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## PARLIAMENT OF TASMANIA.

INSPECTOR OF FISHERIES:

REPORT FOR HALF-YEAR ENDED 31 DECEMBER, 1888.

Presented to both Houses of Parliament by His Excellency's Command.



## FISHERIES DEPARTMENT.

REPORT for the Half-year terminating 31st December, 1888.

201, Macquarie-street, Hobart, 14th January, 1889.

I HAVE the honor to present you with my final Report in association with my engagement as Superintendent and Inspector of Fisheries of Tasmania, and which engagement during the past year and a half has been limited to my required attendance in the Colony for two months only in the course of the year.

My attendance rendered has been connected mainly with the subject of the Oyster Fisheries. Since the presentation of my last Report, in June, 1888, but little has transpired to place on record, it being too early yet to assess the outcome of the summer spatting season and operations on the Oyster Reserves pending the uncertainty as to their continued maintenance, combined with a shortness of funds for their further development having been almost entirely restricted to their protection. I propose, in consequence, to devote this Report to a short account of the general condition and prospects of the Oyster Fisheries of this Colony as influenced by the operations connected with them with which I have had the honor of being associated within the past four or five years.

Briefly summarised, I may state that on my appointment in May, 1884, the Oyster Fisheries of Tasmania were practically an obsolete industry. About twenty years previously they were so productive as to have been estimated, at current prices, as representing in one single year a value of upwards of £90,000. (Report Royal Commission of Fisheries of Tasmania, p. x., 1882.) Through over-dredging and the reckless destruction of the young brood or spat, the natural beds had for commercial purposes become completely exhausted. Now and again spasmodic efforts had been made in various localities to revive the fisheries by artificial cultivation. Such efforts, however, owing to the absence of practical knowledge on the part of the cultivators, were attended with negative results. No brood or spat was collected, and the more or less complete sacrifice of the oyster stock laid down was in most instances involved. So soon as opportunities had been afforded me of making myself personally acquainted with the condition of these fisheries and the latent capabilities of the Tasmanian coast line, recommendations were made by me for the establishment in such suitable districts as I should select of efficiently protected Government Reserves upon which breeding stocks of oysters of the best quality should be carefully cultivated and permanently retained. These Reserves were designed to fulfil the double purpose of breeding centres from whence the surrounding waters would be re-stocked, and also of model oyster farms around which private beds would be established on similar lines and contribute yet further towards the resuscitation of the Oyster Fisheries.

Adopting the above recommendation, the Government authorised my establishment of the proposed Reserves in such places as I might select, and the number of which has been increased from year to year. The general principle involved in the establishment and conduct of these Government Oyster Reserves has been identical throughout, corresponding essentially with the system developed so extensively in recent years on the coast of France. Such system, I may remark, however, is of considerable antiquity, having been in operation in Lake Fusaro, in Italy, from the time of the ancient Romans to the present day, and from whence M. Coste derived his ideas of and introduced the same system so successfully in French waters. Attempts have been likewise made to establish the same system of oyster culture on the English and Irish coasts, though hitherto, owing apparently to climatic influences, without any marked success.

Sir,

The system of oyster cultivation adopted consists of laying down stocks of breeding oysters in suitable localities, and in association with them various descriptions of materials and appliances for the collection of the oyster brood or spat. Faggots of wood or "fascines" were most profitably employed as spat collectors by the Roman cultivators. Similar collectors are extensively used in the French fisheries; but the most efficient forms introduced by M. Coste consisted of earthenware tiles and pipes coated with cement. Earthenware collectors being too expensive for profitable tiles and pipes coated with cement. Earthenware collectors being too expensive for promatic employment in Australian waters, and but few of the native woods yielding satisfactory results when utilised as fascines, some other cheap and efficient description of collector was in demand. This desideratum, after some years' trial, has been effectually supplied by the writer through the medium of the common commercial article known as "split palings," which can be obtained throughout the colony at the cheap rate of from 8s. to 10s. per thousand. These paling collectors are coated on their under surface with cement, a brick is securely fastened underneath at each end to give them stability, and a wire loop through the centre of their upper surface forms a convenient handle by which they can be manipulated on shore, or be raised with a boat-hook from beneath the water for examination. Other collectors, but of necessarily more expensive construction, introduced by the writer, have consisted of slates attached to wooden frames or simply suspended in the water. Additional apparatus that has been advantageously employed by the writer in association with Tasmanian oyster culture consists of portable wired frames whereon the oysters are laid, and raised some inches off the bottom of the water. Under such circumstances it has been found that the oysters grow with remarkable rapidity, and being covered with the collectors, are protected from the many enemies such as crabs, starfish, stingrays, and a certain species of shark, Cestracion, that devour them under their normal conditions. Through the employment of these frames it has been them under their normal conditions. further found possible to cultivate oysters on ground otherwise too soft for such a purpose, the areas adapted for their cultivation being thus, with their aid, greatly extended. Handles being fixed to the frames so that they can be easily raised, facilities are afforded for cleaning, manipulating, and maintaining a surveillance over the condition of the oysters otherwise unattainable. Somewhat similar appliances, known as ambulances, have, I have ascertained, been introduced on certain of the French oyster grounds chiefly for the culture of the young brood.

Before proceeding further, it is perhaps desirable for me to remark here that, as indicated in previous reports, the operations undertaken under my supervision on the Government Reserves within the past few years have been initiated with the sole object of obtaining the most rapid and abundant possible propagation of the oysters laid down. Their special manipulation, assortment, and preparation for the market falls strictly within the province of the private growers. It was at the same time intended, had the opportunity been afforded, to have followed up their successful propagation with practical demonstrations of special methods of 'oyster fattening for consumption.

The sites selected by me for the establishment of the Tasmanian Government Oyster Reserves were primarily Spring Bay and Little Oyster Cove. Similar reserves were subsequently inaugurated at Little Swanport Lagoon, George's Bay, the River Tamar, Battery Point, and Shipwrights' Point. Among the most formidable obstacles associated with the formation of these Reserves has been the requirement of sufficient stocks of breeding oysters for laying down upon them. These have been collected laboriously and by degrees, chiefly from the old deep-water beds off Swansea, and have been sufficient only for the initiation of operations on a very modest scale. Spring Bay and Little Swanport Lagoon may be referred to as representing the stations at which the most marked results have been obtained. These two districts alone formerly produced about two-thirds of the entire yield of the Tasmanian Oyster Fisheries, so many as eight million and five million oysters respectively having been dredged from them in a single season. At Spring Bay, in which the first established reserves are located, the oysters, previously practically exterminated, have so multiplied and spread from the stocks laid down as to afford profitable employment to the local fishermen there to dredge them for further stocking the reserves and private fisheries. In a recent communication from the district overseer of these Reserves, I am thus informed-" While throughout the more than ten years previous to the establishment of the Government Reserves the local oysters had almost disappeared, they are now present in millions, filling up the beds and bay, and adhering to everything, including stakes, stumps, rocks, old bottles, crockery, and other refuse in the water, and even to the bottoms of the vessels stationed in and that frequent the Port." The most practical testimony as to the substantial progress that is being made towards the revival of the oyster fisheries in this district, as well as to the confidence commanded by the operations initiated, is perhaps adduced by the fact that as many as fifteen areas, ranging in size from one to sixteen acres, are already occupied or have been bespoken by individuals or associated companies for the purpose of forming private fisheries. It is anticipated that within a very few more years the entire remaining area in Spring Bay available for such a purpose will be similarly taken up. An outline chart, indicating the localities already occupied by the Government Oyster Reserves and private fisheries in Spring Bay, is herewith annexed.

So far as the District of Spring Bay is concerned, the object originally aimed at has been practically accomplished. Oysters are again growing there in abundance, and an important and rapidly extending industry in the direction of their artificial culture has been established. At Little Swanport Lagoon a small Government reserve was formed in the year 1886. Two complete summer spatting seasons only have elapsed since then, but the quantity of brood or spat that has been deposited on the collectors and cultch on the bed and adjacent area within this period exceeds in comparative abundance that produced at Spring Bay. Examples of collectors from these two localities, illustrating the adherent artificially cultivated oysters in all stages of development, have been placed on view in the Fisheries Court of the Melbourne Centennial Exhibition. Areas for the establishment of three private fisheries at Little Swanport have been taken up, and it may be predicted that within a few years this inlet of the sea, in conjunction with Spring Bay, will, as in former times, yield a supply of oysters sufficient for an extensive export trade. A third station on the East Coast, where a Government oyster reserve has been established, is the entrance of Swanwick River, Great Swanport. A remarkably large deposition of spat has also been secured on the collectors placed on this reserve, and the locality, while not so ready of access as the two preceding stations, is well adapted for the formation of private fisheries.

The two Government Reserves at Little Oyster Cove were formed in the year 1885, on sites originally selected by the Tasmanian Oyster Culture Association. During the first two years of their establishment a considerable amount of spat was deposited on the collectors. For the past year or two, however, while a remarkably rapid growth has accrued to the oysters laid down, a very small amount of spat has been taken, and, in consequence of the altered condition of the beds, the question as to the desirability of their further maintenance may be raised. In association with the formation of a new road along the foreshore of this bay culverts have been constructed which discharge flood-water with suspended sediment in the immediate vicinity of the Reserves, while at the same time a general silting up of the foreshore around the margin of the cove is in progress. A small and comparatively clean area remaining on the opposite or north shore of the cove, I had intended transporting to it, so soon as sufficient funds were available, all the stock and apparatus now on the other Reserves. In connection with my more recent visits to this locality, however, it has become clear to me that it is not one on which oysters will propagate abundantly, nor a locality constituted, like those already referred to on the East Coast, to form the centre of extensive private ovster fisheries. One special circumstance, hitherto unrecorded, that militates very seriously against the successful maintenance of the oyster reserves and private fisheries in this district, is the great and increasing extent of the ravages of a species of teredo, or shipworm. In a very short space of time this boring mollusk completely riddles and destroys the stakes, collectors, frames, and all articles of wood employed in oyster cultivation. This enemy has, so far, limited its destructive attacks to the oyster beds in this bay and a private fishery in the adjoining one of Great Oyster Cove. Taking these several circumstances into consideration, it would be judicious, in my opinion, to utilise the stock of oysters on these beds for the establishment of new reserves in other centres, particular care being taken in effecting their transport not to export with them any of the teredo-infected woodwork.

In the years 1885-6 operations were initiated in the direction of resuscitating the oyster fisheries of the Tamar estuary. As recorded in my Report for the year 1885, natural conditions, influenced to a considerable extent by human agency, had so modified the character of this river that oysters no longer survived in any but its lowest portions. Originally plentiful as high up as Whirlpool Reach, the West Arm then represented the highest point where a few oysters still grew naturally. A small experimental reserve was established there, which it was found desirable a year later to transport to a more desirable locality yet nearer the mouth of the river; and by the present time it has been practically demonstrated that the area between George Town and the Tamar Heads is alone adapted for the purpose of artificial oyster culture. In this association it has been further found that while the indigenous species of oyster, Ostrea edulis, does not now thrive in this district, it seems well adapted for the culture of the New South Wales and Queensland rock oyster, C. glomerata. A small stock of this variety has been experimentally placed on the beds, and has so far made astonishing progress. That the species can withstand exposure to the severer temperature of the Fisheries Establishment formerly in existence at Battery Point. It remains yet to be seen whether the species will propagate abundantly in Tasmanian waters, in which case there is an extensive area adapted for its culture in the district named, coinciding closely in character with that of some of the best rock oyster producing grounds recently visited by the writer in New South Wales and Queensland.

Two remaining stations at which Government Oyster Reserves have been established are those of Shipwrights' Point, in the Huon estuary, and George's Bay, on the North East Coast. Sufficient time, however, has not yet elapsed, nor has sufficient attention been given to these reserves to demonstrate whether oyster culture can be profitably conducted in those two neighbourhoods. A Reserve was also formerly associated with the Fisheries Establishment at Battery Point, and it is of interest to record that last year, shortly after its dismantlement, a number of young oysters propagated from the stock laid down were found attached to the stones in its vicinity.<sup>\*</sup> This fact demonstrates that the locality was not ill chosen for the maintenance of a small model Reserve at which private growers could at a short distance from town be made familiar with the best methods and apparatus for artificial oyster culture.

\* This circumstance has been attested to me by Mr. Henry Maning, Clerk Assistant to the House of Assembly, to whom the young oysters were exhibited.

Among the directions in which I may now point out that the resuscitation of the Oyster Fisheries of Tasmania may be substantially advanced is the founding of a Government Reserve in the neighbourhood of Southport. This township was formerly the central station of one of the most important natural Fisheries, and represents a district in which, as mentioned in my last report, I proposed establishing a Reserve as soon as sufficient means were available. The Carlton River, near Pittwater, and Port Sorell, on the northern coast line, are additional stations where the establishment of smaller Reserves were contemplated, in anticipation of their constituting the centres of extensive private Oyster Fisheries.

The future progress and development of the Oyster Fisheries of the Colony will now, it is anticipated, be assured to a large measure by private growers. The industry of artificial oyster culture, as now established at Spring Bay and Little Swanport, is likely to extend to other suitable localities, and will, no doubt, lead to operations on a larger scale than has yet been attempted. Hitherto, the formation of a Government Reserve or Private Fishery has been associated only with the laying down of a few thousands of oysters, and the expenditure of less than one hundred pounds. In order to obtain substantial returns, millions in place of thousands of oysters should be dealt with, and a considerable area should be adequately stocked and carefully worked by some associated company, if beyond the scope of private individuals. In this connection, the greater unoccupied portion of Little Swanport Lagoon might be safely recommended as offering unprecedented opportunities for the establishment of a profitable Fishery. Cloudy Bay Lagoon, again, in the D'Entrecasteaux Channel, formerly a most productive oyster ground, offers special inducements for the establishment of an extensive Fishery, and was referred to in my report for the year 1884 as possessing natural features that correspond in a remarkable manner with those of Lake Fusaro in Italy, and the products of which, under skilled management, it might be made to rival. There are numerous other land-locked bays and lagoons around the coast that present similar facilities and inducements for commercial enterprise.

Before dismissing the subject of the Oyster Fisheries it is incumbent upon me to bear testimony to the satisfaction and ability with which the caretakers and assistants employed on the various Government Reserves have accomplished the works and acquitted themselves of the responsibilities committed to their charge. A list of their names has been already submitted to you, and I have every confidence in recommending their continued engagement. The valuable services rendered by Mr. Joseph M'Cluskey, as Overseer of the East Coast District, including the Government Reserves at Spring Bay, Little Swanport Lagoon, and Swanwick River, are too well known to you to require further comment on my part.

Among the few remaining topics that demand brief mention on the present occasion, it is a satisfaction to me to have the honor to report to you that the Blackfish (Gadopsis marmoratus), brought by me from the Northern rivers and liberated in the Derwent in the year 1887, have apparently established themselves in that river, reports of their capture having been recently recorded in the daily papers. Details of the method adopted for the successful transport of these fish are included in my Report for the year 1887. Additional evidence as to the re-establishment of the Cucumber Mullet or Grayling (Prototroctes marcna), raised from artificially fertilised ova obtained from Northern fish and liberated by me as fry in the same river, is also to hand.

Some further opportunities have been recently afforded me of examining examples of the acclimatized Salmonidæ sold in the Hobart market as English salmon, and so classified in the Returns published under the authority of the Fisheries Board. Certain of these fish were undoubted estuarine varieties of the Brown Trout, Salmo fario, while the most salmon-like examples examined correspond in every essential detail with the ordinary form of the Salmon Trout, Salmo trutta, and lacked the diagnostic distinctions afforded by the dentition, scales, relative length of the maxilla, and number of pyloric appendages that characterise the typical English or Atlantic Salmon, Salmo salar. So far no alteration in the position of the question regarding the acclimatisation of the last-named species in Tasmanian waters would appear to have been brought about. The 30,000 odd fry, known as the "Yeoman" consignment, turned out in the year 1886, have apparently, on descending the rivers as smolts, followed in the wake of their many thousand predecessors similarly liberated within the previous twenty years. Whether any more favourable results will attend the latest and crucial experiment now in operation, represented by the "Kaikoura," 1888, importation, from which some 150,000 healthy salmon fry have been reared, remains to be seen. Whilst wishing every possible success to this experiment, it would be presumptuous, in face of the teachings of the past twenty-four years, to prognosticate it. Adhering to the opinion expressed in my most recent Reports, I still regard the higher temperature of the Tasmanian, as compared with that of the British seas, as affording the most logical explanation of the fact that the young Salmon, after descending to salt water, do not return to the rivers in which they were bred; the probability being that they wander away in search of colder water, and are lost to view in the vast expanses of the Southern Ocean. Prospects of acclimatising the Atlantic Salmon in the latitudes of Southern New Zealand would appear to be more encouraging, and much interest is necessarily attached to the results of the successful culture of the large shipment of half a million Salmon Ova now on the way out from England to that Colony. Should the species be established in New Zealand, less difficulty would probably be associated with its

acclimatisation in Tasmania from that colony than obtains in the case of direct importations. In the event, however, of these latest experiments failing, I would earnestly recommend the Government of Tasmania to devote some attention and expenditure to the possible acclimatisation of the Pacific Salmon, Salmo quinnat. This species, if perhaps not quite so delicate in flavour as the Atlantic species, would be of equal value as an item of revenue, it, in fact, supplying the bulk of the world-famed tinned article that constitutes such a source of wealth to the United States. An element strongly in favour of the possible acclimatisation of the Pacific Salmon in Tasmania is the fact that it thrives in water of a considerable higher temperature than those to which the Atlantic species is limited.

Assuring you, in conclusion, of the pleasure it will at all times afford me to assist by advice or otherwise through my association with the Fisheries Departments of other of the Australian Colonies in promoting the interests and further development of the fisheries of Tasmania, and, with grateful acknowledgments of the support and consideration experienced at your hands throughout the tenure of my engagement as Superintendent and Inspector of the Fisheries of this Colony,

I have the honor to be,

Sir, Your obedient Servant, W. SAVILLE-KENT, F.L.S., F.Z.S.

The Hon. the Chief Secretary.

## WILLIAM THOMAS STRUTT, GOVERNMENT PRINTER, TASMANIA.



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