Physical Procedures

The physical factors in the sanitation of bathing places are their location, design, and construction. To be successful financially, recreationally, and from the standpoint of health, bathing beaches and swimming pools must be readily accessible to the public, as far removed as practical from sources of pollution, and in attractive surroundings.

Under design and construction we include all the engineering and architectural features which reduce contamination, prevent drowning, safeguard against injury, promote cleanliness, and provide for the comfort of the bathers. The sloping of the floors, runways, and sidewalks, the provision of scum gutters, the location of inlets and outlets, the arrangement of the showers and the placing of footbaths are structural considerations which may contribute quite materially to the sanitation of both indoor and outdoor pools.

The arrangement of dressing rooms; the adequacy of toilets, lavatories, and showers; suitable temperatures of both the room and the water; and good ventilation are conducive to sanitation through the cleanliness and comfort of the bathers. Recirculation systems and their accessories and filtration are all essential physical or engineering and architectural factors in swimming pool sanitation.

Safety

The depth of the water, the height of diving boards, the sloping of the bottom of the pool, its markings, the number of swimmers permitted in its various zones, and lighting have a direct bearing upon the occurrence of accidents. The reduction of turbidity by storage, coagulation, sedimentation, filtration, dilution, or other processes of clarification is also a measure of safety. The provision of a special closet for chlorine containers, the avoidance of cross connections, and the insurance of good acoustics are likewise important safeguards.

Chemical Considerations

The chemistry of swimming pool water may affect its sanitation, safety, cost of operation and popularity. When large quantities of calcium bicarbonates are present in the water it may become difficult to keep it clear. The excessive use of alum may cause turbidity by the substance passing through the filters in solution and producing a floc in the pool. The use of chloride of lime may also increase the cloudiness of the water until the pool is unsafe. The continuous use of alum, the presence of calcium sulphate, and calcium hypochloride or of chemicals added to influence the reaction of the water may lead to the formation of deposits in the circulating equipment and to consequent turbidity.

Hardness in water, due especially to the salts of calcium and magnesium, adds to the expense of operation of bathing places by increasing the cost of soap, liming of heaters, and clogging of strainers. One grain of calcium carbonate will use up eight grains of soap before a lather can be provided. Thus, hard water causes an enormous waste of soap. The scale of heaters is usually a deposition of the sulphates and carbonates of calcium and magnesium. These substances damage valves and otherwise hasten the depreciation of plumbing.

The color of swimming pool water may be of both organic and inorganic origin. In some instances in outdoor ponds it may be an extraction from such vegetative matters as leaves, bark, or roots, or its source may be algae. Manganese and especially iron are inorganic substances which give the sides, bottoms, and fixtures of pools a more or less characteristic color. The greeness