OUR PRIZE COMPETITION.

DEFINE THE WORDS (a) STERILE, (b) ASEPSIS, (c) DISINFECTANTS, (d) STERILIZATION, (e) WHAT IS MOST EFFECTIVE?

We have pleasure in awarding the prize this week to Miss J. G. Gilchrist, Gilmore Place, Edinburgh.

PRIZE PAPER.

In medical and surgical work certain terms are used to denote a special condition or procedure adopted in safeguarding patients and others from the attacks of harmful bacteria, such as the pathogenic organisms producing specific diseases, and, in surgical cases more particularly, the strepto and staphylococci, germs which cause pus formation and other morbid processes.

(a) *Sterile* is a word denoting the highest degree of safety from germs—absolutely free from harmful organisms. In surgical work this ideal must be attained before an operation commences, and applies to everything which comes in contact with the surgeon, the patient, and the assistants. Sterility is accomplished by a routine of cleansing and disinfection conscientiously carried out in every detail, and afterwards careful avoidance of contact with anything *un*sterile. The word "sterile" is mostly used in connection with those articles, such as towels, overalls, vessels, water, and instruments, which can, from their nature, be made unmistakably safe and germ free by both simple and scientific means of the highest order —*i.e.*, boiling water; saturated steam; and strong chemical solutions, used as to their suitability for the article required.

(b) *Asepsis* is a word akin to sterile in that it means freedom from pathogenic organisms, and especially in medical and surgical nursing, where there is risk of infection. It is the opposite state of sepsis, and denotes a pure and wholesome condition. The term "surgically clean" is sometimes used. A surgical wound which heals without interference—*i.e.*, which has not been infected with pathogenic organisms—is commonly called aseptic, and all aseptic wounds should be induced to remain in a state of asepsis throughout by aseptic treatment, which includes surgical cleanliness in the immediate surroundings, the hands and clothing of the nurse or operator, and the dressings and vessels in daily use. The patient's skin on the site of operation is required to be in a state of asepsis by repeated cleansing and preparatory disinfectant dressings. Also the surgeon's and assistants' hands must be aseptic; some call it a surface sterility, obtained by thorough washing and soaking in disinfectants. Asepsis in surgical and midwifery work is of the utmost importance, and this preventative condition should be at all times conscientiously maintained in details.

(c) *Disinfectants* are agents employed for the purifying from and destruction of the organisms of disease, the most efficient not only destroying the adult bacilli, but also killing the spores.

Three classes of disinfectants are: (1) Heat, dry and moist, at an extreme temperature.

(2) Chemicals used in various forms and strengths. Disinfectant drugs for most purposes are used in the form of antiseptics, which have the power of preventing and arresting the growth of organisms. Used as lotions, the perchloride of mercury, 1 in 1,000 for the hands, is perhaps one of the strongest, and boracic acid, for wounds, one of the mildest; both are good antiseptics, the latter valuable in keeping an aseptic area clean and fresh while repelling the onset of bacteria, where a stronger might be apt to destroy the newly formed tissues. Disinfectants vary in their destructive properties, some being of a very poisonous character, and harmful to the skin and tissues if used in great strength. The best are those soluble in water, non-corrosive, and as non-irritating as possible to the skin. Izal is one which is good and reliable for general purposes. Some, such as carbolic, are useful for those things which cannot be subjected to heat, such as metal, wooden, and leather articles; also for disinfecting stools and urine. Chloride of lime (bleaching powder) is especially useful for disposal of sputum or stools in insanitary places.

(3) Aerial or gaseous substances are employed for disinfecting rooms, furniture, and the air they contain. Sulphur dioxide, chlorine gas, and formaldehyde are commonly used, the last the most germicidal in the shortest space of time. These act best in the presence of moisture. The fumes, both for burning and, in formaldehyde, for spraying, are very penetrating and irritating to the sensory organs.

(d) *Sterilization* is a process to render an article absolutely pure and free from living organisms. Instruments, glass vessels, rubber gloves, and other materials can be sterilized by being placed in boiling water in a covered vessel, and the temperature kept at boiling point for twenty or thirty minutes. Overalls, list slippers, towels, bedding, and thick and bulky textile materials are sterilized by placing in a specially built receptacle, where they are subjected to a high temperature (about 250° Fah.), known as the "thermal death-point,"

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