

American Board of Industrial Hygiene

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II. THE AMERICAN BOARD OF INDUSTRIAL HYGIENE

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History

The Industrial Hygiene Section of the American Public Health Association, now known as the Occupational Health Section, was established in 1914. This may be taken as the beginning of general recognition of industrial hygiene as a specific and distinct activity. Fifty years later industrial hygienists consider themselves to be practitioners of a profession. Most of the other professionals with whom industrial hygienists cooperate agree, and those of the public who know of industrial hygiene seldom disagree that it is a profession.

Forty years after the beginning of industrial hygiene the two most active organizations seemed to have stabilized into routine. The American Conference of Governmental Industrial Hygienists and the American Industrial Hygiene Association were then about 15 years old. They had passed their periods of early enthusiasms and rapid growth. Both had active technical committees producing valuable reference material and manuals. They cooperated in large and rewarding annual conferences. The latter organization had devoted all of its resources for its first ten years to establishing a sound journal, and was proud of the result, which seemed on the verge of becoming self-supporting.

In the middle 1950's, the attorney-general of one state concluded that industrial hygiene laboratories were covered by the act which regulated clinical laboratories, because industrial hygienists sometimes examine body fluids. This conclusion may still be debatable. Body fluids are examined in the clinical laboratory for the purpose of judging the health of an individual. Hence this work is related to the practice of medicine. The industrial hygienist examines body fluids for the purpose of estimating the exposure of workers. It is a way of monitoring the industrial environment and does not seem to be related to the practice of medicine. Certain industrial hygienists in the particular state felt that the decision was a threat to their livelihood. The local section of the American Industrial Hygiene Association appealed to the parent body for help.

While considering the situation, the AIHA Board of Directors came to the conclusion that, since some industrial hygienists offer professional services to the public, it was

likely that licensing and regulations would eventually be established in at least some of the states. It seemed desirable that the profession should define its area of activity and the requisite qualifications of practitioners in order to offer sound guidance should state licensing begin. The immediate aim was to prepare for state regulation. More importantly, it was the first assumption of one of the major responsibilities of any profession, self-regulation.

The board appointed two committees to study the related questions of state registration and voluntary certification. They were instructed to render early reports with recommendations. The reports were presented in 1957. The board concluded that voluntary certification was preferable as an immediate goal, that it could be achieved only with the informed support of the entire membership, and that confusion would result if both legal registration and voluntary certification were presented to the membership at one time. Accordingly, the report on state registration was tabled. A Committee on Certification Standards was appointed to develop a practical program for voluntary certification in the profession of industrial hygiene.

Early in 1958 the board accepted a recommendation of the Committee on Certification Standards and invited the American Conference of Governmental Industrial Hygienists to join in planning and support of voluntary certification. The conference accepted, and a Joint Committee on Certification Standards was formed.

In the spring of 1959 the Joint Committee reported its proposed program to the separate business meetings of ACGIH and AIHA. Each business meeting authorized a mail ballot of the entire membership of its organization. The ballot was accompanied by explanatory material attempting to make clear the importance to the profession of certification, as well as the provisions of the proposed program and eligibility requirements for certification.

It is of interest that the sole question voted upon was whether ACGIH and AIHA should advance funds to allow incorporation and initial operations of the American Board of Industrial Hygiene as a certifying body not under control of the two existing organizations. An unprecedented proportion of the members voted and the results were overwhelmingly in favor of the loan, speaking well for the character of the educational material accompanying the ballot, and indirectly expressing approval of the proposed program.

Each of the associations delegated six members with high qualifications as industrial hygienists. In 1960, these 12 persons completed incorporation as a Pennsylvania corporation not-for-profit.

Industrial hygienists having specified high qualifications of experience were given one year to apply for certification without examination. When that year elapsed on July 1, 1962, 484 people had been certified. This is believed to be about one-fifth of the practicing industrial hygienists on that date. It is apparently close to the number who had

been in continuous practice for 15 years, the period required for certification without examination.

Since July 1, 1962, examinations have been offered six times. Eighty-three candidates have been certified by examination. Twenty-five of the 566 diplomates are practicing outside of the United States, but about 15 of these received their industrial hygiene training in this country. Fifty-six per cent of the diplomates received postgraduate training and hold master's or doctor's degrees appropriate to their professional practice.

Relations with the Societies

The American Board of Industrial Hygiene has no formal obligation to the societies which initiated its incorporation. The board has even repaid the funds advanced for its initial expenses.

When a vacancy occurs by resignation or expiration of the six-year term of a board member, the society which suggested his name nominates two qualified candidates and the board elects one of these as the successor. The board is empowered by its bylaws to elect a successor should a society fail to make nominations. It is empowered to elect qualified members on its own initiative, or to broaden its base of support by electing members nominated by other societies, up to a total board membership of 23, one less than twice the number of incorporators.

The board makes voluntary reports for information to the two societies, but is not controlled by them. Board members are not responsible to the societies which nominated them. Initially some members of the two societies were reluctant to encourage the creation of an independent board. As far as the board is aware the arrangement has worked well. Apparently there is full cooperation and mutual trust. This happy state may persist for as long a time as the board devotes itself to purely professional activities, without encroachment on the day-to-day interests of the societies.

Definition of Industrial Hygiene

One of the first functions of a certifying board is the formulation of a definition of the profession certified. However, the AIHA adopted and published in 1959 a statement on definition, scope, and functions of the profession. This statement was acceptable to the board and was adopted.

The definition reads "Industrial Hygiene is that science and art devoted to the recognition, evaluation, and control of those environmental factors or stresses, arising in or from the work place, which may cause sickness, impaired health and well-being, or significant discomfort and inefficiency among workers or among the citizens of the community."

It has been said, irreverently, that this definition covers the waterfront, staking out a broader area than AIHA is prepared to occupy. The production of a valuable manual on

Air Pollution by AIHA, and some degree of interest in board certification in the Air Pollution Aspects of Industrial Hygiene tend to contradict the skeptical attitude. It may be a generation before the true limits to industrial hygiene are fully agreed upon.

Related to the matter of definition is the question of the best name for the profession. Historically there is no question that the name should be "industrial hygiene." Doubts have been raised by the drift toward the names "occupational health" and "environmental health." Without belaboring semantics, it may be pointed out that Webster's definition of hygiene is "the science of the preservation of health." Hence, health is a condition, and hygiene is the science which maintains that condition. The creation of the board to certify in industrial hygiene may have some tendency to keep the name of the profession unchanged.

Purpose

The certificate of incorporation of the board states that its purpose is the improvement in the practice and educational standards of the profession of industrial hygiene. This acceptance of responsibility for the competence of one's colleagues is one of the criteria by which one distinguishes between a profession and a trade.

The only function which the board has yet exercised is the issuance of certificates for training and competence, first to the long-experienced who have made recognized contributions, and currently after written examination of those having briefer experience.

The board is now concerned with education, but it may not become active itself. The examination program has had some part in the increase in refresher courses offered by AIHA. Moves are under way to reach agreement upon suitable undergraduate training and graduate education for new industrial hygienists. One phase in which no constructive activity is yet apparent is recruitment, persuading young people to train for the profession.

The early discussions of certification elicited the objection from industrial hygienists that it would enforce regimentation and lead to a trade union attitude. As a matter of fact it appears that the ideas represented by these emotion-loaded words are indeed what certification aims to bring about. The cultural predecessors of the unions were the medieval guilds. Skilled trades banded together into guilds and enforced standards of performance upon the membership to maintain public confidence in their skill, and incidentally to protect the public against incompetence. No newcomer was admitted to a guild until he had demonstrated his skill after a period of apprenticeship. This system bears many similarities to the professions of today where the group, by certification and other means, establishes standards of competence.

Aspects

The work of the industrial hygienist requires application of many different scientific and engineering specialties. Some widely known and respected industrial hygienists are

basically chemists, some are chemical or mechanical engineers, some are physicists, some toxicologists, and at least one a geologist. Despite this, the 1957 committee report recommended certification in the "overall field of industrial hygiene regardless of the individual's basic specialty." Later committees agreed that this could be done for the old-timers. Their original specialized education has been overshadowed by their years of experience, and they have a broad knowledge of the entire field. It was not seen how a single certification could be applied to those with briefer experience whose qualifications must be evaluated by examination. A single examination would either handicap the specialist or be so elementary that it would not be a worthy test of competence. Furthermore, a single form of certification would mislead outsiders. They might conclude that a man who was actually competent to apply a specialty to industrial hygiene, was fully competent to handle alone every area of the field.

The solution adopted was to issue seven forms of certificates, one to cover experience which embraced all of the important areas of industrial hygiene, and six for those whose experience had been essentially confined to a single important area. After considerable struggle with semantics, it was decided that the word aspect best suggests the concept of an individual area, while the phrase comprehensive practice suggests all-inclusive experience in all areas.

Accordingly, certificates are issued in the Comprehensive Practice of Industrial Hygiene, and in application of a specific aspect to industrial hygiene. It is the view of the board that certification in an aspect does not mean that we are certifying in chemistry or in engineering, but in the application of one of these specialties to the problems of industrial hygiene. No one has charged that we are encroaching on the prerogatives of other professions.

The aspects chosen were acoustical, air pollution, chemical, engineering, radiological, and toxicological. Much private debate was devoted to the possibility of including medical aspects. It was concluded that this would serve no useful purpose. A few physicians have been found qualified for certification in radiological aspects, a larger number in toxicological aspects, and 40 in comprehensive practice. The standard applied to these 40 was somewhat different from that applied to nonmedical applicants. Physicians were certified in the Comprehensive Practice of Industrial Hygiene when there was evidence that they were thoroughly familiar with working conditions, that they routinely observed operations in the plant and that they took responsibility for control of the working environment, even when the major part of their time was spent in clinical care of industrial workers.

Eligibility

During the year ended July 1, 1962, certificates were issued without examination to what we refer to as the grandfathers, or with more dignity as the founders. The specific qualification was 15 years of full-time practice of industrial hygiene, at least five of which had been in a responsible position during which recognized contributions had been

made to the profession. The longest period of actual practice among this group was 35 years.

Specific educational qualifications were not set because it was these industrial hygienists who had defined the field. Their formal training was irrelevant. Their knowledge of industrial hygiene was largely what they had learned themselves on the job, because to a considerable extent there had been no one to teach them. There were few if any among the group with whom members of the board had not had close professional contacts in joint activities.

Since July 1, 1962, all certifications have been made on the basis of written examinations. The qualification for admission to examination is eight years of full-time practice subsequent to attainment of a baccalaureate degree acceptable to the board. The usual major field has been chemistry, physics, or biology, or chemical, mechanical, or sanitary engineering.

Graduate study in industrial hygiene or in a science utilized by industrial hygienists may be accepted as equivalent to part of the eight years of practice. Through 1963 candidates could be admitted to examination without a baccalaureate degree if the board was satisfied that practice in excess of eight years compensated for this lack.

The requirement of full-time practice excluded people who have utilized the technics of industrial hygiene as an incidental part of their activities, but cannot be regarded as industrial hygienists. The major group which is excluded by this requirement is the safety engineers.

Practice is interpreted as including teaching, research, and professional administration of industrial hygiene activities, and is not restricted to personal responsibility for monitoring and modifying the industrial environment.

Examinations

Every candidate must pass two written examinations, but no verbal examination is given. The core examination covers all aspects of industrial hygiene in a somewhat rudimentary fashion. Its primary purpose is to determine whether a man who has been rather specialized, and who is a candidate for certification in an aspect, knows enough of the basic principles and multiple areas of industrial hygiene to be qualified for any form of industrial hygiene certification. That it actually serves this purpose is shown by the fact that candidates for certification in an aspect generally make lower scores on the core examination than on their specialty examination, and some have failed because of their scores on the core while passing the second examination, the reverse of candidates for comprehensive certification.

There are seven versions of the second examination, one for comprehensive practice and one for each of the six aspects. The comprehensive examination covers the same ground as the core, but in more detail and more searchingly. Some questions appear in all seven

examinations, and candidates are warned in advance that the aspect examinations are not confined to their specialty.

In order to obtain balanced examinations, the area of industrial hygiene was divided into 32 rubrics, grouped under five headings: agents, environmental evaluation, potential injuries, operations, and control (including legal aspects and communications). The core and comprehensive examinations give approximately equal consideration to each of the 32 rubrics.

Very early in the planning stages it was decided that the board would never have the resources to allow professional assistance in preparing examinations. Questions were collected from the founder's group through committees. They were edited and distributed for criticism to a group of advisers. A very small committee eliminated duplications and assembled questions into balanced examinations.

The examinations are closed-book, composed exclusively of multiple choice questions, 250 to 350 for each eight-hour examination. They are not confined to simple memory of facts, but evaluate coordination of different areas, computation, and judgment. It is believed that only responsible practice will prepare a man to attain a high grade. Initial skepticism of the validity of the multiple choice question has decreased with accumulating experience. Each question, taken alone, is trivial but the total examinations discriminate well.

Over 1,200 questions are in use in an average of 1.4 examinations each. A record is maintained of the answers given to every question, and an index of discrimination is calculated. The less successful questions are replaced, and new questions are added to keep the examinations up to date.

Passing grades have never been announced. It is thought that no individual will ever attain a score close to 100 per cent. Random selection of answers would result in a 20 per cent score. Median scores on the core examination have been in the low seventies, and on the comprehensive in the low sixties. Somewhat more than 100 candidates have been examined and 70 per cent have passed. Not many candidates have made scores so close to the passing grade that either passing or failing seemed an injustice.

Present regulations allow two reexaminations, but it is probable that these will be modified to allow an unlimited number, perhaps with the requirement of evidence of having taken refresher courses. About half the reexamination scores are sufficiently improved so that it seems likely that the candidate had seriously studied after his initial failure. Most of the questions in an examination have so far been unchanged in later years. It is judged that memory is not sufficient to allow a candidate to pass his second examination despite relying almost entirely on the same questions, because of the large number of questions, and the absence of a source of authentic correct answers.

Limited guidance is sent to every candidate, including a few specimen questions to illustrate form, not content. A list of sources of information is furnished, with the

statement that they should be familiar to every industrial hygienist, not that they contain all of the answers.

The American Academy of Industrial Hygiene

In the initial planning for certification it was predicted that only about ten persons would take examinations each year, and only about 100 would be certified initially without examination. It appeared that no certification fee which industrial hygienists could afford would allow operation of a certification program on initial fees alone. Accordingly, it was decided that it would be necessary to receive an annual fee from those certified to allow necessary meetings of the board and to prepare examinations.

As a token justification for this annual contribution each diplomate becomes a member of the American Academy of Industrial Hygiene and receives a dignified annual roster of the academy. At present the academy is a paper organization which can be activated should activities be desirable beyond the abilities of the small volunteer board.

The unpredicted large number of candidates certified without examination yielded sufficient funds so that there has not yet arisen the need to assess the annual dues in the academy which every diplomate is pledged to pay. Part of the explanation for our present surplus lies in the judicious selection of meeting sites to minimize travel which the board must pay, the contribution of clerical services, and the willingness of the two societies to pay for examination and meeting rooms as part of the expenses of their annual joint conference.

Evolution

It was expected that only about one-fourth of the certifications would be for comprehensive practice, and that chemical, engineering, and radiological would lie the most frequent certifications in specific aspects.

Actually two-thirds of the certifications have been for comprehensive practice, and the aspect most frequently certified has been toxicological. There is a growing tendency for diplomates in an aspect later to apply for certification in comprehensive practice. Some candidates explain that the broader certification will give them a more secure expert status when they are called upon for legal testimony. The board is quite willing to grant a second certification by examination when adequate and appropriate experience is shown.

It seems probable that each year a smaller proportion of certifications in specific aspects will lie sought and granted. Nevertheless, a review of the situation does not lead the board to conclude that it was a mistake to provide for aspect certification. The board expects that there will be an increasing proportion of practicing industrial hygienists who have been specifically educated for the profession by graduate training. Each step toward specific training will reduce the need for aspect certification to recognize the competence of men with specialized education and experience.

The board recognizes that the certification program must be only the first of its activities, and perhaps in retrospect it will be found to have been least important. Of much greater value to the professional will be general agreement upon adequate educational standards for the practice of industrial hygiene. The board is reluctant to appear to encroach upon the fields of the professional societies in this area. It is watching committee activity in the direction of setting educational standards and is attempting to exert informal influence upon the outcome. It is logical that the group which evaluates competence should be an important factor in setting educational standards, but it would be very unwise were the board to attempt unilaterally to pre-empt the area where some progress has already been made by societies.

Requests have been received from other countries for the board to give its examinations outside of the United States. The board is not sympathetic with the requests and has no aspirations to be a world-wide certifying agency. When adequate evaluation of training and experience can be made, an industrial hygienist anywhere in the world can be certified by the board, but only if he is able to come to the United States for examination. Professional stature can best be achieved by the cooperation of an homogeneous group of professional people. Certification by an organization outside of the local area of practice may enhance the standing of an individual, but does nothing to enhance the profession in the particular area. Indeed, it may tend to depress the stature of others in the area.

Problems

Many problems have been solved quietly among ourselves during the initial period of planning and operation. They are worthy of discussion only with other groups contemplating their own programs of voluntary certification. The only problem now recognized as affecting present and future activities is the familiar one of obtaining continuity of intensive effort from a small group of unpaid members, all of whom are concurrently engaged in demanding professional practice.

Benefits

Continued operation of a certification program increases coherence of the profession of industrial hygiene, and of itself tends to improve practice.

Financial benefit to individuals was not an important aim of those who have organized the certification program, but it is understandable that some will measure success in financial terms. Increasingly we hear the statement from employers seeking an industrial hygienist that they would prefer one who is certified. At least one state Civil Service Commission is in the course of writing qualifications for certain positions in terms of certification in industrial hygiene. We hear that those currently receiving graduate degrees in industrial hygiene are resolving to become certified at the earliest possible moment.

These beginnings of recognition of our certification program by persons not certified and by persons outside of the profession are encouraging. They suggest that we who have devoted our best efforts to getting the program under way may have spent our time well.

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