

## BELGIAN COASTAL EROSION

By Dr. Roger H. Charlier

The 50 miles of Belgium fronting the North Sea is the site of a major part of the recreation industry of the country. The coast shows little variety and the coastline is nearly straight. It is low, but immediately beyond the beach are sand dunes varying in width from 1,000 to 2,000 yards. Their average height is 50 feet while the highest point is at Coxyde, where the Hooge Blikker is about 106 feet high. (1) The dunes narrow in the East to less than 25 yards in places.

All along the coast flourishing shore resorts have developed, but for more than two years great concern is shown for their very existence. The beach is composed of two different sections: the *slikke*, a muddy, hard, wet type of sand, regularly covered by the waters at each tide, and the *schorre*, a clean, dry, light sand above the waterline except at the high seasonal tides known here as *marées d'équinoxe* or still *marées de syzigie*. Notwithstanding continuous preventive efforts, the Eastern section of the Belgian shore between Heyst and the Dutch border is gradually disappearing. In Heyst, except for a strip some 100 yards long, the *schorre* has disappeared, and with it a good many of the tourists who used to make Heyst their summer rest resort. It is difficult, if not impossible, to obtain accurate figures illustrating the gradual drop in visitors, since the statistics used by the municipal administration vary according to the purpose to be served. For publicity purposes the Administration uses the number of overnight guests who slept at least one night in Heyst: then statistics register a continuous increase from about 450,000 in 1951 to 700,000 in 1954. However, when the Administration, which was incidentally elected on a platform of "Save the Beach," openly presses the National Government for action, then it uses the number of persons who spend their holidays as a block: these statistics indicate a decline of 35% from 1952 to 1954. These vacationers who remain for at least two weeks actually form the backbone of the tourist industry.

These economic consequences are quite distressing in as much as more than two-thirds of the year-round residents of Heyst depend on summer tourism for their living. Heyst and Duinbergen, although two separate resorts, are only one commune: the majority of the permanent residents were fishermen before 1920. Since tourism developed, the number of hotels and pensions has steadily increased. Today, of 7,803 permanent inhabitants, an estimated 2,600 live from the fishing industry and 5,200 from tourism. Heyst has 17 major hotels, 28 pensions, Duinbergen has 9 hotels and 11 pensions; both have hundreds of rooms and apartments.

Less advanced but impending is the destruction of the Duinbergen, Knocke, Albert-Plage, and Le Zoute beaches. The waters are yearly carrying away tons of dry sand and the *schorre* is rapidly shrinking. At Lekkerbek, east of Le Zoute, the *schorre* is completely gone and while at Het Zwyn dunes still resist the advance of the sea, engineers foresee the possibility that Het Zwyn's plain may

(1) RAHR, E.: *Au pays des grandes dunes*. Bruxelles, Touring Club de Belgique 1928.

ROUCH, J.: *Pour comprendre la mer*. Paris, Hachette 1923.

VAN BLADEL, Georges: *Le littoral belge de la mer du Nord*. Bruxelles, Ligue Maritime Belge Aout 1930.

WERY, Joséphine: *Sur le littoral belge*. Bruxelles, Lamertin 1908.

ZEEMANSIGIDS voor Nederlandsche Kust. 's Gravenhage, Van Cleef 1930.

be one day again directly connected with the sea. Were storms like those of 1953 and 1954 to recur, the entire coast might be endangered.

It must be kept in mind, indeed, that the Belgian shore is a rather recent geologic formation. The Zwyn, for instance, was the source of Bruges' wealth in the XIVth and XVth centuries, when it connected the city directly with the North Sea.

During the Quaternary, the Flandrian Sea covered Flanders, Antwerp, almost all of Brabant and a sizeable part of Namur. Recently only (estimated since 5000 BC) a positive level movement caused the Flandrian Sea to withdraw to about 6 to 9 miles beyond the present coastline. Consequently, today the continental platform projects at a great distance from the shoreline and the waters covering it are not very deep. (2)

However, ever since the beginning of the Christian era, the sea has regularly conquered territory from the beaches. (3)

There are no plans for readjustment of the permanent population, since the only other means of earning a living is the fishing industry, itself saturated at the present time. Meanwhile, profits have been dropping, some seasonal businesses have relocated, but there is no solution in sight for hotel operators, small pension owners and those who live from summer rentals.

The emphasis has been put on saving the beaches and restoring them rather than to attempt any mass readjustment.

Engineers have constructed new jetties but little or no results have been booked regardless of expenses nearing the \$3,500,000 mark. (4) The erosion process seems to result from the marine currents striking the Belgian coast from East to West; currents start near the mouth of the Scheldt River and gradually come closer to the shore striking it between Het Zwyn and Zeebrugge. No effects are felt beyond Zeebrugge because of the wave-breaking action of the mole. The sea waters attack the beaches directly and carry the sand to a sandbank located at about 1/7 of a nautical mile or approximately 200 yards from the beach itself between Heyst and Le Zoute. This sandbank, the Paardenmarkt Bank, is split in two parts by the Appelzak Channel. Each outgoing tide has taken away some more dry sand. Each incoming tide has brought in less dry sand, because the sand carried away from the shore is ultimately deposited in the Appelzak Channel which is gradually filling up.

Present plans call for the lengthening of the last jetty within Belgian territory. Partial prolongation had adverse results because the waters that spared the Lekkerbek area stormed with twice as much vigor the beaches of Het Zoute and Knocke. Hence, the lengthening of the last Belgian jetty and of those of the Lekkerbek region seems the only wise solution. Waters must be redirected so that

(2) CHARLIER, Roger & PULINX, Lucienne: *Géographie de la Belgique*. Anvers, Pol Meire 1942.

HAENECOUR, B.: *Formation de l'Escaut Maritime et de la côte environnante*. Soc. Roy. Géogr. Belg. Jan. 1947 (Abstract).

LERICHE, MAURICE: *Géologie de la Belgique*. Bruxelles, Lamertin 1923.

(3) MASSART, JEAN: *Pour la protection de la Nature en Belgique*. Bruxelles, Lamertin 1912: "The dune still advances. The inhabitants corked the hollows, thus avoiding the invasions of the sea, but the sinking of the soil continues, hence if the barrier ever crumbled, the sea inundation would reach further and further inland."

(4) The Bridges and Highway Service, under whose jurisdiction the Hydraulic Service falls, refuses to disclose any of the attained results. It is assumed that this attitude is taken in view of the growing concern of the public opinion.

they do not any longer strike the coast with great violence: they will be thrown from the last jetty to those of the Lekkerbek and thence to the high seas. Lengthening of the jetties of Heyst until they reach the Appelzak will avoid any attacks directed perpendicularly to the coast.

Meanwhile, the entire matter of beach erosion has become a hot political issue and efforts of the National Government are closely followed by the inhabitants of the affected areas, since the value of real estate as well as earnings and profits has declined too rapidly.

