tionally satisfying. There are many examples of a relationship between health and an individual's assumption of responsibility for the consequences of personal practices, e.g. consuming food, liquor, drugs, wearing protective devices on the job, buckling auto safety belts, complying with prophylactic or therapeutic regimens, etc. Theoretical arguments against acceptance and ultimate dissemination of the Heart Healthy curriculum include: the need to extend the limited observations of Coates, *et al,* in order to establish the replicability and generalizability of their initial observations, the possible low cost-benefit of this curriculum component compared to some other curriculum, and the possibility that childhood diet and exercise may not affect adult cardiovascular disease appreciably.

The preceding reflections should in no way detract from the contribution represented by the study of Coates and his colleagues. These investigators undertook a difficult evaluation with limited state-of-the-art tools and demonstrated that health education effectiveness could be measured objectively and that children's behaviors could be changed by relatively efficient means. Whether or not the specific behaviors they changed are critical to health seems less important than the fact that behaviors can be changed by soundly based and executed health education, when and if the relationship of these behaviors to health are established.

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The Ups and Downs of Prevention

"The great object of sanitary science is to teach people the causes of disease,—how to remove or avoid those causes,—how to prevent disease,—how to live without being sick,—how to avoid premature decay. And one of the most useful reforms which could be introduced into the present constitution of society would be that the advice of the physician should be sought for and *paid for* while in health, to keep the patient well; and not, as now, while in sickness, to cure disease, which might in most cases have been avoided or prevented."[1]

With a few changes to conform to current jargon, Lemuel Shattuck's words in 1850 might have appeared today in a popular or professional journal. Some believers would denigrate Shattuck's paternalism and his focus on the medical model, while others would strive to convert the model to a "(w)holistic" one; some would condemn Shattuck's blame-the-victim approach while others would defend its pragmatic reality; but all believers would unite in affirmation of Shattuck's aspirations.

As a believer in the miasmatic etiology of disease and the observer of epidemics which recurrently took their toll in Massachusetts, Shattuck could be confident that measures to control the environments in which miasmas were thought to generate were effective tools of preventive medicine. His confidence was enhanced by the experiences of other countries. It is more difficult to understand his faith in the virtues of medical services or advice. Over one-half of the deaths he recorded in Massachusetts from 1842-1848 were ascribed to "zymotic" (infectious) diseases or consumption, and a substantial proportion of the remainder would be now so classified. Jacob Henle had advanced a germ theory of disease, but it was not taken seriously.[2] The only effective preventive measure in the hands of physicians was vaccination against smallpox. If physicians were privy to other wisdom, they did not absorb it themselves. Their average age at death (55 years) was exceeded by that of lawyers, clergymen, coopers, hatters and farmers. One solid piece of advice might have been to stay on the farm (farmers lived to be 65). It is unlikely that such advice would have been heeded, however. As is so often the case, cultural pressures outbalanced wisdom: industrialization of the Bay State was well under way, and farmers were moving westward.

In spite of Shattuck's well-intentioned plea, the idea of a periodic health examination did not take hold for another 50 years. Although a few physicians may have practiced "preventive" examinations earlier, the Boer War (like World War I and World War II which followed) called the attention of authorities to the low standard of "physical fitness" among recruits.[3] The immediate response was a call for the periodic medical examination and correction of "defects" found in school children so that more healthy soldiers could be inducted.

In the United States this concept fitted in well with the growth of the conservation ethic in the early years of the twentieth century.[4] Paralleling the burgeoning public health movement with its scientifically based focus on contagious disease and environmental sanitation, life insurance companies (beginning in 1909) introduced the concept of a "preventive" examination for adults, their model being the "well baby clinic" and the school health screening examinations which had been introduced a decade or two earlier. Substantial promotional efforts accompanied the new movement. Supportive resolutions were passed by the American Medical Association and numerous other professional and civic organizations.[4] According to Haven Emerson, one could read the following advertisement in New York City subway cars: "Your body is a wonderful machine. You own and operate it. You can't buy new lungs and heart when your own are worn out. Let a doctor overhaul you once a year."[5] The remainder of Dr. Emerson's 1922 speech, when viewed from today's perspective, leaves the impression that an overhaul at that time might have done considerable damage to the machine. Children would emerge without their tonsils, adults without their teeth (removed because of "cryptic"

foci of infection), and everyone's bowels would have been thoroughly washed out.

In spite of the promotion, the periodic (annual) medical examination did not become popular. In 1929 a Committee of the New York Academy of Medicine complained of "the relative tardiness of the medical profession in recognizing the value of the periodic health examination." In an effort to stimulate the interests of general practitioners, the Committee produced a manual, the product of 21 specialists and sub-specialists, each of whom wrote of "the ways in which his (sic) specialty is related to preventive medicine." It is a strange compendium that focuses largely (and in some specialty areas, virtually exclusively) on the pathogenesis and treatment of disease.

Some 16 years later the New York Academy of Medicine took another look at preventive medicine. Edward Stieglitz, a pioneer in the field of geriatrics, produced for the Academy a slim volume entitled "A Future for Preventive Medicine."[7] Stieglitz was a great believer in what he termed "constructive" medicine and the "health inventory." "Yet," he wrote, "in spite of the importance of applying to mature adults personal and individualized guidance toward health construction, it is conspicuous that thus far this type of approach has been developed entirely in the fields of pediatrics and obstetrics." Stieglitz was wiser (and vaguer) than his predecessors. He avoided claims for specific preventive procedures and played up the individualization of each "inventory", based largely upon "the health status of the patient and the probable effects of his previous life upon the physical organism," correction of "remediable defects" (the term is derived from the school health program), and "advice and guidance regarding habits of life which may be detrimental to the specific individual."

In the decades which followed, prevention was pushed into the doldrums by the growth of biomedical research and the advances of technology until the costs of these investments within a shrinking economy began to balance their observable benefits. Today prevention is on the upswing once again. Its scope is very broad indeed, encompassing environmental and occupational controls and a variety of efforts to effect life style change. Here we will confine our observations to those efforts that can be made within the framework of personal health services.

Apart from fringe movements and the distortions of the media, medical spokespersons for prevention today are far less rhetorical and more cautious than their predecessors. They frequently call attention to unproven claims; they attempt to rationalize the timing and specificity of the measures advised. This is true even for pediatrics, the parent of prevention, which has substantially reduced its recommendations for periodic examinations and delegated many responsibilities to nurse practitioners.[8] The United States Surgeon General candidly admits that "not by any means has every service delivered in the past in the name of prevention been efficient. Routine annual check-ups, although traditional, have not been as effective in reducing health problems as the tailoring of pertinent screening, detection, diagnostic and treatment services to specific risks for individuals at specific ages."[9]

Breslow and Somers, in an adaptation of the report of an American Task Force [10] on the application of prevention in personal health services, offer a series of packages with specific goals and services tied up in each package. Packages are delivered in nine stages, starting with four visits during the first year, dropping to a low of visits every five years in middle age, and rising to visits at least annually in old age.[11] The staging reminds one of the melancholy Jaques expounding in the forest of Arden: "All the world's a stage,/ And all the men and women merely players . . . And one man in his time plays many parts,/ His act being in seven stages."[12]

By far the most comprehensive documents on the subject, however, have been produced by the Canadian Task Force on the Periodic Health Examination. The Task Force documents include an evaluation of the potential impact of intervention on 78 target conditions, culled from an initial group of 128,[13] and an extended critical review of some 1,500 published papers.[14] Evidence for the effectiveness of each detection (or preventive) "maneuver" was categorized on a four-point scale (ranging from at least one properly randomized controlled trial to expert opinion only) and recommendations for each condition categorized on a five-point scale (ranging from good evidence to include in the examination to good evidence to exclude). The entire product is summarized in an easy to read, multicolored chart that packages recommendations by specific age groups.

The principal departure from tradition embodied in the Canadian recommendations, however, is expressed in the following statement: "We recommend also that, with certain exceptions, the procedures be carried out as case finding rather than screening techniques; that is, they should be performed when the patient is attending for unrelated symptoms rather than for a specific preventive purpose. These visits provide an excellent opportunity for the selective use of detection maneuvers. The exceptions we have in mind are pregnant women, the very young and the very old; for these groups we think it desirable to arrange a schedule of visits specifically for preventive purposes."

The good sense and logic of this recommendation are reinforced by an article in the current issue of the Journal. Kleinman and Kopstein, using data from the 1973 National Health Survey, found that those women at highest risk of cervical cancer were least likely to have ever had Papanicolaou smears.[15] The finding was not unexpected since similar relationships had been reported before in studies of less representative population groups. In discussing the significance of their findings, the authors point out that although nearly one-half of poor Black women, ages 45-64, in nonmetropolitan areas report never having had a Pap test, more than three-fourths of the same group reported at least one visit to a physician during the two years preceding the interview. They suggest, as do the Canadians, that incorporating the Pap test into regular ambulatory care visits (when indicated) will improve our coverage of high risk groups.

The same suggestion had been made earlier in this Journal by Fruchter and her colleagues after analyzing the well-documented history of unscreened cases of cervical cancer cared for in two Brooklyn hospitals.[16] In still another Journal

article, Cypress, after examining the frequency with which blood pressure was measured in physician visits reported through the National Ambulatory Medical Care Survey, concluded (in somewhat of an understatement) that opportunities for blood pressure measurement during routine visits did not appear to be fully utilized.[17]

Blood pressure measurement was the only "maneuver" given a top priority rating for both sexes and all ages 16 and over by the Canadian Task Force. The only other detection "maneuver" which received a comparable rating was annual breast examination and mammography for all women aged 50-59. Papanicolaou smears rated highly compared to all other detection "maneuvers" for adults; however, they were placed one category below that for blood pressure (evidence obtained from well designed cohort or case-control analytic studies); the recommendation for including them in the examination was based on "fair" (rather than "good") evidence, with advice to perform Pap tests every three years on the general female population aged 16-34, every five years from 35-59, and annually on high risk groups. In the latter connection a fourth paper recently published in this Journal is of interest. Briggs and his colleagues in Seattle found that positive cervical cytology screening results were five times as common among women attending a sexually transmitted disease (STD) clinic as in the general population and twice as common as among women attending a planned parenthood clinic.[18] Yet Papanicolaou smears are rarely obtained from women attending an STD clinic.

Obviously detection is only the first in a sequence of steps, all of which must be followed before intervention can be effective. However, it is impossible to take subsequent steps if the first step is not taken. Furthermore, incorporating "unrelated" detection "maneuvers" into ambulatory care, primary or secondary, generalized or specialized, seems a practical way to achieve greater equity and possibly greater efficiency in the delivery of preventive personal health services. In a somewhat different context, this was demonstrated by Dugdale in Malaysia several years ago: by incorporating the indicated immunization shots into ordinary illness visits of children, he was able to improve the immunization levels of the clinic population substantially.[19]

The concept of periodic health examinations in adults was modeled on the well baby clinic and the routine school medical inspection. These two programs were born at a different time and designed for a different purpose.[20] As times changed, their frequency and purposes have also changed. They are still recommended, albeit with reduced frequencies and optional delegations; except for vision, hearing and developmental testing, they tend to be justified on bases other than the detection of disease, e.g., immunizations, and counseling.

The effectiveness of health promotion, education, and counseling (for all age groups) is assigned research priority by the Canadian Task Force which clearly was uncertain about how, when, and where to include them in its packages. However, there is no reason to tie these services to the "health" examination visit, nor should they be based upon some mystical or inspirational view of life. As listed by the Task Force, all are linked to specific conditions such as parenting, smoking, alcohol, accidents, marital adjustment, etc., where evidence at least exists that behavior and attitude play etiologic roles.

Custom, provider convenience, and (to some extent) monetary incentives work to restrict the practice of preventive medicine to the periodic health examination. All of these obstructing factors can be overcome with judicious planning. The effective practice of preventive medicine does not depend upon performance of periodic health examinations; it depends upon a body of scientific knowledge which is still pitiably small and a sensitivity that takes advantage of the most appropriate time, place, and opportunity to apply this knowledge, whether (in Jaques' words) to: "The infant, mewling and puking in the nurse's arms . . . (to) the lover sighing like a furnace . . . (to) the justice in fair round belly . . . (or to) second childishness . . . sans teeth, sans eyes, sans taste . . ."

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ERRATA FROM DECEMBER 1980 JOURNAL

IN: Warren CW, Gold J, Tyler CW, et al: Seasonal variation in spontaneous abortions. Am J Public Health 1980; 70:1297, there is an error in the text. Under the section on "Results" para 1, the first sentence should read: "The seasonal pattern for the average monthly number of spontaneous abortions at month of conception is a significant ($p < .05$) bimodal curve which has a minor peak in March through May, a major trough in June through September, a major peak in October through January, and a minor trough in February (Figure 1)."
Editor's note: the underlined matter above is the correction.

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IN: Beebe G: Record linkage systems—Canada vs the United States. (editorial) Am J Public Health 1980; 70:1246-1248, we gave a former address for Dr. Beebe. His present affiliation is: Gilbert W. Beebe, PhD, National Cancer Institute, Bldg. 31, Bethesda, MD 20014.