

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET • • CHICAGO 10, ILL.

Cable Address • • • • "Medic, Chicago"

Subscription price • • • • • Eight dollars per annum in advance

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SATURDAY, MARCH 8, 1947

THE HEALTH CHALLENGE OF OUR SCHOOLS

Manifest unrest prevails in the field of education in the United States. Teachers' strikes and threatened strikes, pupils' strikes, surveys of school systems and widespread public discussion indicate that there are real problems to be solved in American education. Educational facilities surely need improvement. However, the most immediate problem is insufficient money for payment of teachers.

An increasing shortage of teachers threatens because of abandonment of the teaching profession in favor of better paid occupations. Moreover, new recruits to the profession are few because of the poor inducements offered in existing positions. The shortage of teachers has resulted and will continue to result in increased burdens for the teacher, deteriorating quality of available teachers and steady deterioration in the quality of education received by the students.

In many places local funds are insufficient to provide adequate educational standards. Several bills have been introduced into the Congress to procure federal money for improving local educational programs and particularly to meet the serious problem of teachers' salaries.

In sixteen states the majority of classroom units have to be maintained on less than \$1,600 a year. Yet in all but two of these states the percentage of state income allocated to education purposes is greater than the national median. Obviously federal assistance is necessary in at least fourteen states if educational opportunity is to be equalized.

The American Medical Association has a long standing and deep interest in the schools because of its interest in health and health education. Adequate health education is impossible unless the general standards of education are maintained. In the schools today a newly awakened and active interest in health education is manifest. The Office of Education, the Public Health Service and the Children's Bureau are concerned in health education. The professional associations of educators and of physicians also have a profound interest in the health of the nation's children.

The national health program of the American Medical Association proposes that if federal money is made available for local use it should be in response to demonstrated need. Only in this way can the poorer and less populated districts be adequately helped. The Association has stood, moreover, for the greatest possible measure of local financing and control. Federal control should be limited to the necessary auditing of federal funds, if any. School health service is already administratively placed in some states in the health department and in others in the education department. Some of the proposed legislation would complicate the picture unnecessarily by making federal appropriations, if any, for school health service to a third agency, such as the Children's Bureau. Such a third agency would then have to redistribute funds to states through health or education departments.

Since 1911 the American Medical Association and the National Education Association have had a Joint Committee on Health Problems in Education. In common with educators the medical profession holds that the schools are for educational purposes and are not intended to be made into hospitals or clinics. THE JOURNAL endorses the principle expressed by the American Association of School Administrators in its year book "Health in Schools":

. . . In the field of medical service responsibility must be assumed jointly by the individual, school, home, family physician, and dentist and community. . . . The responsibility for medical and dental service must not be usurped by the school because of the immediacy of current health problems. The schools in general have avoided undertaking medical treatment. The medical service has been limited to health examinations, consultations, and advice. The recommendations within the school are concerned with the child's program, involving shortening of the school day, adding rest, extra feedings and indication for special classes.

Good administration will allow the educational specialist and the health specialist to work together, each respecting the professional status, skill and activities of the other.¹

GLYCOL VAPORS FOR DISINFECTING PURPOSES

The desirability of developing a method of disinfecting air in closed and heavily contaminated spaces is unquestionable. Many procedures have been under investigation. During recent years numerous studies on the germicidal properties of vapors and mists have been published. Various substances have been employed, but through the work of O. H. Robertson and his associates and others special attention has been given to the glycols, notably propylene glycol and triethylene glycol.

Up to 1943 serious practical difficulties inhibited adequate study of glycol vapors. Robertson,¹ for example, said at that time "Practical application of the use of glycol vapors for the purpose of controlling air borne

1. American Association of School Administrators: Health in Schools. National Education Association, Washington, D. C., 1942, pp. 58 and 308.
1. Report of the Standard Methods Committee for the Examination of Germicides and Antibacterial Agents. 1943, Am. J. Pub. Health 34: 286 (Aug.) 1944.

infection has had to await the construction of suitable apparatus for the dispersion of glycol vapors into large and enclosed spaces and the development of an instrument to control automatically the concentration of glycol vapor in the air. Rapid progress is being made in the solution of both these problems."

An extensive study of glycol vapors for the control of bacteria in large spaces was reported by Bigg and his colleagues² in 1944. Their studies were carried out in a specially constructed air conditioned room. The glycol determinations were made on 2 liter samples of room air when propylene glycol was analyzed and on 1 cubic foot samples of air when triethylene glycol was used. Several methods for the production of glycol vapor were employed in their studies. An air scrubber was constructed in which room air was blown through a spray of liquid glycol and droplets were eliminated by a series of baffles and filters which permitted only the vaporized glycol to escape with the carrier air. This proved to be a satisfactory apparatus for vaporization.

These workers found that the concentration of propylene glycol and triethylene glycol vapor necessary to produce bactericidal action is 0.1 mg. per liter and 0.005 mg. per liter respectively. This concentration appears to be free from health or explosive hazard. Another important study of the possible value of glycols in the control of air borne bacteria was carried out by the Navy Medical Research Unit No. 1³ and reported in 1944. The technic of dispersion varied somewhat from that employed by Bigg and his colleagues. The navy studies indicated that under the conditions of study glycols are bacteriologically ineffective in controlling droplet dust contamination of air, though this does not mean that their action on droplet nuclei or on the incidence of infections is absent.

In 1946 Robertson,⁴ serving as referee for the Committee of the American Public Health Association on standard methods for the examination of germicides and antibacterial agents, reviewed the evidence concerning glycol vapors as germicides. It has been found, he said, that relative saturation of air with a glycol vapor is of greater significance as far as germicidal activity is concerned than is the actual content in milligrams of glycol per liter of air. Consequently an important unsolved problem is the development of testing of apparatus for the dispersion of glycol vapors and the control of their concentration in the air. The principles of such apparatus have been fairly satisfactorily worked out, but, at the time of writing, Robertson said that the actual production of dependable instruments had not yet been achieved. There is also available a device for the automatic regulation of glycol

vapor in the air called the glycostat. This instrument has been calibrated so that it can measure degrees of saturation of the air with glycol vapor by direct reading of the variations in the intensity of light reflected from the glycol condensing surface of the wheel of the instrument.

Glycol vapors for the disinfection of closed spaces, such as schoolrooms, barracks or theaters, are not yet ready for general use. Adequate proof of the germicidal effects of both propylene and triethylene glycol appears to be established. The choice of agent, certain details of vaporization and other technical aspects have not yet been worked out to the extent that would warrant the large scale use of glycol air disinfection. Commercial promotion⁵ of apparatus for glycol vaporization in public buildings is, therefore, premature.

BASIC SCIENCE INSTRUCTION IN HOSPITAL RESIDENCIES

Apparently misunderstanding has developed regarding the nature of instruction in basic science that ought to be part of the training of a hospital resident who wishes to qualify for practice of one of the specialties in medicine. Such a physician should, of course, know the application of the basic medical sciences employed in the specialty of his interest.

Apparently many hospitals and their staffs have concluded that such training is possible only if the hospital is affiliated with a medical school; the school is requested to present organized course work and supervised laboratory exercises for the residents of the hospital. Elsewhere in this issue is a statement by the Council on Medical Education and Hospitals of the American Medical Association defining its concept of applied basic science instruction in hospital residencies. Applied basic science instruction does not necessitate formal courses but should be distinctly of an applied nature, integrated with the daily clinical work.

In the instruction of residents in anatomy the attitude and enthusiasm of the hospital attending and resident staff in employing the opportunities to teach and learn gross and microscopic anatomy from clinical and pathologic material are more important than an available dissecting laboratory. The facilities and professional personnel of the hospital should afford opportunity and incentive to broaden the resident's existing knowledge of bacteriology. Similarly the biochemistry laboratory of the hospital should provide the stimulus for the resident to enhance knowledge of that subject acquired in medical school and to relate such knowledge to the clinical problems he encounters. The clinical-pathologic conference can be a most effective device for correlating the basic sciences with clinical

2. Bigg, Edward; Jennings, Burgess H., and Fried, Sherman: The Use of Glycol Vapors for Bacterial Control in Large Spaces, *Am. J. M. Sc.* **207**: 361, 370 (March) 1944.

3. Laboratory and Field Studies of Glycols and Floor Oiling in the Control of Air Borne Bacteria (The Personnel of Navy-Medical Research Unit, No. 1, University of California, Berkeley, Calif.), *U. S. Naval M. Bull.* **42**: 1288 (June) 1944.

4. Robertson, O. H.: Disinfection of Air by Germicidal Vapors and Mists, *Am. J. Pub. Health* **36**: 390 (April) 1946.

5. The Present Status of the Control of Air Borne Infections, Report of the Subcommittee for the Evaluation of Methods to Control Air Borne Infections, of the Committee on Research and Standards, James E. Perkins, Chairman, *Am. J. Pub. Health* **37**: 13 (Jan.) 1947.