AIHA *Analytical Abstracts*—a series describing chemical analyses of industrial materials, which could be of great help to your plant chemist if he should become involved in air sampling.

AIHA *Journal*—a bimonthly highly technical journal.

By far the most useful book on design of local exhaust ventilation systems as well as other types of industrial ventilation is the *Manual of Industrial Ventilation*, published by the American Conference of Governmental Industrial Hygienists[3], now in its 9th edition and thoroughly up to date. This is crammed with well over 100 line drawings showing engineering details of exhaust hoods and ductwork of all types, even design details labeled "bad" and "good." Its value is to flip open to a sketch to illustrate to your engineer, or to a supplier, a good design for a specific dust-producing machine or process where an air contaminant must be brought under control.

If you have to supply respirators or gas masks, your bible might well be the *Respiratory Protective Devices Manual*, jointly prepared and issued three years ago by the AGGIH and AIHA.

In these days of plant building and expansion and automating, we sometimes have the ideal opportunity for controlling environmental health hazards: eliminate them from the *original design* of the facility. We should never be so submerged in details of day-to-day work that we neglect to stand back and take a far-reaching view if our company is to build a new plant, or expand an existing one, or change a basic process. This is the golden time to build-in dust control, noise abatement, heat control, air pollution reduction, as well as all safety measures needed to avoid accidental injury. This is a situation where the safety engineer may do his management a lasting service. By consulting closely with his engineers, process people, and purchasing department, he can watchdog the health and safety aspects so they get the full attention of the designers. It seems to be human nature that some architects, engineers, and process layout people, perhaps because they have such multitudinous chores to handle and deadlines to meet, skimp in giving attention not to the machinery that goes in a building but to the humans who will work there.

A *change in process* often offers an ideal chance to improve working conditions. Most such changes, of course, are made to improve quality or reduce cost of production, only occasionally to improve the in-plant environment. Yet, we must always keep this possible benefit in mind. This applies to the safety engineer more than anyone else.

There are chances for savings here, too. The new process, for example, may be so designed that cost of an elaborate local exhaust system later can be avoided. In some industries, processes are changed with moderate frequency; in others, rarely, if ever. But we should be always mindful of this happy approach to a solution of an in-plant health problem.

In buying individual machines, the need for accessory ventilation, noise suppression, vibration and heat control should be considered *before* purchase. Often the best approach is to thrash out these requirements with the supplier in advance. Put on him the task of providing equipment that fits the operator's health and safety needs. If customers demand built-in health protection through proper human engineering, eventually they will get it.

Consider now the main technics for controlling health hazards—the ones applicable to present machines and processes.

A less hazardous material can *sometimes* be submitted for the offending one. Certainly this has no universal application, but there are *some* shining examples. In the field of industrial solvents—a very broad field—while all are hazardous to some degree (as Dr. Irish has warned us, even the commonest solvent of all, water, is the most hazardous based on mortality statistics), some have much greater inherent toxicity than others. Carbon tetrachloride is one. It must be completely outlawed for solvent cleaning. A mere teaspoonful of carbon tet tossed in the air of a room 10′ x 25′ with an 8′ ceiling will on evaporating—if uniformly distributed—produce an air-borne concentration twice the threshold limit value (TVL). Many other solvents are less toxic. One of the most attractive is methyl chloroform, which has a threshold limit value 350 ppm instead of carbon tet's 10 ppm, and is just as good an all-purpose cleaner. Even in offices, dangerous carbon tet has been used for generations as a typewriter cleaner. Only