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QUARTERLY PROGRESS REPORT NO. 7

HINGE POINTS OF THE HUMAN BODY

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Project M996

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This seventh quarterly report consists of three short monthly reports of work covering the months of July, August, and September of 1953. Additional comments are presented under the heading "ANNOTATION".

REPORT ON WORK DURING JULY

During July, the project was well into its summer schedule. Nearly 730 hours of research time, 187 hours of secretarial time, and 138 hours of illustrator time were devoted to the work. Principal activities were:

1. an intensive effort dealing with the consolidation of research records and the writing up and illustration of the phase of study dealing with foot range of living subjects (half of the study sample has been consolidated with the present write-up; the remainder will also be evaluated for the final report);
2. work on the balance of force vectors for the seated subject under conditions of pushing and pulling (this work will lead to an evaluation of how the body handles its dead weight in the production forces);
3. continued work on localizing of hip and shoulder axes; and
4. some miscellaneous experiments on body area-to-height relationships for different postures on one subject.

REPORT ON WORK DURING AUGUST

Activity on Project M996 during August involved 996 hours of research time, 152 hours of secretarial assistance, and 164 hours of illustrator time. The principal activities consisted of:

1. a concentrated effort in consolidating, graphing, and writing up of data on hand range;
2. a similar activity on regional distribution of body volume;
3. some work on locating instantaneous axes of the knee and hip;
4. continued measurement of the effects of dead weight on push-and-pull forces; and
5. a conference between the principal investigators and members of the Aero Medical staff at Wright Field on August 4-5 concerning project work and possible follow-up studies.

REPORT ON WORK DURING SEPTEMBER

During September, the research effort on Project M996 involved some 660 hours of work in addition to that of the principal investigator. The main activities consisted of:

1. a continued working up of data on living subjects relating to hand range;
2. more work on data concerned with the regional distribution of body bulk, including the write-up;
3. the construction of reduced three-dimensional models illustrative of items 1 and 2; and
4. some work on foot-range data and on other schedules of the study.

September involved changes in personnel and the setting up of a smaller and largely new team of workers for the fall period.

ANNOTATIONS

The three months reported above represent a period in which the major effort was placed on sifting and consolidating the records of the preceding year on the forty living subjects of our study sample. Most of the attention was put on the development of information on the range of movement of the hand and foot in different orientations. At this writing, probably two-thirds to three-quarters of the data on hand range have been processed.

Information on the distribution of the body mass has taken secondary attention, and the processing of these data is more nearly complete at this time.

Illustrations and written drafts have been prepared on the above activities as the data have been resolved, and these are almost as far along as the processing permits. In these studies, data on individual subjects had to be separately plotted, calculated, and verified from the records. In many instances, the data were intelligible only in graphical form; tracings of such graphs had to be averaged and measures of variability had to be developed through superimposing of tracings. A group of three-dimensional scale models has been prepared from averaged data on the hand kinectosphere, and these represent clearly many aspects of hand movement.

From time to time as information developed, one or more selected subjects were put through special study procedures so that secondary supporting data would be available. Apart from this activity, the only active data-gathering was related to the study on the effect of body dead weight on push-and-pull forces. Difficulties in getting the equipment refined, so that results with minimal error tolerance were possible, took much time, but finally consistent records were achieved. Many records have been accumulating and the processing has continued.

As indicated in the monthly reports above, some work was done on the localizing of hip and shoulder axes for the seated subject and attention was given to the study on joints relating to the locating of instantaneous axes of rotation.

A synoptic plan for the writing of the final report has been prepared and its general content has been discussed with Mr. H. T. E. Hertzberg of the Wright Field Anthropometric Unit. A start has been made on this document.

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