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Detailed table of contents for the supplement, categorized into sections like ENGINEERING AND MECHANICS, TECHNOLOGY AND CHEMISTRY, BIOLOGY, ELECTRICITY, etc., with page numbers.

A NEW AND IMPORTANT FIELD FOR RESEARCH.

The hope of finding some substance not greatly injurious to higher forms of life and yet so fatal to all sorts of morbid germs that it would answer as a general disinfectant is not greatly encouraged by the progress of discovery. In their life habits and capacities the lower orders of living things—bacteria or what not—seem to differ almost as widely as the higher orders do. Conditions which kill one class are harmless to another while others specially thrive under them. And curiously, with varying conditions, the same germs may exhibit an enormously variable power to resist the action of germicides.

For example, the germs of the cattle plague symptomatic anthrax, after drying, are able to withstand disinfectants which quickly destroy the fresh virus. Thus it appears that for the certain antagonizing of any specific disease germs it will be necessary to study the action upon them not only of all the different disinfectants, but these separately under all the conditions in which the germs are likely to be met with.

An excellent illustration of the kind of work thus required is seen in the researches recently reported in the Lyons Medical, by Arloing, Cornevan, and Thomas, in which was demonstrated the fact just noted as to the superior resisting power of dried anthrax virus. These investigations were undertaken to discover the effect of the various disinfectants in use when applied in turn to a particular class of disease germs. They were carried out with pulp taken from tumors in symptomatic anthrax, when in a fresh condition, and also when the matter had been slowly dried at a temperature of 95° Fah. The dried virus, even after two years' keeping, showed, when diffused in a little water, a virulence not exceeded by that of the fresh virus, while, as already noted, its power to resist the action of disinfectants was greatly increased. The test of virulence was the hypodermic injection of five drops, the virus having previously been subjected for forty-eight hours to the action of the substance whose antiseptic power was under examination. In this way it was found that (with respect to the virus of anthrax) many substances regarded as efficient antiseptics had no effect whatever on the fresh virus, while but few of the substances which destroyed the fresh virus had any effect upon the virus after it had been dried.

Reviewing the results of these experiments, the Lancet points out that pure or camphorated alcohol, which is largely used by surgeons to wash their instruments, is evidently capable of giving only an illusory safety against morbid germs. We should say rather this class of morbid germs. "Quicklime, in which it is often recommended that the bodies of animals dying of anthrax should be buried, and with which the walls of infected places are washed, is no better. At the moment of its hydration some organisms are probably destroyed by the heat which is disengaged, but those which are not in immediate contact with the lime seem to have preserved all their activity. Very thin layers of the tissue of the tumors of anthrax were taken and rolled up and plunged into the quicklime, and left in it for forty-eight hours. At the end of that time they were rubbed up with water, and the liquid was found to possess full virulence. The inutility of tannic acid suggests the question whether tanning is really adequate to destroy the poison in the hides of the affected animals, and it is clear that salting has no influence on the virus contained in the flesh, etc. Quinine, so powerful in the paludal diseases, which are now believed to be due to organisms, was found to have no influence over the bacteria of anthrax. Ammonia and its compounds were also powerless. Ammoniacal fermentation, therefore, which is said to destroy some bacteria, does not influence those of anthrax. Sulphate of iron, and chloride of manganese, substances which have been strongly recommended as disinfectants, were equally powerless. Further, the sulphurous acid, which is so potent in action upon some parasites of high organization, and on many forms of virus, has no influence on the bacteria of symptomatic anthrax. Chlorine and sulphide of carbon, which destroy the fresh virus, are powerless against that which has been dried. Of all the vapors bromine is the only one which seems to offer complete security. Another important result, from a surgical point of view, is the action of carbolic acid. A two per cent aqueous solution destroys the activity of the dry virus, but all the power is lost if the carbolic acid is mixed with alcohol. This fact has already been noted by Koch with regard to other kinds of spores. On the other hand, salicylic acid, mixed with alcohol, preserves its power. Turpentine, recommended by Pasteur for the purpose of destroying the bacillus of true anthrax, has no influence on that of symptomatic anthrax. At the head of the efficient agents stands corrosive sublimate, of which a solution of one in five thousand is sufficient; next come in order nitrate of silver, salicylic acid, and carbolic acid. A two per cent solution of the latter was found, however, only to destroy the organisms when it had been in contact with them for eight hours in the case of the fresh virus, and for twenty hours in the case of that which had been dried."

The value of these results in connection with the treatment of the disease in question need not be insisted on here. The great point to be kept in view is the importance of conducting similar investigations to discover the influence of possible germ killers upon the germs of diseases more especially afflicting humanity. For those diseases which are not transmissible to the lower animals, and consequently cannot be directly studied in animals, it may be possible to conduct operations with culture liquids. Having found

artificial compounds in which the bacteria of the particular diseases to be studied are able to live and multiply, the potency or impotence of supposed germicides could be determined with these perhaps as well as with the living (human) organism. At any rate enough might be accomplished to prevent the mistake of trusting individual or public health in special cases, to the protection of disinfectants that would not disinfect, simply because the same substance had been found useful in other cases.

THE HEKTOGRAPH.

This is the well-known copying process in which gelatine transfer pads are used. Contests were carried on for a long time after its invention, before the United States Patent Office, to determine who were the original and first inventors. A mass of testimony was taken; but the priority of invention was finally awarded to Vincenz Kwaysser and Rudolf Husak, of Austria, to whom Letters Patent were granted June 1, 1880. During the progress of the interference proceedings hundreds of dealers began to make and sell the article, and it was difficult for them to understand that, now that a patent had been issued to the inventors, they must cease to manufacture or assume the liabilities of infringers. In some cases it became necessary for the Hektograph Manufacturing Company, the owners of the patent, to bring suit for damages. One of these suits has lately been brought to a conclusion, the patent being fully maintained by the United States Court, as will be seen by reference to the advertisement in another column, in which the particulars are fully given.

Fasting in Acute Rheumatism.

Dr. Wood, professor of chemistry in the Medical Department of Bishop's College, Montreal, reports in the Canada Medical Record a number of cases in which acute articular rheumatism was cured by fasting, usually from four to eight days. In no case was it necessary to fast more than ten days. Less positive results were obtained in cases of chronic rheumatism. The patients were allowed to drink freely of cold water, or lemonade in moderate quantities if they preferred. No medicines were given. Dr. Wood says that from the quick and almost invariably good results obtained by simple abstinence from food in more than forty cases in his own practice he is inclined to believe that rheumatism is, after all, only a phase of indigestion, to be cured by giving complete and continued rest to all the viscera.

A Colored Reaction of Atropine and Daturine.

If a specimen of either of these alkaloids or of their salts is covered with a little fuming nitric acid, let dry up on the water-bath, and when cold moistened with a drop of potassa dissolved in absolute alcohol, a violet color is instantly produced, and soon passes into a fine red. Only the violet color is characteristic, as strychnine also gives a beautiful red color if similarly treated. According to the author, 0.000001 gm. of atropine sulphate can thus be detected. None of the other important alkaloids give a similar reaction.—D. Vitali.

Spontaneous Combustion of Cotton.

During one of the hot days of June a Connecticut lady thought she smelled something burning up stairs. In searching for the fire she entered a small close garret room used for storage. She opened a window and instantly a bag of carpet rags hanging there burst into flame. The rags had been there all winter. The fire was promptly smothered; and when the bag was opened it was found that only balls of cotton rags were burned. Whether the rags had been dyed is not stated.

Converting a Negative into a Positive.

Capt. Bing, of Paris, has devised an ingenious method of making a positive on glass from a negative, and on the same glass. The back of the negative is covered with soluble bitumen or asphalt and then illuminated through the negative. After an exposure sufficient to render the light portion insoluble, the remainder of the asphalt is dissolved off with any of the usual solvents, leaving a positive. The silver negative is then dissolved off with the chloride of copper and a fixing agent, such as cyanide or hypo.

Leatheroid.

Leatheroid is a new article made of paper. It consists of a number of thicknesses of cotton paper wound one upon another over a cylinder. The remarkable qualities of strength and adhesion it possesses are derived from a chemical bath, through which the paper is drawn on its way to the cylinder. It is moulded wet, and retains its form. When dry, it cuts like raw hide.

CARRIER PIGEONS FOR NAVAL SERVICE.—The Secretary of the German Navy has resolved to employ carrier pigeons in the coasting service, all the experiments with them made by the Prussian Government on the coast of the North Sea, since 1876, to establish communication with the lightships lying off the coast having been successful.

The American Association.

The American Association for the Advancement of Science will meet at Buffalo, N. Y., August 23, next.