

“TROUT IN SOUTH AFRICA”

From Newspaper Cutting Book of W. Wardlaw Thompson, Dept. of Agriculture,
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(Some quotations from Walton's *Compleat Angler* omitted)

ROUND at the Castle office (i.e. the steamship company), in the sanctum of that rare Piscator, the MacLean of that ilk, you may see a gallant trout that Izaak and his scholar might e'en have eaten to supper—aye, marry. Not now, by'r Lady, for he is by this time somewhat overpickled, is that trout, in his glazed bath of spirits of wine. (This solves the mystery of the disappearance of MacLean's historic 3 lb. brown trout, a survivor of the shipment of eggs imported in 1884, and hatched in the woolwashery near Ceres Road station. Some were washed out into the Breede River during heavy floods, but this specimen survived in a pond until 1890. Under the impression that W. W. Thompson in his chapter on "Trout and Other Freshwater Fishes" in *Sea Fisheries of the Cape Colony*, Maskew Miller, 1913, meant that this fish had been stuffed, we have made enquiries about it for years. Doubtless, as it was preserved in a bath of alcohol, it came to grief and was thrown away.)

But there was a time when a supper might have been made of that trout, albeit he is a trout born and bred in South Africa, and give Mr. MacLean but reasonable good fortune, a time shall come when even the Breede River and the Berg River shall bring forth trout in due season, and furnish royally a fish dinner at which there shall be a feast of reason and flow of soul in congratulation thereupon. For hath not this present deponent seen, at the Anneberg of Newlands Brewery a sight of such "troutlets in a pool" as even Lord Lytton's usher might have smiled at? True, they were not yet such trout as that one of them should supply a supper for Piscator and his scholar, for they measured, on an average, but three-quarters of an inch in length. . . . But Rome was not built in a day; you must give these young Cape Colonists time to grow their fins, and then Mr. MacLean will proudly ask with Piscator, "Well, scholar, what say you now?—is not this worth all my labour and your patience?"

Here, therefore, is rhyme and reason why the trout should be worth taking trouble with to acclimatise in Cape Colony, and there is yet more reason in that he is a fish that affords capital sport to the angler, for whom, in the quiet reaches of some of our rivers—there are such—halcyon days may yet be in store. Probably the latter was the prime reason which weighed with Mr. MacLean, and its weight could not have been small to cause him to expend so much time, money and anxiety as he has spent upon this labour of love.

The Early Attempts

The very first attempts at trout hatching in South Africa were made in Pietermaritzburg County, Natal, by Mr. J. C. Parker, in 1881 and 1883, but were on a small scale and unsuccessful. Other experiments on a small scale were also made without success at King William's Town by Mr. Ellis. Mr. MacLean made the next essay, in 1884, and with success, and it is he whom we must beyond doubt hail as the pioneer Trout-hatcher of Cape Colony—an honour to which years of close study of the subject and very laborious care most justly entitle him. Mr. MacLean, who has been an enthusiastic angler from his youth, has taken great interest in trout-hatching, and when he came out here thirteen years ago was a little disappointed at finding no attempt had been made to introduce trout into the rivers of the Colony. (This ignores A. R. Campbell Johnston's attempt, per Donald Currie & Co.'s *Windsor Castle* in February 1875, when salmon and trout eggs were brought out in the ice house for Cape Town and Durban. None survived the voyage.—Ed.) He therefore resolved on the first favourable opportunity to see what could be done.

MacLean's 1884 Importation

In 1883, when the Fisheries Exhibition was held in London, he made a special study of the subject at Home, seeing amongst others Sir James Youl, who was successful in introducing trout into Tasmania, and who gave him much valuable information as to the experiments there. Sir Thomas Scanlen, the Cape Prime Minister, being in London at the time, Mr. MacLean interviewed him on the subject of Government funds for an experiment on similar lines in Cape Colony; and although Sir Thomas was not able to promise Government money for that object he generously gave of his own towards the expense of the experiment.

Sir Charles Mills also took a lively interest, and procured some London financial aid. The result was that Mr. MacLean in February, 1884, brought out here 20,000 trout ova. At Mr. W. Dickson's wool-washery, near Ceres Road station (Wolseley), he was successful in hatching out of these 20,000 ova no fewer than 17,000 fry. But a small thing will sometimes suffice to make the best laid schemes of mice and men gang a-gley; and in this case that small thing was the zinc lining to the hatching boxes. While Mr. MacLean was away up country, oxide of zinc formed in the water, and speedily played havoc with the little fry. The sixty saved were placed in a pond, supplied by a stream from the Breede River. One fine day (this is a figure of speech, as other accounts say that it was very wet—Ed.) the trout escaped out of the pond into the river, and then, like the Negro Boys, "there were three . . ." and they waxed fat in their pond until one hot day in February 1890, when . . . the water had got too low and the sun too high (some "little nigger boy" versifying is omitted—Ed.) . . . all that was left of them, left of 17,000, was the fair red and gold specimen, weighing three pounds avoirdupois, now to be seen in Mr. MacLean's sanctum at the Castle office, as hereinbefore set down.

However, that three-pounder in pickle is an ocular proof that it is possible successfully to acclimatise trout in South Africa, and doubtless the success of Mr. MacLean's experiment in some degree influenced the Natal Legislative Council in 1889, when they voted £500 for the purpose of introducing trout and salmon into Natal.

Negotiations and Plans

Having proved that acclimatisation in the Cape was possible, Mr. MacLean endeavoured to induce the Government to provide funds for further experiments, as that just conducted had necessarily proved rather expensive for private enterprise to undertake. Sir Gordon Sprigg's Government pleaded the farmers against the proposal, and did not see it. (*sic*) With the present Government Mr. MacLean was more successful, "and I want", said he to the present writer, on being asked for information, "to give particular credit to Mr. Sauer, who has the satisfaction of being the Minister who provided the funds for the first really successful experiment in introducing trout into the country". Mr. Sauer promised that a sum would be placed on the Estimates for defraying the cost of a further experiment, and on his suggestion Mr. Ronald Trimen and Mr. W. C. Fairbridge were associated with Mr. MacLean in the matter on the Government's behalf. Neither gentleman had any previous experience to boast, but both, we believe, have taken a great interest in the work.

As a first stage, information regarding Australasian experience was sought, Mr. MacLean writing a long letter on the subject. It appears they have been thoroughly successful in acclimatising trout in Australasia, but we have it on the authority of Sir Charles Mills, who made special inquiries from the Agents-General of the Australasian Colonies in London, that the success of the salmon experiment was somewhat equivocal. Although they have been successful in hatching out salmon ova and introducing a large number of salmon fry into the rivers, they have never proved that these fish after leaving the rivers for the sea came back to the rivers as salmon, so that they have really not yet introduced salmon into the Australian rivers. This guided Mr.

MacLean and his colleagues in deciding to attempt this year only the acclimatisation of trout. An experiment with salmon may be tried next year; in fact, the Duke of Roxburghe who visited the hatchery the other day promised to send out some salmon ova in January next.

The trout experiment being on a large scale this time, and it being indispensable that a trained expert should be in constant attendance, it was recommended to the Government to procure the services of a trained working expert, who should come out from England with the hatching boxes to superintend the erection of the necessary appliances and the hatching of the ova; and later on such an attendant was secured in Mr. Latour, a gentleman of French extraction, a life-long enthusiast in the study of his interesting science.

The Newlands Hatchery

Meanwhile the Committee cast about for a site for hatching more accessible from Cape Town than the Breede River, and as the requirements were, on the one hand, proximity to an ice factory for the supply of ice used in reducing the temperature of the water used for hatching the ova, and on the other hand, an available supply of cool pure water as free as possible from sediment, the choice fell upon Newlands, since there is an ice-factory there, and Newlands spring water would answer better than any other the Committee were acquainted with. Mr. MacLean therefore called upon Mr. Ohlsson, M.L.A., through whose property the water runs, and that gentleman readily offering every assistance, a consultation with his engineer resulted in the selection, for the hatchery, of a cool well-ventilated basement room in the old mill adjoining Anneberg Brewery.

This provided for, the Committee ordered from England (from Thos. Andrews, of Guildford, Surrey—Ed.), through Sir Charles Mills, 100,000 trout ova, comprising:—

Ordinary brown trout (<i>Salmo fario</i>)	....	....	....	....	70,000
Loch Leven trout (<i>Salmo levenensis</i>)	....	....	....	....	30,000

Of these, the first box of 50,000 arrived by the *Roslin Castle* on March 16th, and were placed in the hatching boxes on March 19th; the next box arrived by the *Tartar* on March 24th, and were placed in the hatching boxes on the 26th; and the third lot arrived by the *Hawarden Castle* on March 30th, and were placed in the hatching boxes on the 2nd of April instant (*sic*).

The results achieved with the three consignments have been diverse. The first—the *Roslin's*—arrived in fairly good condition, but unfortunately a very large percentage of the ova fell victims to one of three contingencies which somehow always will happen in these experiments, and which would have been guarded against had Mr. MacLean's directions been strictly followed. In fact they were killed during the hatching process by rust which formed in the water owing to its passing through iron pipes. The hatching boxes, and the expert with them, were particularly ordered out at least two or three weeks before the ova, but unfortunately reached here only about twenty-four hours before the ova; consequently experiments with the water (which is very soft) could not be made before the ova were placed in the hatching tray. *Hinc illae lacrimae!* (Hence these tears!)

Then the second lot—the *Tartar's*—were found to be in very bad condition—whether from want of care on the voyage, or whether the eggs were not impregnated from the first, could not be ascertained.

The third lot made up, however, for these very trying disappointments. They arrived ex *Hawarden* in splendid condition, and the rust having been conquered at the hatchery, are hatching very satisfactorily indeed—as the writer, by Mr. MacLean's courtesy, was able to see for himself on paying a visit to Newlands for the purpose.

The old mill cellar, with its walls of fortress-like thickness, forcibly reminds the visitor who descends into its coolness of the famous castle dungeon hallowed by the poetic footsteps of the Prisoner of Chillon. (François de Bonnavard, d. about 1570, Genevian prelate and politician. Byron.) And when one learns the anxiety and dread of mishap that brood upon the nightly watchers there, lest some deadly enemy hitherto unsuspected should suddenly spring up and deal *coups de grâce* amongst the precious ova, it seems possible that either of the two attendants, or even Mr. MacLean himself, might outdo Bonnavard himself by getting their hair turned white in a single night before the series of "interesting events" is over and the white glove is put on the door-knocker;—Mrs. Poyser's lying awake o' nights with ten gallons of milk on her suffering mind is nothing to it! To a lay eye, however, no reasonable precaution seems to have been omitted—you can hardly provide a separate midwife for every one of these 100,000 births.

The idea is, of course, to give the trout eggs a cool pure stream of water in which to mature into little fishes in an easy natural way, just as they might in an English river, or, in the case of *Salmo levenensis*, their habitat, the loch made famous by the imprisonment of Mary, Queen of Scots. In this cool birth-chamber, or hatchery, we have the stream conducted over a series of gentle waterfalls mounted on wooden stands, after the water has been cooled by passing through worm-pipes covered in ice, and purified by straining upwards through filters of charcol and canvas. It would only confuse the gentle reader to go into detail about the six-inch pipes and the filters here and filters there, and the ice-boxes and the rest of the paraphernalia. Suffice it that the object is by any or every means to exclude everything that defileth, and iron rust in particular, and to keep the flowing gentle stream of limpid water to a temperature of about 59 degrees Fahrenheit. Another time rust will be guarded against more effectually by employing none but earthenware pipes for conduit purposes; these iron ones had been laid down before the rust became a factor in the calculations.

To resume then, the purified and cooled water flows gently down through the series of hatching boxes, three rows arranged in succession of five steps. Lifting reverently the cover of one of these wood boxes, we find within it five oblong wire trays, and on the bottoms of these trays, through which the water is flowing, there lie the little trout ova, opaque white globules, round eggs, about the size of this O. (If the writer's eye was caught by "opaque white globules" on the trays, these were not destined to produce alevins. The capital O of the original article printed in the type used in those days was far too small to convey the average size of a trout egg.—Ed.) From the day the ova are taken from the parent fish until the fish are hatched takes about ninety days in England, or sixty days here (depending on temperature). (The latter was a pure guess. No one had had the opportunity of stripping brown trout at the Cape until John L. Scott took his first eggs in June 1895 at Jonkershoek. The hatching period is much shorter than sixty days at a Cape winter temperature of about 50 deg. F.—Ed.) During the first forty days they are in a very delicate state, and must not be handled. (Again for a shorter period at the Cape.—Ed.) Then they become "eyed"—you can see two little eyes on the surface of the eggs—and it is safe to send them on their long voyage from England.

At this stage the ova came from Andrews, Guildford, lying on beds of muslin butter-cloth and wet moss, in layers on trays having bottoms of perforated zinc; and over all in the box ice had continually to be placed and replaced during the voyage out, in order to keep the ova in a state of suspended animation by a temperature of 37 degrees to 40 degrees. After being placed in the hatching boxes here, as they were on April 1st, the ova soon began to show signs of appreciating the ameliorated temperature, beginning to hatch out at once.

In the boxes you may see scores of the tiny embryo fish, half an inch long, chiefly noteworthy for their goggle eyes and the umbilical sac of albumen which each carries

as its food. In this stage the little *alevins*, as they are called, remain frolicking and tumbling about with their ungainly appendages for about six weeks. By the end of that time the umbilical sac has been absorbed and the fish has become a "fry" darting about seeking what he may devour. As there is no food in the filtered water, and rust is not sustaining, you must feed him then or he dies. Over in a trough at the other side of the hatchery there were the fry in all their glory, some thousands of them, an inch or more in length, and much more like reasonable Christian fish in appearance. There they disport themselves in their running stream of filtered water, and are fed on finely-pounded meat—and reckon not of the time when they will go out into the wide world to fend for themselves and afford sport for others.

Nor would they go out there, it may be said, were they not watched and tended with more than a mother's care in this restricted preliminary stage of their existence. Deadly indeed are the perils that encompass the little *alevin*. If one of his own brothers prove a bad egg, and be not removed, there is murder by wholesale. A little white matter exudes from the shell, and so rapidly does this grow and spread that if the hatching tray were left for a night the whole of the ova would be ruined. Armed with tweezers the attendant goes from tray to tray removing the bad eggs as soon as his sharp eye detects them, yet by the time he has got to the end of the trays he may find others freshly "gone" at the top of the series. Then there is rust, a deadly foe already spoken of; and such foes as oxide of zinc, also mentioned. (This was before the general use of bitumen paint in trout culture, to prevent oxidization of metal, and as an improvement to "charring" of wooden boxes etc. to repel fungus.—Ed.) And yet another is suffocation. A heap of gelatinous relatives will get crowded together on the bottom of the tray so as to exclude the water from some poor fish, leaving him to die in an air or gas bubble; unless haply the attendant come and tilt the tray and let the bubble escape so that all may be well.

Outside of the hatchery a pond is being made for the reception of the fry. In shape it is something like a funnel or an ear trumpet, being 20 feet wide and 12 feet deep at one end, and then tapering off to a channel 100 feet long, a foot wide, and an inch deep, thus constructed for the purpose of feeding and examining the fish. This pond will be supplied with a running stream of Newlands spring water, and in it the fish will enjoy themselves for a year or so, preparatory to being removed carefully to some of the rivers of the Colony that may be fixed upon later on. Two of these rivers will doubtless be the Breede and the Berg. "We hope," said Mr. MacLean, "to get about twenty thousand fry out of the lot—possibly twenty-five thousand—and after all our difficulties that will not be bad. It took them nine years to be successful in Tasmania."

Some of the fish will be retained for breeding purposes, a second pond being made for spawning; the rest will go to enrich the rivers. And if anyone asks, upon this, the natural question of how the trout will be protected when placed in the rivers, he may be informed that the means of doing that is already at command. There is in existence an old Act, No. 10 of 1867, which provides for the protection of fishes not native to Colonial waters; and all that will be necessary is that the Governor should proclaim it.



Zinc Poisoning in a Trout Hatchery. Following extremely severe losses of trout ova, alevins, fry and fingerlings at Snobs Creek Hatchery, Victoria, Australia, where the typical pH of the creek water is 6.8; R. J. Affleck, Fisheries and Game Dept., reported on his investigations in 1952. (Aus. Jour. of Marine and Freshwater Res., vol. 3, no. 2, pp. 142-169, 1952.) As the result of over 300 individual experiments, he found that natural acid waters will dissolve zinc from galvanised-iron pipes, and in some acid waters with a very low mineral content 0.01 parts per million dissolved zinc is toxic to brown and rainbow trout ova and alevins. Rainbow trout are more susceptible to

zinc poisoning than brown trout. Mortality amongst trout fingerlings from zinc poisoning may occur after they have been in a zinc vessel for 15 minutes. After removal to relatively zinc-free water, affected trout may appear normal but death may occur within 48 hours. Zinc is an unsuitable material to use in a hatchery with an unbuffered water supply.—A.C.H.

The Newlands Spring Water. Mr. H. W. Cousins, who was Head Brewer at Ohlsson's Brewery, Newlands, for many years, has kindly contributed the following comments:—

“From enquiries I made some years ago it would appear that the water used at Anneberg must have been from the spring which is situated to the right and a little above the ‘Foresters’ Arms’ on Newlands Avenue. This spring is known as the ‘Kommetje Spring’ and was the water used in brewing by Ohlssons at the brewery pulled down about 25 years ago, situated on Newlands Avenue. Mr. Anders Ohlsson himself lived at ‘Monte Bello’ not far from the top of Dean St., Newlands.

“The true ‘Newlands Spring’ is situated just off Kildare Rd. and is behind the ‘Cardiff Castle Bar’ on Main Street, Newlands. I very much doubt if Newlands Spring water was use at the Anneberg Hatchery, for owing to its elevation it would not flow with any force at Anneberg. However, both the Kommetje and Newlands springs have almost identical waters. This I know because we used both these waters at the present brewery at Newlands and we analysed them on many occasions. They were both acid, having a pH range of 5.4—6.0. The acidity was due to a high CO₂ content, and this no doubt was the cause of the rust in the hatching trays.

“This high CO₂ content was probably the reason for a glass-lined 3-inch main being laid from the Kommetje Spring to the present brewery. Later, I had an old 6-inch main from Kommetje to Newlands cement lined, and also the main from the Newlands Spring, in an effort to arrest the high corrosion in these pipe lines. Apart from the high CO₂ both waters contain very little else, and only about .6 p.p.m. of Calcium and Magnesium Carbonates. There is also a trace of NaCl. An ideal brewing water, as we did not have to remove any salts or metals harmful to beer and could add those necessary, such as CaSO₄ and MgSO₄.

“Both these springs are very pure from a bacteriological point of view and the Kommetje wells out from a fissure in rock whilst the Newlands bubbles out from a sand bed in a depression.”