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Safety Education and the Library

BY E. GEORGE PAYNE

Principal, Harris Teachers' College, St. Louis, Mo.
Author, "Education in Accident Prevention"

One of the finest educational outcomes of the great World War has been the recognition on the part of educators as well as of business men generally that school keeping is an exceedingly serious and important business. People have discovered that school keeping is vitally significant because of the fact that the schools occupy a crucial place in the program of social reconstruction. The weaknesses and strength of our educational system have become apparent in the world struggle. Faults and failures of educational endeavor have been magnified by the exigencies of the world struggle until, to any but the blind, it has become evident that the schools have a new task and a new opportunity for service.

What are some of these shortcomings of the schools? The war made it evident that new notions and habits of thrift are essential in the American people to make a healthy and robust nation. It is, moreover, clear that health, both social and individual, must be conserved and accidents must be prevented if the American people are to face with vigor the problems of democracy and promote democratic civilization. It is, furthermore, common knowledge that the American people must be created anew in their civic, political, and moral life if they are to perform the world function forced upon them by an uninvited world conflict. These problems and many others are not only vital, but their solution depends upon the school teacher in a very large measure. The educators of the country are therefore facing the necessity of reconstructing their method and subject matter so that social outcomes may be realized; so that the result of school instruction will be health, safety, civic righteousness, and morality.

The problem of the educator looms large on account of this very definiteness of the demand upon him made by the American people who have come to fully appreciate education. The day is past when we can defend the curriculum on the ground that it develops a healthy citizenship and is worth while without being able definitely to show the elements of citizenship and personality that are created through school instruction. We must be able to show how this is to be done. Therefore, the principle of importance in the education of the child for the complex life of the community of the present day is that he is trained by learning, not the useless, but the useful things. The old notion that a person by some mysterious way is being educated when he is learning something that he can never use is doomed. We are committed to the principle, with all its implications, that a person learns best and learns to think most effectively when he is dealing with subject matter which has a practical bearing and of the purpose of the study of which he is definitely aware. It is obvious that a child as well as an adult writes and speaks best when he is dealing with subject matter with which he is familiar. For that reason, the best possible English exercises deal with accidents, as they come within the experience of the child and possess enough of the dramatic character to engage his attention and interest. It is, moreover, true that the greatest stimulus to thinking is found in matter that is related to the life interests of the individual. The child as well as the adult thinks best when he faces a situation the mastery of which seems necessary for the accomplishment of his purpose in life. The point of view represented here is exactly that from which we constructed a program of education in accident prevention, a program that is not supplementary to the curriculum, but is a vital part of it. The necessity of teaching accident prevention has long been apparent; and, therefore, this plan presented has been accepted and put into operation in a remarkable way by the educators of the country. In recent years, however, there has grown
up in our midst an institution which is indispensable to successful school keeping; and that is the library. In the complex life of the modern community one cannot, even if it were necessary, come into contact with all situations that he will have to face in his later career. Furthermore, the individual may take many short cuts by having put at his disposal the experiences of others in the community. We have, therefore, found indispensable to our school work books and libraries. The school and the library, then, cannot function separately; that is just as true in safety education as in any other kind of education.

We are even at a much greater disadvantage when it comes to accident instruction than we are in the regular school work because of the fact that no textbooks are prepared in which safety material has found a place. The book prepared by the National Safety Council entitled “Education in Accident Prevention,” does not purport to give the data. It is, rather a book in educational methods and principles with abundant concrete suggestions to help carry out the theories discussed; but the plan there suggested can be successful only when the class room teacher is provided with abundant data from which she may draw a store for the enrichment of her instruction.

This material may be comprised under a number of heads: first statistics. One of the most valuable publications of statistics is a book entitled “Mortality Statistics of Insured Wage Earners and Their Families” Metropolitan Life Insurance Company 1919. This is the type of material that should be gathered together in the libraries and made available by them for the use of the teacher in her daily instruction. The teacher cannot construct problems out of nothing. Moreover the children themselves cannot construct and solve problems without data of this kind. There is an abundance of material but it needs to be brought together and put into such shape as will make it available for the use of the teacher. Second, reports. These include the reports of the state departments, the census and other reports of the United States Government, reports of the national and local safety councils coroners’ reports of the various cities, daily newspapers and magazines. From these different sources may be gathered all the data necessary for effective work in arithmetic and an abundance for history and geography. (There is, however, a dearth of reading material that relates to safety.) Third, such books as “Safety First for Little Folks” and “Sure, Pop” are valuable publications, and use may be made of them, but what we need is not so much stories constructed for the occasion with a protruding moral, but actual stories as they are reported in newspapers and statistical reports, which, because of their very nature, hold the interest of the child.

The library is in a position to gather this material from its various sources, grade it, and make it available for the reading class in school. I do not need to go into detail and point out how material may be gathered for English, geography, history, civics, drawing and other subjects, because these examples suggest the relation of the library to the movement of education in accident prevention.

In concluding this article I must emphasize the necessity of regarding the whole question of education in accident prevention in a comprehensive way. We must not conceive of safety education as simply the development of certain controls that will keep the individual out of danger. Those controls are important, but we do more than that. The individual must become master of his environment; and being master of his environment demands knowledge, ideas, ideals, attitudes, and points of view as well as habits and skill. The individual must, furthermore, have ideas about all those organizations and institutions that have for their aim the protection and care of human life. This ideal can only be realized when the libraries do their share by putting at the disposal of the class room teacher a body of data and subject matter that she may use for the purpose of realizing her aims and ideals.

Building Up a Safety Library

BY SIDNEY J. WILLIAMS

Secretary and Chief Engineer, National Safety Council

The Librarian’s present or potential interest in safety rests on two facts: first, that the modern library, if it is to be of real service to the community or to the enterprise with which it is connected, must not only contain an epitome of the world’s experience and the world’s wisdom in such fields as history, philosophy and literature, but must also reflect more or less completely the many-sided and rapidly changing world in which the men and women of today live, work, and play; and second, that the safety movement occupies a definite and an important place in present-day American life. I shall assume that every librarian who reads this magazine is sufficiently intelligent to ac-
cept the first of these propositions without argument, and that the preceding articles in this issue have demonstrated the second. This being the case, the librarian's next question is—"What sort of material on Safety should I have, and where may I get it?"

The librarian undertaking this task will find it considerably less simple than selecting a shelf full of books on Persian art or on the fauna and flora of North America. The organized movement for accident prevention, as it exists today, is so new and is developing so rapidly that it has not yet crystallized, to any great extent, in the form of standard reference works. There are, of course, a few books of recognized authority—a list of them will be furnished by the National Safety Council on request—but these do not by any means cover the field.

To do this, even in the limited way necessary for a library of general circulation, there must be added numerous pamphlets and other publications of a more or less ephemeral character.

Any Safety Library should have, first of all, as complete a collection of literature on accident hazards and means of their elimination as it is possible to obtain. Because of the newness of the whole field of systematic accident prevention work, the value of any treatise on accidents and their prevention depends largely on the extent of the experiences described. Thus, the accident experience of a particular plant during the period of one year may lead to certain conclusions and the accident experience of that same plant over a period of five years may justify entirely different conclusions. Similarly, the experiences of one plant in a particular industry may indicate certain causes and preventive methods of the accident hazards in that industry, whereas the experiences of a great number of plants in the same industry might justify a radical revision of the conclusions regarding the causes and cures of accident hazards resulting from the experiences of any one plant in the industry. Going a step farther, whereas the experiences in a particular industry with a particular hazard may lead to certain valuable conclusions, the experience of all the industries to which that hazard is common would obviously lead to a more thorough analysis of that particular hazard and proper methods for its elimination.

This, we hope, explains the necessity for and the advantages of a co-operative accident prevention agency such as the National Safety Council. Probably in no respect is the Council co-operative to a greater degree than in its publications and it is largely because of this co-operation of practically the entire safety engineering talent of the country in the preparation of the literature of the National Safety Council that such notable results in accident prevention have been obtained among the plants of the members of the Council.

The publications of the National Safety Council may be divided into four classes: Bulletins, safe practices pamphlets, proceedings of the Annual Safety Congress, and miscellaneous publications including the line of lectures delivered before the Council's schools for safety supervisors, foremen, chauffeurs, and others.

Four bulletins are issued by the Council each week, most of them being illustrated through the reproduction of photographs or drawings. These bulletins for the most part describe accidents that are common and the proper methods of eliminating such accidents. Though intended for bulletin board service, these bulletins constitute a valuable addition to any library where the interest in safety is likely to be permanent.

The safe practices pamphlets are now being issued by the Council fortnightly. Each such pamphlet constitutes an orderly presentation in loose leaf form of a specific group of accident hazards and the best practices for their elimination. Each safe practices pamphlet is the work of an safety engineer who has given long and close study to the particular group of hazards involved.

To the research work of the author in the preparation of a safe practices pamphlet is added the experiences of a conference committee of fifty safety engineers. These pamphlets are illustrated with photographs, charts, tables, and drawings. Safe practices pamphlets have been issued by the Council on the following subjects: Ladders, stairs and stairways, boiler rooms, cranes, belt shifters and belt shippers, knots, hitches, slings, bolts and belt guards, shafting, couplings, pulleys, gearing, engine guarding and engine stops, oiling devices and oilers, floors and flooring, scaffolds, grinding wheels, goggles, freight elevators, clothing, yards, power presses, exits, fire alarms, and fire drills, woodworking machinery and equipment, accident records, shop lighting, gas and electric welding, fire extinguishment, acids and caustics, Manila and wire rope.

A complete set of the safe practices pamphlet of the Council should be on hand in every library interested in accident prevention, though these pamphlets are intended for close study on the part of the men in charge of safety, superintendent and foreman, rather than as a reference volume in a safety library.

The nature of the proceedings of the annual congresses of the Council are self evident. Each year some two or three thousand members of the Council and their representatives gather for a four day exchange of experiences, opinions and ideas regarding accident prevention work and the other
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phases of industrial relations in which the members of the Council are interested. At the 1919 congress, in Cleveland, October 1 to 4, one hundred and seventy speakers presented formal papers. These were followed by round-table discussions of the subject involved. There were four general sessions and about thirty-five sectional sessions devoted to the discussions of problems in specific industries. These papers and discussions, after being carefully edited for the exclusion of irrelevant matter, constitute the Congress Proceedings.

A complete set of the proceedings of the eight safety congresses held thus far constitute, without a doubt, the most important contribution to safety literature at present available.

Among the miscellaneous publications of the Council are hand books for technical schools and colleges, outlines of lectures for the safety schools conducted annually by various local councils of the National Council and literature on the methods of organizing safety work in plants conducting safety campaigns.

The Library and Information Bureau of the National Safety Council, Chicago

BY MARY BOSTWICK DAY

Librarian and Associate Editor of "Special Libraries"

The Library and Information Bureau of the National Safety Council is a working reference library, specializing in the literature of safety, industrial relations and allied subjects. It is a clearing house for the solution of thousands of technical and non-technical problems which arise among workers interested in the conservation of human lives in industries, on the railroads, on the streets, in the school and in the home.

Starting in 1913 with forty members the National Safety Council now has a membership of some 3,800 members, including factories, railroads, public service companies, mines, insurance companies, technical schools, libraries, etc. It is a voluntary, cooperative association of employers and others, non-political, not for-profit. A centralized Library-containing very complete and specialized material carefully analyzed, is maintained at headquarters for the use of members. With a library staff of five (four of whom are trained librarians) every effort is put forth to bring the very best and latest thoughts on safety to the workman and executive. Only subject material bearing directly on safety is kept. Through a close co-operation with the other libraries of the city, an exchange is often made. As an illustration, articles, pamphlets, etc., on cement and concrete which drift into our Library are sent over to the Portland Cement Association, and in return they send us many valuable duplicate copies of material on safety. Much time is also spent in the John Crerar Library in research work.

Through circulation of pamphlets, abstracted articles, accession lists, book bulletins and notes, charts, blueprints, etc., the very best and latest thoughts on safety are brought directly to the desks of members.

Much of his material is noted in the "Weekly News Letter," which goes to members. In this condensed form, an individual, be he a safety engineer, a workman or a busy executive, may keep up to date on all phases of the safety movement. That this service is appreciated by members is shown by the hundreds of specific requests which pour into the Library. These inquiries are vital, - a man has been killed in the shop, what can be done to guard that special machine; a man has lost an eye, what kind of goggles can be used for this special work. The following are a few reference requests which came to the Library one day:

"We have under consideration the question of equipment with lockers or properly designed coat and hat hangers and wish to compare these two arrangements on the following points. Floor space, initial cost per capita, general advantages and disadvantages; we should appreciate your comment."

"Have you a bibliography on "Women in industry?"

"Do you know of any concern selling fire-proof duck caps to be worn by women workers using Bunsen Burners, to protect them from the fire hazard?"

"Have you the fatal industrial and street accident statistics for 1919 for the following cities: St. Louis, Chicago, Rochester and Cleveland?"
"Our oilers object to keeping sleeves rolled up, stating that they have had trouble with burns and bruises to arms when leaning over revolving shafting; do you know of any specially made closefitting sleeves which we could recommend or furnish to oilers."

"Is carbon monoxide explosive and just what are its properties?"

"We are considering a 'No accident week' in our plant. Can you tell us how to organize such a campaign?"

"We desire to offer a prize to the most careful elevator operator, and wish to know what basis we can use in judging a contest of this character?"

"One of our policy holders asks if mica goggles are serviceable for use of the bark-ermen in the sulphite mill wood-room, suggesting that these goggles have the advantage of light weight and low cost."

If the information is not in our files and not obtainable in other libraries, a questionnaire is sent to our members interested in this special subject, asking just what their experience has been. For example, if a person should desire to know the effect of a certain acid on workmen's eyes, possibly they have had some serious trouble—letters will be sent to our members interested in this specific acid, as to their experience. If it is an acid used in the tanning industry, the letters will go to tanneries. As the results come in, the data is carefully tabulated, duplicate copies made and a copy furnished the individual who asked for this information. It is carefully cataloged and filed, and we are in a position to give out the information whenever it is called for.

The Library contains besides these invaluable reports, statistical data, thousands of clippings, pamphlets, magazines, bulletins, photographs, blueprints, etc. Last Spring the librarian visited fifteen business libraries in the East with a view of obtaining literature on industrial relations and allied subjects. The Library has very complete files on such subjects as "shop committee plans," "profit sharing," "bonus systems," "co-operative stores," "industrial housing," etc, etc.

Among the five "safety librarians" in the country,—Safety Institute of America, New York, National Workmen's Compensation Service Bureau, New York; Independence Bureau, Philadelphia, Philadelphia Rating Board, Philadelphia, and the National Safety Council, Chicago, a "round robin" envelope has been circulating with great success. Unique and unusual items regarding safety are included. The system of routing was worked out at the meeting of the Special..."
A "Library Booth" was a feature of the annual Congress of the National Safety Council in Cleveland, September 28th-October 4th. The booth was located in Gray's Armory, where the most prominent manufacturers of safety devices had their exhibits. An immense book, representing the annual proceedings of the Council, occupied the entire space of the booth. The pages swung bulletin boards, contained various exhibits showing the activities and resources of the Library of the National Safety Council on the literature of accident prevention and industrial relations. A unique exhibit was one on "safety" from Japan. This collection included posters and bulletins used in a "no accident week" in Tokyo, and a copy of the first book written in Japanese on the subject of "safety." Several hundred individuals visited the booth, were explained the exhibits by two members of the library staff, and were given safety literature. Students from the Western Reserve Library School, members of the Cleveland Public Library staff and business librarians of Cleveland examined the exhibits, as well as many safety engineers, manufacturers and welfare workers. The "classical atmosphere" was disturbed from time to time by a "dust collector" on one side and a brawny band on the other side. Miss Mary H. Day, Librarian of the National Safety Council, Chicago, was in charge.

The Accident Prevention Bureau and the Library of the Portland Cement Association

BY MARY A. HATHAWAY
Librarian, Portland Cement Association, Chicago, Ill.

The work of the Accident Prevention Bureau of the Portland Cement Association has more than a commercial value, for it has as its end the safety and welfare of the worker in cement mill and quarry, and is instrumental in bettering his working conditions.

The bureau is kept constantly in touch with affairs, both through visits to cement mills, and through live co-operation with the National Safety Council and like organizations; and also, in somewhat different way by the activity of the Portland Cement Asso-
ciation Library. Here all incoming literature is received, recorded, and from here sent out with pages carefully marked. This material varies greatly, from current magazines, such as Factory, Industrial Management, Concrete (with its Cement mill section) "Rock Products," Safety Engineering, and "Cement, mill and quarry," to bulletins of the United States Bureau of Mines, or the Department of Labor. Then there is much trade literature, from manufacturing concerns, showing dust eliminators, safety appliances, goggles, machine guards, gloves, masks, and so on. Also there are various house organs, which show industrial relations, such as the South Works Review, "published by and for the employees of the Illinois Steel Co.," and the Cary Works Circle, on the cover of which appears the motto "Safety first."

All of the material after being circulated is systematically arranged on the shelves. An index is kept of the current magazines, and of the pamphlets and books, which latter are classified and filed together according to the Dewey decimal system. Even the trade catalogs are indexed. So that if a request comes to the Library for the names and addresses of firms handling machine guards, it is only necessary to turn to this heading in the trade catalog index, where the desired names are listed alphabetically. It is a simple matter to have lists copied in duplicate from the card index. These may be then mailed if the request has come from outside of the office.

Besides the specialized literature mentioned there are many general reference works which are of value to the bureau.

Twice a month the "Accident Prevention Bulletin" is published by this department. This is really a résumé of accidents in the industrial field, and suggestions for preventing them in the future. A few paragraph headings give an idea of the scope. The following are very good illustrations: "Goggles," "The danger of falling hot clinker," "An opinion on the value of physical and medical examinations," "Pry wheel explosion," "The result of disobedience," "Working on high tension circuits," "Washing with gasoline." This bulletin is circulated freely among Member Companies, and two copies of each issue are kept on file in the library. A study of accidents for the year preceding is published annually by this bureau, and is a summary of the year's accidents, and of the progress made in eliminating them.

The manager of the bureau co-operates with the National Safety Council in its annual exhibit and conference. Through this cooperation, and through the circulation of department bulletins, and his conferences with executive offices and visits to cement plants, the manager is able to spread his information on accident prevention methods and warfare to affect the forming of safety committees in practically all cement plants, and in many ways to insure the safety and health of the workers.

That the work of this bureau has a humane feature is self-evident; and it is equally true, though less apparent, of the work of the entire Association, which is really an effort to make for better living, and are therefore of real service to mankind. The library in such an organization is very essential, and grateful that it is so.

Seeking Safety*

BY R. LOUISE KELLER

Librarian, Independence Bureau, Philadelphia

When my work at the Bureau was not more than a year old I began to keep a work diary, and now, looking back over the reference questions recorded therein, I feel justified in saying my work has been both varied and exciting. Yet certain types of questions are so often repeated in one form or another, it has occurred to me that the experience I have gained in answering them might be of value to librarians engaged in answering the same. It is not merely of law, but of department regulations and rulings, and on top of these the insurance requirements in connection with workmen's compensation and employers' liability: for all must be considered and given due weight by a safety engineer who would perform his full duty to a client or an employer. To keep all this constantly changing information carded and charted for instant use would be a task that nothing but hourly need would justify, and in a library where the demand may come for New York one month and for California the next, it is not to be wondered that the chart idea in the librarian's knowledge of her tools.

*The Independence Bureau is a firm of consulting engineers in fire protection, accident prevention, and industrial relations. The library was organized in 1912.
So far as law texts are concerned, I place my main dependence on the series of bulletins, "Labor Laws of the United States," issued by the United States Bureau of Labor Statistics. Bull. 146 in two large volumes contains the labor laws in force in 1913, while each succeeding year down to, and including, 1918 has a separate volume. This leaves 1919 uncovered until next spring or summer, but even this calamity will be partly obviated when the "American Labor Legislation Review" sends out its annual Review of Labor Legislation. This issue of the quarterly comes out either as the fall or winter number and consists of:

1. Lloyd's Accident History for 1918, issued by the United States Bureau of Labor Statistics.
2. Accident Statistics, a report of the number of accidents occurring in each state.
3. Laws of the United States is more trustworthy, but even here the preliminary portion of each volume should be consulted to ascertain what has been omitted. For one thing, the later volumes omit workers' compensation laws, which are issued in another series; nor is it wise, or even possible, to depend upon the bulletins for the regulations issued by the boards and commissions of certain states, to which have been granted legislative powers. In some cases, the regulations are listed by state, while in the 1918 volume not so much as a reference can be found for Pennsylvania, although at least four "Safety Standards" were issued during the year. This is unfortunate for the safety engineer, since he must rely on the bulletins for these regulations in the absence of direct communication with the state department.

One outcome of the growing interest in accident statistics was the discovery, that the total time lost, and the results of accidents, were of more significance than the number of accidents occurring. This led to the idea of accident weighting, that is, for statistical purposes a scale of days lost from work is assigned to each type of injury, including loss of life itself. The scales advocated by the National Safety Council have been used in the United States, notably the National Electric Light Association, while the Portland Cement Association has studied the accidents of member companies for the last half dozen years. Some companies publish magazines in the interest of safety, which contain accident figures, and the National Safety Council has collected and published from time to time, in Bulletins and Weekly Letters, figures showing accident reduction due to safety work.

The United States Bureau of Mines issues yearly accident statistics for metallurgical works, coal mines, coke ovens and quarries. The United States Bureau of Labor Statistics has made studies of machine building, and of the iron and steel industry, and issued several other studies of statistical interest.
Among these is "Industrial Accident Statistics," by Frederick L. Hoffman, published in 1815. This drew upon much of the best material then in existence, at home and abroad, and has numerous references scattered through it. It is, in itself, an excellent beginning for an accident statistical library.

**EQUIPMENT AND APPLIANCES.** It is natural that many safety questions should deal with this. The first thought upon finding a defect is how can it be remedied, and the second may well be, can we buy it on the market? That question is not usually answered by a trade manufacturer's directory. Drinking fountains, safety goggles, and even many more articles may be listed, but it will not be specified whether or not, the Dash-Blank Company sells hoods with its grinding wheels.

The Bureau's collection of literature at the time the library was organized, consisted in part of trade catalogs and leaflets. To this we have steadily added at the cost of a considerable expenditure of time. Trade periodicals have been examined in the office and engineers have made observations while at their work. We have gathered the chart as well as the wheat, for it is almost as important to study bad examples as good. From the first we have considered our collection not as purchasing data, but as technical literature, and have filed it as such, with other technical books and papers.

Closely associated with safety trade literature is the growing body of engineering reports and specifications concerning it. The Underwriters' Laboratories, Chicago, maintained by the National Board of Fire Underwriters, tests, and inspects, apparatus, devices. Machines and materials, in respect to life and fire hazards, and accident prevention. Products submitted it, and that meet with its approval, are admitted to its label service, and Lists of these are published semi-annually and sent free upon request. The U. S. Bureau of Mines tests and approves permissible explosives, lamps, and mining equipment, and publishes schedules of procedure for establishing certain lists of permissible products. Its publication in Technical Paper 77, of the Report of the Committee on Resuscitation from Mine Gases hastened improvements in the mechanical devices in use for that purpose. The U. S. Bureau of Standards in Technical Papers No. 23 and 119, gives the results of examinations of glasses in respect to the transmission, or non-transmission, of rays injurious to sight. The University of Minnesota made an investigation of drinking fountains which proved that this recognized means of promoting health might easily become a death trap. The investigation was published by the U. S. Public Health Service in Public Health Reports, volume 23, No. 19, and as Reprint No 397. The list might be longer but its possibilities have been indicated. "Safety Engineering reflects the interest in literature of this type, and in its section," "Materials, Apparatus, Processes," as well as in its advertising pages gives safety trade information. The Safety Institute of America, maintaining the American Museum of Safety, has collected trade information for years. I understand it is now planning a library page in each issue of its bulletin, Safety, which will list books and trade devices. The National Safety Council is also a collector of trade literature.

The work may sound a little cut and dried, but it has exciting moments, and I have dealt with only a portion of the questions. The remainder include subjects as diverse as the measurement of fatigue, the lubrication of air compressors, and the hazards of fumigating plants. The Bureau made its imprint on my diary. In 1915 came questions concerning picric acid, toluol and other coal tar products. The year 1916 brought a question as to the handling of an incendiary bomb, and 1918 an interest in the problem of women in industry. Going back to the earliest records, in June, 1913, I found noted a request for a report on the American Museum of Safety and the National Council for Industrial Safety, now the National Safety Council; and in November of the same year, I answered "no" to the question, whether we were members of the latter. I think we joined the next month. Verily, much water has run under the bridge since that time.

**Scientific Literature in New South Wales**

"We learn that a well attended meeting was held last month at the Education Department, Sydney, to discuss the manner in which the usefulness of the Public Library can be extended in connection with scientific and trade literature. Mr. F. Leverrier, K.C., B.Sc., chairman of the New South Wales State Committee of the Institute, explained the object of the meeting, and pointed out that both scientific and industrial men are equally interested in the importance of technical literature. A committee, including representatives of the Royal Society of New South Wales and its Industrial Section, the Australian Chemical Institute, the Society of Chemical Industry, and the Sydney Technical College Chemists' Society, was appointed to wait upon the Government to urge the necessity for more commodious library premises and for increasing the grant to the Public Library for the purchase of scientific periodicals."

From Science and Industry, Melbourne, (vol. 1, no. 5, Sept. 1919.)
The Safety Institute's field covers accidents and their prevention, industrial hygiene, occupational diseases and industrial relations.

The library, a highly specialized collection of up-to-date material on these subjects, consists of pamphlets, reports, official documents, periodicals, plant publications, bulletins, clippings, photographs, blueprints, lantern slides and trade catalogues. We do not have many books. Aside from those which really are encyclopedias upon their subjects and are so used, such as Beyer's Industrial Accident Prevention, Oliver's Dangerous Trades, and reports of safety congresses and state industrial commissions, there are few bound volumes, for the aim of the Institute is not to duplicate the resources of public libraries but to possess information which they do not have and in a form that is easily accessible. Our object is to have on file more recent information than may be found in books, in order that we may be of service to authors and magazine writers and to enquirers desiring to organize any kind of safety work, whether for the general public, for industrial workers, in the schools, in the home on the farm. A vast amount of information suitable for a working collection is contained in pamphlets and reports to be had for the asking, papers that give the last word about many forms of social work.

We do not attempt to keep all the printed matter that comes to us and legitimately might find a place in our files. We are glad to have it all and most of it is routed to the directors and members of the staff, for their information, but only those publications are filed that give the views of authorities, state a new or unusual attitude toward a subject, or give reliable statistics. The only periodicals kept intact are those on safety, industrial relations, industrial physiology and hygiene. The others are clipped, the clippings filed appropriately, though no card is made unless the clipping is likely to be permanently valuable. A weeding-out process is constantly going on which discards superceded material, a method which keeps the files from becoming choked up with useless, out-of-date papers. The librarian is charged with the collection of the right kind of literature and is expected to be always on the lookout for news items and ideas that might
promote safety work, and desirably advertise the Institute’s activities.

Photographs are loaned for illustrations, lantern slides for lectures and exhibitions.

The documents that we keep permanently are closely analyzed. Dewey is used as a basis for classification with the difference that subjects are spread all over the ten classes instead of being confined to the few numbers reserved for them. For instance, safety in building construction is classed 690 with subdivisions for accidents, safeguards, orders and standards; fire protection is 352.3, with subdivisions; in like manner 542.7 is used for the gas industry, 615 for occupational diseases, 640 for safety in the home, 660 for safety on the farm, 796 for sports and their hazards. Electrical engineering, except lighting, is now being classed 680 instead of 211.3, to avoid the long numbers which would be necessary in using Dewey. The selection of 500 is merely an arbitrary choice but one which is safe for us because we will never have purely literary productions in our library.

All sorts of liberties are taken with the library system. Unconventional methods are used which “work” and give quick relief. For instance, we sometimes have inquiries over the phone for accident statistics to be used that evening in a lecture. There are cards on different subjects which contain the latest figures about accidents, accident reduction, cost of industrial sickness, proportion of accidents to non-English speaking workers as compared to English speaking workers, etc., with authorities given. There are clippings short enough to be pasted directly on the cards, under subject headings done on the typewriter. These cards are a great labor-saving device for the few moments required to make them are more than balanced by the saving in time and hurried searching through pamphlets and papers while the inquirer waits, more or less impatiently, at the other end of the phone. Then, when these figures are out of date it is the matter of a moment to destroy the cards.

Though primarily for reference, we also are a lending and distributing library. Whenever possible, duplicates are obtained, one copy to be kept on file for the use of directors and staff and visitors who prefer to do their own reference work here at the Institute, others to lend to personal inquirers, and by mail to those who consult us by letter, as well as to give away to those whom we think would make good use of them.

There is an extensive file of trade catalogues of safeguards, of safeguarded machinery, protective clothing, goggles and equipment of employees’ service, commonly called welfare work. Thousands of these catalogues are distributed during the year.

The library is used by business men in search of safeguards for machinery, protective clothing, etc., by men and women who are studying to pass civil service examinations for factory inspectors, by magazine and newspaper writers, by ministers interested in social work, college students and pupils in the public schools. We would be very glad to have it used more than is done at present by foremen and working men. Probably it is too much to expect these busy workers to come to us even when they know of our existence and our desire to serve them. Without doubt these men confine their reading to the daily newspapers because they do not know what else to read, where to get it, or have the time to look for it. It is here that industrial librarians can extend their influence from managers to workers in the lowest ranks, and greatly advance the cause of safety. Whatever tends to lower the cost of production and to stabilize the personnel is bound to interest the officials of any concern. Whatever makes for security and physical protection in his job cannot fail to strike a responsive chord with the workman. Safety work meets both of these needs. Beginning with the November number, each issue of Safety, the Institute’s bulletin, will contain a selected bibliography of the important textbooks, reference works and serial publications, and authorities given. There hope these lists will prove helpful and we will be glad to have librarians, industrial and others, call upon us for further lists upon any of the subjects within our province.

Chemical Literature and Its Use

"Chemical Literature and Its Use" by Marlon E. Sparks, Library Assistant in Chemistry of the University of Illinois, is a pamphlet of 46 pages representing an outline of a series of 12 lectures prepared for classes of students registered in the chemical and chemical engineering courses of the University of Illinois. These notes were compiled to serve as a brief guide to the immense amount of literature on chemistry. The importance of instruction in the use of chemical literature is gradually being realized by educational institutions teaching chemistry, and this publication should prove of invaluable assistance to both instructors and students. It presents an excellent working bibliography of the important textbooks, reference works and serial publications, and is classified under the following headings: History of Chemistry, General Works, Inorganic Chemistry, Organic Chemistry, Industrial Chemistry, Theoretical Chemistry and Biochemistry.

This pamphlet can be secured from the author at 80 cents per copy.

E. D. GREENMAN.
Accident Prevention Data as Found in the Library of the National Workmen's Compensation Service Bureau

BY ESTELLE L. LIEBMAN
Librarian

The keeping of accident prevention and safety data should be of interest to any technical and industrial library in particular and to every library in general. The principal aspects of safety are (1) Public safety including the street and the home (2) Industrial safety applying to the workman and (3) Safety in transportation applying to both the public and the workman.

Any library using the Dewey Decimal classification will find itself somewhat at a loss to classify accident material properly. The Decimal Classification includes accident prevention as part of public health (614) which it distinctly is not. Only a small part of safety is a health problem. It is distinctly an engineering problem and as such it has been treated in the Library of the National Workmen's Compensation Service Bureau. It has been placed in engineering under class 621.7, industrial management. While there may be objections to this, it was found best in the long run as it did not displace other classifications that were needed. So far, the use of 621.7 for safety engineering has worked out very well.

Occupational diseases and industrial hygiene are a part of accident prevention in industry. Class 618 was retained for hygiene, but an entirely new classification for industrial diseases had to be drawn up. In the book on occupational diseases by Dr. Gilman-Thompson there is a grouping which was used. This classification has been inserted in class 618. The grouping as used is as follows:

Occupational diseases due to harmful substances (with expansions).
Occupational injuries and traumatism (with expansions).

Diseases due to the nature of the industry.

Material on safety engineering may be divided into the following groups:
1. Engineering standards and codes including rules and regulations of associations, corporations and state laws.
2. Specific devices for safeguarding of certain machines and appliances.
3. Education and publicity for the engineer, for the workman and for the public.

Provision was also made for the social side of accident prevention in which the work of the Bureau is less vitally interested.

Keeping track of standardized and approved safety devices is an especially important function. Insurance companies and associations for the advancement of safety do not care to be used as mediums for advertising. To avoid this, the library keeps a record of all devices that adequately guard the machine and leaves it to the manufacturer to choose the one he prefers. Trade catalogues describing safety devices are filed with the machine or tool for which it is made, but the general trade catalogues are arranged by themselves. A safeguard for a punch press is classified under punch presses but a trade catalogue of punch presses in general, with the trade catalogues

The library contains a card index which lists under each machine or device the names of the manufacturers whose appliance has been approved by either our own engineers or by those whose judgment is trusted. There are also on file the cards of the Underwriters Laboratories of the National Board of Fire Underwriters. These cards give very full information as to the name and address of the manufacturer; the device is simply explained and they are constantly being revised. The Safety Section of the Underwriters Laboratories is the newest department, and not many devices have as yet been tested and approved.

Material on education in safety is mostly found in pamphlet form. The government has been standing sponsor to the movement to introduce safe practices in trade and technical schools. The National Safety Council and the American Society of Mechanical Engineers have standing committees to promote safety courses in colleges, technical and public schools.

Industrial hygiene and diseases are modern subjects. They have been brought into prominence in this country only during the past decade. There is now quite an extended literature to be found in books, health reports, pamphlets and medical journals. This material has been classified in accordance with the principles stated above and has been thoroughly catalogued.

Wherever possible, everything pertaining to a given industry has been brought together. This is necessary as in the process
of rate-making for workmen's compensation insurance the actuarial and rating committees study each industry from many angles. Every industry is included under the workmen's compensation laws, and there are practically no limits to the material which can be used in the Library. For this very reason the utmost care has been taken in the selection of the material.

Public safety is a question that must be treated separately from industrial safety. To the insurance world, public safety comes under liability insurance and is not a part of workmen's compensation, but the keeping of statistics for public liability being a part of the work of the Bureau is included in the material to be found in the Library.

Public safety includes accident prevention in streets, highways, on trains and street cars, on and by automobiles and other forms of traffic, on elevators, in and about buildings and the like. Data on accidents may be found in building reports, coroner's reports, highway reports, in fact in almost any place according to the city or state government in which the accidents occur. This is the most difficult kind of information to keep track of, and it is impossible to enumerate the bibliographical sources. A place for public safety has been included in class 621.7, although for the average library this is not strictly applicable. The library has had to make a decided distinction between accident prevention, that is possible dangers and their elimination by specific safeguards and the statistics of accidents or accidents enumerated by numbers and kinds. This is due to the nature of the actuarial work. In making a classification for insurance it was found advisable to drop class 200 (religion) from the Dewey Classification and adapt it to insurance. Accident statistics have been provided for in this class. They are grouped accordingly to (1) Causes, (2) Specific Industry, (3) Public Accidents.

In cataloging it was found advisable to give each subject heading three subdivisions beside the general one, as for instance:

Iron and steel industry (general).
Iron and steel industry—Accidents (statistics).
Iron and steel industry—Hazards (health).
Iron and steel industry—Safeguards (mechanical).

While these details are applicable to this library in particular, libraries in general will find it advisable for the purpose of making their safety material of the greatest value, to follow these suggestions: (1) to classify material with the specific industry, machine, process or hazard to be safeguarded; (2) to catalogue so as to bring safety subjects together as well as under the specific heading.

What Does Safety Mean?

BY ALBERT W. WHITNEY

General Manager, National Workmen's Compensation Service Bureau

Librarians, I assume, will be particularly interested in the scope of the Safety movement and in its tendencies in order that they may be prepared to deal with its bibliographical side. The word safety suggests a narrow, negative and mechanical range of ideas,—largely inhibitory and restricted to personal physical danger. In actual practice the connotations and implications of the idea turn out to be far more voluminous and opulent.

In the first place safety is not a negative idea, that is it does not impoverish life by removing adventure but rather substitutes a worth-while adventure for a mean adventure. Secondly, it is not a merely personal and physical matter, but involves the family, the community, the state, the nation and even the world. Nor can the idea of danger be confined solely to physical danger.

In actual practice the National Safety Council has found it necessary to deal with the safety problem in its expanded form—the bringing about of right conditions affecting life and happiness. These are the radiations of the idea; the kernel of it is of course the problem of personal physical danger.

The industrial safety problem, which has been up to the present the chief problem that has been attacked, on its more obvious side involves such processes as the guarding of machinery, the organization of shop committees, the design and construction of buildings and the influence of workmen's compensation laws, particularly through the economic pressure of insurance.

The public safety problem involves questions of traffic and other human relationships in which large numbers of people are involved as well as the more individual hazards that are found in home life. The approach to public safety is largely through education, for in the field of both industrial
and public safety the problem is fundamentally psychological.

The child must be taught safe habits and the young engineer must be brought up to realize that the conservation of human life is certainly as important as the conservation of material and energy.

In this connection it is interesting to note that safety education in practice is turning out to have a mental and spiritual value in itself aside from its effect in the reduction of accidents.

That our accident record needs to be improved every one knows, but few realize the enormity of our sin. It can be expressed this way: The drain upon our community in killed and seriously injured by accident is equivalent to more than two European wars going on all the time; in other words, the killed and injured through accidents in the United States during the period of our participation in the war was over twice as great as our loss during the same time on the field of battle.

The Cleveland Public Library

and Safety Week

"Safety Week" in Cleveland began September 29 and closed October 4.

Long before the opening of the exhibit in Grays Armory, school teachers and pupils descended on the Library and its branches for study material on safety. Right here was developed an apparent gap in the literature of the subject. Much as has been written on safety, there is very little which was satisfactory from the standpoint of the school; and books from the industrial standpoint were accepted chiefly as substitutes for more easily digested material.

Beginning with Monday of Safety Week, the show case at the street entrance to the Main Library was filled with an exhibit of safety literature. This included a good sized poster bearing the familiar safety emblem, with the words, "Safety Books." Besides the poster there were shown safety publications of one sort or another, and the clever verses by Mrs. Beyer, "Safety Last," taken from Safety Engineering.

The part of the Library in the exhibit at Grays Armory was impromptu, as it was not known until the last moment, owing to delay in the mails, whether there would be an available booth. However, we at last found ourselves assigned a space at one end of the gallery, which we shared with our good friends, the Americanization Council.

The logic of the Library position was, that what makes for intelligence, makes for safety. Consequently the sizable map of Cleveland showing the distribution of the library branches, with its explanatory legend was actually if not superficially, decidedly appropriate. It attracted much interest.

There was also a long narrow poster: "A-m-e-r-i-c-a-n-i-z-a-t-i-o-n," spells "Civic Safety!"

On a stand were laid out piles of library lists and circulars, the best of those on hand which were adapted to the probable interests of the visitors to the Exhibit. They included business lists, lists for mechanics, and night school students, and circulars setting forth library service. All this literature disappeared at a gratifying rate.

For the rest, safety posters were displayed at the Main Library and branches, and one branch had an exhibition of safety jingles composed by school children.

From the foregoing summary of activities, it will be realized that several desirable things were left undone, for reasons which were good, be it said, but which need not be specified. Nevertheless, from the Library standpoint, participation in Safety Week was felt to be more than an opportunity to advertise. It is hoped that its co-operation may have been worth while to the cause of safety.

G. O. WARD,
Technical Librarian,
Cleveland Public Library.

Litany of Labor

"I believe in safety first because the loss of my ability to labor means suffering for those I love most on earth; it leaves to the mercies of a more or less indifferent world those whom every workman desires most of all to protect.

I believe in safety first, because it tends to conserve my ability to labor and that ability is my sole capital; losing it, I am bankrupt.

I believe in safety first, because my safety means the safety of my fellow workmen. In risking myself I risk others. I believe in safety first, because the bread I earn with my own hands is sweeter to me and mine a thousand times than charity in any form."—National Safety Council

"A little neglect may breed great mischief. For want of a nail the shoe was lost, for want of a shoe the horse was lost, and for want of a horse the rider was lost, being overtaken and slain by the enemy; all for want of a little care about a horseshoe nail!"—Benjamin Franklin.

"Chance will not do the work—chance sends the breeze.

But if the pilot stumble at the helm, The very wind that wafts us towards the port May dash us on the shoals.

The steerman's part is vigilance,

Blow it or rough or smooth."—Ben Johnson.
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EDITORIALS

The Annual Meeting of 1920

At the December meeting of the Executive Board it was voted to hold the eleventh annual meeting of the Special Libraries Association in New York City in April, 1920. The exact dates fixed are April 14-17, 1920. The first and opening session is to be held on the evening of April 14; thereafter there will be two sessions daily except on Saturday, the 17th. Committees on arrangements, publicity and other phases of convention work have been appointed. While eager to provide a program that will be attractive, substantial and also directly useful to every special librarian, the Executive Board feels deeply the inadvisability of too many sessions, and the danger also of so much talk from the platform as to reduce the time for discussion from the floor or force hasty thought or hurried action. Therefore no more than two sessions will be held each day and the aim will be to draw as many as possible into the discussion.

Conventions that do not result in interchange of opinion have no reason for being held; the measure of success of an annual meeting is not in the number of papers that have been read or the set addresses which have been made, but in the thoughts with which those attending the meeting have gone away. As special librarians with a definite obligation to the firms or organizations to which we are attached, the only sound reason for attending this or any other convention that we can give is the concrete gains that we expect to derive—whether those gains be informational or inspirational.

Last misconception arises as to the reason for holding this meeting both at a different place and at a different time from that of the American Library Association, we wish to emphasize again the fact that our Association is bound to consider the interests and welfare of its members first. The majority of our membership is to be found east of the Mississippi. Experience with conventions held farther west does not seem to warrant trying the experiment again at this time. The conventions that have been best attended have been those held in the East. Furthermore, never was there a period so important for special libraries and special librarians as now. More business men, more institutions are interested in special libraries and the uses to which they can be put than ever before. The opportunity for special librarians is so great that we dare not jeopardize it. A well-attended convention at which action on important matters will go hand in hand with well-considered thought is essential. That is in a word the situation as it presents itself to the Executive Board.

Announcement of such matters as will be placed before the annual meeting for consideration will be made in these pages at another time.

It is hoped that all special librarians will plan to attend this Opportunity Conference in April, 1920. Those that wish will, because of the different dates of meetings, be enabled to attend also the American Library Association Conference in June at Colorado Springs.

The Need of the Moment

At the First Bi-Monthly Conference of the National Association of Employment Managers held in New York in October, 1919, the subject of "Training the Supervisory Force" was discussed. The following aids to train-
ing foremen were agreed upon as of great assistance.

Individual attention
Correspondence courses
Manuals
House organs
Bulletins
Questionnaires
Charts
Pamphlets
Library
Assigned reading
Assigned problems
Social gatherings
Meetings
Lectures
Shop talks by foremen
Observation trips
Optical projections
Product exhibits
Seminar
Survey of supply and demand
Shop talks by staff men.

Notice the large part that library materials play. Notice, too, how many of these aids the library can supply. Does this not suggest something? What is your library doing to make better foremen? To make better managers and managerial assistants? Have we thought of this phase of our work as broadly as we might? Is it not too true that too often we have been too much concerned with catalog cards, with clipping files, magazine routing systems and other matters of library economy? Can we expect that the librarian will come into his own so long as this is the case? The fact is that the business librarian, the law librarian, the medical and institutional librarian, the special librarian in every field must take the broadest view of his work, side by side with the men who are doing things, making things, thinking things. Individually and as an Association we must take a more active part in plant and community activities than we have.

Too frequently in the past have we tried to build a narrow wall about ourselves, to encircle ourselves in a cocoon or cyst of the technique of librarianship. We have met always among ourselves and with ourselves. Book and pamphlet collections have at times stood out too much as an end than as a means to an end. Intimate knowledge of library economy is presumed, and quite naturally, in the special librarian. But we must go beyond this. We must make the information serve a useful purpose. Only as we do this, do we justify our place.

But beyond this we must engage in an active effort to acquaint others with what we are doing. The business librarian should try to reach every body of business men and lay before them what we are doing; the agricultural librarian must do this with the farmer and other associations who may be interested, and each other group must try to reach en masse those whom we can serve. We must not rely on passive effort alone. Special Libraries does much, but it cannot do everything.

Already an effort in the right direction has been made. Early this year before the Buffalo meeting of the American Chemical Society an afternoon was given over to chemical libraries, and several librarians told by word of mouth, by picture, by citation of example what they were doing. At the more recent convention of the National Safety Council a booth was given over to the National Safety Council Library, and the large number of industrialists and safety men who came to the meeting carried away with them a definite idea of the library as a living, active force presenting numberless points of contact and opportunities for usefulness. The Medical Library Association goes even further, holding its meetings with the American Medical Association. Its officers are as frequently physicians as librarians. A direct and intimate contact has thus been developed with mutual advantage.

For most special librarians the problem is not as easy of solution. We have not sold the business man in every instance. There are many reasons for this, but two stand out quite definitely.

First, the Special Libraries Association is yet in its teens. We are just entering on the second decade of our existence. Without any assistance except that of our membership, and sometimes in the face of the active and more often passive resistance of the sister association that should be doing everything in its power to help us, we have forged ahead until today the business concern as well as the special librarian comes to us as the recognized and most efficient body for information, for advice, for opinion in the many problems that are encountered each day. We are, in spite of our youth, today the recognized clearing-house for information on special librarianship—recognized because we have always stood for service and have always given that service. In the same way that our members have made good in the organizations in which they are employed, we have as an Association tried to "deliver the goods."

A glance at the mail that comes daily to the editor's office shows clearly how we have succeeded and the esteem in which the Association is held. Similar letters come to the President and to the Secretary. But should we rest satisfied with this? Does this not in itself indicate the larger usefulness to which we may aspire and the larger service which we may in time extend? Here is an aspect of our work worth a prominent part in the discussions at the annual meeting.
The second reason why we have had to creep when we might be able to walk is the too narrow conception we have at times taken of our work. The library has too often bound us as a straitjacket. All this has been too evident to warrant extended discussion. The dissatisfaction with the name "librarian" is the most definite testimony of the existence of the fact. A suggestion as to how this condition may be eradicated has already been made at the outset. But in our relations with other associations, whether library or other, as with the outside world, we have got to recognize this fact: We must do our own loving; no one will do it for us. In other words, our success is conditioned by our own efforts. Realizing this truth, is it not fair to ask, what shall we do about it?

J. H. FRIEDEL.

Chemical Warfare

BY DR. CLARENCE J. WEST

Information Department, Arthur D. Little, Inc.

Among the many modern innovations of the present war, probably none had a greater influence upon the fighting forces than did chemical warfare. To the man in the front line, chemical warfare did not mean much more than a gas alarm and a gas mask. But he soon learned that one of the best friends he had was his mask. The importance of gas warfare is shown by the figures that 20 per cent of all the casualties were from gas.

The humanity of gas warfare is shown by the fact that not over 4 per cent of the gas casualties were fatal, whereas with all the other cases from 20 to 25 per cent were fatal.

As far as we can judge, the idea of using poison gas in attack originated with the Germans about Christmas, 1914. It may have been much earlier, but could not have been much later. The time intervening between this and the date of the first gas attack, April 22, 1915, was filled with preparations of all kinds. First, a gas had to be selected and manufactured. Because it was readily accessible, as a commercial product, and also because it met, as nearly as possible, the requirements of an ideal war gas, chlorine was the first poison selected. Then a cylinder had to be developed, which would permit of the ready discharge of a large volume of gas within a comparatively short period. Troops had to be trained in the art of making a gas attack. A certain amount of defense had to be provided in case of accident. Field conditions, such as the nature of the country and the direction and the velocity of the wind, had to be studied. When all these things seemed ready, the first attack was launched against a troop, who had no idea of the nature or effect of the new form of war, and who had absolutely no protection against it. Fortunately for all concerned, the Germans did not realize the advantage they had gained through this attack and did not press it to the full. The way was clear to Calais, had they only known it.

While there was a certain hesitation on the part of the Allies about adopting gas warfare, it was not long before they were forced to do so, because of its continual use by the Germans. It was not until September, 1915, that the Allies were ready to use this new form of warfare. This gave us the measure of time that must have elapsed between the Germans' decision and the first attack. Since that time, gas has been one of the deciding factors in every large battle. At first the advantage certainly was always in the Germans' favor. In December, 1915, they introduced a mixture of phosgene and chlorine, and while the British had warning of this, it caused many casualties until the men became used to its new properties. Then followed, during the course of the year and a half that followed: "vomiting gas," chloropropin; "sniffling gas," diphenylchloroarsine; and "blistering" or mustard gas, dichloroethyl sulfide. Each of these created a temporary advantage for the German Army.

As the war progressed, it became more and more evident that it was not so much the number and nature of the gases employed as the quantity that could be expended in any one attack that was important. It was this fact that finally enabled the Allies to win through Gas Warfare. Especially after the United States had entered seriously upon its gas program, the monthly production of the various gases used by the Allies grew by leaps and bounds, until finally the United States itself was producing gases on a much greater scale than Germany was ever able to attain.

The production of toxic gases was paralleled by the development of the methods of protection, and especially of the gas mask. Starting with the types used by the British and French, the Americans were able to improve the absorbers and modify the face piece until they had a mask which was the equal of the best type developed by the
British. This was the mask used by the fighting units. Just before the armistice was signed, a new type Tissot mask was placed into production, which would have simplified greatly the discomforts of wearing a mask while fighting. Unfortunately this mask never reached overseas in any quantity.

Chemical Warfare also involves many other questions, such as smoke, incendiaries, signals, rockets, protective clothing, gas alarms, horses, masks, grenades, etc., which cannot be mentioned here. The references on gas warfare which follow have been classified into three groups: I. Books and Pamphlets, II. General and Chemical, and III. Physiological and Pathological.

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ABBREVIATIONS USED

Am. City. American City.
Arch. d'Ophthalm. Archives d'Ophthalmologie.
Arch. dl'Hist. Arch. d'Histoire Pharmaceutique et des Sciences Affines, Roma, Italy.
SPECIAL LIBRARIES

Deutsche med. W. Deutsche Medizinische Wochenschrift.
Frankfurter-Ztg Frankfurter-Zeitung.
Génie C. Genie Civil.
Gronl. farm. chim. Giornale di farmacia, di chimica e di scienze adatt.
Ind. Independent.
J.M.D. International Military Digest.
J. de Méd. de Bordeaux. Journal de médecine de Bordeaux.
J. Physiol. J. Physiol.
J. Physiol. J. Physiologie.
J. Royal Medical Service Journal of the Royal Medical Service.
L'Ind. chim. L'Industrie chimique, Revue universelle des produits chimiques et des industries annexes.
Lit. Digest. Literary Digest.
Marseille-Méd. Marseille-médical.
Med. Rec. Medical Record.
Muxen med. W. Muchen medicinske Woch- enschrift.
National Guard Mag. National Guard Magazine.
Policlin. Policolnico, Roma.