

ONE OF NATURE'S GLUTTONS.

BY DANIEL C. BEARD.

It was one sultry day last summer that I sent a messenger boy down on Fulton street to secure me a model for a picture I was to paint. After a short time the boy returned, bringing with him a most peculiar individual.

A pair of bright gem-like eyes and a blunt nose, together with a broad, tightly-closed mouth, made up a countenance not easily to be forgotten; and his odd shaped head rested closely upon the shoulders. Add to this a pair of short arms terminating in hands of but four fingers each and disproportionately long legs, to which were attached very broad feet, and you have before you a picture of my model.

A musician by birth and occupation, he belongs to the genus *Rana*, known to naturalists as the *Rana pipens*, but to the schoolboy as the bullfrog! The particular batrachian whose portrait adorns this sheet is quite a favorite, in spite of his previous bad character. Although a tyrant and cannibal, he now numbers among his personal friends many well known artists and noted engravers, who gladly drop their brush, pencil, or graver for the pleasure of seeing the frog devour some crab, bug, or insect that has been captured for him. An old fish globe has been brought into requisition, and through its transparent wall the green prisoner now stares at me as I write. The frog had fasted in this crystal prison for over three weeks before it occurred to me that he might be hungry. To make amends for my neglect I spent almost half a day chasing blue-bottle flies around the room with but indifferent success. However, I captured twenty-

all of which he swallowed tail foremost, keeping up a lively kicking and scratching with fore and hind feet to prevent his prey from curling up and biting. Enough water is always kept in the globe to keep its inmate moist, but too shallow for a mouse to drown in. The wily batrachian is well aware of this fact, for it is not until nothing but the head and fore feet of the mouse protrude from between his jaws that he bends his head down, holding it and the mouse under water until the latter is suffocated before it is finally gulped down. Partly to make a more even fight and partly as an experiment to see what the frog would do under the circumstances, a little over a month ago, before putting in a large male mouse, we emptied all the water from the globe. Then ensued a chase; round and round went the mouse, trying in vain to scale the glassy walls, but never missing an opportunity to give the frog a savage nip with its sharp teeth. Round and round plunged the batrachian after him. Once he caught the mouse by the tail, whereupon the mouse turned and mounted the slimy back of his enemy and bit him severely; but quicker than thought the powerful hind leg of the frog swept the mouse from his back and dashed it violently against the side of the globe.

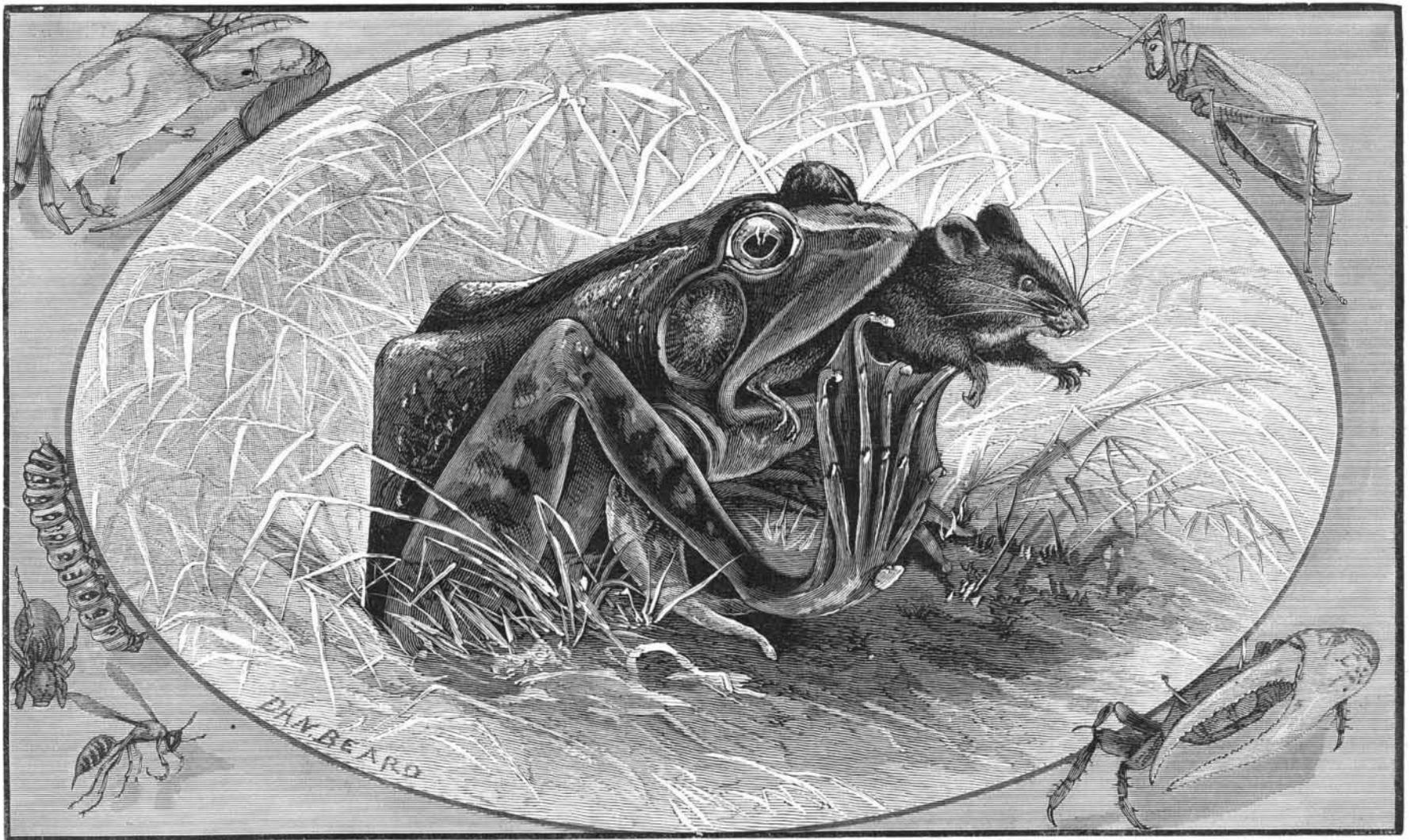
The battle had commenced and lasted about five minutes, when by a lucky snap the frog got the mouse by the hind quarters; the little mammal buried his sharp teeth in the frog's nose. Then again did the mill-pond croaker exhibit an intelligence and activity which I had always been led to believe these creatures never possessed. He kicked with his hind legs and pawed with his fore legs with such vigor that

ted from the central organ to the muscle with the utmost rapidity, but the contraction of the muscle is just so much and no more than the designed effect demands for its accomplishment. This is what we mean by *responsiveness*.

Endurance is the capacity of repetition of the same act, the reiterated discharge of the same amount of nerve force to produce equal muscular contractions for an indefinite period. It is the "staying power" which the tissues must acquire in order to do their best work. It also means the learning and adoption of the line of least muscular force to perform a given task. This is slowly acquired, but when once known, allows of the performance of apparently most onerous tasks with little effort.

Strength is the third, and, beyond a certain moderate amount, least important end of athletic training, although it is often put first. The utmost strength that it is possible for any one to acquire is strictly limited by conditions of age, height, weight, and structure beyond the individual's control; nor is it at all necessary to develop the strength of muscles to their utmost in order to reach their utmost physical perfection. Quite the reverse, indeed, is the case.

To develop these three qualities of tissue wholly different methods of physical culture are required. They do not go hand in hand. The country lout with big muscles that can throw an ox has, as a rule, little endurance and less responsiveness. All army surgeons know how soon these big strong fellows will break down. The circus clown, agile as a cat, is often physically weak, and with no more endurance than an ordinary mortal.



BULLFROG DISGORING A MOUSE.

five of them, and one vicious hornet that had strayed in through the open window. All these were successively swallowed by the frog in a most business like manner. A pink fleshy tongue would shoot out and in an instant the insect aimed at would disappear. When he came to the hornet the frog appeared to think his food was rather highly seasoned, for he winked his eyes several times, if that term can be applied to the act of sinking his eyes down in his head and then popping them up again.

Next day he ate fifteen large flies, two big lively katydids, and two full grown fiddler crabs, life-sized drawings of which may be seen upon the border to the accompanying illustration. He had for dessert the same day a dragon fly and an ichneumon fly. I have since tried him with raw meat, but he could not be persuaded to touch it until a piece cut to represent some insect with long legs was put upon a straw and dangled in front of his nose; this he instantly snapped up.

Insects, crustaceans, mollusks, and small animals, anything with life and not too large to be taken into the capacious mouth of this animal, are greedily devoured, even its own tadpoles and young frogs form a palatable viand for the parent. Once I took a dead mouse and, holding it in the globe, jumped it around to give it the appearance of life. Without hesitation it was seized and speedily swallowed by the frog before he discovered that he had been swindled by a corpse. He then opened his mouth and with his fore feet deliberately pulled out the obnoxious mouse in a manner that set the spectators off in roars of laughter. Since then he has devoured many live mice with apparent relish,

the rodent had very few opportunities of biting. Once the mouse's teeth fastened upon the hind foot of the frog, causing him to turn two or three complete somersaults in his efforts to free himself. The mouse was so large that it was no easy task for the *Rana pipens* to swallow him. Slowly but surely, however, he disappeared, until nothing but the head was visible. There being no water in the globe the frog could not drown him, so he did the next best thing—choked him to death by squeezing his neck until the poor rodent's bead-like eyes stuck out from its head, and life was extinct.

Scientific Gymnastics.

Exercise, to be beneficial in the highest sense, should be for itself alone; it must not be work in any sense; it should pursue its own objects, and no other; it should be made a pleasure and not a labor; it should be utterly divorced from ulterior notions of economizing expended powers; and this should never more firmly be insisted on than in the case of those abnormal creatures who say they take no pleasure except in useful work.

The theory of scientific gymnastics is directed to bring about three qualities in the tissues. 1. Responsiveness; 2. Endurance; 3. Strength. The first of these is displayed in suppleness or agility. The muscle is well under the control of the will; it responds at once, with promptness and to the required extent. The quick blow of the prize fighter, the exactly graded and lightning-like motion of the swordsman, are examples. Not only is the nervous message transmit-

Moreover, all three of these qualities are to be imparted to all the muscles of the body, in proportion to their uses, so that a symmetrical development may be secured. The blacksmith, with his mighty right arm, but who is "blown" in a foot race of a hundred yards, and the ballet dancer, with her legs like Diana's and her arms like stems, are familiar examples of the absence of symmetry.—*Medical and Surgical Reporter*.

The Benzoate of Sodium in Consumption and Diphtheria.

The inhalation of the benzoate of sodium in phthisis continues to attract attention in Germany. Prof. Rokitansky, of Innsprück, was the first to advocate it, and Dr. Winter-nitz and others who had visited his clinic report upon it very favorably. They aver that nearly all cases improve upon it, at least at first. This result is categorically denied by many other observers.

Its success as an agent in diphtheria is attested by Dr. Letzerich, of Berlin. The pseudo-membrane is dusted with powdered benzoate, applied through a glass tube or quill, two or three times a day. Older children may use a gargle of one part to twenty. The temperature and pulse together decline under this treatment. The pseudo-membrane contracts and becomes thinner and more transparent.

It is estimated, by those in position to know, that more miles of railroad will be built during 1880 in this country than during any year before. About 9,000 miles of new road are already under contract.

THE ACTION OF LIGHT ON PLANTS.

The phenomena which the prolonged action of sunlight produces on vegetation in high latitudes are recorded by M. J. A. Broch in a work recently published.

The farther we go eastward from the Gulf Stream the more severe is the climate, even though the degree of latitude be the same. Thus Scandinavia and Finland possess an exceptionally mild climate, considering their high polar altitude. Indeed, barley and oats will ripen in the most northern districts of Norway, Sweden, and Finland, and immense forests are met with; while in Iceland, Greenland, and the polar confines of Russia and America, the earth is barren and sterile, and there are eternal snows. The cause of these advantageous climatic conditions is to be attributed to the enormous mass of warm water and hot air which the Gulf Stream brings down from the equatorial region to the coast of Norway, and which it approaches between 60° and 61° of latitude. This circumstance, together with the difference in the geological formation of the various northern countries of Europe, naturally lead to certain dissimilarities in the respective climates of these countries. The isothermal line passing through the places whose mean temperature is zero—skirting in Norway the chain of mountains and the sea coast from the North Cape, embracing also the central part of that country between the 60th and 63d parallels—begins in Finland at the 66th degree of latitude and rises rapidly to the north, forming a curve which incloses the elevated lands of the interior between the Gulf of Bothnia and the Arctic Sea, so that not only the countries situated south of that parallel, but also those which slope toward the Arctic Ocean and are submitted to the salutary influence of the Gulf Stream, have a mean temperature above zero. Of all the countries situated in the same latitude as Finland, the Scandinavian peninsula alone enjoys a milder climate. European Russia is much colder, and the climate of Asiatic Russia still severer. With regard to the action of prolonged solar light on the vegetation common to all those countries, Dr. Schübler, of the University of Christiana, has demonstrated that the seed of corn or other plants obtained from the northern regions ripens more quickly than that produced in the more southern countries. In the regions of the extreme north, where grain crops are uncertain in their yield, the seed corn of the north is always used in preference to any other. It is not less true that the various kinds of grain and vegetables cultivated in the northern regions yield better and are much richer in carbo-hydrates than the varieties cultivated more to the south. The color, moreover, is deeper—a phenomenon which applies also to all trees and plants. Foreign botanists visiting Norway and the other countries of the extreme north, in summer, are astonished at the fresh dark green of the foliage, and the bright colors of those flowers which grow both in northern and southern climes; and as this richness of color increases regularly with the latitude, trees and plants have at first been considered as new varieties. The leaves of trees grown in the north are larger even when the seed has been brought from more southern countries. M. Schübler has likewise proved that the aroma of all kinds of plants and fruits, both wild and cultivated, increases as the north is approached. Ordinary vegetables and herbs grown in high latitudes have a far more aromatic taste than those grown in southern countries. The caraway is an example of this fact; grown at Christiana, it contains 5.8 per cent of volatile oil, while that cultivated in Germany and Central Russia contains only from 4 to 4.8 per cent. But this large development of aromatic essence is not always considered an advantage; for instance, the tobacco plant grown in Norway or other northern countries contains, it is said, too much nicotine. In proportion, however, as the aroma increases with the latitude the saccharine substance diminishes; the berries and fruits of the north are less sweet than those which are cultivated or grown wild in the more southern parts of those countries. Consequently, while Norway, as well as Sweden, and even Finland, produces the most delicious apples, the pears are not sufficiently sweet. These facts, as well as the rapid growth of vegetation in the northern regions, are attributed to the prolonged action of solar light. Indeed, at Christiana, at the summer solstice, the sun remains below the horizon only 5 hours 17 minutes; at Trondhjem, 3 hours 34 minutes. At Bodø, the chief town in Nordland, the sun does not descend below the horizon from June 2 to July 11; at Tromsø, from May 20 to July 24; at Hammerfest, the chief town of Finmark, from May 15 to July 29. On the other hand, the center of the sun does not appear above the horizon at Bodø from December 14 to December 28; at Tromsø, from November 25 till January 16; and at Hammerfest, from November 20 to January 21. It is not surprising that barley, potatoes, and many other plants and vegetables ripen in the most northern latitudes, seeing that they are exposed to a considerable amount of heat during two or three months of the year. In those regions where the sun hardly descends below the horizon in summer, there is no night, only a short twilight; and the growing plant, therefore, enjoys permanently and without interruption the heat and light which it requires.

Mactear's Artificial Diamonds.

Some weeks ago an item was cabled from London to our daily newspapers stating that real sparkling diamonds had been artificially made by a Glasgow gentleman which withstood all the tests used in determining the natural stone. The *Journal of the Society of Arts* brings us the following facts concerning the alleged great discovery.

Professor Nevil Story Maskelyne, F.R.S., of the British Museum, has examined the presumed "diamonds" manufactured by Mr. James Mactear, of St. Rollox, Glasgow. The result of his examination is in a letter to the *Times*, from which the above *Journal* extracts:

"First, the diamond excels all substances in hardness. Secondly, its crystals belong to the cubic system, and should not, therefore, present the property of doubly refracting light. Frequently, however, from the influence of strain within the crystal, caused by inclosed gas bubbles or other causes, diamonds are not entirely without action on a ray of polarized light sent through them. Finally, the diamond is pure carbon, and as such, burns entirely away when heated to a sufficiently high temperature in the air, and more vividly so burns or glows away when heated in oxygen gas.

"The specimens I had to experiment upon were too light to possess appreciable weight, too small even to see unless by very good eyesight or with a lens, yet were, nevertheless, sufficiently large to answer the three questions suggested by the above properties.

"A few grains of the dust, for such the substance must be termed, were placed between a plate of topaz—a cleavage face, with its fine natural polish—and a polished surface of sapphire, and the two surfaces were carefully 'worked' over each other, with a view to the production of lines of abrasion from the particles between them. There was no abrasion. Ultimately the particles became bruised into a powder, but without scratching even the topaz. They were not diamond.

"Secondly, some particles, more crystalline in appearance than the rest, were mounted on a glass microscope slide, and examined in the microscope with polarized light. They acted each and all powerfully in the manner of a birefringent crystal. It seemed even in one or two of them that, when they lay on their broadest surface (it scarcely be called a 'crystal face'), a principal section of the crystal was just slightly inclined to a flattish side of it in a manner that suggested its not being a crystal of either of the ortho-symmetrical systems. Be that as it may, it was not a diamond.

"Finally, I took two of these microscopic particles and exposed them to the intense heat of a table blowpipe on a bit of platinum foil. They resisted this attempt to burn them. Then, for comparison, they were placed in contact with two little particles of diamond dust exceeding them in size, and the experiment was repeated. The result was that the diamond particles glowed and disappeared, while the little particles from Glasgow were as obstinate and unacted on as before. I had previously treated the specimen I have alluded to as the first on which I experimented by making a similar attempt in a hard glass tube in a stream of oxygen, and the result was the same. Hence I conclude that the substance supposed to be artificially formed diamond is not diamond and is not carbon; and I feel as confident in the results thus obtained from a few infinitesimal particles that can hardly be measured, and could only be weighed by an assay balance of the most refined delicacy, as if the experiments had been performed on crystals of appreciable size.

"Not content with merely proving what these crystalline particles are not, I made an experiment to determine something about what they are.

"Heated on platinum foil several times with ammonium fluoride they became visibly more minute, and a slight reddish-white incrustation was seen on the foil. At the suggestion of Dr. Flight, assistant in this department, a master in the craft of the chemical analyst, these little particles were left for the night in hydrofluoric acid in a platinum capsule. This morning they have disappeared, having become dissolved in the acid, and on evaporation there is seen a slight white incrustation, on the capsule, of the residuary fluoride. I have, therefore, no hesitation in declaring Mr. Mactear's 'diamonds,' not only not to be diamonds at all, but to consist of some crystallized silicate, possibly one resembling an augite, though it would be very rash to assert anything beyond the fact that they consist of a compound of silica, possibly of more than one such compound."

Mr. Maskelyne concludes that "the problem of the permutation of carbon, from its ordinary opaque black condition into that in which it occurs in nature as the limpid crystal of diamond, is still unsolved. That it will be solved no scientific mind can doubt, though the conditions necessary may prove to be very difficult to fulfill. It is possible that carbon, like metallic arsenic, passes directly into the condition of vapor from that of a solid, and that the condition for its sublimation in the form of crystals, or its cooling into crystal-diamond from the liquid state, is one involving a combination of high temperature and high pressure present in the depths of the earth's crust, but very difficult to establish in a laboratory experiment."

THE INDUSTRIAL USES OF FISH SKINS.

Although the skin of fishes is chiefly gelatinous, and easily soluble in water, some are of a firm, strong texture and of a useful character. Up to within a few years, however, their employment for practical purposes has been rather limited, and it is only comparatively recently that attention has been more generally directed to their utilization on an extended scale. At a Maritime Exhibition held at the Westminster Aquarium in 1876, a Norway exhibitor showed a variety of tanned fish skins, among which were: tanned whale skins; upper leather made from the white fish; skins of flatfish prepared for gloves; skins of soles tanned and dressed for purses; skins of thornbacks prepared as a substitute for sandpaper; and skins of eels, dressed and

dyed, suitable for braces, etc. Shoes have been made at Gloucester, Mass., from the skins of the cusk or torsk (*Brosmus vulgaris*), the use of which has been patented, and an industry is said to be carried on at Colborn, Canada, with the skins of species of siluroids for glove making. In Egypt, fish skins from the Red Sea are used for soles of shoes. The skin of the losh or burbot (*Lota maculata*) is used by the people in many parts of Russia and Siberia to trim their dresses. It is also utilized by some of the Tartar tribes, as material for their summer dresses, and the bags in which they pack their animal skins. The inhabitants of the eastern coasts of the middle of Asia clothe themselves with the tanned skin of the salmon. The spring and tuberculous skins of many sharks and allied fishes are largely employed, under various trade names, for polishing woods, and for covering boxes, cases, etc. From a certain portion of the skin of the angel shark (*Squatina angelus*) the Turks make the most beautiful sea-green watch cases. Turners, ebonists, and carpenters in Europe use the rough skin of the blue dog-fish (*Squalus glaucus*) like emery paper, for smoothing their work and preparing it for polishing. This shark skin is also made into shagreen. That most used at present appears to be the skin of the ray (*Hypopteryx sephen*), which is very common on the Malabar coast. The house of Giraudon, Paris, makes excellent use of them for morocco and *tabletterie*. At the recent Paris Exhibition, this establishment exhibited numerous illustrations of the ornamental application of the prepared skin in large office-table inkstands, candlesticks, boxes and caskets, paper knives, reticules, card cases, photograph frames, bracelets, scent bottles, etc. The fish called *chat* (*Squalus catulus*) at Marseilles is smaller than the angel fish, and furnishes a product known as *peau de rousette*. This skin is reddish, and without spots, and of a uniform grain, flat, and only used to make cases and other articles known as shagreen. *Peau de chien de mer* is another name given to some species of *Squalus*. That found on the French coasts is known under the names of *chien marin*, *rousette tigrée*, etc. Turners, cabinet makers, and carpenters use the skin for scraping and smoothing their work, and it is also used for like purposes by metal workers. This skin, when worked up with the tubercles with which it is studded, takes the name of "galuchat," and is usually dyed green, to cover cases, sheaths, and boxes. Under the name of *chagrín*, these skins used to be much employed in Turkey, Syria, Tunis, and Tripoli; that made in Tripoli being considered the best. It was colored black, green, white, and red.

The Quinealt River Salmon.

The *Transcript*, of Olympia, Washington Territory, describes a new salmon which promises to make a valuable addition to our list of food fishes.

The Quinealt River is situated midway between the mouth of the Columbia River and Cape Flattery, and empties into the Pacific Ocean, thirty-two miles north of Gray's Harbor. Salmon of one of the finest varieties visit this stream, and commence ascending the river about the 1st of March, and continue running up until the 1st of July. These fish are about 20 inches in length, 6 inches deep, and 3 inches thick, and weigh from 6 to 7 pounds each. They have very small fins and tails, and are very uniform in size and weight. Their color is a deep greenish blue on the back, with silver sides and white bellies. The meat is of a bright red color. They are extremely fat, and when put upon sticks before the fire to cook, as is the custom of the Indians, large quantities of fat drip from them. They are particularly noted for their rich and exceedingly fine flavor, and as far surpass the Columbia River Chinook silver-side as the latter does a dog salmon.

The Indians are very superstitious about them, and as all the catching grounds are on a reservation they have a monopoly of them. When they first commence to run it is impossible for a white man to get one for love or money, as the Indians believe it would stop the run. They are also superstitious about cutting them with a knife, and the first catch is always cut open by the old klootchmen with a sharp shell, and the heart of the salmon thrown into the fire and burned, for fear the salmon will be offended and not come into the river. Later in the season they cut them with knives and are glad to trade them to the whites. In May and June they run in endless numbers, and are as thick as herring in the sound, the water in the river at times being seemingly alive with them. The fish will not take either a fly or hook in any manner, and are only caught by the Indians in their primitive manner with weirs built across the stream, and made of poles and hazel brush. These weirs are built like all other weirs of the country, and are set at certain places in the river. The fish are taken out with dip nets, often from fifteen to twenty at a time. The weirs are made to stop all the fish ascending when fishing is going on, but are opened at other times to allow the fish to go up and spawn (a fact which white fishermen on other streams might heed to their advantage). It is supposed that they spawn in the river and do not ascend to the lake. Those engaged in propagating fish would do well to examine these salmon, as we are satisfied they would be a valuable addition to the varieties of fish now propagated by the United States Fish Commissioners and various State Commissioners. Coming early in the season, they could be put in the same streams with later salmon, and thus continue the fishing season nearly the whole year round. Their eggs can easily be obtained, and the trial, if successful, would be one of the greatest additions to fish culture ever undertaken.