

S GEORGE V, A. 1918

(a) The main object to be attained by instituting a closed season for fishing is the protection of the beds during the breeding season. Incidentally, however, a second benefit naturally accompanies the one sought, for by limiting the length of the season, the extent of the fishing will likewise be diminished. Since the chief commercial shells so far shipped are *Quadrula plicata* and *undulata*, and since these species have short periods of gravidity during the summer months, the closed season restriction peculiarly applies to the Grand. But the river also supports other shells of some commercial value which have long breeding seasons, and thus the protection afforded would not be sufficiently wide-reaching. This will be particularly true in case of artificial propagation. Besides, an interruption of fishing operations during a few summer months would seriously interfere with the industry.

(b) At present the shells are obtained in one way only, as described above. This method is fortunately not the one against which complaints are generally made. Although it roots up the bed it does not unnecessarily injure the mussels which are too small for commercial purposes, and these should be returned to the water.

(c) It is obvious that there is a limit to the size of a shell beneath which it is pure wastefulness to retain it. The fishermen and the button manufacturers lose time in handling the material and the beds are depleted at a much greater rate than they would otherwise be for the same finished product. A limit for every species is, as a rule, impracticable if for no other reason, at least for the fact that the determination of species is sometimes difficult. After a size limit has been decided upon, considerable details will have to be worked out in order to satisfactorily enforce any regulations agreed upon.

(d) One of the most immediate protective measures is that of closed areas. This best meet the case of the long breeding species and gives them an opportunity to restock areas, preventing for a term of years the disturbance of gravid clams some of which, when disturbed, discharge the young even though not mature. It also favours the building up of beds by allowing the young clams to establish themselves. The system on which a river or portions of it are to be closed, and the time and duration of areas closed can best be determined by studying field and biological conditions.

(e) By the granting of fishing permits as at present on the Grand, no doubt the number of shellers is thereby limited. It is a question, however, just how far the interests of a private person or firm are safeguarded as well as those of the fishing grounds. Although such a fishing permit was granted with a view to stimulating shell prospecting it nevertheless undoubtedly discriminates against other persons or firms. If fishing licenses were granted to resident fishers, thereby emulating the exploiters or such persons as would not wish to follow up the industry, no doubt good results would be obtained. This would also leave to fishers the opportunity to sell to such firms as paid the best prices.

## RIVER AUX SABLES.

In the brief survey of this river for shells I confined my attention chiefly to its lower stretches from which reports of abundance of shells had come in.

The east branch of the river rises a short distance north of Jaffa, in the township of Hibbert, county of Perth. The west branch has its course several miles to the west of this point and the two branches unite near the northern boundary of Stephen township. After a course of about 90 miles the river enters Lake Huron at a point 12 miles, almost due west, from the confluence of the two branches. This U-shaped river is remarkable for its meandering course and for its apparently recent geological history.

Until about 25 years ago the river outlet was not as now, but at a distance of 10 miles further south, near the village of Port Franks. It is an artificial channel