SCHOOL POSTURE AND SEATING

A MANUAL FOR TEACHERS, PHYSICAL DIRECTORS AND SCHOOL OFFICIALS

BY

HENRY EASTMAN BENNETT, PH.D.

AUTHOR OF "SCHOOL EFFICIENCY," "PSYCHOLOGY AND SELF-DEVELOPMENT," ETC.

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PREFACE

Increasing use of machinery, specialization of labor, higher standards of comfort and efficiency, have brought it about that most forms of modern activity are done better sitting than otherwise. Our fathers sat to rest from their labors. Increasingly we sit both to labor and to rest. It might be said of sitting, as was said of soap, that its use is a measure of civilization.

Fixed habits of sitting are inevitable. They are bred in the bone and in the muscles. They affect the condition and functioning of the vital organs and in large measure determine one's vigor, energy, resistance to disease. Upon these things depend efficiency, happiness, attitudes toward life. Sitting habits affect all of life's values. They are controllable through knowledge, ideals, and material aids. *Upsitting* should express more of alertness, self-reliance, energy, poise, and power than does *upstanding*, in proportion as sitting enters more into life than does standing.

The habitual sitting posture of most people is distinctly bad. A chair conducive to good posture is a rarity. Much of the seating in public buildings and conveyances makes wholesome sitting impossible. School seats, even those designated as hygienic or posture seats, often violate the fundamentals of posture hygiene. There is a medical literature of scoliosis, a physical-training program for standing and movement, a library of school hygiene; but on the simple matter of wholesome sitting habits there is no adequate literature or organized knowledge.
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Such are the reasons for this contribution to a science of sitting and seating. It is made as practical as possible because the need is rather for doing something than for saying something about it. It is focused upon the problems of the school because going to school is among the most sedentary of occupations, because in school permanent habits of sitting are formed, because "what you would have in the life of a people you must first put into the schools," and because educators are the most responsive and responsible group to whom to appeal.

The technical portion of this study was undertaken as a doctor's thesis under the inspiring guidance of Dr. Charles H. Judd at The University of Chicago. Much of the experimental work was done in the training schools of that university, and measurements were made there and in the schools of Des Moines, Cleveland, Philadelphia, and in the New Trier High School at Winnetka. My gratitude for assistance and courtesies is due to so many officials and teachers of these and other schools that I am compelled to forgo the privilege of naming them here.

If this work shall in any measure accomplish its primary purpose of practical service to educators and school children, their indebtedness, like my own, is chiefly to the American Seating Company, without whose liberal spirit and material support it could not have been accomplished. The larger part of the work has been done with means and equipment provided by this company with no restrictions except "Find the facts and let us and the rest of the world know them without any commercial bias or prejudice."

H. E. B.
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NOTE TO THE READER

The reader who desires only to get the main argument, facts, and conclusions of this book will find these presented in continuous sequence in the large print. The illustrations are related to this part of the discussion.

In the condensed print will be found the statistical data and methods of their interpretation, such summaries of comparable studies as seemed justifiable, and the more technical discussions. These will be of interest to the critical student and to the general reader so far as he may desire to follow them out in connection with the particular topics under which they are presented.

The analytical Index and the Contents are arranged with a view to making the subject matter of the book available for ready reference, particularly for school administrators in dealing with the concrete problems on which they must often act quickly.

It is thus hoped that the book will serve both as a practical handbook and as a text about as comprehensive as the subject seems to justify. To accomplish the first of these purposes it has seemed wise to indulge in some repetitions which the systematic reader is asked to pardon.
CHAPTER I

THE SIGNIFICANCE AND SCIENCE OF SITTING

A growing problem. Various are the characterizations of modern life by those who would solve its problems. It is mechanical, it is electrical, it is industrial, it is sanitary, it is moral, it is immoral, it is godless, it is hopelessly complex, according to the point of view. Let us add another: modern life is sedentary. The most universal physical occupation of civilized human beings is sitting.

In the main we take our meals, our transportation, our amusements and recreations, and, increasingly, our daily occupations, sitting. Despite strap-hangers' complaints we do most of our "running about" while seated. Even plowing and reaping, ditch-digging, excavating and the lifting of great weights, by the aid of modern machinery, are done mostly by those who sit. Those who are "on their feet" at their customary occupations usually devote more continuous time during their hours of relaxation in a fixed sitting position than they do to any standing position during their working day. Many of us sit during all but a small proportion of our waking hours. More and more modern life is sedentary. There is nothing we do so much or so badly as sitting.

A difficult problem. Those who sit well are so rare as to be conspicuous. Most of us merely slump or sag into our
seats, and the makers of seats seem to have conspired to make it difficult for us to sit as we should. At best they have been slow to recognize and meet the new responsibilities imposed by the rapid spread of the sitting habit. Urban life has entailed its problems of housing, sanitation, and traffic; commercial life, its problems of finance and transportation; industrial life, its problems of safety and welfare; indoor life, its problems of recreation; every change in human habit has introduced difficulties demanding scientific analysis and solution. No less has sedentary life brought its perils, and they can be met not so much by vainly demanding less sitting as by better sitting.

A problem of vital economy. For, physically speaking, as a man sitteth, so is he. By one’s sitting is determined the form and development of the skeletal frame and musculature of the trunk, and upon these depend, far more than we realize, the vigor and functioning of the vital organs. Habitual bad posture inevitably means the compression, displacement, and interference with the functioning of thoracic, abdominal, and pelvic organs, and these affect the efficiency, happiness, and length of life. Because these effects are very gradual and subtle, because they are rather predisposing conditions than specific forms of disease, because they are not brought to medical attention until other complicating factors have rendered them acute, they have not had the prominence in medical literature which they deserve; yet their reality and importance are scarcely questioned. If there were no specific pathological effects of bad sitting posture, if there were but a lower level of physical vigor, a lessened zest in living, or merely an inferior comeliness of appearance with its inevitable psychological penalties, the subject would be worthy not merely of a book but of the earnest study of all men. All
these are in the price we pay for bad sitting habits, and
these are not nearly all that we pay.

A problem of womanhood. More especially is posture a
woman's problem; for women, by their physical nature
and the function of maternity, are peculiarly sensitive to
these postural perils, and their occupational, domestic, and
socially determined habits of life render them especially
subject thereto. A great service to humanity will be ren-
dered by one who can effectively make known to woman-
hood the undoubted relationship between the sufferings and
frailties of women and the habitual manner and conditions
of their sitting.

A problem of childhood. Even more is posture a problem
of childhood, for civilization has imposed upon the child one
of the most distinctly sedentary occupations yet devised.
At whatever age, whether we will or no, long-continued
hours of sitting do develop posture habits of some sort, good
or bad. In the case of the child, whose skeletal framework
is yet plastic and progressively acquiring its permanent
form from the pressures and strains to which it is sub-
jected, whose muscular equipment is developing in ac-
cordance with the demands made upon it, whose physical
as well as mental habits are acquiring their permanent set
in the nervous system, the postural tendencies which
school life imposes are an inevitable part of the educational
determinants for weal or woe which childhood bequeaths
to maturity. Whatever studies of posture may disclose,
they are primarily matters that concern the schools. Re-
sponsibility for the right education of children involves a
very large responsibility for the understanding and control
of the influences which determine postural habits. Un-
doubtedly the tree grows as the twig is bent, and that
human twigs are being ruthlessly bent with little regard
to causes or consequences a study of the postures of children in almost any school will demonstrate.

A controllable situation. Postural habits are controllable. They are as definitely subject to educational direction as are habits of language, of thought, of manners, of conduct, or other objectives in teaching. There are individual differences and environmental influences to be considered as in other forms of training. The technique of teaching posture, particularly as relates to sitting, has had little systematic analysis or constructive study. Curiously enough, teachers of physical training have considered the subject mainly from the angle of standing posture or of carriage and movement. And here they have proved their efficiency by their results. Yet standing of a sufficiently continuous sort to affect form and development is rare, whereas sitting which actually determines the growth of muscles and bones is universal. An interesting fact is that innumerable school children stand beautifully erect, only to slump into a distressingly unhygienic position as soon as they sit. They stand for moments but sit for hours. The very condition of standing is a fair degree of erect poise, for most of us would topple over if we stooped as badly in standing as we do in sitting.

A national ideal. That posture can be taught is a commonplace of military training. Soldierly erectness or the bookkeeper’s stoop are alike results of controllable influences. Neither is inherited nor, barring deformities, due to original variations of physical structure. Many are the occupations which leave their indelible marks for good or bad in the form of habitual posture and carriage. Each of us has his own characteristic sitting, standing, and walking habits which are the
result of some combination of educational, occupational, psychological, or mechanical influences. In every case some combination of causes has made us erect or stoop-shouldered, full-chested and soldierly or hollow-chested, round-backed and ungainly. When these causes are thoroughly understood, they can be controlled. Is it not reasonable that when we have achieved a thorough analysis of the contributing factors and a widespread dissemination of knowledge and interest in the matter, there may be gradually brought about a higher national standard of posture, with the inevitable general improvement of health, vigor, efficiency, and better appearance — an upstanding and upsitting nation?

Posture and efficiency. Certain progressive industrial organizations have already made careful motion studies of their employees and, by the introduction of improved seating with suitable rearrangement of machines, lighting, etc., have got increased output as a direct result of improved posture and consequent greater efficiency of the workers. Similar gains are possible in the life economy of any individual. Each of us can increase his output of the values of life — whether of work, rest, enjoyment, or good cheer — by securing the conditions and mastering the technique of wholesome sitting. There is scarce room for doubt that there is a definite relationship between the manner in which one habitually sits at his desk and his working attitudes, energy, and efficiency. In the schools the influence of posture upon success in penmanship and some other motor activities has been studied with positive results. In purely mental work the totality of causative factors and of educational results is so complex that the relation between posture and efficiency is difficult to demonstrate in arithmetical
fashion, yet the fact can hardly be questioned. There is a challenge here for statistically minded students to find the correlation between individual posture and efficiency in school work. There will be little disagreement on the assumption that an alert physical attitude denotes and contributes to a correspondingly tense mental condition; or that capacity for sustained mental activity is immediately dependent on an abundant supply of oxygen, on the rapid elimination of toxins from the system, and on other wholesome physiological conditions, and that these are conditioned by a posture favorable for vigorous vital processes.

Posture psychology. A director of physical training in a great university recently said that in his opinion erect posture is to be esteemed as much for its social and psychological suggestion as for its direct hygienic value. There is a self-respect and self-reliance incident to erect posture and carriage which go far toward making one worthy of the respect and reliance of others. The belief that soldierly bearing develops soldierly qualities is basic in military training. One squares his shoulders and stiffens his spine when he exercises those moral traits with which these physical attitudes correspond, and mental habits of such sort are almost inseparable from the physical ones. The world has always judged the character of people from their physical bearing, and so far as that bearing is habitual the judgment has proved reliable. There is an interesting field of study to be developed in checking posture characteristics against character traits as indicated by "will-temperament" tests and other indexes.

Whether for physical hygiene, for mental efficiency, for social and character values, or merely for the sake of personal appearance, there can be no doubt but that pos-
ture and its control are well worthy of scientific investigation. The present study has been undertaken in the firm faith that it is worth while for all these reasons and that a more general knowledge of the subject will contribute to improving the general health, vigor, and efficiency.

Posture and seating. Sedentary school posture passes from a speculative to a very vital interest when we consider its bearing on permanent health and present efficiency. It comes out of the clouds of educational theory to the solid ground of practical procedure when we discover that it is the direct outgrowth of the sitting and of the seating in the schoolroom, that it is a question of dimensions of wood and steel, of angles of illumination and the arrangement of seats, of the scoop in the seat, the curve in the back, and the slope of the desk top. It is with these very practical aspects of the matter that this book is chiefly concerned.

Seating reforms now needed. Great hygienic reforms have usually been astonishingly simple and obvious after they are appreciated, although a deluge of books, expert opinion, propaganda, and campaigning was necessary to get them appreciated. Witness the drives in behalf of fresh air, pure water, exercise, cleanliness, and simple food. The most urgent reforms in seating are in a similar case. They are almost absurdly simple and obvious, but it will take a deal of strenuous propaganda to get them recognized and heeded. Everyone agrees when attention is called to the reforms needed, but few feel that the responsibility is theirs to do anything about it, and no one can undertake to find and convince all those upon whom the responsibility rests.

Approximately in the order of their urgency the reforms needed in school seating may be stated in all
their nude simplicity thus: (1) lower seats in all grades; (2) shorter seats, in most cases; (3) less backs—lower at the top and higher at the bottom; (4) simple but more rational forms of seats and backs; (5) lower tops and closer spacing of desks; (6) arrangement according to well-known but sadly neglected principles of lighting; (7) the adjusting of seats that are adjustable and the moving of those that are movable (intelligently, to be sure, but quite simply); (8) appreciation of the sanitary, aesthetic, and structural excellences which are available; (9) selection according to the diverse requirements of varying grades and uses; (10) buying with the same foresight and intelligence that is applied to the purchase of other things.

The needed reforms are almost as simple as that. Expert advice will indeed be necessary to interpret these requirements and to avoid swinging from one error into another. Detailed applications must be worked out on the basis of scientific study and wide knowledge, even as sanitary experts are essential to the simplest community cleanliness. But the objectives are neither abstruse nor recondite. They are obvious and easily attained. They cost nothing in the long run and pay large returns. The succeeding chapters have sought to make an original contribution to the practically new field of a seating science, with the hope that it may be developed by subsequent studies into an important body of knowledge; but their primary aim is the very practical one of emphasizing the immediate need of a few very simple and obvious reforms in the hope of direct results.