

(Advance Copy)

Rec'd Oct. 7/18

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Prof. C. Shaunessy
Dr. Fromme

WAR DEPARTMENT

COMMITTEE ON EDUCATION AND SPECIAL TRAINING

Special Descriptive Circular

HYGIENE AND SANITATION

The course on Hygiene and Sanitation outlined below is designed to cover one term of twelve weeks, allowing a total of nine hours per week for classroom work and supervised study. The topics suggested are given in further elaboration of the list presented in General Circular C.a.4, par. 11 (C). Hygiene and Sanitation is listed as an essential subject for students in Group I (see Circular C.a.4, par. 8). The instruction should be as practical and definite as possible and should be illustrated by diagrams of camp organization, sanitary devices, etc. In class discussions, quizzes and examinations the questions should bring out clearly the proper action to be taken by officers for the health of their men and by soldiers for their own health.

The course outlined is a tentative one, and must be adapted to meet local conditions; and the topics must be treated in a broad and elementary fashion suited to the capacity of the students. Each of the suggested topics may be treated in one class meeting.

I. *Military Life*.—Necessity of physical fitness; The old-time army surgeon,—care of sick and wounded; Present-day methods based on prevention (a. Ambulance service. b. Hospital service. c. Hygiene and sanitation. d. Morale); Individualistic character of army life—a man must know how to take care of himself; Communistic phases of army life, association of men; Military environments (a. The trench. b. The temporary camp. c. The billet and dug-out. d. The permanent camp. e. The march.); The responsibility of the officer for the health of his men; Duty of soldiers to civilians.

II. *The Living Machine. Health and Disease*.—Health and disease—ancient theories of disease (a. The demonic theory. b. The theory of the four humors.); Rise of modern physiology and sanitation—the living machine; Health, the normal, disease the abnormal working of the living machine; Internal and external factors in disease—personal hygiene and public sanitation.

III. *Parasitism and the Microbes of Disease*.—Meaning of the word parasite (the mistletoe)—animal parasites—hookworm disease; The bacteria—discoveries of Leeuwenhoek, Pasteur, Koch, Lister—form, size, structure, physiology of the bacteria—how they cause disease; The protozoa and their relation to disease; Filterable viruses.

IV. *Sources and Modes of Infection*.—Short life of disease germs outside the body; The incipient case, the missed case and the carrier—human

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beings the source of danger; Spread of disease germs by contact; Spread by food and water; Spread by insects; Relatively slight importance of long-distance transmission by fomites; Direct transfer of human discharges the danger.

V. *Disposal of Excreta and Solid Wastes*:—Distinction between mere litter and wastes dangerous to health; Danger of spreading fecal matter on surface of ground; Latrines—construction and maintenance (a. For temporary use. b. For longer use.); The pail system (a. For trenches. b. For camps.); Disposal of urine (Night service); Garbage disposal (a. Open incineration. b. Types of incinerators. c. Utilization.); Disposal of manure; Disposal of dead animals; Necessity of camp cleanliness.

VI. *Sewage Disposal*:—The water carriage system—its advantages, its dangers; Quantity of sewage—variations in flow; Character of sewage (a. Organic matter. b. Bacteria. c. Grease.); Removal of suspended matter (a. Screens. b. Settling tanks. c. Septic tanks.); Processes of oxidation (a. Application to land. b. Contact beds and trickling filters.); Dilution of sewage—advantages and dangers; Disinfection of sewage; Points of similarity and difference between municipal sewage disposal and sewage disposal of military camps; Disposal of greasy water—sinks, wastes and bath water.

VII. *Water Supply*:—Quality of water; Water analysis—object and general methods; Sources of water supply (a. Ground water. b. River waters. c. Lake supplies.); Water purification (a. Storage. b. Sedimentation. c. Filtration. d. Disinfection. e. Distillation.).

VIII. *Military Water Supplies*:—Quantity of water (a. On the march. b. In the temporary camp. c. In the permanent camp. d. Requirements of animals.); Use of old wells—dangers; Field disinfection (a. Small quantities. b. Large quantities. c. Permanent supply.); Field filtration; Storage and distribution of waters (a. In camp. b. On the march. c. In the trenches.); Use of canteens.

IX. *Camp Sites*:—Military requirements; Topography; Nature of soil; Natural drainage,—standpoint of sewage disposal; Supplies of water, forage, fuel; Layout of camps; Examples of camp layouts.

X. *Sanitation of Foods*:—Possible dangers from foods, human infections, animal infections, foreign poisons; Milk epidemics—danger of bovine tuberculosis; Pasteurization the only sure safeguard; Shellfish and other raw foods; Diseased meat; Food poisoning, specific infection with paratyphoid and botulism; Adulterants and preservatives; The carrier in the kitchen.

XI. *Food and Nutrition (A)*:—Calorimetry of foods; Oxidation of food in the body; Animal calorimetry; The basal metabolism; General influence of temperature, of food ingestion and of mechanical work on metabolism; Condition and length of life in starvation.

XII. *Food and Nutrition (B)*:—The behavior of protein in metabolism; The behavior of carbohydrate; The behavior of fat; The requirement for salts; The vitamins; A balanced diet.

XIII. *Food and Nutrition (C)*:—The influence of mechanical work on the protein metabolism; The influence of marching and of carrying equipment on metabolism and food requirement; The importance of flavor and psychology of good cooking and clean service; Avoidance of waste; Grain should not be fed to pigs when needed by man.

XIV. *Insects and Disease*:—Insects as disease carriers; Life history of the fly; Prevention of fly breeding (a. Care of manure. b. Care of fecal matter.); Fly killing (a. Traps. b. Poisons.); The story of the Spanish war camps; Distinction between the danger of the fly and the "fly as a carrier of fecal matter."

XV. *The Mosquito*:—The mosquito as a disease carrier (a. Yellow fever. b. Malaria.); The life history of the mosquito; Difference between *Culex* and *Anopheles*; Drainage; Use of oil and larvicides; Use of screens (a. Over standing water. b. On doors and windows. c. Size of mesh.); Results of mosquito control.

XVI. *Lice, Fleas, Etc.*:—Lice—typhus fever, relapsing fever, trench fever; Fleas—plague; Kinds of lice (a. Head louse. b. Body louse. c. Clothing louse); Delousing measures (a. Preventive measures. b. Removal of lice from the person. c. Removal of lice from the clothing and bedding. d. Disinfection of buildings).

XVII. *The Contact Borne Diseases*:—Nose and throat diseases—Diphtheria, Influenza, Common Cold, Tonsillitis, Pneumonia, Cerebro-Spinal Meningitis, Poliomyelitis, Measles, Whooping Cough, Scarlet Fever, Smallpox, Tuberculosis; Intestinal diseases—Typhoid, Paratyphoid, Dysentery, Cholera, Tuberculosis; Venereal diseases (*see Public Health Reports, U. S. Public Health Service*).

XVIII. *Isolation and Disinfection*:—Old conception of quarantine, new conception of isolation; Disinfection of discharges, danger of mouth spray; Terminal disinfection (relatively slight importance); Isolation period, termination of isolation.

XIX. *Carriers and Contacts*:—Importance of early stages (measles); Carriers (typhoid, diphtheria, epidemic cerebro-spinal meningitis); Control of carriers and contacts—incubation periods of common diseases; Methods of laboratory control.

XX. *Vaccines and Sera*:—General vital resistance and specific immunity (natural or acquired); History of vaccine therapy, smallpox, Jenner, typhoid

vaccination and its results—paratyphoid immunization; Diphtheria and the antitoxic sera—sera for meningitis and pneumonia; Diphtheria immunization by the use of toxin-antitoxin mixture.

XXI. *Tuberculosis*:—Etiology of the disease—historic prevalence and present importance; Checking the spread of the germ—Pasteurization of milk, care of sputum—importance of infection in infancy; Building up vital resistance—principles of sanatorium care; Importance and hopefulness of early treatment—first signs of the disease; Social machinery for combating tuberculosis—clinics, sanatoria, control of careless consumptive, supervision of housing and industrial conditions.

XXII. *Veneral Diseases*:—Physiology of reproductive organs; Venereal diseases—symptoms and sequelae of gonorrhea and syphilis; First line of defense—chastity; Second line of defense—prophylactic and curative treatment; Suppression of organized vice and provision of exercise and recreation; Mental attitude, frankness, spirit of efficient service to nation and loyalty to ideal of home.

XXIII. *Mental Hygiene*:—Old and new viewpoints in regard to mental disease—sanity relative, not absolute; Hereditary factors in mental disease—feeble-mindedness; Environmental factors—"Shell Shock"; Mental examination of recruits (intelligence, leadership, personal character, adaptability); Treatment of mental cases, successful results.

XXIV. *Principles of Personal Hygiene*:—The parts of the living machine—the muscular system, the digestive system, circulation, excretion, co-ordination, the sense organs; Fundamentals of personal hygiene (food, fresh air, exercise and rest); The value of exercise—the need for rest and recuperation, posture; The hygiene of the skin (air conditions, clothing, bathing—sleeping in the open air); The hygiene of digestion—avoidance of overeating, exercise after eating, danger of constipation; Mental poise.

XXV. *Selection of the Recruit*:—Age; Height, weight and chest measurement; General physical condition—head (scalp), eyes, ears, nose, mouth (teeth, tonsils, tongue), glands, arms and legs, genital organs, skin; Examination of heart and lungs, orthopedic defects, tests for tuberculosis and mental diseases.

XXVI. *Clothing and Equipment of the Soldier*:—The use of clothing; Absorption and conduction of heat; Absorption and evaporation of water; Permeability to wind; Visibility and distinctiveness; Weight and distribution of equipment; Head covering; The army shoe.

XXVII. *Personal Hygiene of the Soldier*:—Cleanliness; Hot and cold baths—soap produces an emulsion of oily matter on the skin; Care of the mouth, hair, beard and feet; Care of the clothing; Care of the feet.

XXVIII. *Air and Health*.—Changes in air due to human occupancy; Increase of carbon dioxide and decrease of oxygen of no practical significance under ordinary conditions—(Note exception in mountain sickness of aviators); Effect of organic and other chemical poisons unimportant (except for case of poison gases and similar hazards in industrial processes); Effect of changes of temperature and humidity—overheating produces discomfort and inefficiency and decreases resistance to disease; Effect of climate and season.

XXIX. *Ventilation of Barracks and Ships*.—Space allotment—standard schedule; Problem of re-breathing; Relative opportunity for spray infection, night and day conditions; Drafts—limits of air currents; Use of fans to stir air; Use of blowers and air ducts; Air distribution within the ventilated space; Methods of heating.

XXX. *Drugs and Stimulants*.—Influence of caffeine; Influence of morphine; Influence of alcohol—effect on appetite, use as a food, effect on the power to do muscular work or intellectual work or work requiring discrimination, effect on aviators, on workmanship, use as a narcotic following exhaustion.

XXXI. *Vital Statistics*.—Reasons for use of statistics; Rates and ratios; Statistical graphics; Statistics of disease; Army morbidity and mortality rates.

XXXII. *The General Public Health Campaign*.—Sanitation of the environment—disposal of sewage and garbage, control of nuisances and insect pests; Supervision of water and food supplies—education as to food values; Control of communicable diseases— isolation, disinfection; Special campaign against tuberculosis, infant mortality, venereal disease; Modern public health largely educational—the work of the public health nurse; Socialization of medicine—health insurance.

XXXIII. *Civil and Military Health Organizations*.—Civil organizations (a. U. S. Public Health Service—extra cantonment work. b. State Department of Health. c. Local Boards of Health.); Military Organizations (a. Medical Department of the Army—subdivisions. b. Quartermasters' Department of the Army—Cantonments. c. Engineer Corps of the Army—in the field. d. Medical Department of the Navy.); Auxiliary organizations (a. American Red Cross. b. Y. M. C. A. and Knights of Columbus. c. The American people.); Use of the Red Cross symbol (see *Annual Report Surgeon General of the Army*. *Annual Report Surgeon General of the Navy*).

XXXIV. *Organization of Medical Work*.—First aid stations; Ambulance service; Field hospitals; Base hospitals; Sanitary trains; Hospital ships; Florence Nightingale; Evolution of the Medical Service.

XXXV. *Care of Wounds*:—Care of recent wounds before infection is appreciable; Care of infected wounds; Harmful results from foreign materials left in wounds; Drainage and dressings; Antiseptics in watering solutions, oils and powders; Microscopical and cultural examination of wound discharges as aids to surgical treatment; The use of antitoxins to prevent infections from the tetanus bacillus and the group of bacilli producing gas gangrene.

XXXVI. *Victories of Public Health*:—Disease in armies of olden time (army a menace to civilian population); Achievements of present war (army a model and an inspiration); New York City death rate reduced 40 per cent in 20 years, saving of over 100 lives a day; Promise of the future.

COMMITTEE ON EDUCATION AND SPECIAL TRAINING,

By R. C. Maclaurin,

Educational Director, Collegiate Section.

September 19, 1918.