

ammunition and provisions. Emin Pacha is an Egyptian officer, and Stanley travels as well for the Egyptian Government (which is almost an English government) as for the English Relief Committee, the president and secretary of which are Mackinnon and Mackenzie, who are also directors of the English East African Company. This fact is very significant.

Undoubtedly Stanley's silence regarding his interview with Emin Pacha is due to the fact that this interview was of a political character, and that its subject is not yet to be made public. It is very remarkable that Stanley did not carry a single line from Emin. His object was to save Emin's province for Egypt, that is to gain it for England, and to forestall any other power which might contemplate occupying that territory. We believe that Stanley has succeeded in doing so. Emin continues to consider himself an Egyptian officer. As the Sudan continues to be closed, his next object will be to open communication with the east coast through English territory, and thus his further course becomes self-evident. Stanley states in his letter that he does not contemplate returning on the Kongo route. Mr. Stokes, agent of the missions at the Victoria Nyanza, informed Dr. Meyer that he had long ago sent hundreds of loads of goods and provisions for Stanley to Kavirondo, on the east side of the Victoria Nyanza. The second English relief expedition, which started from Mombas in November of last year through English territory, and which was greatly helped by the discoveries of Count Teleki, who returned at that time to Mombas from the interior, will probably have advanced sufficiently far to help Stanley in reaching the coast and protecting the expedition from any attacks of the Wagonda. The latest rumors of Stanley's march eastward are quite probable, and presumably he will reach the coast at Mombas. But it is improbable that Emin Pacha will accompany him. He will stay at his post for Egypt—and for England.

THE LAKES OF THE SAN JOAQUIN VALLEY.

THE rapid contraction by evaporation of the three lakes of the upper San Joaquin valley, the consequent concentration of their waters into alkaline lies too strong for animal life, and the nature of the soils laid bare on their margins, have formed the subjects of investigation and discussion in several reports of the Agricultural Experiment Station of the University of California, especially in connection with the reclamation and cultivation of alkali soils. It is a matter of regret that it has not been possible to pursue the subject by personal visits as systematically as its practical importance and theoretical interest might have warranted; for we are here in presence of a group of phenomena that have been repeated many times in past geological epochs, and for the study of which, in their physical, chemical, and biological aspects, opportunity is not often afforded. Hence, while the information and data given in a bulletin issued by the experiment station June 15, are of necessity incomplete and fragmentary, they are of interest as affording an insight into processes regarding which but little is thus far on record.

A personal examination of Kern Lake, and of the region lying between it and Buena Vista Lake, as well as of the Mussel Slough country, made under the auspices of the United States census in March, 1880, satisfied Professor E. W. Hilgard that in none of these rich agricultural sections could the slightest increase of alkali be safely risked; and analyses subsequently made of the waters of both Kern and Tulare Lakes prove that a very few years' use of the water then filling either of these reservoirs would be promptly fatal to the productiveness of the lands irrigated. As regards Kern Lake, this was obvious enough from a casual examination and tasting of the water. Having been shut off from the natural influx of Kern River for a number of years, it has been rapidly evaporating and receding from its former shores, so that at the time of Professor Hilgard's visit a difference in level of over four feet had been produced in fifteen months, leaving high and dry a boat wharf built at that distance of time. About eighteen months before, all the fish and turtles in the lake had suddenly died, creating a pestilential atmosphere by their decay; and even the mussels were mostly dead, a few maintaining a feeble existence. A strong alkaline taste and soapy feeling of the water fully justified their choice of evils. The tule marsh, laid dry by the recession of the lake, was

thickly crusted with alkali; and the tules were dead, except where still moistened by the water of the lake, showing that the latter was not yet too strong for such hardy vegetable growth, albeit fatal to animal life.

Buena Vista Lake was stated to be in a similar condition, but not yet quite so far advanced in evaporation, and still maintaining some animal life in its waters, having lost its connection with the river more recently. Tulare Lake is well known to be full of fish, and, as it annually receives the overflow of Kern and the regular inflow of King's River, its evaporation and recession have been much slower; yet its water's edge is now distant several miles from the former shore-line, and, as the water of the river is more and more absorbed by irrigation, it will doubtless continue to recede until a point is reached at which the regular seepage from the irrigated lands will balance the evaporation.

A comparison of an analysis in 1888 with those made in 1880 shows that the solid contents of the water of Lake Tulare had increased very nearly two and a half times in eight years, and that its concentration approximated closely to that of Kern Lake in 1880. Yet it appears that an abundance of fish survived, at least of certain kinds, although the mussels had already succumbed.

Having been informed in November, 1888, that "the fish in Tulare Lake were dying by shoals," Mr. J. G. Woodbury of the State Fish Commission visited the north-eastern part of the lake, near the mouth of Cross Creek, during the first week in February.

On inquiry about the reported dying of the fish, the fishermen said that it occurred last summer and autumn, and that it was mostly catfish, "greasers," and some of the so-called trout, also some carp, but very few perch. Now, it is the perch that is so much valued by the fishermen; in fact, the perch is what they fish for, as the catfish do not sell so well, and the greasers are of no account. The "trout," they say, are very soft, and do not keep well, also are very insipid.

The perch are certainly very fine fish, large, bright, and clean-looking; they are also very good eating, as Mr. Woodbury had occasion to verify. These perch have enormous mouths, and in that of every one in the pound can be seen a "shiner" (or "slick," as they call the fish) with the tail sticking out of the great mouth, being drawn farther in as the process of digestion proceeds. One perch which he took along to have cooked, he took by the gills, and, looking down his big mouth, saw the tail of a fish, which he readily got hold of with his fingers and pulled out. It was six inches long, and only had its head partly digested. The fishermen say that all these perch, when caught, have fish in their mouths, in proof of which he pulled out one at random with a dip-net, and showed the perch with a shiner's tail still out of the mouth.

The fishermen state that no catfish are now caught, while two and three years ago they would get a wagon-load at each haul; also that trout are now seldom caught, although they used to be very abundant. The men expressed no opinion as to the cause of the death of the fish, but stated that the catfish especially were drifted upon the shore, dead, by thousands. Catfish, however, are found by millions at present in the creeks and sloughs that run into the lake.

All the shore of the lake for miles was strewn with mussel or clam shells. The surface of the ground was white with them, and the wheels of the carriage crushed through them, as though more than half the substance of the ground was actually made up of shells. These shells extend here as thickly as on top, down to the depth of a hundred feet. Not a live clam can be found in the lake now. Ten years ago there were large numbers of live mussels in Tulare Lake, and the hogs used to live on them. They would wade out into the lake, and plunge their heads under water, get hold of a mussel, and hold their noses up in the air and chew it up.

For the whole distance of twenty miles from Tulare City the country is of remarkable fertility, almost level; and, where put into wheat, the growth was strong even to within two miles of the shore of the lake. The lake must have been at some time a good deal lower than it is now, for near the mouth of Cross Creek there are many stumps which were under water only last year, and among which the fishermen used to get their nets entangled. These stumps are now just at the water's edge.

Analyses show an extremely rapid increase of the solid contents of the water between June, 1888, and February, 1889, as compared with the effect produced during the previous seven and a half years. The latter was about two and a half times or 150 per cent on the whole, or an average of 13 per cent a year; while in the eight months preceding the last examination the increase was nearly 45 per cent. It should be noted that these eight months were remarkable for very great evaporation elsewhere on the coast, also, and that they formed the end of three years of rather deficient rainfall in the State. The more abundant moisture of the season just passed may have stopped or perhaps even reversed the process.

It is hoped that all persons who may, from their own observation, be able to throw light upon the history of the recession of these lakes, will communicate the facts, so as to place them on record.

THE CAMERA ABROAD.

IN a recent article in *The Swiss Cross*, when speaking of photographing in foreign countries, I advised every one to become familiar, to some extent at least, with the French language, and particularly with the technical terms used in photography; the different portions of the apparatus; the chemicals; short phrases to be used in the custom-house, to the police, to hotel servants, etc.

I need hardly say that those who intend to visit the German fatherland ought to pursue the same course with the German language. As a general rule, the traveller will find that English is spoken tolerably well almost everywhere; but it is when he goes out, and rambles about in the country or in the older and more picturesque portions of cities and towns, that he comes in contact with a class of persons who rarely speak any other tongue than their own. The mere presence of a stranger in such places will attract notice. Any thing like sketching, drawing, or photographing will be sure to draw a crowd of idlers, who will sometimes render work in these places very unpleasant, or even at times quite impracticable. A little knowledge of the native tongue is invaluable under such circumstances.

I have frequently been asked the question whether the lower orders of the people in different European countries acted differently toward the out-door photographer. On the whole, I think I can say that there is less annoyance in Germany than in most other countries. I must, however, make this reservation: that if a public school is dismissed while the photographer is anywhere near, there is sure to be trouble. The children crowd around the camera, and spoil every thing. On one occasion I was fairly driven from the field from this cause; for, even knowing the language, I found it impossible to keep them from encroaching. There is no ill nature, however, in this sort of interference with photographic work; but in some parts of the Netherlands I have had very disagreeable encounters with drunken roughs, who persisted in standing directly in front of the instrument, even when they saw plainly that they were hindering the work.

Supposing that the amateur travels for Germany on one of the comfortable Bremen or Hamburg steamers from New York: he will find himself pretty well in the fatherland from the moment when he sets foot on the vessel. The officers and crew are German to a man. The food is German, and so are the customs observed on the vessel. A very pretty one is the music which is generally furnished by the stewards during the dinner-hour every day, and early on Sunday mornings. At these times some piece of a solemn or religious character is always selected, and the effect made upon the mind by being thus awakened on a steamer in mid-ocean by religious music is not soon forgotten. The music at dinner, however, even on Sundays, is any thing but solemn in character; and the choruses to the well-known German convivial songs are joined in by all the passengers who can sing, and roared out right lustily, to the great satisfaction of those who, not being able to sing, contribute their part in screams of laughter and ringing applause. The good cheer at the table does not suffer neglect during all this babel of sounds, and, let me say in parenthesis, it is of unsurpassed quality. Americans are too apt to associate ideas of German cookery with sauerkraut and beer; but on these vessels such ar-

ticles are rather conspicuous by absence, and the table is furnished with every luxury that a pampered appetite could demand.

If the photographic apparatus is of small and convenient size, there will be numerous scenes and incidents on board a large ocean-steamer worthy of being recorded. The same apparatus could hardly be expected to answer for groups on the deck and for effective views of vessels passing. While steaming in the harbors of cities like New York, Hamburg, or Bremerhaven, capital instantaneous shots may be made at the water-craft of all kinds, but a lens of long enough focus to reach them nicely would probably be found unmanageable for groups of people on deck. If photography be attempted at sea while the vessel is rolling, take care to keep the camera level with the horizon, no matter what position the ship may assume. This, of course, is easier to say than to do; but, if neglected entirely, the pictures will make the level surface of the ocean appear like a steeply inclined plane. Remember that the forward part of the vessel is the most desirable standpoint for the camera, because the jarring motion of the screw is less felt here than in the after part. If the instantaneous shutter was a rather slow-working one, the outlines of the picture might be doubled by the vibration of the screw.

Those who are fond of making studies of clouds will here have an excellent opportunity. As a general rule, the best time to work is in the afternoon; and in selecting a position for the camera, take care that none of the ship's braces or shrouds cut across the field of the lens. This may happen at times when work has to be attempted in a hurry; as, for instance, when the pilot is taken on, when the tug comes for the mail, etc.

Great care must be taken not to expose the outfit, and particularly the sensitive plates or paper, to the damp sea-air for a longer time than is absolutely necessary. The sliding doors in the plate-holders should be constantly looked to, and special examinations made by red light at night to see that the spring cut-off in the slot of the holder closes properly when the door is withdrawn. A little time and trouble bestowed in this manner will be well rewarded by clean results, free from light-streaks and fog; for it will often happen that the cut-off swells just enough to leave a crack open when the door is pulled out, and the consequence is that every exposure is "light-struck." It is a good plan to take a sheet of fine sandpaper, a small screw-driver, and a sharp pocket-knife on all photographic excursions, so as to be prepared for accidents of the kind. The practice of throwing the focusing-cloth over the holder when the door is drawn out is a great protection to the film, and should always be done.

The port of Bremerhaven, where the amateur will probably land in Germany, offers little of interest; but just the reverse is true of Bremen, seventeen miles away. Of this I will speak in my next.

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PREPARATION AND PROPERTIES OF MANGANESE.¹

THE properties of manganese, like those of iron, appear to differ according to the method used in the reduction of the metal. When obtained from the oxide by heating with carbon, most authorities agree in the statement that the metal oxidizes so readily in the air that it can be preserved only under "rock oil" or in well-sealed vessels. In water it is said to "oxidize rapidly, with evolution of hydrogen, and crumbles into a dark gray powder." Cast manganese containing eight per cent of iron is said to be unalterable in the air.

In the year 1869, some manganese prepared after the process of Brunner (the reduction of the chloride mixed with fluorspar, by means of sodium) was found to have as little tendency to oxidation as iron. Repeating recently this process, pure chloride of manganese was fused in a clay crucible, and poured on a stone slab. When cold, it was pulverized, and mixed with an equal weight of powdered fluorspar. This mixture, divided into portions of one ounce, was introduced into a French clay crucible, previously heated to redness. Eighty grains of sodium, cut into small pieces and freed from naphtha, being added to each portion, the crucible was covered, and re-action allowed to take place before adding an-

¹ Paper read at the meeting of the chemical section of the Franklin Institute, Philadelphia, May 21, by Charles Bullock.