# The Konicide Club (1932-1940)

## A Brief History

**Theodore F. Hatch, Sc.D. and Eugene P. Pendergrass, M.D.**

In January, 1932, a small group of physicians, scientists and engineers met informally at the Pittsburgh Laboratories, U.S. Bureau of Mines to exchange experiences and views concerning the problem of silicosis in U.S. mines and factories. No list of the participants is now available but the number probably did not exceed 20, representing essentially all the research institutions and field investigative groups in the country at that time. Particular interest centered around standardization of atmospheric dust sampling and assessment of dust exposures and the parallel medical procedures for evaluating the respiratory injury found in exposed individuals. There was great need for such standardization to insure comparability of results, derived in the same manner by all investigators. One recommendation coming from the meeting was to develop a sturdy, all-glass impinger designed to be easily duplicatable, and to settle on a standard method of dust counting. The modified Greenberg-Smith impinger resulted and is still in use, as are the counting techniques delineated at that time. Beyond these specifics there were wide-ranging discussions of the many other aspects of the silicosis problem. Great enthusiasm over this two-day conference and the desire to continue such meetings were expressed by all the participants with the further wish to keep the meetings small and informal to insure lively debate and exchange of views. At the end of the meeting, Drinker proposed a scheme for the calling and conduct of the meetings. He suggested the name "Konicide Club" and on February 12, 1932, he sent the following letter to all participants, plus a few additional individuals. Because of its typical Drinker style, the letter is given in full, followed by the names on the first mailing list together with their respective institutional affiliations.

Konicide Club

February 12, 1932

At a recent meeting at the Bureau of Mines, Pittsburgh a number of us decided to start an informal, small, and very select (?) club with the above name and with the purpose of having occasional meetings to discuss research problems on the relation of dust to health. The club will have no dues, will meet anywhere or any time any member desires and can persuade at least one other member *not in his own organization* to meet with him. The meeting will select its own chairman as the club has no president and does not propose electing one. If the members present see fit, they will send a notice or minute of their meeting to the secretary, who will pass it along to the other members. Any member publishing an article on any phase of the dust question will either send through the secretary a reprint to each member or mail the reference to his paper.

The membership will be kept small and is to be elected from time to time by a committee of Messrs. Yant and Leake and the secretary.

Until February 1, 1933, Drinker will serve as secretary, which means attempting to do the dirty work a secretary should do, such as arranging meetings and attending to correspondence. On February 1, 1933 Drinker will appoint his successor.

Your suggestions as to other members would be appreciated, but bear in mind that we do not want members not now engaged in investigative work on dust. We want the membership kept small and above everything to be informal and no precedents to be established.

Attached is a list of proposed members. Please be good enough to send the secretary word as to whether or not you wish to become a member.

Philip Drinker, Secretary
55 Van Dyke Street
Boston, Mass.

Konicide Club Members

(First Mailing List — about March 1932)

*Bureau of Mines*, Dept. of Interior, Washington, D.C.: Mr. Daniel O Harrington; Mr. F. B. Meriwether; and 4800 Forbes Street, Pittsburgh, Pa.: Mr. W. P. Yant; Dr. C. E. Brown.

*Chicago, Ill.*, 330 South Wells St.: Dr. C. O. Sappington.

*Employers Mutual Insurance Co.*, 800 Empire Building, Milwaukee, Wis.: Mr. E. G. Meiter.

*Harvard School of Public Health*, 55 Shattuck St., Boston, Mass.: Mr. Philip Drinker; Mr. Theodore Harch; and Dr. W. I. Clark, The Norton Co., Worcester, Mass.

*Metropolitan Life Insurance Co.*, 1 Madison Avenue, New York, N.Y.: Dr. A. J. Lanza; Dr. W. J. McConnell; Mr. J. W. Fehnel.

*Northwestern University*, Medical School, Chicago, Ill.: Dr. James A. Britton.

*Owens-Illinois Class Co.*, Toledo, Ohio: Mr. W. G. Hazard.

*Public Health Service*, Treasury Department, Washington, D.C.: Dr. R. R.

From the Graduate School of Public Health, University of Pittsburgh (Dr. Hatch, Professor Emeritus) and the School of Medicine, University of Pennsylvania, Philadelphia (Dr. Pendergrass, Professor Emeritus).

Sayers; Dr. Albert E. Russell; Dr. R. R. Jones; Mr. J. J. Bloomfield; Dr. J. M. Dallavalle.

*Saranac Laboratory*, Box 551, Saranac Lake, N.Y.: Dr. L. U. Gardner; Mr. Donald Cummings; Dr. Homer L. Sampson; Mr. Andrew Redlin; Mr. Thomas Durkan.

*Toronto, Ontario*, Parliament Buildings: Dr. George Blair Brink; Dr. John Grant Cunningham; Dr. A. R. Riddell.

*University of Pennsylvania*, University Hospital, Philadelphia, Pa.: Dr. H. K. Pancoast; Dr. E. P. Pendergrass.

*State Department of Health*, Hartford, Conn.: Dr. A. S. Gray; Mr. Warren A. Cook.

*Westinghouse Electric & Manufacturing Co.*, Medical Dept., East Pittsburgh, Pa.: Dr. T. Lyle Haziett; Mr. Edgar C. Barnes.

Six additional names were on the membership list in the last days of the the Club. Manfred Bowditch, W. C. Dressen, Leonard Greenburg, Oscar Sander, H. H. Schreuk and Charles R. Williams

The first meeting of the new club was held at the Saranac Laboratory on April 2, 3, 1932, attended by Messrs. Gardner, Clark, Pancoast, Pendergrass, Clifford (guest), McConnell, Leake, Brown, Meiter, Fehnel, Hatch, Bloomfield and Cummings plus other members of the Saranac Staff. The first day was devoted to the pathology of silicosis and the second to dust sampling and counting. Some of the highlights of the meeting were summarized as follows and give an idea of the state of knowledge of silicosis in 1932: the hazard from a silicious dust is in proportion to its free-silica ($SiO_2$) content, provided that no inhibitory substance is present; other compounds of silicon have not produced fibrosis in experimental animals (except magnesium silicate which produces a different kind of fibrosis); intravenous injection of $SiO_2$ produces fibrosis in the suprahepatic lymph node followed by fibrotic nodules in the liver; no similar fibrosis is produced by aluminum oxide. Respecting dust counting, there was lively discussion of dark-field vs. light-field microscopy, especially with reference to ease of particle counting in the $< 1\ \mu$ range. To change from light-field, however, would entail a considerable series of comparative counts. There was no agreement on such a change.

A second meeting was held in conjunction with the National Safety Congress in Washington on October 3-5, 1932. Messrs. Gardner, Russell, Bloomfield, Hatch and Drinker presented a series of "dusty addresses" (Drinker's wording) to the congress. This was, perhaps, the first large gathering from U.S. industry before which representatives of the small group of pneumoconiosis specialists presented the dimensions of the silicosis problem and the needs for its control. Messrs. Thompson, Leake, Russell, Bloomfield, Yant, Brown, Gray, Cook, Cunningham, Gardner, Hatch and Drinker were present at the club meeting on October 4th. The relative merits of dark and light-field illumination in dust counting were further discussed with a final conclusion to continue with the latter. All agreed, however, that an easier method would be welcome. An important contribution was made by Dr. Clark, who outlined recommended procedures for a continuing medical control program in the dusty industries. The application of these procedures, so well understood and commonplace now, was only beginning in the early 30's.

For the 1933 meeting (November 11th and 12th), Drs. Pancoast and Pendergrass were the hosts at the X-ray Department, Hospital of the University of Pennsylvania, Philadelphia, Pa. With their colleagues they prepared for this meeting a very comprehensive series of subjects for discussion. The first day was devoted to clinical examination in silicosis and the importance of associated diseases, especially tuberculosis, pneumonia and other respiratory diseases. During the second day, discussion was directed mainly to radiological techniques and differential diagnosis between silicosis and silico-tuberculosis and lesions simulating silicosis. At the end of the second day, Dr. Gardner spoke briefly on "What is Known About Asbestosis", an early contribution to a subject that looms so large today in the occupational health field. It is not too much to say that this was the most detailed seminar on the medical and radiological aspect of the pneumoconiosis problem presented in the United States up to that time (1933).

The next meeting was held in Washington, January 13-14, 1935, under the auspices of Dr. Sayers and associates, Office of Industrial Hygiene, U.S.P.H.S. Among the topics discussed were: recognition of the roentgenologic changes, etc., described at the earlier Philadelphia meeting, as significant diagnostic events in the development of silicosis and the essential procedures to be recommended in both medical and environmental control of dust hazards. Dr. Sayers and associates reported on the findings of the recent PHS study of the health hazards in anthracite coal mining and Savers and Miller described their findings from intraperitoneal injection of dusts in experimental animals. In the course of this meeting, as in earlier ones, there was much discussion of the need to establish limits of permissible dustiness to serve as guideposts for effective dust control efforts. Out of these came Cummings' suggestion of the formula used for many years subsequently to calculate acceptable levels of dustiness in proportion to the free silica content of the airborne dust, starting with $5 \times 10^6$ mppcf for pure quartz. This formula, with some modification, is still widely used in other countries as well as the U.S. We recall also his view, shared by Dr. Lanza, that no "safe" level of dust exposure could be set for individuals with any degree of tuberculous infection. This dictum was laid down, of course, to emphasize the absolute necessity for tuberculosis prevention along with control of the industrial dust hazard.

This gathering was of particular significance as a preparatory session for two meetings shortly to be held: one at the Mellon Institute, out of which came the "Air Hygiene Foundation" (now Industrial Health Foundation) and the other, the 1936 Silicosis Conference, sponsored by Miss Perkins, the Secretary of Labor. Konicide club members played leading parts in the planning and conduct of both of those meetings.

In January, 1936, a club meeting took place at Harvard, organized by Drinker and Hatch. The importance of particle size in the etiology of pulmonary dust disease was emphasized. Brown discussed respiratory dust deposition and retention; Hatch reported on the striking variations in the composition of mineral dust as particle size is reduced, with particular reference to the decreasing $SiO_2$ content with particle size for dusts from granite, sandstone and other silicious minerals. Professor Larsen of Harvard's Geology Department demonstrated petrographic techniques for dust analysis and discussed size limitation in such analysis. Dr. C. K. Drinker described the lymphatic system and discussed its importance in the development of silicosis and P. Drinker reported on nasal dust filtration.

Later in 1936 (November 23rd and 24th), Drs. Lanza and McConnell and Bill Fehnel offered a program at the headquarters of Metropolitan Life Insurance Company, New York City. The first day was devoted to medical questions and progress in animal studies. Speakers included Drs. Gardner, Sampson, Lanza, Pendergrass. During the second day Dr. Greenburg described a New York state program of industrial hygiene and Fehnel discussed a dust control program in an asbestos plant. Decrease in $SiO_2$ content with particle size found in industrial dusts, notably in foundries, was also a topic of continued interest.

On July 12th and 13th, 1937, the club enjoyed the hospitality of the Montreal Mining Co., Montreal, Wis., with whom the Saranac

Laboratory had close association. The program, arranged by Dr. Ringo, Medical Director, was focused on the health problems of the ferrous mining industry, with detailed discussion of the problems encountered in the Montreal and neighboring mines. Speakers included Drs. Gardner and Sampson who emphasized the significant differences in the pathological and roentgenological changes seen in the iron miners, compared, for example, with granite cutters. The medical facilities and dust monitoring equipment employed at the Montreal mine were inspected and club members enjoyed an underground inspection trip. The meeting concluded with a general review and summary of the medical and engineering problems encountered in the industry.

On January 22, 1939 another meeting was held at the University of Pennsylvania under arrangements made by Dr. Pendergrass. The program was devoted to the health problems of the asbestos industry. Titles of separate lectures were: General Survey of the Asbestos Industry and Its Engineering Problems; Experimental Pathology Concerning Asbestosis; Clinical and Roentgenological Survey of the Asbestos Industry; Pathology in Patients Dying with Asbestosis; Roentgen Studies in Industries Having Asbestosis. Speakers included Drinker, Gardner, Sayers, Dreesen and Drs. James Bullett and Rush Shull, guest speakers.

Over the years there had been frequent inquiries by nonmembers about the club activities and increasing pressure to include in its deliberations individuals not engaged in pneumoconiosis research, especially by lawyers concerned with compensation claims. These widening interests and more particularly, the organization of the American Industrial Hygiene Association in 1939 suggested to the members that the "exclusive" Konicide Club had served its purpose and its activities should be concluded. There were no more meetings.

It is difficult at this late date to recapture the excitement and stimulation that one found in the club meetings. In the course of the successive conferences, new findings and new research and investigative procedures were quite regularly brought to our attention. In many instances these required abandoning old ideas and adopting new ones, but these changes did not come easily for the proponents had to defend their proposals against much (constructive) criticism by their colleagues. One of the fortunate contributions was to bring together from the start the scientists and practitioners from both sides of the problem, respecting both man and environment — biological science and medicine together with physical science and engineering. The collective responsibility of such teams of specialists for the development and application of preventive measures for the control of silicosis and other disabling occupational dust diseases was constantly emphaszied. Not the least accomplishment was learning to talk to each other and each to recognize the essential need for the skills of the others in the joint solving of important health problems. The expansion of this concept in dealing with other job-related diseases has given special strength and effectiveness to the whole occupational health effort in the United States.

## Regulated Progress

Scholarly review is such an effective barrier to novelty that a new idea can seldom be announced to the world until it has first been sold to the establishment. Most innovators are ill-suited to promotional work, and begrudge the time and effort. Many ideas die at this stage. The innovator must buttonhole important people to enlist their support, or perhaps apply for a grant to study his innovation. If successful, this gets the idea on to the grapevine which is its announcement to and acceptance by the world. Publication is a formality, like a letter confirming a telephone call. By thus standing astride the channel of communication, the establishment maintains its rule and regulates progress for its own convenience.

— From "Evolved Conspiracy" by Charles McCutchen in *The Sciences*, July/August 1976.

der anaethesia until the full range of lateral motion is obtained. A light cast is then applied with the foot in dorsiflexion, the heel in full supination and the forefoot in compensatory pronation. This should be maintained for about three weeks, with a walking iron having been incorporated. At the end of that time, after care is administered consisting of physiotherapy and the wearing of a stiffened shank shoe or foot plate. The latter is absolutely essential in forestalling the possible eventuality of a traumatic weak foot.

**Summary**

THE common derangements of the ankle joint have been discussed and the mechanism of their production outlined. It has been pointed out that a clear understanding of the pathological physiology of these lesions is essential to intelligent treatment and good end results.

# Medical-Engineering Control of Industrial Health Hazards

*By* T. LYLE HAZLETT, M.D.,
*Medical Director,*
*Westinghouse Electric & Manufacturing Co.,*
*East Pittsburgh, Penna.*

THE development, over the past few years, of an added interest in human relationships has led to a new trend of medicine in industry. This has been due in part to the even greater recognition of the solidarity of interests between employers and employees, more particularly in the larger companies, and in part to the increased frequency of common law suits for alleged negligence on the part of employers and to the inclusion of certain diseases in compensation acts in various states. During this depression period, also, industrial workers with decreased earnings have leaned upon employers to a greater extent for medical care. The result has been a great galaxy of diseases, some of which are definitely from an industrial source while others, notwithstanding they are common to the race, are being classified as "occupational." Industrial management is now showing an increased interest in alleged health hazards in industrial plants, and is seeking closer contact with the medical profession.

Until recently the physician in industry received too little recognition as a part of industrial management. With these changing conditions the usefulness of the physician is undoubtedly becoming more appreciated, with the result that there will be a constantly increasing demand for his services in a consulting capacity.

The following "ad" which appeared not long since in one of our leading newspapers may be said to reflect the present general attitude of employers:

**INDUSTRIAL PHYSICIAN**

Large manufacturing organization with headquarters in Middle West and factories throughout the country has opening for young clinician in industrial medicine; research in health maintenance; potential opportunity to assume responsibility for direction of comprehensive medical program. Successful candidate will be given opportunity for special training in industrial hygiene.

Many are of the opinion that this attitude ma change, but there is no doubt that certain policie recently adopted with respect to the safeguardin of the health of industrial workers will be permanent.

How is the medical profession going to meet this situation? The passive attitude which physicians have shown in the past with reference to the formulation of medical policies in industry, has given non-medical groups a wide latitude in carrying out many controversial practices in the medical care of industrial workers. Unless the medical profession becomes interested and formulates some means of protecting the health of industrial workers the responsibility will undoubtedly be placed in the hands of lay groups, which has so often been the case in the past. Consequently, there has arisen considerable criticism both on the part of industrial management and the medical profession as to the extent to which industry may assume the care and safeguarding of the health of employees in whom a very considerable investment has been made.

THE lowest estimate of the cost for employing a new industrial worker is $100, while some estimates are as high as $500. This includes the time necessary for training, defective work during the training period, efficiency to be attained to bring the new worker to a point where he can contribute an equal share with his fellow workers. In many instances it takes considerable time to discover the ability of a new worker to perform work assigned, which often means he may not have the necessary qualifications for the job for which he was employed but he has shown sufficient ability and personal qualifications to warrant transferring him and training him for other work. Such procedure is of great advantage to the worker as well as to the employer.

Investment in this individual multiplied by the number of employees in any single industrial organization is large, and if ignored means thousands of dollars invested from which there is no return; hence employers recognize that any labor turnover demands close attention, and necessary policies to eliminate the causes must be instituted.

In the larger industrial organizations the Medical Department should assume responsibility for proper placement with respect to mental and physical qualifications, having attached to its staff the necessary engineering consultants. This medical-engineering staff should have at its disposal the necessary equipment for investigating any plant condition or process which might be suspected of being a health hazard. The equipment should include sampling devices and chemical materials for determining dusts, fumes, and gases which may be encountered in the particular industry.

In the smaller plants where such a staff could not be supported financially, close cooperation might be maintained between the physician to whom injured employees are referred for medical care and the engineering staff of the plant, the engineering staff of the compensation insurance carrier, and, if possible, larger plants having similar processes. In this manner medical-engineering control might function at all industrial plants regardless of size, thereby building up knowledge which would be invaluable both to employers and employees.

THE physician working in conjunction with the engineer who understands the various processes is in a better position to diagnose any disease which may be felt to have an industrial origin or to eliminate the industrial cause. This in turn may determine the proper and immediate medical treatment, and avoid possible errors of diagnoses due to a lack of knowledge of the exact nature of the occupation; as, for example, the confusion perhaps of carbon monoxide poisoning with a diabetic coma; chronic lead poisoning with a peptic ulcer; occupational dermatitis with dermatophytosis (fungus infection).

The engineer, in turn, with a *medical* contact will have a clearer understanding of what conditions may constitute a health hazard. In the designing of new equipment or in changing present methods of manufacture possible health hazards will be foreseen and eliminated before installation. This will result in a material saving in future cost of protective equipment, in increasing the efficiency of workers, and in eliminating future liabilities.

The engineer should study conditions which may be detrimental to health and by quantitative measurements determine the dosage of substances that workers receive. In conjunction with the findings of the physician safe practices may eventually be determined for any occupation. Among the means at the engineer's disposal for eliminating an occupational hazard may be mentioned:

1. Removal of source:
   (a) substitution of non-toxic materials;
   (b) complete isolation of process;
   (c) wetting dry, dusty materials.
2. Protective devices:
   (a) air conditioning;
   (b) respirators;
   (c) dermal coverings.

The investigations by the physician of industrial processes thought to have an injurious effect on the individual worker will require a careful periodic physical examination. In certain types of occupations it will necessitate additional studies, as blood, urine, sputa, feces, and roentgenological examinations.

The practice by industrial management of making periodic physical examinations of industrial workers has been somewhat controversial. Many physicians have felt that this procedure has been opposite to good medical practice, whereas in reality it fosters a closer relationship between physician and patient, for most physical defects found at the time of such an examination are in no way connected with the individual's occupation. The employee is urged to correct, by consulting his family physician, conditions found which later may or may not cause lack of earning capacity and economic insecurity, whereas if these conditions were not brought to his attention he would have had no thought of seeking medical advice. With this added knowledge of health problems the worker also feels an increased responsibility for the medical care of his family.

Thus there is established a still closer contact with the family physician.

The economic value of such examinations, not only to industry but also to the individual, cannot be estimated by any known standard of measurement. It can be appreciated only by one who over a period of years sees the number of individuals in a large group who, without medical supervision, would have become totally disabled and forced to cease all gainful employment.

The greatest example of such health supervision has been in the control of tuberculosis in industrial organizations that have had well defined health programs over a period of years. No other disease affects the economic security of the industrial worker to such an extent as tuberculosis.

From the large number of physicians who see industrial workers from a surgical standpoint certain contacts have already been established with employers so that it is only a step ahead for them to assume the responsibility of safeguarding all workers from a health standpoint.

And who is better qualified?

WHILE industrial hygiene must of necessity be considered a post-graduate course in our medical schools, nevertheless some conception of this problem should be given to undergraduates. Simply knowing the symptoms of a few common poisonings which may occur in industry will handicap the average medical graduate if practicing in an industrial community. This lack of training often results in hasty diagnosis and in the patient's occupation being regarded as the cause of the illness, if no other cause is easily discernible. All too frequently no effort is made to contact the employer to learn the true nature of the employee's occupation.

Correct diagnosis is most important, for if a belief is unjustly created in the employee's mind that the materials with which he is working are injurious to his health it is most difficult to eradicate, and it is mentioned by him on all occasions of mental or physical illness during his entire employment. There cannot but arise, therefore, a feeling on the part of the employer that some physicians attribute all illnesses of industrial workers directly or indirectly to their occupations.

As information is gathered by physicians and others doing research work our knowledge will be more accurate, thus enabling both the employer and the employee to reach a more satisfactory understanding without the conflicting testimony now so often heard in our courts. A clearer conception of what constitutes an occupational disease will prevent serious mistakes in diagnoses which are unfair to all alike.

If more attention is not given to these problems the present tendency will become more pronounced for industry or governmental agencies to establish bureaus where workers in certain types of occupations will receive physical examinations and be given working credentials. Various State Departments of Labor are at present making medical-engineering surveys, and there is at least one state where the Insurance Commission offers to employers complete medical care for industrial accidents, so that it would seem as if occupational diseases will be included in the near future. This will tend to result in complete medical care of the industrial worker by such agencies.

Active medical-engineering control of these problems at this time will have an important bearing on future practices and on future legislation. Which way the pendulum will swing will depend on how actively cooperation is established between industrial management and physicians.