THE CHOLERA IN EGYPT.

The German Commission which visited Egypt for the purpose of studying the etiology of cholera and for making experiments designed to instruct doctors in its successful medical treatment, have recently made a report through Dr. Koch, dated Alexandria, Sept. 17, 1883. From it we extract some items of interest. The purpose of the commission was first to make preliminary investigations which might afterward be extended and applied. This desire was fully gratified by the kindness of the doctors of the Greek Hospital, who put at the disposal of their visiting brethren their laboratories, all the cholera patients, and also the corpses of those who died with this disease.

The commission established itself upon the first floor of the hospital in two adjacent and well lighted halls. In one microscropic studies were pursued, in the other culture experiments. The animals intended for experiments were placed in both apartments until their numbers had so much increased that it appeared dangerous to work with poisonous matter in the same place occupied by the commission all day, and they were then removed and isolated.

Up to the date of the report the material examined was obtained from 12 cholera patients and 6 corpses. Of the 12 patients 9 were examined in the Greek Hospital, 2 in the German, and 1 in the Arab. The symptoms in all cases were those of true Asiatic cholera. The blood of the patients, the vomits, and feces were all studied. As it was soon seen that the blood did not contain micro-organisms, that the vomits were relatively barren of them, while the feces contained large numbers, these latter have principally afforded material for experiments of infection among the animals.

The numbers of autopsies made is slight, but they yielded important results. The corpses belonged to very different nationalities (3 Nubians, 2 Austrians, 4 Greeks, 1 Turk), and were of various ages (2 infants, 2 old men over 60 years old, the next between 25 and 30 years of age), and finally the durations of their sickness had been unequal. But a great advantage was found in being able to perform the autopsy almost immediately after death or at most a few hours later. Under these conditions it has been possible to exclude with certainty all the changes that putrefaction might effect in the organs, especially in the intestines, which often prevents any microscopic examination of these parts.

In the blood and in the organs which for other contagious diseases are frequently the seat of micro-parasites, viz., the lungs, spleen, the kidneys, the liver, no infectious material was discovered. At times bacteria have been detected in the lungs, but their form and position showed that they had no connection with the malady itself. In the contents of the intestines and in the feces microbes have been encountered in astounding numbers and of very diverse species. None, however, predominated, and moreover nothing showed any relation between these bacteria and the disease.

But an examination of the intestine itself revealed an important fact. With the exception of one patient who died of a different disease, the walls of the intestines of the rest yielded a peculiar species of bacterium. These bacteria were rod-like bodies, and therefore properly *bacilli*, and closely resembled the bacilli of glanders. In the cases where hand examination showed but slight alterations, the bacilli had penetrated the tubular glands of the intestinal mucus and had excited there intense irritation. Frequently the bacilli had effected an entrance behind the epithelial covering of the gland, and had multiplied between the epithelium and the membrane of the gland. In addition they were found in great numbers upon the surface of the intestinal villosities, and had frequently entered into their tissue. In severe cases accompanied by a blood infiltration of the intestinal mucus the bacteria showed themselves in great force, and then they continued their encroachments past the glands, the surrounding tissue, the deeper layers of mucus, until they reached the muscular support of the intestine.

The principal seat of these alterations was found toward the lower part of the slender intestine.

These facts observed upon recently dead subjects were valuable, as there could have been no possible vitiation of these results from decomposition, which produces a very similar bacterial vegetation. The same points had been observed by Dr. Koch in cholera patients from India, but as these were less recent subjects he had felt unwilling to assign the phenomena exclusively to the progress of the disease. The exact coincidence of observations in the Egyptian and Indian subjects proves the identity of the disease and establishes one character of its action. Dr. Koch reports that there can be no doubt as to the existence of some relation between the bacilli and the disease, as they have been found upon all recent cholera victims, but absent upon patients who had succumbed to other maladies. Nevertheless, he adds, the coincidence of the cholera and bacilli in the intestines does not justify our regarding them as the cause, but might as well be interpreted as the consequence of the disease.

To prove the first of these assumptions it is necessary to cultivate the bacilli in great purity, and then to attempt to reproduce the disease by their inoculation in animals. For this it is of the first importance to have animals which exhibit a certain receptivity for the infectious germs, but as yet, despite all efforts, cholera has not been communicated to animals in an incontestable manner.

Experiments have been made again and again upon rabbits, dogs, cats, monkeys, pigs, rats, etc.

The only facts in this connection which merit attention are those instanced by Thiersch, who has seen mice die of diarrhœa who had been inoculated with the intestinal contents of cholera patients. Burdon-Sanderson has confirmed this, others deny it. Mice were experimented with at Alexandria without success; various materials, as vomits, feces, intestinal contents, fresh or kept some time, or dried, have been mingled with their food, but the animals remain as ever in undisturbed health.

They went further; they raised by culture intestinal bacteria, and gave them as food or inoculated them upon animals. Some septic maladies developed in consequence, but no cholera.

Dr. Koch offers a presumptive explanation of this unexpected result. Toward the end of an epidemic the infectious matter has lost its activity or at least has become uncertain in its action. If, then, when the plague is over men are no more susceptible to the infecting germ of cholera we cannot expect to find it different with animals of whose receptivity we at present know nothing. The commission reached Alexandria when the scourge was disappearing, and it seems now important for them to repeat their experiments of inoculation at some point where the cholera is at its height. In Egypt it is stamped out in the principal cities and exists only in the villages of Upper Egypt, where it is impossible to execute an autopsy for fear of the inhabitants.

Dr. Koch, in consideration of the interesting results already gained, earnestly recommends the transference of the labors of the commission from Egypt to India, where, as at Bombay, the plague rages almost unabated.

ARGOLS.

When the hot sun was ripening the grapes on the hillsides of Tuscany, or along the Tagus or Garonne, there was a wonderful amount of chemical action going on in the fruit, a tolerably fair illustration of the way Nature's laboratory is always busy. By and by the grapes were crushed and wines of one grade or another were the result. We are apt to think that since wine "maketh glad the heart of man," its stimulant effect is all that we owe to it. Very true, grape juice fermented exhilarates the spirits, and its influence on the destinies of the human race has been practically without limit longer than any history, even monumental or traditional, can trace, but we cannot look to that now. We are going after something in the wine besides its alcohol (to which it owes its stimulating power), and in order to reach our point we must go back to the grape, and see how it grew and what it did.

All the time that the fruit was growing, even before it began to ripen, the vine, which had drawn up potassa from the soil, was depositing more or less of it in the cells of the grape. It did not leave it there as potassa, for it was making an acid from the carbon, oxygen, and hydrogen which it took in both by roots and by leaves, mostly the latter. This acid we call tartaric, and as the acid and base united the result was tartrate of potassa; and by one of those singular freaks of Nature's chemistry, whose individual causes we have not yet detected and perhaps never shall, the potassa would not be satisfied with one proportion of the acid, but took two and made thus a bitartrate, and in this peculiarity lies its import to us, for that extra supply makes it an *acid tartrate*, and its constitution unstable.

As the grape ripened, sugar was formed, and with that—probably through it—more tartaric acid, the change being caused only by the combination of an additional amount of oxygen together with water. When the grapes were fully ripe, therefore, and were crushed, we had a juice flowing, the future wine, containing a variety of substances, only two of which concern us now—sugar and bitartrate of potassa.

The juice when placed in casks began to ferment. Its sugar was of the glucose type, which has received its name, grape sugar, from this very fruit, though found abundantly in others, but all the sugars—cane or grape—in fermentation do one thing—they split into carbonic acid and alcohol. The acid escapes as a gas, if it is free to do so, but the alcohol remains.

Now the bitartrate of potassa which had been formed during growth is not soluble in alcohol, and consequently whatever alcohol is produced by the fermentation must necessarily separate from the wine just its proportionate amount of the tartrate. This tartrate, from the curious and mysterious laws which regulate crystallization, goes out to the sides of the cask and attaches itself there. It is heavier than the wine, and we might suppose that it would all gradually settle to the bottom, but it does no such thing; and though the deposit is certainly thickest at the bottom, it is only moderately so.

Of course it has taken with it such materials as it found floating, and by so doing it has swept as with a net the grape juice, and a beautifully clear, transparent wine remains. The bitartrate has crystallized as it adhered to the sides and bottom of the cask, and has formed a solid crust of thickness corresponding to the nature of the grapes and the strength of the wine. It is not uncommon to find a firm, strong layer half to three-quarters of an inch thick, and even more. The crystals are of moderate size, sharp, four sided, trimetric. Their transparency depends on the nature of the juice from which they have been formed. Some are brilliant and clear; some have entangled so much of the muddy dregs as to be almost entirely opaque. And their proportion of actual bitartrate of potash varies in the same degree from 95 down to 15 or 20 per cent.

This mass of crystals is what is known in commerce as *argols*. It is sometimes called crude tartar, and when refined and purified is cream tartar. Of course argols can be an article of export only from the countries producing wine in large quantity, and naturally our supply comes mostly from the south of Europe. It is usually reckoned that red wines are richer in argols than the white, but it is the fact that very often the red argols from Oporto are so "muddy" as to be the poorest of all.

As cream tartar is simply argols refined to their highest grade, the question as to which of the two shall be imported becomes in part a matter of tariff regulation. Crude argols are now free of duty, while cream tartar pays heavily. Under this state of things the importation of argols, taking say the year 1877, was 8,999,470 pounds and of cream tartar 2,456,924, while in 1867, when the duty on argols was double that on cream tartar, the former were 2,012,000 pounds and the latter 2,051,168. The custom house value of the importations of 1877 was $1,839,205.

We are beginning to make wine in this country, and every cask of wine produces argols, but the quantity thus far is so small as to be of no moment, and it will in fact be many years before American argols will have any effect on the market.

The greater proportion is sold and used without refining into cream tartar. For the purposes of cookery only the latter can be employed, but this takes only a small part. The chief use is in the processes of the dyer. A.

Pattern Designing.

A writer in our esteemed contemporary, *Cotton, Wool, and Iron*, thinks that our pattern designers for fabrics have not kept pace with loom building. Novelties in fabrics are very rare; we imitate foreign makers too much, and if we accidentally drop on something new in imitating, we then imitate each other. Most of us are satisfied if we do as well as some who have gone before us. There are not enough whose ambition leads them to "look beyond," to reach into untrodden fields. For ten years past the progress in the building of fancy cassimere looms has been wonderful, and the loom maker of to-day can say, with a feeling that he can fill the bill, "If you don't see what you want, ask for it." We do not believe the same feeling holds good with our designer, who has a chance to-day unknown to the designer of years ago. He has a loom on which he can do most anything; he has yarns of silk, worsted, jute, mohair, etc., which he can combine in entirely new fabrics, if he would only "look beyond" and step into untrodden fields. Don't imagine that you must do only just what has been done before, but try something entirely new. If you get a new fabric don't be set back by any commission man, for they are only mortal, and as liable to err as any set of men we ever had to deal with. If you get a new thing, make enough for a garment, and according to what that garment is to be, go to the most fashionable maker and get his opinion. If he objects, and you are satisfied you have a good thing, then go to some leaders of fashion and persuade them to wear the garment. Don't give up. Remember that a new fabric is the same as any new invention, and that a new invention often takes a lifetime to perfect it. Do not get discouraged, but persevere; combine new materials and make a bold stroke for novelty.

We have now plush looms for working up mohair. Some of them weave a single fabric, some of them weave two pieces together face to face, and the plush is cut apart by a knife in various ways according to the make of loom. When this is done there are two pieces of perfect plush that were woven at one time. By a combination of the mechanism of the two looms there is nothing to prevent weaving a mohair plush figure on a woolen ground. This could readily be done in various colors, and beautiful and entirely novel effects could be produced in this way. A plush spot or figure on a woolen ground would look brighter than in a body by itself. Combined goods of this kind would have of necessity to be a melton finish, as the shearing could only be applied to the plush face. As the ground work of the cloth would not be touched by the shear, hard knotted yarn could be thrown in that could not be used under other circumstances, producing effects that would be entirely novel.

How Wooden Spools are Made.

The birch is first sawed into sticks four or five feet long and seven-eighths of an inch to three inches square, according to the size of the spool to be produced. These sticks are thoroughly seasoned. They are sawed into short blocks, and the blocks are dried in a hot air kiln. At the time they are sawed a hole is bored through them. One whirl of the little block against the sharp knives, shaped by a pattern, makes the spool, at the rate of one per second. A small boy feeds the spool machine, simply placing the blocks in a spout and throwing out the knotty or defective stock. The machine is automatic, but cannot do the sorting. The spools are revolved rapidly in drums, and polish themselves. For some purposes they are dyed yellow, red, or black. They are made in thousands of shapes and sizes. When one sees on a spool of thread "100 yards" or "200 yards," these words do not signify that the thread has been measured, but that the spool has been gauged and is supposed to contain so much thread. When a silk or linen or cotton firm wants a spool made, it sends a pattern to the spool maker. This pattern gives the size and shape of the barrel and the head and bevel. These patterns determine the amount of thread that the spool will hold. One Maine factory turns out 100,000 gross of spools per day, and consumes 2,500 cords of birch annually.