Good Health.

The Philosophy of the Lungs.

The office of the lungs, in its relation to health and life, is so important in the human organism, that everybody ought to understand it.

The work performed by the lungs is of two kinds. First, they endow with life the elements which repair the wear and tear of the body. The stomach digests the food we eat, but has no power to make that food into blood. The product of digestion is a white fluid, devoid of life, and possessing in itself no power of assimilation. It is sent to the lungs to be vitalized—or, in other words, endowed with life, and made capable of entering into combination with the tissues of the body. This white fluid is called chyle, and when the lungs have acted upon it, becomes bright red blood, in which condition it is sent to the heart to be distributed throughout the system. Every breath we draw manufactures a certain quantity of new blood. It is in this way that the food we eat imparts strength and health to our bodies.

No sooner is one meal digested by the stomach, and made into blood by the lungs, than the sense of hunger returns to tell us we must eat again. If we do not heed this demand for more food the making of new blood stops and the body grows weak. This renovation of the blood is going on unceasingly. The quantity of new blood made depends on the size of the lungs. A man with small lungs only breathes a small quantity of air, and can only make a proportionate quantity of blood. With large lungs more air is inspired, and consequently more blood is made. This is why those having large lungs are strong, muscular men, while others with small lungs are thin and weak. It is a law of nature, and you cannot find in all the world an instance of a stout, muscular man with small lungs. The nutrition of the body is governed by the size of the lungs and the freedom of the breathing.

This being the case you can understand how essential it is to health and strength that the lungs should always be kept free from obstruction. If you permit colds to settle on the chest, and the mucous lining of the air tubes to become congested and inflamed, you by that prevent the lungs from doing their appointed work, and inevitably lose in flesh and strength.

This explains the reason why all lung diseases are characterized by loss of flesh. That malady called consumption is so named from this very peculiarity. The body consumes or wastes away, because the lungs are obstructed by tubercles. So, also, of catarrh and bronchitis, though in a less degree. They impair the blood-making power of the lungs by clogging the air tubes with phlegm and mucous, and in this way injure the general health, and weaken the body. To remedy this weakness and increase the flesh, it is common to advise, in these lung cases, all kinds of nourishing food, under the delusion that the fault is in the stomach. But they do no good for the reason that assimilation does not take place in the stomach. The stomach may be supplied with the strongest nourishment, and may perfectly digest it, and yet the patient will continue to lose in proportion to the extent the lungs are diseased. But improve his breathing, and from that moment, without any change in his diet, he will begin to gain.

Good health depends on the rapid transformation of matter—on the constant introduction of new elements of nutrition into the blood, and the constant expulsion of old, worn out elements from the blood. This brings us to the second duty performed by the lungs. They not only give us our strength by making new blood from the food we eat, but they purify the old blood by casting out its most corrupting impurities. Every breath we draw comes back from the lungs loaded with carbonic acid. Carbonic acid is formed by the combustion of the fatty tissues of the body. In this way animal heat is generated and the warmth of the body maintained. Its formation is essential to life. It takes place every moment of our being and must be expelled by the lungs as fast as it is formed or our health suffers.

Now, on the subject of treatment. Suppose your general health to be impaired in the way explained, you could not expect any permanent benefit to result from treating the loss of flesh, bad circulation, torpid liver, disordered nerves, etc., while their cause remains in operation. Their cause is the state of the lungs, and these are but the effects or symptoms. No cure ever yet resulted from such a course. No remedy devised by man can cure the symptoms while their cause remains in force. Restore the function of the lungs and all these general effects will disappear of their own accord. The most that is ever accomplished by treating symptoms is a little temporary relief, while, by going to the root of the evil, and treating the lungs, the disease itself and the symptoms disappear together, and the cure is radical.

In explaining these matters I have endeavored to give the reader an insight into some of the higher mysteries of medical science, which as yet are but imperfectly understood, even by the general profession. The philosophy of respiration teaches the paramount importance of the lungs over all organs of the body, the injury which results to health from even the slightest obstruction of their function, and indicates clearly the remedial means which alone can guide to success in the treatment of lung complaints.—*Robert Hunter, M. D.*

Domestic Economy.

Choice Treatment of Foods.

In the choice of foods we cannot exercise too much care. It is cheaper to procure only the very best articles. All vegetables and fruits should be grown on the best soils, and the fertilizers used should be well decomposed and not fresh and rank. Partially decayed food of whatever kind should be avoided. For breads, the best white wheat is none too good. If grown in new soil it is likely to be better and to contain abundance of the mineral matter so needful to health. Fruits for eating without cooking should be ripe, tender and not too tart; while those for cooking may be either sweet or sour, but they must possess the peculiar quality of retaining when cooked their best flavors. Potatoes should be fresh and ripe—old ones are less wholesome, especially when they have been exposed to the light and air, and bruised by much handling, or long exposed to the cold.

Animal food should be chosen with great caution. Only healthy animals should be used for eating. They should neither be too old nor too young, too fat nor too lean. In butchering, all the blood should be removed from the body, as otherwise the flesh putrefies readily. It should be thoroughly cooled before eating. It is also desirable that the animal be not killed for several hours after eating or after fatigue. The long journeys animals are sent on crowded, filthy cars, render their flesh unwholesome.

The treatment of animal food is a matter of importance. Why do we cook it at all? First, to render it more pleasing to the sight; second, to develop its best flavors; and third, to render it digestible and palatable. Flesh cooked too much is rendered innutritious and indigestible; if cooked too little, it is disagreeable eating. Liebig said he would never have flesh subjected to a higher temperature than 170° F., except for a few minutes after it is put into the pot, when it may be submitted to a temperature of boiling water in order to coagulate the albumen into a sort of crust on the outside to hold in the flavors that might otherwise be evaporated. In roasting meat, also, let the heat at first be high, and gradually decrease to the boiling point for the same reason. Stewed meats are more wholesome and nutritious than any other. The process renders flesh tender and succulent and easy of digestion.

Fish Flour.—A novel and remarkable article of food, prepared from the products of the ocean, has lately been brought prominently forward—this is fish flour. It is not as yet manufactured in any great quantity, as the article is still new in the market, and consequently there is no great demand for it. The flour is prepared in Norway, from dried codfish of the first quality; it is thoroughly desiccated and then ground in a mill. There are two qualities, the coarse and the fine-ground. It is especially the former which has found favor with the public; from it an excellent dish of preserved fish can in a short time be prepared; while the finest ground is used for fish puddings, a dish highly appreciated in Norway and Sweden. In Catholic countries, in localities where there is no regular supply of fresh fish, it is presumed this article will be more particularly important.

Barley and Bread Soup.—Take three ounces of barley, one and a half ounces of stale bread crumbs, one and a half ounces of butter, one-half ounce of salt, and one quarter ounce of parsley. Wash and steep the barley for twelve hours in one-half pint of water, to which a piece of carbonate of soda, the size of a pea, has been added; then pour off the water not absorbed, and add the crumbs of stale bread, three quarts of boiling water, and the salt. Digest these in a salt-glazed covered jar, in the oven, or boil them slowly in a well tinned covered pan, for from four to six hours, adding the chopped parsley, with the butter, thirty minutes before the expiration of the time of boiling.

Horseradish Sauce.—Grate as much horseradish as will fill a breakfast cup, mix with it two teaspoonfuls of powdered white sugar and one each of salt and pepper, a dessertspoonful of made mustard, and enough vinegar to make the whole as thick as thick cream. A small cupful of cream is also a great improvement. To use with roast beef the sauce is heated by being placed in a jar in the oven till warm, but it must not boil; and it is very good cold, to eat with various cold meats. Double the quantity may be made at a time, and it will keep for some weeks if bottled.

Buckwheat Cakes.—One quart of buckwheat flour and a half a pint of Graham meal. Mix with lukewarm water into a batter, stir in a teacupful of good yeast sponge or a half cent's worth of bakers' yeast; mix in an earthen or stone vessel, and set over night in a warm place to rise. If the temperature and yeast have been just right, the batter will be light and sweet, and not need soda. It should be considered a mistake when the ferment needs neutralizing, and care taken to set cooler or correct the yeast.

Cheese Sandwiches.—Take two-thirds of good cheese, grated, and one-third of butter; add a little cream; pound all together in a mortar; then spread it on slices of brown bread or gems; lay another slice over each; press them gently together, and cut in small square pieces.

Mining the Great Civilizer.—The London *Mining World* discourses on the effects of mining on civilization at considerable length, and very legitimately concludes as follows: It is not too much to say that all the civilization of which we boast may be traced to the application of the metals and to the use of coal. Wherever nations have learned to mine and work metals, they have become powerful and rich, subduing their neighbors either by force of arms or by greater industrial activity, and in either case acquiring their wealth. In the earlier stages, those who possessed the metals made an easy prey of their rivals, and in the present day nations mining their coals and metals do in a better and more elevated sense outstrip their competitors and become the masters of the world. All history teaches that those nations which learned to mine and work metals became wealthy, powerful and civilized, whilst those which have had no mining industries or no metallic manufactures have remained in a state of barbarism, and that such at the present day is the distinguishing feature of savages. Mining industry is, indeed, the foundation of all civilization and the chief basis on which all industries must rest, as well as being at the same time the principal element of progress. Without it the working class could gain little beyond the mere necessities, and, as we have often shown that coal and iron are the first requisites of national prosperity, so it is to mining that we must refer the advancement of the present age.

A Substitute for Hydraulic Lime.—Zeiodelite is a comparatively new material, which has latterally come largely into use in France, as a substitute for hydraulic lime. It is said to be much superior to that material for uniting stone and resisting the action of water. It is made by mixing together sulphur and pulverized stoneware and glass, in the proportion of nineteen pounds of the former to forty-two of the latter. The mixture is exposed to gentle heat, which melts the sulphur, and then the mass is stirred until it becomes thoroughly homogeneous, when it is run into suitable moulds, and allowed to cool. This preparation is proof against acids in general, whatever their degree of concentration, and will last an infinite time. It melts at about one hundred and twenty degrees Cen., and may be re-employed without loss of any of its qualities, whenever it is desirable to change the form of an apparatus, by melting at a general heat, and operating as with asphalte. At one hundred and ten degrees it becomes as hard as stone, and therefore preserves its solidity in boiling water. Slabs of zeiodelite may be joined by introducing between some of them paste heated to two hundred degrees, which will melt the edges of the slabs, and when the whole becomes cold it will present one uniform piece.

To Fix Magnetic Curves.—The following neat methods of fixing the beautiful curves made by iron filings on paper, under the influence of a magnet, are from an interesting article in the *Electrical News*, describing the practical instruction in electricity and magnetism at the South Kensington science school:

1. Make a solution of gall nuts. Brush over sheet of paper with solution; remove superfluous moisture by blotting paper. Place damp paper over curves, press evenly, carefully lift paper; dry quickly, and shake off filings. A permanent impression in ink will be left on the paper. 2. Fix pair of magnets to one side of square of glass, coat other side with very thin gum water; when plate is quite dry, dust fine iron filings over gummed surface, tap, then breathe gently on plate. Gum is thereby softened and curves fixed.

Miscellaneous.

McCloud River Salmon Fishery.

Work Done by U. S. Fish Commission Under Superintendence of Deputy Commissioner L. Stone.

Part First—Historical.

Far off as any such result may seem now, it is nevertheless true, that were the salmon rivers of this coast left to take care of themselves they would in a few years be despoiled of their inhabitants and therewith loose their chief value. Such has been the result in the Eastern States, where salmon once swarmed in the streams, and it is only after long years of almost utter barrenness that they are now being fitted for the reception of and restocked with the fish that once made them their homes.

This work of preparation is one of great trouble and expense. Fish-ways have to be built over dams and falls; manufacturers have to be compelled to keep the injurious drainage from their factories from polluting the streams, and many a suit has to be instituted and carried on to bring about all the results necessary to fit the water for the reception of the fish. When their home is ready the fish have to be put into it and protected for a number of years, to be allowed to breed and restock the waters.

The stocking of rivers by catching and transporting the fish alive is a slow and tedious process and one unproductive of quick results, and in its place—quicker, safer and cheaper—has grown up the new art of fish hatching. The art, as it is now practiced, has in truth grown from seeds sown hardly more than ten years ago, when the attention of legislators was most forcibly called to the condition of the fish rivers of the East.

Although the process of the artificial impregnation of fish eggs was discovered in 1763 by Jacobi, a German, yet it had undergone no change of any great note till about twelve years ago, when the thoughts of many intelligent Americans were turned to it. Then it was taken up in good earnest, and like that of many other Old World inventions, its history in America is but a record of rapid and continued improvement, and here in California it has made, within the last four years, some of its most rapid advances, and has adapted itself to the scale of grandeur characteristic of all things in the land.

The Rise of Fish Culture.

About 1866 almost all the Eastern States passed laws providing for the protection and propagation of fish within their limits, and appointed commissioners to take charge of the work. Very good work has been done by these commissioners, and the Western and far Western States have taken up the work, and many are now reaping the fruit of their wisdom. In our own State much good has been done by the State Commissioners and the Acclimatization society; white-fish have been put into Clear lake, shad into the Sacramento, and salmon into Lake Merced, the Truckee, the McCloud, etc., and the work of protection carried on as thoroughly as possible.

In 1871 a United States Fish Commission was organized, with Prof. Spencer F. Baird as chief commissioner, and a fishery was established, in conjunction with several State Commissions, on the Penobscot river in Maine, under the superintendence of Mr. C. G. Atkins, where salmon were caught and their eggs taken and prepared for shipment. This was, till the establishment of the McCloud river fishery, the largest salmon fishery in the world, and great good has been done by it.

There are there, however, several disadvantages that are not experienced on the McCloud. As the fishing grounds on the Penobscot are all owned by private parties, the Government has no right to use them for procuring salmon eggs; all fish, therefore, have to be bought from owners of the grounds at $3 a piece. Then, as there are laws prohibiting the capture of salmon for some time before the spawning season, all the fish have to be caught five months before they are ripe, transported to a pond a mile from the river and there kept till ready to spawn. The consequence of all this handling and interference with nature is that the eggs are soft shelled—the shell of a salmon egg is a tough membrane—and consequently very difficult to handle. Notwithstanding these disadvantages, the Maine fishery has done an immense amount of good work, and millions of young fish from it have been put into the Connecticut and other Eastern rivers.

Numbers of private persons have also gone into fish culture with great success, and to many of them the eggs from California are sent to be hatched out for the different States, by whom the cost of the packing, transportation and hatching is paid.

Successful as were the results obtained at the Maine fishery, yet the number of eggs was found so inadequate to the demand that it became necessary to provide some other source of supply, and California being well known as having rivers well filled with salmon, was selected as the new field of operations.

The McCloud Fishery, 1872.

In the summer of 1872, Mr. Livingston Stone, Deputy Fish Commissioner, came to California, in compliance with orders from Professor Baird, to inspect the salmon rivers of the State, to find a site for a salmon fishery, and to commence work immediately if possible. Strange as it may seem, he could find no one in San Francisco who could answer his inquiries as to the time and place of the spawning of the California salmon. It was generally known that they were most abundant in the Sacramento and that they ascended it in the fall; but no one to whom he applied had ever seen them on their spawning beds. After many days of fruitless inquiry, Mr. Stone learned from Mr. Montague, Chief Engineer of the Central Pacific railroad, that he had seen salmon in great numbers in the McCloud river, and he pointed out on a map a spot that he thought would do for the site of a fishery. Thither Mr Stone and his assistant, Mr. J. G. Woodbury, proceeded, arriving September 1st, 1872.

They found the salmon abundant, but on examination it became apparent that almost all had spawned, and that the number of eggs would necessarily be but small that year. They established themselves at a stage station, about three-quarters of a mile from the river, by a small brook, and in three days by hard labor built a house and troughs, and were ready to set to work to collect eggs. Here came trouble for them. They experienced great difficulty in obtaining fish. They tried many nets, but all failed, except the sein, and their's was not suited to the rapid current and did not work well, and most of their fish were got by watching the Indians, and as soon as any one speared one to rush and take it from him and take the eggs. But the fall run was nearly over, and twelve ripe females, yielding 50,000 eggs, were all that could be obtained.

The now old style of troughs, with charcoal and gravel bottom, were then in use, and into such the eggs were put, out in the sun, with the thermometer sometimes at 110, with only a board to cover them, for there was no time to build a roof. There many died, but the remainder prospered till the water, stirred by animals, began to deposit on them a coating of hard mud that could not be washed off. No remedy could be found for this, and it went on till not an egg was visible and all were in imminent danger of suffocation. All hope was given up at one time, but Mr. Woodbury decided to run the risk of killing them immediately in washing off the dirt. Taking the eggs in a bucket, he put in a handful of sand and held them under a stream of water, that stirred them gently till all were scoured clean. Of the eggs thus treated, only a small percentage died from the operation and most of these were unimpregnated. Of the original 50,000, 20,000 died from heat and other causes, and 30,000 were shipped East, hatched and put into Eastern water, and last year the grilse were taken, being three times as large as Eastern grilse of the same age.

These eggs were packed in wooden boxes, instead of tin or glass jars; this was then necessary from the length of the journey, and more so since from the immense number of eggs and the rapidity with which it is necessary to pack them. The results, too, are more favorable with wooden than with tin boxes.

Season of 1873.

After a season's experience, Mr. Stone decided, as there was no clear spring water available, to move his whole establishment down to the river, near the seining ground, and, contrary to all precedent, to use the water from the river in the troughs. This was done, a dwelling house erected, troughs put up under a tent sixty feet by thirty feet, and an undershot wheel, twelve feet diameter and eleven feet shaft, was made and set up to raise water, a fish barrier put in the river to stop the salmon, and by August 19th, all was in readiness to begin the work.

The McCloud.

The McCloud river, on which the fishery is situated, is a tributary of the Pit or Upper Sacramento. It rises in two forks in the foot-hills of Shasta butte, and nearly half its volume comes from a spring that rises in the bed of the stream, coming underground from the melting snows of Shasta. This is very cold and gives the river a low temperature that it never loses, running an icy flood to its mouth. The temperature of the water in mid-summer is never above 63°, though the air is sometimes 130°, and at night it generally falls to 40°; in the winter it is still lower, but it never freezes, on account of its rapidity. The descent of the river is very swift—about forty feet to the mile—and every few hundred yards there is a rapid, where the water boils and surges over the rocks with tremendous force. At the fishery the stream is from thirty to fifty yards wide with an average depth of seven feet. About sixty miles from its mouth the river passes over a perpendicular fall about seventy feet high, said to be one of the most beautiful in the State. The edge of the fall is perfectly even, and the water passes over it in one unbroken mass, twenty or thirty yards wide.

The valley of the McCloud is shut in by high hills, or, more properly, mountains—as some of them rise 4,000 feet high—that rise but a short distance from it, leaving but little low land that is of any value; this is covered with oak, pine, ash and underwood, and was once thickly inhabited by a tribe of superior Indians, but they are nearly extinct, and none are to be found more than twelve miles from the mouth. The banks of the river are fringed with a water-plant, bearing large green leaves. This lives naturally in higher altitudes, but has become naturalized to the McCloud valley from the coldness of the stream.

The river is one of the chief spawning grounds of the Sacramento salmon, and so long as its waters are kept clear and unobstructed there can be little fear of the extinction of this fish. To this end all miners must be kept from it, and the wisest use that the Government can make of the whole valley is to appropriate it for an Indian reservation.

Inventions and Improvements.

In 1872, Mr. Woodbury, the foreman, had experienced great inconvenience from the cracking of the charred bottom and sides of the old troughs, and experimented with various substances in the endeavor to find something that could be used in place of the charring to prevent the growth of fungus, that would have no harmful effect on the eggs. All others seeming useless and thinking of the insolubility of asphaltum, he experimented with it with favorable results, and the second year part of the troughs were coated with it. No harm resulted from it, and ever since it has been used exclusively with the greatest success. It gives a hard, glossy coating to the wood and can be very easily cleaned of any dirt deposited on it, and renders the trough perfectly water-tight.

In 1873 some of the then new trays of wire gauze were used to hold the eggs and the accompanying double dams to secure complete circulation of water. These were found to be an improvement on the gravel, but had to be handled with care, as the eggs rolled off from them with perfect ease. From this circumstance Mr. Woodbury decided to put sides to these trays, and contrary to the directions of fish culturists, to put in several layers of eggs. This was done in 1874 with part of the trays, all charcoal and gravel being done away with, and 25,000 eggs were placed in a tray two feet by one foot and six inches deep; the double dams being also used.

This invention was a great success; the eggs were more healthy and could be handled with great ease and rapidity; by moving them gently up and down all dirt could be freed from them; and it is principally by the use of them that this fishery has been able to send away such large numbers of eggs.

Season of 1875.

The seasons of 1873 and 1874 were very successful in their results, and the latter in particular noteworthy for the large number of eggs taken, but the season of 1875 has far surpassed any preceding in all respects. Not only has the number of eggs been larger, but they have been much healthier, and although the water brought down more sediment—for there was no freshet last winter to clear the river bottom of last year's deposit—the eggs at packing were noticeably clean, having no fungus attached to them and as bright as when first taken.

Whether it was the natural result of experience or some favorable condition of the work is not evident; but this year it was found that two men, with Indian assistants, could spawn twice as many fish as in any previous year, and that the eggs taken thus rapidly were in no wise inferior, but rather superior to those of former years. The greatest number taken in one day was 896,500, and more fish could have been spawned but could not be obtained. The largest number taken from one female was 9,000.

The Result.

The whole number taken in 1875 was 7,822,900; of these about four per cent., 314,900, died and were picked out; 5,658,000 were shipped East, and 1,850,000 left for California. Of those left for California 240,000 were sent to the Truckee river and hatched, and as many to Kern river, but the latter were killed by the alkali water. 1,370,000 were hatched on and put into the McCloud. 50,000 eggs were sent to New Zealand by the Acclimatization Society, and as every effort has failed to get them from England, if this succeeds—as it can be made to with sufficient care—there will be quite a demand for eggs from the countries beyond the equator. Those sent East went to various States as follows: Utah, 160,000; Colorado, 240,000; Iowa, 300,000; Minnesota, 400,000; Illinois, 80,000; Wisconsin, 40,000; New York, 80 000; Pennsylvania, 480,000; Michigan, 800,000; New Jersey, 320,000; Maryland, 560,000; Virginia, 320,000; Connecticut, 480,000; Rhode Island, 200,000; Massachusetts, 80,000; the Canadian Government, 80,000; N. W. Clarke, for U. S. Fish Commission, 988,000. Those first sent arrived in good condition, the others have not been heard from. The following is a comparative table of the four years' work. Twice as many males were taken as females.

	1872.	1873.	1874.	1875.	Total.
Females.	12	5,00	1,350	1,792	3,654
Eggs Hatched.	50,000	2,000,000	5,675,000	7,822,900	15,547,900
Eggs Shipped.	30,000	1,500,000	4,100,000	5,658,000	11,488,000
Eggs Hat'd at Fishery.	......	....	850,000	1,370,000	2,220,000

Future Work.

It is now evident that the fishery, as now arranged, has nearly reached is maximum of productiveness, and that that can only be increased by the establishment of new seining grounds, above and below the present one, and the building of a permanent hatching house. Both of these are of easy performance and will, in all probability, be carried out next year. The hatching tent, as now situated, is in the bed of the river in winter time; but about a hundred yards up stream, close to the hill, a permanent hatching house can be built, that will be out of the reach of the floods, and opposite is a rapid where a wheel can be placed to raise water to it.

As there is plenty of timber, of all kinds, on the hills around and numbers of Indians ready to work for moderate wages, one white man can, during this winter, get out all timbers necessary for the frame, and next summer all the hands can be employed in putting up this building, instead of the tent that has to be taken down every year. Perhaps it may seem strange to speak of taking hands from raising a tent to a building; but, be it known that to put up and *take down* every year the tent, boxes and flumes, costs between one and two thousand dollars. Thus the building expenses for not more than two years would easily pay for any hatching house that is needed on the McCloud. All the sawn lumber needed will be shakes for roofing and sugar pine boards for boxes, flumes, etc., and if this is ordered and sawed a month before it is wanted, so as to have time to season, the expense of hauling will be but small.

After the troughs have been once erected there would be no need of tearing them down, which cracks and injures them; but they could remain for years with no repairs but a coat of asphaltum annually. If this house were erected the cost of the eggs would be very small and the usefulness of the fishery greatly increased.

As one of the men is to remain at the fishery all winter, there is all probability that this work will be done next year.

Future Hatching on the McCloud.

As the fish hatched from the eggs taken here will, in due time, grow up and spawn in Eastern rivers, and their eggs can then be taken and hatched there, the demand on California will, before long, be over.

As the State Commissioners have every year numbers of eggs hatched, on the McCloud, as soon as this establishment is suspended, there will be need for them to have a fishery of their own on the McCloud; and Mr. Woodbury, the superintendent of their works, has found a place that seems to possess all the advantages that can possibly be imagined for hatching salmon, and collecting the eggs of the "Dolly Varden" trout.

The Dolly Varden or Wye-dar-d'ee-kit

Is a trout indigenous to the McCloud and Little Sacramento. There are reports of its having been found in some other streams, but they are not well authenticated. It is peculiar in shape, having a large head and mouth, and increases in size regularly from the tail to the head. It is bright yellow in color and has along its back rows of large dark spots, and on its sides spangles of red, silver and gold; presenting altogether a very beautiful appearance. Its tail and fins are of the most beautiful construction, giving it great power and rapidity in the water. They are frequently caught of eight and ten pounds weight, and there are rumors of larger ones, but only rumors. It is comparatively rare, being usually found near the head waters, and only in cool water. It is altogether, perhaps the finest trout in the world, and if it were once known there would be an increasing demand for it. It is the intention of the commissioners to obtain eggs, if possible, and introduce them into other streams.

The Place for a Fishery.

But the work of obtaining these eggs from the river will be attended with great difficulty, as they probably spawn in the winter, when the river is high; but there is a place about eight miles above the fishery, where a brook comes down from the mountains. On this brook, near where it empties into the river, lives an old Californian, Mr. J. B. Campbell, who has there a garden and orchard watered by the water from the brook. This is a fine, cold stream at all seasons, and the only one on the river available for hatching purposes, as above it all is an uninhabited wilderness for sixty miles.

In this stream, every winter, spawn the Dolly Varden and other trout, and their young are frequently seen in the irrigating ditch in summer. Here then is the place, and the only place on the McCloud, to establish a permanent State hatching house and fishery for trout and salmon; and the conformation of the brook bed is such that a large fish pond for breeding trout could be built there at a trifling expense.

Mr. Campbell favors the establishment of a fishery there; and as he has been, during this whole season, assisting at the fishery, understands the business thoroughly and could thus render valuable assistance. The only trouble in having a fishery there would be the necessity of widening the present trail into a road, as it is eight miles from the stage road; but as this runs along the valley bottom, it can be done at no great expense. It will be done sometime, and the sooner the better.—*Herman Dwinelle in Rural Press.*

Steel Wire Rope.—Steel wire rope has replaced iron wire rope with advantage in several collieries in Prussia, particularly in Westphalia. In all the pits, however, it has been found that cast steel rope must be lubricated at least once a week, and laid on one side on the least appearance of fraying. At the Saarbruck collieries the experience of other places was repeated, that steel rope could be used of a smaller strength than iron, but required a greater drum cylinder.

Professor F. E. Nipher suggests the following optical experiment: Observe a white cloud through a plate of red glass with one, and through green glass with the other eye. After some moments transfer both eyes to the red glass, opening and closing each eye alternately. The strengthening of the red color in the eye, fatigued by its complementary green, is very striking.