controlled conditions were warranted.

Part 4 of the article describes these trials, which were conducted on Naval personnel by Surgeon Commander W. A. Hopkins. Experimental work showed that patulin has bacteriostatic powers against a number of Gram-positive and Gram-negative aerobic organisms. Preliminary experiments have shown that it is also active against anaerobes. Commander Hopkins says that patulin differs from penicillin, gramicidin and citrinin in showing no selective differentiation between Gram-positive and Gram-negative organisms. It is very much less active than penicillin against Gram-positive organisms, but is more active than penicillin against Gram-negative ones. It is more active than penicillin against organisms of the coli-typhoid-salmonella group and against *Bact. dysenteriae* Shiga. The *Lancet*, in its leading article entitled "Moulds and Colds", points out that these comparisons are made against the impure preparations of penicillin available two years ago. Pus and serum do not affect its action. Solutions of 1:8,000 do not affect the phagocytic activity of leucocytes, although solutions of 1:2,000 inhibit it.

Patulin keeps well in a phosphate buffer at pH 6 and this was used for the trials. Patients in whom differential diagnosis between the common cold and influenza arose were excluded; only cases of acute or subacute rhinitis with or without pharyngitis, that is, cases of the ordinary common cold, were used. The commonest organisms found by swabbing the nasopharynx of the patients were *Strep. pneumoniae*, *Micrococcus catarrhalis* and streptococci (alpha and beta). When solutions of patulin of from 1:5,000 to 1:20,000 were sprayed at intervals of four hours or so into the nose, or snuffed up from the hand or introduced by a pipette or gargled, 57 per cent of the patients recovered completely

within forty-eight hours, while only 9.4 per cent of the controls recovered in this time. A large number were cured by the end of twenty-four hours. When five cases of influenza were treated with a 1:10,000 solution, the course of the disease was not influenced in any way. This confirms Gye's statement above. Some difficulty was experienced in assessing the results, because the common cold has few objective signs and the patient's statements are not always reliable. A statistical note on the results by Prof. Major Greenwood concludes the whole paper.

Commander Hopkins is wisely cautious about the conclusions to be drawn from his results. He says that the etiology of the common cold is not yet fully understood and that further extended trials are required before definite claims can be made for patulin. It would seem that extended trials on patients with pre-existing or concomitant sinusitis are especially needed, because, in some cases described by Commander Hopkins, after an apparent cure of a cold by patulin, severe sinusitis developed. The public interest in a cure for the common cold is naturally so keen that Commander Hopkins's caution is as necessary as the statement by Prof. Raistrick that patulin will not be released for general issue until further large-scale confirmatory trials have established its value and complete freedom from danger. Meanwhile the Therapeutic Research Corporation, which has helped both financially and technically in the work here described, is arranging for the manufacture of patulin in adequate quantities.

¹ NATURE, 152, 604 (Nov. 20, 1943).

² Brit. Med. J., 654 (Nov. 20, 1943).

³ Lancet, 638 (Nov. 20, 1943).

⁴ Lancet, 609 (Nov. 13, 1943).

⁵ J. Bact., 45, 233 (1943); Science, 96, 202 (1942).

⁶ Lancet, 625 (Nov. 20, 1943).

⁷ Lancet, 641 (Nov. 20, 1943).

OBITUARIES

Mr. E. H. Clifford

EDWARD HERBERT CLIFFORD, who died on October 11, aged sixty-seven, was a distinguished mining engineer whose name will long be remembered by his professional brethren. His career contained no spectacular incident to bring his name prominently before the general public, his *métier* being rather that of a 'back-room' boy, who nevertheless left behind him a record of solid achievement which will remain a monument to his name so long as gold and copper mining is carried on in the Transvaal and the Rhodesias.

Born in 1876, he went to St. Paul's School and commenced his technical education in 1892 under Sir Clement Le Neve Foster. Graduating as an associate of the Royal School of Mines in 1895, he spent a year at the Bergakademie, Freiberg, before going to South Africa. During his early years on the Witwatersrand he filled a number of junior posts of a varied nature both on the surface and underground in different mines, thereby laying the foundation of the wide general knowledge he ultimately accumulated. In 1899 he obtained his first executive appointment as chief surveyor at Langlaagte Deep, which now forms part of the Crown Mines. During the South African War he enlisted in the Johannesburg Mounted Rifles and saw extensive active service in the Eastern Transvaal. On demobilization he

returned to Langlaagte for a short time before being appointed chief surveyor to Rand Mines, Ltd. During 1907-11 he acted as assistant to the consultant engineer to the Eckstein Group and was given the highly responsible task of investigating and reporting on properties in various localities which were then considered 'outside' areas but are now recognized as extensions of the original Rand series. One of these was the Modder B Mine, of which he was appointed manager in September 1911 just as it came into production. The company paid its initial dividend the following year and has continued to pay annual dividends ever since. Modder B, at the time Mr. Clifford became manager, differed in many respects from the then operating mines of the Central Rand in that the gold-bearing conglomerate had a very flat angle of dip. Consequently methods of working and development differing materially from those in common use on the goldfield had to be devised. The record of the mine is an eloquent testimony to the skill and knowledge with which Mr. Clifford faced and successfully overcame the problems.

Clifford's technical ability was so widely recognized and his professional status so well established that in 1912 he was appointed consulting engineer in Johannesburg to the Central Mining and Investment Corporation, a position he held until 1923, with the exception of a period during the War of 1914-18, when he acted as chief technical adviser to the Mineral Resources Department of the Ministry of Munitions. While with the Central Mining Group he became interested in the question of deep mining, which he foresaw would become a matter of vital importance to the Witwatersrand. He gave much time and thought to the problems of deep winding and ventilation which would thus arise and pressed his views strongly on his colleagues in regard to these matters.

His experience with the Ministry of Munitions in the War of 1914-18 was invaluable to Sir William Larke and his colleagues on the Non-Ferrous Metallic Ores Committee, which was formed in 1940 to advise the Minister of Supply on the possibility of supplies from home metal mines during the War. Nobody knew better than Mr. Clifford that ample labour, time, money and patience are required to open or re-open even the smallest mine, and that, unless steps were taken quickly, nothing of any value was likely to be produced in the immediate future. He also had strong views on the necessity for reviving home

metal mining on a long-term basis, and at times expressed himself forcibly on the subject.

In 1919 he returned to South Africa for a few years and, after resigning his position with the Central Mining Corporation, spent some time visiting mines in various parts of the world.

In 1926 he was appointed consulting mining engineer to the British South Africa Company, and commenced what was probably the most productive part of his professional life. Though he held no post directly responsible for the development of the great Rhodesian Copper Mines, he visited Rhodesia on behalf of the chartered company every year, where his advice was eagerly sought by the local managements, and his informed reports of great value to his colleagues in London.

Mr. Clifford's eminence as a mining engineer was recognized by the members of his profession when he was elected president of the Institution of Mining and Metallurgy in 1941, a difficult task in a difficult time, which he carried out admirably. His devotion to the Royal School of Mines was proverbial and, however busy he might be, he was always ready to advise and assist young mining engineers. He went to great trouble to find ways and means of encouraging the right type of recruit to enter the profession. He was also a governor of the Imperial College of Science and Technology, being appointed as their representative by the Royal Commissioners for the Exhibition of 1851.

Yachting was his great hobby, and, whenever his many professional duties allowed him, he turned to the *Vigilant* for recreation. She was a Thames barge converted into a comfortable cruising yacht in which, assisted by his wife, formerly Miss Jane Leck of Johannesburg, he delighted to entertain his friends. Every year he attended the barge races, flying the winning pennant won by *Vigilant* many years ago. Many of the fittings he made himself, as he was both a skilled carpenter and metal worker.

J. A. S. RITSON.

WE regret to announce the following deaths:

Mr. Clive Cuthbertson, O.B.E., F.R.S., fellow of University College, London, on November 16, aged seventy-nine.

Sir Edward Poulton, F.R.S., formerly Hope professor of zoology in the University of Oxford, on November 20, aged eighty-seven.

NEWS and VIEWS

Economic and Technical Reconstruction in Europe

THE address on "Economic and Technical Reconstruction in Central Europe" delivered by F. Nemec, Minister of the Czechoslovak Government in London, at a meeting of the Association of Austrian Engineers, Chemists and Scientific Workers on July 12 not only pays a tribute to the work of the Inter-Allied Committee on post-war requirements. It also gives an outline of the plan which that Committee has already worked out to cover the requirements for the first six months after the liberation of Europe. The Committee indeed forms an important and valuable basis for setting up the proposed United Nations Requirements and Rehabilitation Association. Mr. Nemec emphasized once more that the technique of executing

and rendering speedy relief to the enemy-occupied territories leads naturally to the second task of economic rehabilitation, which is essential if the European nations and European civilization are to be saved.

The requirements of the 'master plan', Mr. Nemec indicated, are based, so far as foodstuffs are concerned, on British consumption, giving due consideration to variations in climate and to any unusually severe malnutrition as well as to differences in the general diet of the countries concerned. Animal and vegetable oils and fats are of particular importance, and a maximum consumption of 70 per cent of the pre-war consumption has been accepted for the first six post-war months, for countries like Britain where the consumption is high, and smaller restrictions for