merits weighed before one manufacturer was singled out who agreed to make up chairs as they were whittled out in the medical department on the basis of the continuing studies of the posture clinic. Occasionally one of these trial chairs was put on the market by the manufacturer.

One of the features of the posture clinic was a "trick" chair which was devised to record lateral and vertical back curves. It was equipped with a flexible steel band which would conform to the curves of the back and provision was made for recording these curves on a drawing board mounted on the chair. It was found, however, that the curves which were secured by means of this device were not in the main borne out by the silhouette pictures. They were, however, together with the silhouettes, of some assistance in arriving at a composite height of waist and protrusion of the buttocks for the women studied.

A chair that seems generally suitable at this stage of the investigation was finally evolved and manufactured for one unit of workers. At first only twenty of the chairs were installed but later the number was increased by one hundred—a complete installation in a department. Its special features are its irons, the scoop of its seat — three-quarters of an inch in the deepest part which is farther back than in the ordinary seat — and the removal of the ridge at the back of the seat. The back is raised so high above the seat that it permits the worker to sit well back in the chair without interference. It is adjustable up and down and backward and forward, and is also narrower at the top than the ordinary back, so that it does not interfere with the arms in work. Every possible sharp edge and corner has been removed from the chair, with a consequent increase in comfort and an improvement in looks. This lack of edges permits the freedom of movement which should be possible in any chair.

A good chair should *favor* good posture and not force it. The feelings and emotions of the worker are as important as her physical well-being, and they require an allowance for freedom. The seat of this chair has been so scooped out as to keep the user *in it*, while at the same time it forces no particular position. The back exerts a gentle pressure at the proper place. Repeated adjustments of the height of the seat and the position of the back are made by sympathetic and informed adjusters. Each operator's chair is marked in a metal clip with her name so that she keeps the chair that fits her. And the fact that the whole department is equipped with this type of chair insures its use by everyone. The workers are, therefore, using the chairs and they appear to like them. There has as yet been no attempt to discover whether or not production has been improved by the installation, which was, incidentally, made in a model department.

Mr. Hopf asked Dr. Wright what he considered a criterion for judging a chair. Dr. Wright believes that if the chair is being *sat in* and is liked it can be considered reasonably good, regardless of production results. The judgment as to whether or not it is being sat in should be made by a trained observer, of course. Mr. Hopf would like to see a controlled experiment undertaken to prove whether or not the investment in a study of this kind pays in dollars and cents. Other factors, such as light, heat and ventilation, would of course have to be controlled also. Dr. Wright reported that there is a possibility that they may make such a controlled experiment. They hope also to check up eventually on the physical condition of the workers using the chairs.

One of the popular posture chairs was discussed. Dr. Wright objects to it on the grounds of mechanical deficiencies and its tendency to force a particular posture. Freedom to move about at will is desirable, and some change in position at least every five minutes is probably necessary because of the number of muscles involved in maintaining the balance of any position of the human body. Even in the relaxation of sleep about twenty changes in position occur during a normal night's rest.

Mr. Murphy asked if the back of the chair should move forward to support the desk worker who has to lean over her work. Dr. Wright considers support in this position unnecessary. It should be available when the worker leans back.

Mr. Newton of the Western Electric Company reported briefly on some experimenting of theirs with general office chairs and showed a picture of the chair they have finally adopted. It is based on a chair formerly used by the company, but the spindles of the back have been entirely remodeled to give much better support.

Mr. Hopf suggested the possibility of adjusting machines and desks, as well as chairs, to workers.

Miss Kelly reported briefly on some work she has been doing along these lines. She has been especially interested in a bookkeeping machine which was apparently designed with no thought of the comfort of the worker. There is a reaching strain attached to operating it and it is impossible to get the knees under it. She is trying to get the manufacturer to mount the machine on an adjustable stand which will permit the operator to use it either in a comfortable sitting position or in a standing position.

The committee in general was impressed with the importance of bringing to the attention of equipment manufacturers the necessity for considering human as well as mechanical factors in designing office machines. It was felt that there was enough prospective buying power represented in the committee to make it a powerful educative force. The possibility of sponsoring a research project, to which big equipment users might be induced to contribute financially, was mentioned but considered impractical at the present. It was thought most feasible at this time to have individual members of the committee take up specific problems with the manufacturers and have them undertake the necessary researches. They should be in a position, when presenting their goods for sale, to state not only how much product a machine will turn out in a given time but also the amount of effort necessary to turn it out and the conditions under which the machine must be operated. Members of the committee are in a position to point out many bad results of present equipment to the manufacturers, and could co-operate with them to great advantage in making the necessary inquiries. It was the consensus of opinion that this was an excellent immediate aim for the committee.

Mr. Davies suggested that the committee seek to give such work as Dr. Wright and Mr. Newton have been doing publicity in the journals of the office appliance people. It was also suggested that the editors of some of the trade journals be invited to attend the meetings of the committee so that publicity for its activities might be secured through them.

It was agreed by all that the group meet periodically for the exchange of information, that definite plans be worked out for approaching manufacturers of office equipment with suggestions for changes in their designs, and that the committee give its support to research projects such as those described in this meeting. It is hoped also that the scope of the committee may eventually be broadened to include other features of office layout.

Spring Meeting Program

Columbus, Ohio—May 1 & 2

Deshler-Wallick Hotel

Thursday Forenoon, May 1

General Administrative Organization and Control.
By Frederick L. Lamson, Assistant to the President, The Kendall Company, Boston, Mass.
Discussion led by John M. Carmody, Editor, *Factory and Industrial Management*, McGraw-Hill Publishing Company, Chicago, Ill.

Thursday Afternoon

Group I: The Major Sales Problems of 1930.
By Frank R. Goodell, Anderson, Davis & Hyde, Inc., New York.
Discussion led by Sidney U. Hooper, Operating Vice President, Hartman Furniture & Carpet Company, Chicago, Ill.
Group II: Basic Conditions of Effective Utilization of Facilities.
By Leslie E. Bryant, Armstrong Cork Company, Lancaster, Pa.
Discussion led by R. B. Bleecker, National Twist Drill & Tool Company, Detroit, Mich.

Thursday Evening

A 1930 Perspective of the Industrial Relations Problem.
By Whiting Williams, Author and Labor Relations Consultant, Cleveland, Ohio.

Friday Forenoon, May 2

Group I: Methods Study (including Time Study).
Leader of Discussion: King Hathaway, Manning, Maxwell & Moore, New York.
Group II: Managing Hand-to-Mouth Selling.
Leader of Discussion: Ralph W. Langley, Production Engineer, New Haven, Conn.
Group III: Functional Organization of Executive Responsibility.
Leader of Discussion: C. S. Carney, Vice President, Trundle Engineering Corporation, Cleveland, Ohio.