

with air, unfiltered, unboiled water, or with materials of clothing.

These and other experiments have been performed over and over again by numerous independent observers in various countries, always, if properly carried out, with the same results, so you may accept them as definite and absolute certainties.

Now if you remember what was said in my last lecture about simple aseptic inflammation, and its difference from progressive, or destructive, septic inflammation, you will see the relevance of these experiments and of the following.

Hulter made certain experiments to prove that severe injuries to living tissues might be made without producing the progressive, or dangerous, form of inflammation, so long as germs were rigorously excluded; and he used a red hot, or white hot, cautery for the purpose, because such a heat absolutely destroys all germs with which it comes in contact.

He made a small incision in the skin of an animal, and drawing it on one side he plunged the cautery into the muscles beneath; withdrawing it, he allowed the skin to fall back, so making the outer and inner wounds not to correspond, and dressed the whole with antiseptic dressings. Primary union was obtained in ten out of thirteen cases—all those, in fact, in which the aseptic character of the wound could be maintained. The animals were killed at periods varying from three to sixty days; and under the microscope little more than a faint brown mark was to be seen.

But Chauveau's experiments are perhaps the most convincing. There is an organ in the body, the cessation of whose function does not prejudice the life of the animal, which is supplied by one artery, the current in which can be arrested by means which do not require any breach of surface. In certain domestic animals, as the calf, such an operation is frequently required; and in the South of France, a peculiar manoeuvre, called *bistournage*, which complies with the above restrictions, has been for many years practised upon millions of animals. It consists of freeing the organ from its surroundings, then rapidly twisting it so that the upper end becomes the lowest, and then several times upon its own axis. Chauveau continued the twisting until all connection between the organ and the body was absolutely severed.

The first experiment would naturally be to perform this manoeuvre upon a healthy animal, and watch the result; but as this had previously been done so many times, it was not necessary. No inflammation of a progressive kind followed, but the organ was quietly absorbed until it almost entirely disappeared.

Chauveau now took some septic pus from an abscess, and diluted it with four times its amount

of water, and allowed this to stand. All the visible elements of the pus gradually sank to the bottom, and in the surface layer of fluid, nothing could be seen under the microscope but micrococci.

Of this surface fluid he injected one dose three hours before, and another ten minutes before the operation, into the animal. The fluid found its way into the blood, and was carried into all the organs, amongst the rest, of course, as the artery leading to it was not yet blocked, the organ in question.

On the fifth day the part was inflamed, the temperature reached 106 degs. During the next two days the organ became more and more painful and swollen. The animal was killed on the fifteenth day. The organ was found surrounded by pus charged with septic germs; its own tissue fetid and discoloured.

In other cases the animals died from septicæmia or blood-poisoning. But the local mischief might be due to the general bad effects of the injection upon the system, and not to the actual presence of bacteria in the injured organ itself. To settle this question, the operation was done first, and the artery leading to that part of the body was thereby closed. Irritation occurred in one instance in the sheath of the organ, with effusion of reddish serum, but generally the course of the case was the same as if no injection had taken place. But the mischief might be due to the poisonous character of the fluid itself, and not to the bacteria, so in the next experiment the fluid was filtered. No mischief resulted; it was as if the fluid had been simple boiled water.

So we have proved, so far, that animal fluids themselves have no inherent tendency to putrefaction, but that they develop such tendency after exposure to the contact of air, unboiled water, clothing; that when pure and unchanged, they have no deleterious effect upon animal life, but that when changed by putrefaction, they become poisonous.

Next, that severe injuries in themselves have no further effect than to excite the tissue so injured to just so much inflammation as is sufficient to repair the damage done, but that if something present in putrescent fluids is circulating in the blood of the part injured, the inflammation excited takes on a destructive character, with a well marked tendency to spread, and to reproduce itself in other parts to which it is carried by the blood stream.

That this something is not a gas, nor a fluid, but a solid.

Now come a whole host of experiments by various scientists, to prove that this something is in itself living, and capable of reproduction; moreover that numerous distinct varieties of it exist, each capable of producing its own specific variety of disease.

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