ANTHROPOLOGICAL RECORDS
5:2

THREE CENTURIES OF WOMEN'S DRESS FASHIONS
A QUANTITATIVE ANALYSIS

BY
JANE RICHARDSON AND A. L. KROEBER

UNIVERSITY OF CALIFORNIA PRESS
BERKELEY AND LOS ANGELES
1940

THREE CENTURIES OF WOMEN'S DRESS FASHIONS
A QUANTITATIVE ANALYSIS

BY

JANE RICHARDSON AND A. L. KROEBER

ANTHROPOLOGICAL RECORDS
Vol. 5, No. 2

ANTHROPOLOGICAL RECORDS

EDITORS: A. L. KROEBER, E. W. GIFFORD, R. H. LOWIE, R. L. OLSON

Volume 5, No. 2, pp. 111–154, 11 diagrams

Transmitted April 12, 1939

Issued October 5, 1940

Price, 50 cents

UNIVERSITY OF CALIFORNIA PRESS

BERKELEY, CALIFORNIA

CAMBRIDGE UNIVERSITY PRESS

LONDON, ENGLAND

The University of California publications dealing with anthropological subjects are now issued in two series.

The series in American Archaeology and Ethnology, which was established in 1903, continues unchanged in format, but is restricted to papers in which the interpretative element outweighs the factual or which otherwise are of general interest.

The new series, known as Anthropological Records, is issued in photolithography in a larger size. It consists of monographs which are documentary, of record nature, or devoted to the presentation primarily of new data.

MANUFACTURED IN THE UNITED STATES OF AMERICA

CONTENTS

TABLES

FIGURES

THREE CENTURIES OF WOMEN'S DRESS FASHIONS
A QUANTITATIVE ANALYSIS

BY

JANE RICHARDSON AND A. L. KROEBER

I. THE PROBLEM

This study is an attempt to define stylistic changes in an objective and quantitative manner.[1] That dress fashions were chosen for investigation, rather than works of pure or industrial art, is due to the greater ease of obtaining material which is not only fairly abundant but strictly comparable from decade to decade and even from century to century. This desideratum enforces that the range of material be narrow: one cannot compare landscapes with genres, atmospheric treatments with portraits. Also the material must not be too utilitarian: chairs in one period may be primarily objects of a certain degree of state, in another they may deliberately consider comfort or serve for lounging. Women's evening or formal dress has fulfilled a fairly constant function for several centuries. At the same time it is about as free from utilitarian motivation as dress can well be. Furthermore, for well over a century it has been designed and published in fashion plates, which have often been preserved where most of the costumes themselves have long since perished or become inaccessibly scattered. In short, formal dress, as a topic for investigation, possesses the advantages of representing an art which while not of the highest order is relatively free and self-sufficient; relatively little limited or warped by considerations of external utility; specific and uniform enough to be comparable from one period to another; of a nature which precludes complete repetitive crystallization and stand-still; and on which, with reasonable industry of search, there can be accumulated fairly adequate information over a long span of time.

It is for these reasons that this type of costume has been chosen for study, rather than because of any special importance or interest which it may possess in itself. In other words, it provides a convenient and promising set of data for a study of the problem of how stylistic or aesthetic changes prove to take place when they are examined quantitatively instead of through subjective intuition or feeling. It cannot of course be asserted that the change behavior of women's evening dress would follow the same patterns as style changes in painting or music or even in some other type of dress. But any findings will presumably have some significance for the wider problem of how aesthetic styles change in general; to which in turn we must have some answer before we can hope to inquire fruitfully why they change.

The investigation had its beginning in a brief article by Kroeber in 1919.[2] The techniques of examination there developed--which will be explained in a moment--are now applied to a much larger body of material. The assembling of this new material was the first contribution of Richardson. Whereas the earlier article covered the seventy-six years from 1844 to 1919, the present study carries on to 1936 as well as back to 1787, continuously except for two years (1822, 1833) for which no data were encountered. This doubles the span for continuous data. Back of 1787, contemporary portraits and pictures had largely to be substituted for pre-wear fashion plates, and they run fewer; but a fair set of specimens was assembled back to 1605. Our total time range is thus three hundred and thirty-two years--longer, we believe, than in the overwhelming majority of statistical studies in economics. To be sure, the seriation is badly broken before 1787. The decade 1631-40 yielded twenty-one available illustrations, the double decade 1691-1710 none at all; 1711-20, twenty, but 1721-30 only three. Our pre-1787 findings are therefore far less significant and reliable than those since 1787. Our more detailed analysis is accordingly based wholly on the last one hundred and fifty years. But the findings made there, projected backward, and supported by the intermittent materials over the preceding one hundred and eighty-two years, allow some tentative conclusions for the whole span of three hundred and thirty-two years.

To the figures computed and plotted year by year, we have added a five-year moving average,

[1] For their kindness and generosity in offering their collections of original fashion plates as source material for this survey, the authors wish to express their appreciation to the Department of Decorative Art, and the late Mr. Robert P. Utter, of the University of California; to Mr. John Howell, Mrs. Morton Gibbons, and the S. & G. Gump Company, of San Francisco; and to Mrs. August Ericson, of Berkeley. Assistance in the preparation of these materials was furnished by the personnel of Works Projects Administration Official Project No. 665-08-3-30, Unit A-15.

[2] On the Principle of Order in Civilization as Exemplified by Changes of Fashion, Amer. Anthr. 21:235-263. Cited hereafter as Kroeber.

which of course smoothes out the mere annual variations and gives a much more vivid picture of the trend of fashion at any one time. On the other hand, the deviation or fluctuation of each year's style from the average for five years is also much more clearly brought out by this new device. This annual fluctuation is obviously a measure of the stability of the style.

Another type of variability is that within the year. How different are the several dresses of one year from one another, as expressed by their "sigma" or standard deviation from their mean? The sigmas as compared over a period of years express the changes in variability.

In short, we have worked out quantities which express the extremes of certain features of women's dress style; the times of these extremes and the intervals between them; the rapidity and consistency of the trends of change; and the degree of homogeneity or stability of the style both in a given year and over longer spans.

THE MEASURES

The traits or features of dresses dealt with number six. These comprise three vertical and three horizontal diameters: of the skirt or dress as a whole, of the constricted middle or waist, and of the decolletage or cut-out at the neck. We are really examining the dimensions of the silhouette of the whole dress. There are many other features of probably equal significance, and of which fashion is perhaps even more conscious: trains, sleeves, girdles, flounces, yokes, and so on. All these however come and go. They are never permanent, but sooner or later disappear completely for a time. This means that only short-range comparisons can be instituted for them. The skirt and waist diameters, however, and in full dress the decolletage, cannot be escaped, as long as the fundamental style of women's wear remains at all. It is this permanence of the six silhouette dimensions that has led to our confining attention to them.

All measurements were made on fashion plates or other pictures with calipers and ruler in millimeters. To render them comparable, they had to be reduced to a common standard. For this the "total length of figure" was chosen and recorded as measurement No. 1. The six dimensions were then converted into percentage proportions of this. It is these percentages that are presented and dealt with throughout. It seems useless to publish the raw or absolute measures; but they have been preserved. Actually, the basic measurement No. 1 is not the whole length of figure, but the length up to the middle of the mouth. The top of the head does not answer, because of varying increments of coiffure and headdress.

All six of the dimensions are maximum diameters. They are as follows:

No. 2, length of skirt or dress.
No. 3, length of waist.
No. 4, length (or depth) of decolletage.
No. 5, width of skirt.
No. 7, width or thickness of waist.
No. 8, width of decolletage.

Originally another measure was made: No. 6, maximum width of skirt if this width occurred above the hem. This was soon dropped as too irregular in occurrence, and it is mentioned only to account for the gap in the numbering; though stylistically, as in recent years, this diameter may be of importance.

In detail, the measurements were executed as follows:

No. 1, or base: Total length of figure from the center of the mouth to the tip of the forward toe.

No. 2: Distance from the mouth to the bottom of the center front of the skirt.

No. 3: Distance from the mouth to the minimum diameter across the waist. The girdle, or the lower edge of the corsage part of the dress, may coincide with this or lie above or below this diameter. The girdle and edge have been disregarded because neither is a permanent feature.

No. 4: Depth or length of the decolletage, measured from the mouth to the middle of the upper corsage edge in front.

No. 5: Diameter of the skirt at its hem or base.

No. 7: Minimum diameter in the region of the waist. See comment under No. 3.

No. 8: Width of the decolletage across the shoulders.

Full-face or nearly full-face figures were used so far as possible. If the cases available were few, profiles and near-profiles were included. A side view eliminates decolletage breadth, and, if the forearm is held horizontally, as is frequent in some periods, one or both waist measures may also be lost. Otherwise, profiles, and especially semiprofiles, seem mostly to yield in fashion plates results not very different from full-face views.

In the seasons covered by monthly fashion journals, the winter months are of course the ones in question for full dress. So far as possible, illustrations were sought in the January to March issues. If these did not suffice, the April to June numbers of the journal were examined, or preferably the December and November issues of the preceding calendar year. For instance, January-March of 1850 plus November-December of 1849 have been counted as 1850.

An absolute requirement was that each particular figure be dated in a specific year. Reconstructed "typical" fashions, even if for a given year, such as abound in most histories of costume, were of course of no use. Moreover, no approximate datings were included. The only exception occurs in the case of a few Van Dyck and Watteau portraits, whose dates are known to fall within

periods of several years. As the pre-1787 data have been used only in ten-year blocks, these approximations would not matter unless the period lapped over from one block into another. Such overlaps have not been used statistically, except that a group of ten Watteaus dated 1710-16 has been included in the 1711-20 average.

The old Kroeber measurements for 1844-1919 were limited to ten figures for each year. Generally some of these ten failed to show one or more of the six diameters. Richardson sought as many examples as possible, so that there would not be less than ten cases for each measurement. This was not a hard task for the last decade and a half. Back of 1844, however, ten ladies per year became a rarity; ten full-face views hardly ever occurred. Therefore it was necessary to get perhaps six dimensions from one figure, content oneself with two from the next, and hope that in the end none of the dimensions would be wholly unrepresented for the year. Nevertheless, there were richer years: 1799 yielded twelve illustrations; 1809, fifteen; 1841, twenty-six.

SOURCES

To fill out the years from 1920 to 1936, Vogue and Harper's Bazaar were consulted, and, for 1920, Costume Royal. Each of these American magazines devotes a great deal of space to the creations of Paris designers. If, however, there were not sufficient of these Paris models in a given year, the gap was filled by unsigned American style plates.

Before 1844, it was necessary to go from one broken set to another, to the few books of copious dated illustrations (Price: Dame Fashion; Fischel and Boehn), and to the engravings, drawings, and portraits by fashionable painters of fashionable women. In these different sources it was possible to find many plates from the Petit Courrier des Dames, previously used by Kroeber for 1844-68, and other elegant lithographs issued in monthly or quarterly series such as "Wiener Moden," the "Galerie des Modes," and the Ankerman engravings for the Ladies' National Magazine, of London.

Seasonal fashion plates are scarce, however, before the French Revolution, not only on account of their age, but also because they were not published to a great extent. Hence we became increasingly dependent on painters and engravers, such as Winterhalter, Debucourt, Reynolds, Moreau le Jeune, Chodowiecki, Boucher, Nattier, Fragonard, Hogarth, Watteau, Terborch, Codde, Velasquez, Van Dyck, and minor painters of the Dutch and French schools.

The idealized lithographed fashion plates from 1789 on, whether published in Paris, Karlsbad, or Vienna, are strikingly uniform. There are changes in face and pose only with the advent of the wood-cut and the zinc-engraved ink drawing and photograph of recent years. The earlier painters are less subject to conventionalization than the lithographers. Faces and attitudes are individualized, waists are thicker, and the excellent likenesses are often far closer to the photograph of today than to the draftsman's or lithographer's formalized delineations. The change from lithograph or drawing to photograph is comparable to the reversed change from painting to lithograph. Thus we may say of our span of three hundred and thirty-two years, that the data are rather conventionalized for the hundred years 1789-1889, but are tempered with realism before and after.

MATCH OF OLD AND NEW DATA

Although the measurements are easily taken, the question may arise as to comparability of the Kroeber data for 1844-1919, and those of Richardson for the remaining years. In none of the six measures as tabulated or graphed, is there any large offset between 1843 and 1844, and only one (No. 5) between 1919 and 1920. However, to see if there were any personal equation of measurement, 1844-46 and 1919 were measured on new data by Richardson, and a comparison with the Kroeber measures is herewith appended (table 1).

TABLE 1

Comparability of Observers*

Dimen.	1844		1845		1846		1919	
	K	R	K	R	K	R	K	R
2	97.9^{10}	98.2^{23}	97.5^{10}	97.3^{11}	98.2^{9}	98.0^{10}	84.2^{10}	89.4^{18}
3	28.9^{10}	28.8^{17}	27.9^{10}	26.9^{10}	28.4^{9}	28.8^{9}	24.1^{10}	25.0^{18}
4	14.6^{10}	14.3^{23}	14.1^{9}	13.1^{10}	13.1^{8}	12.0^{10}	14.2^{9}	14.9^{18}
5	57.0^{7}	58.2^{14}	59.4^{6}	58.1^{7}	57.3^{4}	62.8^{7}	33.2^{10}	12.5^{18}
7	8.2^{10}	9.7^{13}	8.4^{4}	9.8^{10}	8.3^{7}	8.8^{9}	13.2^{9}	13.9^{18}
8	20.3^{10}	19.2^{20}	19.7^{8}	19.2^{9}	18.7^{6}	19.3^{8}	12.9^{8}	10.2^{18}

*Superior figures to the right are the number of pictures measured from which the percentage averages here given are derived.

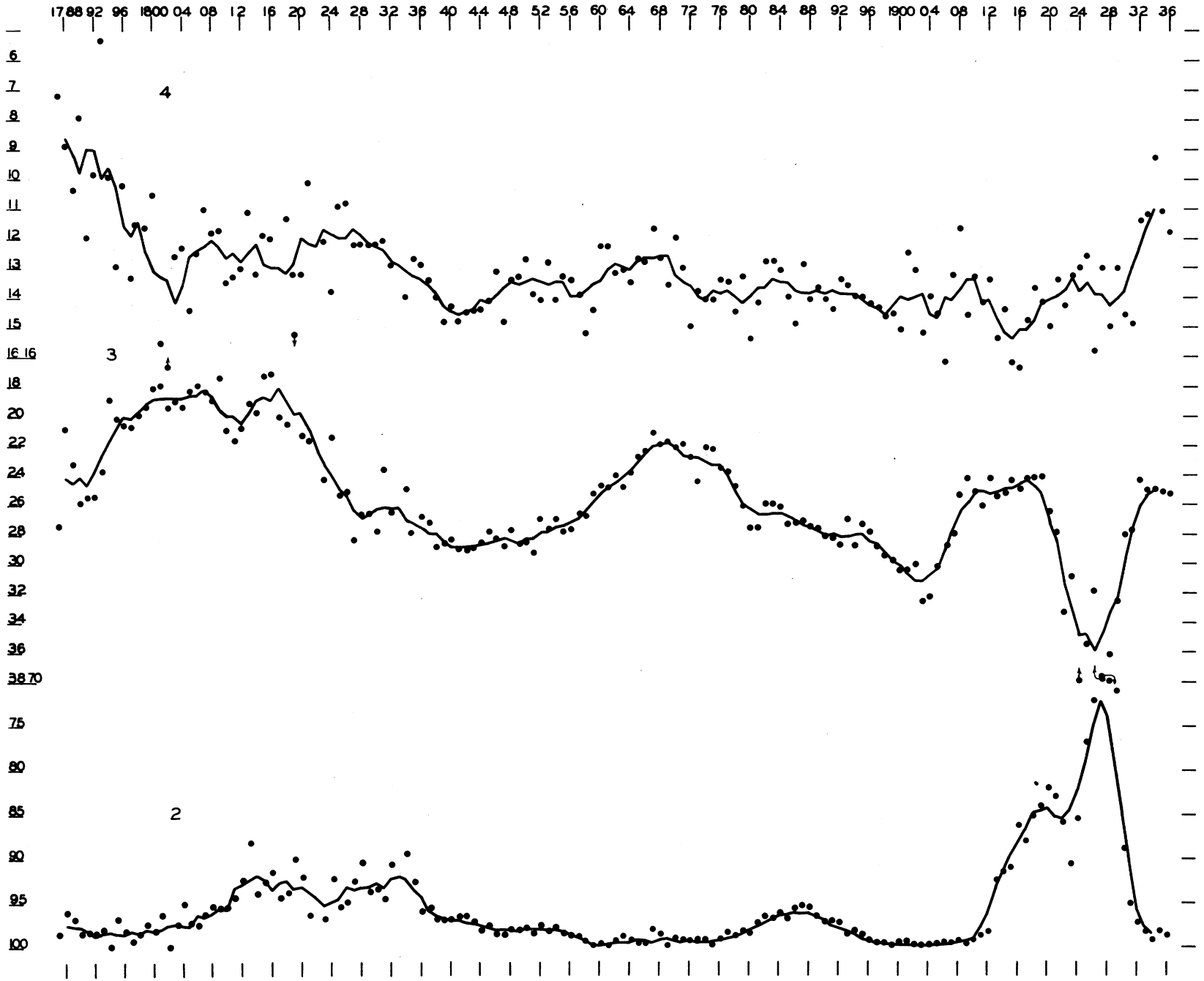

Fig. 1. Vertical dimensions, 1787-1936. Lines, five-year moving averages; dots, means for years. 2, Length of skirt; 3, of waist; 4, of decolletage.

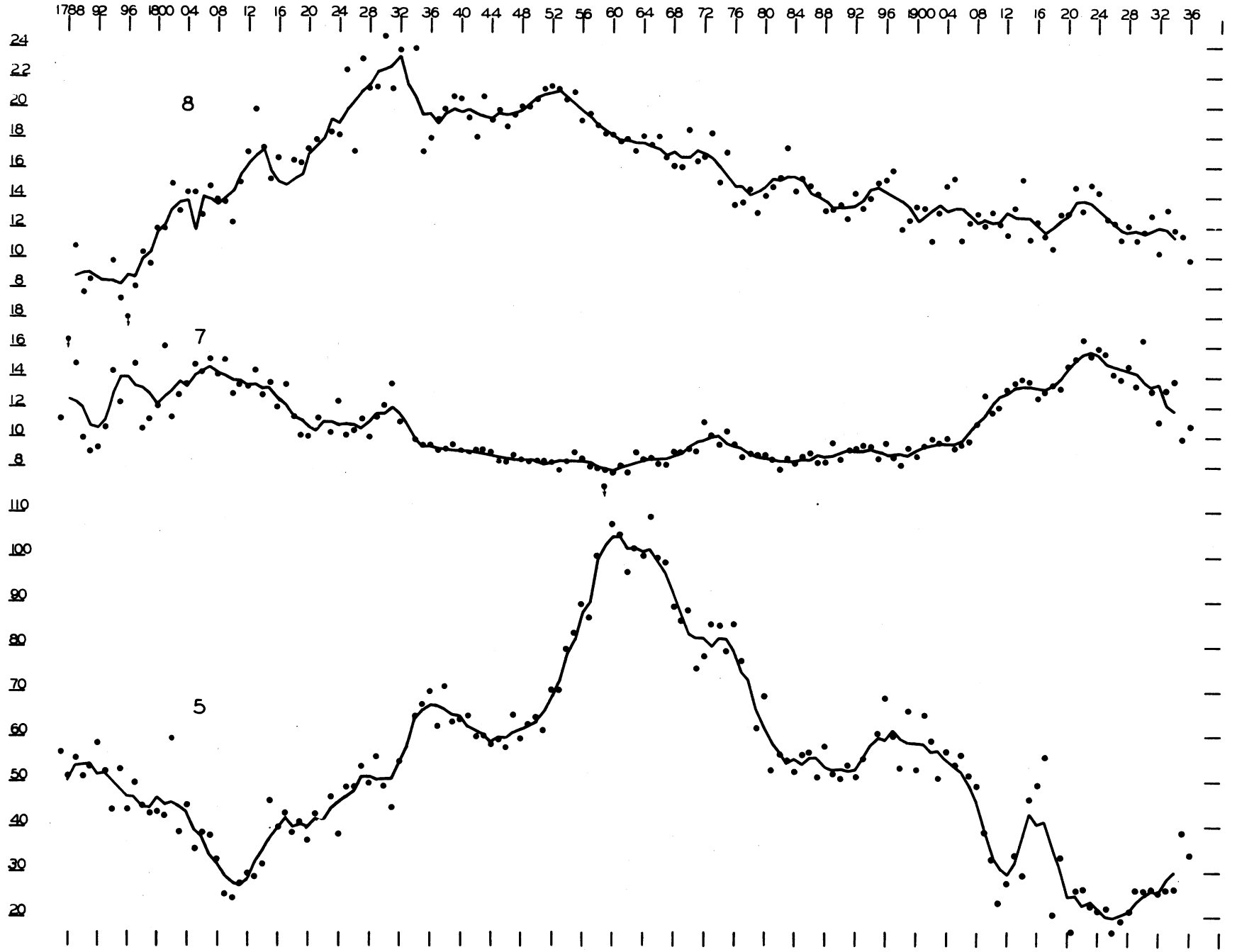

Fig. 2. Horizontal dimensions, 1787-1936. Lines, five-year moving averages; dots, means for years. 5, Width of skirt; 7, of waist; 8, of decolletage.

The two sets of data for 1844-46 seem similar enough. In only one case, dimension 5 for 1846, is the difference of the two sets of averaged measures more than 1.5.

The 1919 comparisons, however, show a startling difference of 20.7 in dimension 5: 33.2 against 12.5. Here Kroeber's data were taken solely from the March number of Vogue.[3] Four of these dresses had trains, six did not. His percentages run (* denoting train): 33; 22; 13[4] or *33; 10; 19 or *67; 16 or *60; 19 or *64; 17; 17; 9. He used the higher train widths for his average of 33.2. The Richardson series for 1919 was taken from Vogue of December 1918, and from Costume Royal for April and June, 1919. All eighteen of these illustrations have no trains, and they average 12.5. The Kroeber average for the ten widths minus trains is 17.5. This is much nearer the Richardson value of 12.5, and it fits well between Kroeber 1918, 20.3, and Richardson 1920, 16.7.

The other larger discrepancies for 1919 are in skirt length: Kroeber 84.2, Richardson 89.4; and in decolletage width: Kroeber 12.9, Richardson 10.2. These we cannot explain, unless it be that since 1919 falls in a period of high individual variability, as shown by the standard deviations, any two samples of ten and eighteen plates, respectively, might well differ as much. The period adjacent to 1844-46 is one of much less fashion variability, hence the two sets of measurements coincide more closely.

On the whole, it seems that the sets of measurements of the two observers are sufficiently alike to be treated as parts of one series.

Another problem concerns the difference between the signed French and the anonymous American designs, as shown in any one magazine, and also what difference might exist between the magazines themselves. Table 2 shows such variations.

In only one case does a range as great as 4.3 occur: No. 4, 1919, 17.5 and 13.2. This is about one and a half times the standard deviation for the period 1916-22: 3.6, 0.8, 2.1, 2.0, 2.5, 3.7, 4.6, mean 2.8. There is a suggestion that the French models of 1919 are closer to the ordinary ones of 1920: compare dimensions 2, 7. This may reflect the fact that the French models used in 1919 and 1920 are late spring modes, and are already pointing the way to fashions of the following winter.

Our conclusion is that any difference between the Kroeber and Richardson measurements, and between models of different magazines, or dresses of French and American design, seems to be less, on the whole, than the fashion changes from year to year. This also holds as regards the change in illustrations from drawings to photographs of living models in the second decade of the present century, on which Kroeber has previously given some sample data.[5]

TABLE 2

Comparability of Sources

Dimen.	1919 Vogue ord. models (Dec., 1918)	1919 Costume Royal ord. mod. (Apr., June)	1919 Costume Royal French models (Apr., June)	1920 Vogue ord. models (Feb., May)	1920 Costume Royal ord. mod. (Apr., June)	1920 Costume Royal French models* (Apr., June)
2	89.7	91.0	87.7	83.3	83.0	79.7
3	24.9	26.0	25.1	26.4	26.1	27.4
4	17.5	13.2	14.0	16.4	15.3	13.7
5	12.6	10.0	14.9	15.2	17.6	15.7
7	13.8	13.0	14.8	14.5	14.9	14.6
8	11.1	9.0	10.5	12.2	12.5	13.0

*Includes one French model from Vogue.

[3] Kroeber, 244.

[4] The smaller number given for the trained dress is the width of the skirt exclusive of the train. These measures are from the manuscript data.

[5] P. 244.

II. MEASUREMENT DATA

The data obtained from the several thousand measurements made by the two authors, respectively twenty years ago and more recently, will now be given in the form of means for each dimension or proportion in each year studied.

For instance, for 1806, eleven fashion plates or illustrations were found which showed length of skirt without impairment. These, in terms of the total length of figure as defined, ran to 95.0, 97.5, 98.5, 97.3, 98.0, 97.1, 97.4, 98.5, 99.5, 97.5, 98.4 per cent. (In other words, the first plate measured showed a "length of figure" [from mouth down] of 119 mm., a length to bottom of skirt of 113 mm.; the second is 95.0 per cent of the first. The second plate happened also to have the figure length 119 mm.; but the skirt length 116, giving 97.5 per cent. And so on.) The mean of these eleven percentages is 97.7, which is therefore the value assigned to dimension No. 2 for 1806. Two of the eleven plates did not show the full width of skirt; the nine that did, yielded 25.2, 46.3, 13.0, 57.0, 35.6, 50.4, 48.5, 35.1, 35.2 per cent, whose mean, 38.4, is the dimension No. 5 value for 1806. The individual raw and percentaged measurements, as here cited in illustration, are being preserved, and the latter have of course been used in calculation of the standard deviations or variability coefficients presented and discussed in section VII; but they are not printed on account of cost. Their means for each dimension each year replace them.

These means, on which all our other quantitative expressions rest, are given in tables 3 and 4. The first of these two tables covers the period from 1787 to 1936, in which almost

TABLE 3

Ratio of Dress Diameters to Height of Figure:

Year-by-Year Means, 1787-1936

Year	2 L.Sk.	3 L.Wai.	4 L.Dec.	5 W.Sk.	7 W.Wai.	8 W.Dec.
1787	98.7^{3}	27.4^{3}	7.2^{3}	56.3^{3}	11.2^{1}	7.9^{1}
1788	96.1^{4}	20.8^{4}	8.9^{2}	51.1^{2}	16.5^{1}	
1789	96.9^{7}	23.2^{6}	10.3^{7}	55.1^{5}	14.9^{4}	10.7^{3}
1790	98.6^{8}	25.8^{6}	7.9^{7}	51.0^{7}	9.9^{5}	7.6^{1}
1791	98.3^{4}	25.4^{4}	11.9^{4}	53.2^{3}	9.0^{4}	8.5^{3}
1792	98.5^{1}	25.4^{2}	9.8^{1}	58.4^{2}	9.3^{2}	
1793	98.1^{3}	23.7^{4}	5.3^{3}	52.1^{3}	10.6^{4}	
1794	100.0^{2}	18.8^{2}	9.9^{2}	43.3^{2}	14.4^{2}	9.7^{2}
1795	96.9^{8}	20.1^{7}	12.9^{7}	52.6^{6}	12.3^{5}	7.0^{2}
1796	98.2^{5}	20.6^{4}	10.2^{4}	43.8^{3}	18.0^{1}	
1797	99.4^{3}	20.7^{2}	13.3^{2}	49.3^{3}	14.9^{2}	8.0^{1}
1798	98.6^{8}	19.9^{9}	11.5^{8}	44.4^{10}	10.5^{9}	10.3^{8}
1799	97.7^{12}	19.4^{13}	11.6^{12}	42.7^{7}	11.2^{10}	9.5^{10}
1800	98.1^{11}	18.1^{11}	10.5^{11}	42.9^{11}	12.0^{8}	11.9^{6}
1801	96.4^{7}	17.9^{6}	15.5^{4}	42.2^{6}	16.0^{2}	11.9^{2}
1802	100.0^{2}	19.4^{2}	16.3^{1}	59.6^{1}	11.3^{2}	14.9^{1}
1803	97.7^{12}	19.0^{12}	12.6^{10}	38.5^{8}	12.8^{8}	13.0^{8}
1804	95.1^{10}	19.4^{10}	12.3^{8}	44.7^{9}	13.5^{5}	14.3^{4}
1805	97.3^{12}	18.3^{11}	14.4^{10}	35.0^{7}	14.8^{5}	14.3^{6}
1806	97.7^{11}	17.9^{11}	12.5^{9}	38.5^{9}	14.3^{6}	12.8^{5}
1807	96.5^{18}	18.3^{18}	11.0^{15}	37.8^{15}	15.2^{8}	14.7^{6}
1808	95.6^{10}	18.9^{7}	11.8^{9}	32.6^{7}	14.1^{3}	13.8^{5}
1809	95.8^{15}	17.4^{15}	11.7^{14}	24.8^{13}	15.1^{13}	13.7^{13}
1810	95.6^{7}	21.0^{6}	13.5^{7}	24.2^{7}	12.9^{5}	12.3^{4}
1811	94.4^{8}	21.7^{7}	13.3^{6}	27.2^{8}	13.5^{7}	15.0^{5}
1812	92.7^{4}	20.9^{4}	13.0^{3}	29.4^{4}	13.4^{2}	17.0^{2}
1813	88.0^{3}	19.2^{3}	11.1^{3}	28.9^{3}	14.4^{3}	19.8^{3}
1814	94.2^{4}	19.8^{4}	13.2^{3}	31.3^{4}	12.8^{4}	17.2^{3}
1815	92.9^{5}	17.3^{5}	11.9^{4}	45.8^{5}	13.6^{3}	15.2^{5}
1816	91.6^{3}	17.2^{3}	12.0^{3}	39.8^{3}	12.0^{2}	16.6^{2}
1817	94.7^{2}	20.1^{2}	16.5^{2}	42.9^{2}	13.5^{1}	9.6^{2}
1818	93.9^{3}	20.6^{3}	11.3^{2}	38.6^{3}	11.3^{2}	16.4^{2}
1819	90.1^{1}	15.5^{1}	13.2^{1}	41.1^{1}	10.1^{1}	16.3^{1}

TABLE 3 (Continued)

Year	2 L.Sk.	3 L.Wai.	4 L.Dec.	5 W.Sk.	7 W.Wai.	8 W.Dec.
1820	92.2[3]	21.4[3]	13.2[2]	37.0[3]	10.0[3]	17.2[2]
1821	96.4[3]	21.7[3]	10.1[2]	42.7[3]	11.2[2]	17.8[3]
1822						
1823	96.9[3]	24.4[3]	12.1[2]	46.3[3]	10.3[8]	18.3[2]
1824	92.5[2]	21.5[2]	13.8[2]	38.1[2]	12.4[2]	18.1[2]
1825	95.5[1]	25.4[1]	10.9[1]	48.6[1]	10.1[1]	22.5[1]
1826	95.0[2]	25.2[2]	10.8[2]	48.5[2]	10.4[2]	17.0[2]
1827	92.8[6]	28.4[5]	12.2[5]	53.2[6]	11.2[6]	23.2[3]
1828	90.4[10]	26.7[10]	12.2[8]	49.6[10]	10.0[6]	21.3[9]
1829	93.9[3]	26.7[3]	12.2[1]	55.6[3]	11.3[3]	21.4[2]
1830	93.7[9]	27.9[9]	12.2[4]	48.7[8]	12.1[8]	24.7[2]
1831	94.8[4]	23.7[4]	12.1[3]	44.2[4]	13.5[3]	21.2[1]
1832	90.8	26.4	12.9	54.4	11.0	23.8
1833						
1834	89.4[4]	27.0[4]	14.0[3]	64.3[3]	9.8[4]	23.9[3]
1835	92.9[9]	28.0[9]	12.7[7]	67.0[9]	9.4[9]	17.0[7]
1836	95.9[14]	26.9[13]	12.9[14]	70.0[12]	9.4[9]	17.9[10]
1837	95.7[11]	27.3[10]	13.4[9]	62.3[8]	9.1[8]	19.1[6]
1838	97.0[10]	28.9[10]	14.0[8]	70.9[8]	9.1[5]	19.9[6]
1839	97.1[14]	28.7[13]	14.8[13]	63.6[13]	9.5[10]	20.7[10]
1840	97.0[22]	28.4[21]	14.3[20]	63.9[15]	9.0[20]	20.6[18]
1841	96.9[26]	29.1[23]	14.8[27]	64.6[17]	8.8[17]	19.3[19]
1842	96.9[17]	29.2[13]	14.5[16]	60.0[14]	9.1[9]	18.0[8]
1843	97.3[24]	29.0[21]	14.4[22]	60.1[16]	9.1[16]	20.7[19]
1844	98.2[10]	28.8[10]	14.4[10]	58.2[7]	9.0[10]	19.2[10]
1845	97.5[10]	27.9[10]	14.1[9]	59.4[6]	8.4[4]	19.8[8]
1846	98.3[9]	28.4[9]	13.1[8]	57.3[4]	8.3[7]	18.7[6]
1847	98.4[10]	28.9[9]	14.8[9]	64.8[4]	8.8[6]	19.6[8]
1848	98.0[10]	27.8[10]	13.4[10]	59.6[5]	8.5[8]	20.0[10]
1849	97.9[10]	28.7[10]	13.3[9]	62.7[6]	8.4[8]	20.0[9]
1850	97.8[10]	28.6[10]	12.7[10]	64.2[6]	8.3[8]	20.7[10]
1851	98.7[10]	29.4[10]	13.9[10]	61.3[7]	8.4[9]	21.2[8]
1852	97.6[10]	27.0[10]	14.1[9]	70.3[6]	8.3[10]	21.4[9]
1853	98.1[10]	27.7[10]	12.8[10]	70.2[6]	7.8[8]	21.2[9]
1854	97.9[10]	27.0[10]	14.1[10]	79.3[7]	8.4[9]	20.6[8]
1855	98.2[10]	27.9[10]	13.3[10]	83.0[4]	9.0[8]	21.0[10]
1856	98.3[9]	27.7[9]	13.4[7]	89.2[4]	8.6[5]	19.1[9]
1857	98.4[10]	26.7[10]	13.9[10]	86.2[5]	8.0[5]	19.6[10]
1858	99.6[10]	26.8[10]	15.2[10]	100.3[6]	7.9[7]	18.8[10]
1859	100.0[10]	25.3[9]	14.4[10]	115.6[9]	7.8[3]	18.3[8]
1860	99.8[10]	24.8[10]	12.3[10]	107.1[7]	7.6[5]	18.1[9]
1861	100.0[10]	24.9[10]	12.3[10]	104.3[9]	8.0[4]	17.8[10]
1862	99.6[10]	24.1[10]	13.2[10]	96.1[9]	7.6[8]	17.9[9]
1863	98.7[10]	24.9[7]	13.1[9]	101.6[9]	9.0[8]	17.1[9]
1864	99.5[10]	23.9[7]	13.5[9]	100.1[1]	8.5[5]	18.1[9]
1865	99.8[10]	22.8[9]	12.7[9]	108.6[1]	8.6[7]	17.5[8]
1866	99.8[9]	22.4[9]	12.8[10]	99.8[2]	8.2[9]	18.0[9]
1867	97.9[10]	21.2[10]	11.7[9]	98.7[9]	8.1[9]	16.7[9]
1868	98.8[10]	22.0[9]	12.7[7]	88.4[10]	9.0[8]	16.1[8]
1869	100.0[10]	21.8[10]	13.6[9]	85.5[8]	9.0[4]	16.0[7]
1870	99.1[9]	22.2[9]	12.0[8]	88.0[6]	9.2[4]	18.5[6]
1871	99.3[10]	22.0[9]	13.0[6]	74.9[8]	9.0[3]	16.4[5]
1872	99.?[10]	22.9[10]	15.0[6]	77.6[8]	11.0[3]	16.7[2]
1873	99.2[10]	24.5[10]	13.8[5]	84.8[10]	10.1[6]	18.3[3]
1874	99.2[9]	22.2[10]	14.1[7]	84.5[6]	9.5[3]	15.0[4]
1875	100.0[10]	22.3[9]	14.1[7]	79.0[7]	10.4[5]	17.0[5]
1876	99.2[10]	23.6[10]	13.4[7]	84.8[8]	9.5[4]	13.5[2]
1877	98.7[10]	23.8[10]	13.5[6]	76.4[10]	8.7[6]	13.7[6]
1878	99.0[10]	24.8[10]	14.5[6]	70.9[8]	8.9[6]	14.6[8]
1879	98.7[10]	26.1[10]	13.3[6]	62.0[5]	8.8[8]	15.0[8]

TABLE 3 (Concluded)

Year	2 L.Sk.	3 L.Wai.	4 L.Dec.	5 W.Sk.	7 W.Wai.	8 W.Dec.
1880	98.8[10]	27.6[10]	15.4[6]	68.8[6]	8.8[8]	14.1[8]
1881	97.7[10]	27.6[10]	14.2[7]	52.3[7]	8.5[9]	14.7[6]
1882	96.6[10]	26.0[10]	12.8[8]	56.0[8]	7.8[7]	15.3[7]
1883	96.9[10]	26.0[10]	12.8[9]	54.7[7]	8.6[8]	17.3[7]
1884	96.4[10]	26.2[10]	13.1[9]	52.2[9]	8.2[6]	14.4[5]
1885	97.0[10]	27.4[10]	14.0[7]	56.0[6]	8.7[8]	15.2[5]
1886	95.8[9]	27.3[10]	14.9[9]	56.6[9]	8.9[10]	14.8[8]
1887	95.6[10]	27.2[10]	12.9[8]	50.9[9]	8.3[8]	14.2[8]
1888	95.7[10]	27.6[10]	14.1[9]	57.8[8]	8.3[10]	13.1[9]
1889	96.7[10]	27.7[10]	13.7[10]	51.5[9]	9.6[8]	13.2[9]
1890	97.3[10]	28.2[10]	14.1[8]	50.2[10]	8.5[10]	13.5[8]
1891	97.3[10]	28.3[10]	14.4[9]	53.7[9]	9.2[10]	12.6[5]
1892	97.4[10]	28.8[10]	13.4[7]	51.1[10]	9.2[10]	14.3[9]
1893	98.8[10]	27.0[10]	13.6[8]	55.0[10]	9.3[9]	13.3[8]
1894	98.2[10]	28.8[10]	14.0[9]	55.5[10]	9.2[10]	14.0[9]
1895	98.7[10]	27.4[10]	14.0[9]	60.7[9]	8.6[7]	15.0[7]
1896	99.2[10]	27.9[10]	14.3[10]	68.3[8]	9.6[7]	15.2[9]
1897	99.9[10]	28.9[10]	14.4[10]	60.0[10]	8.6[9]	15.8[10]
1898	99.8[10]	29.5[10]	14.7[10]	53.0[10]	8.1[8]	11.9[9]
1899	100.0[10]	29.7[10]	14.6[9]	65.3[10]	9.3[9]	12.5[10]
1900	99.3[10]	30.5[10]	15.1[10]	52.5[10]	8.7[10]	13.4[9]
1901	99.7[10]	30.5[10]	12.5[10]	64.8[10]	9.4[10]	13.3[10]
1902	100.0[10]	30.1[10]	13.1[9]	58.9[10]	9.9[8]	11.1[6]
1903	100.0[10]	32.6[9]	15.2[9]	50.4[10]	9.6[8]	13.0[7]
1904	100.0[10]	32.3[10]	14.0[9]	56.5[10]	9.9[8]	14.8[7]
1905	100.0[10]	30.3[10]	14.6[10]	53.7[10]	9.2[9]	15.3[8]
1906	99.6[10]	28.8[10]	16.2[5]	56.0[10]	9.5[8]	11.2[5]
1907	99.6[10]	28.0[10]	13.3[9]	51.2[10]	9.7[6]	12.3[7]
1908	99.3[10]	25.4[9]	11.7[9]	49.0[10]	10.9[8]	12.9[8]
1909	99.7[10]	24.3[10]	14.6[7]	38.4[10]	12.8[9]	12.1[10]
1910	99.2[10]	25.2[10]	13.3[8]	32.9[9]	11.7[9]	13.0[9]
1911	98.7[10]	26.1[10]	14.2[6]	23.2[10]	12.0[9]	12.2[6]
1912	98.3[10]	24.3[10]	13.4[9]	27.4[10]	13.2[9]	11.5[7]
1913	92.6[9]	25.5[10]	15.4[7]	33.7[7]	13.6[9]	13.3[10]
1914	91.8[9]	25.3[10]	14.4[7]	29.1[7]	13.9[10]	15.2[4]
1915	91.1[10]	24.4[9]	16.2[6]	46.1[10]	13.7[9]	11.2[5]
1916	84.3[10]	25.0[9]	16.4[9]	49.1[10]	12.6[9]	12.3[6]
1917	88.1[10]	24.3[8]	14.8[9]	55.7[4]	13.0[9]	11.4[7]
1918	85.3[10]	24.2[10]	13.7[9]	20.3[8]	13.4[10]	10.6[8]
1919	84.2[10]	24.1[10]	14.2[9]	33.2[10]	13.2[9]	12.9[8]
1920	82.2[17]	26.5[17]	15.0[17]	16.8[17]	14.7[17]	12.9[17]
1921	83.1[21]	27.9[21]	13.4[21]	26.0[21]	15.2[21]	14.7[21]
1922	86.0[14]	33.3[14]	14.3[14]	26.4[14]	16.5[14]	13.1[14]
1923	90.7[10]	30.9[10]	13.3[10]	22.4[10]	15.4[10]	14.8[10]
1924	85.6[13]	38.0[13]	13.0[13]	21.3[13]	15.9[13]	13.3[13]
1925	77.0[10]	35.5[10]	12.6[10]	22.0[10]	15.6[10]	12.6[10]
1926	72.2[11]	31.9[11]	15.8[11]	16.5[11]	14.2[11]	12.3[11]
1927	69.7[11]	37.9[11]	13.0[11]	18.0[11]	13.8[11]	11.2[11]
1928	70.0[10]	36.2[10]	15.0[10]	21.2[10]	14.7[10]	12.1[10]
1929	71.2[20]	32.5[20]	13.0[20]	26.0[20]	13.4[20]	11.1[10]
1930	89.0[20]	28.1[20]	14.6[20]	25.9[20]	16.5[20]	11.7[20]
1931	95.1[13]	26.8[12]	14.9[12]	26.0[12]	13.0[12]	12.8[12]
1932	97.3[10]	24.4[10]	11.4[10]	25.8[10]	11.0[10]	10.3[10]
1933	98.3[10]	25.0[10]	11.2[10]	25.9[10]	13.1[10]	13.2[10]
1934	99.3[10]	25.0[10]	9.3[10]	26.2[10]	13.7[10]	11.8[10]
1935	98.2[17]	25.2[16]	11.1[19]	38.7[16]	9.9[12]	11.4[12]
1936	98.8[25]	25.3[23]	11.8[22]	33.8[21]	10.7[17]	9.8[16]

every consecutive year is represented and for most years the data are reasonably sufficient. (See figs. 1-2, pp. 114-115.) The second table the preceding one hundred and eighty-two years from 1605 to 1786, where the data are both discontinuous and fewer. In both these tables, the small superior figures at the right indicate the number of cases measured.

Next follow combinations of these year-by-year means into the averages for longer blocks of years. Table 5 covers the whole three hundred and thirty-two years in ten-year periods. (See figs. 3, 4, 5.) This seemed a better interval than five-year averagings on account of the irregularity of the data before 1787. It should be noted that these values, and all other averages of the year-by-year means, are unweighted for number of cases. For instance, for the decade 1641-50, only four dated illustrations were found: three for 1641 and one for 1647. In dimension 5, skirt width, the three for 1641 averaged 72.2, the one for 1647 was 78.0. The mean of these two values is 75.1, which is the one that will be found in table 5 for this decade; whereas the weighted average would be 73.7.

Table 6 gives the five-year means for the fuller period 1787-1926. Table 7 combines these by pairs into ten-year means. It is, however, not a mere replica of the last part of table 5, because the absolute dates are different: where table 5 treats the years 1881-90 as a unit, table 7 lumps 1877-86.

Next comes the "trend" or moving average, in table 8. Here the value for any given dimension for 1840 is the average of the values for 1838, 1839, 1840, 1841, 1842 as found in table 3; for 1841, of 1839, 1840, 1841, 1842, 1843. In this way, the "exceptionalness" of any single year is minimized by its being merged with the years on either side, and a smoother curve results. For instance, from 1846 to 1855 skirt length was to all intents and purposes at a stand-still. The individual year 1852 comes out, in the measurements that happened to be made, somewhat lower than any other in that decade: 97.6 as against nine others ranging from 97.8 to 98.7. It is doubtful whether a fluctuation so small as this is either significant or reliable. The moving average, which stays at 98.0, 98.1, 98.2 for the decade, probably gives a truer picture of the events. On account of its much greater steadiness, its variations are also much more readily grasped, when they do become appreciable. Take

TABLE 4

Year-by-Year Means, 1605-1786

Year	2	3	4	5	7	8
1605	100.0	23.5	7.0	76.4		
1610	97.1[2]	19.4[2]	3.6[2]	68.1	11.6[2]	5.8[2]
1613	95.9	22.5	8.5	78.9	14.1	8.5
1617	100.0	21.7	2.8		13.0	5.7
1622-27..	100.0[2]	25.2[2]	3.7[2]		13.6	7.9
1625		26.5	16.3		16.3	
1628	96.4	28.6	2.4	53.5	14.3	4.8
1629	97.4[4]	25.9[2]	7.6[4]	41.7[3]	11.3	6.7[3]
1630	100.0	25.9	2.8		11.1	5.5
1631	100.0[2]	23.7[2]	4.8[2]	54.5[2]		6.3[2]
1633	99.2[3]	24.3[3]	13.2[3]	49.6[2]	14.8	16.3[3]
1634	97.8[3]	22.6[3]	6.7[3]	50.4[3]		7.6[3]
1635	100.0[4]	24.1[4]	9.7[4]	52.6		13.0[4]
1636	100.0[2]	21.2[2]	13.1	35.6		16.2
1638	100.0	24.1	11.1	63.0		14.8
1639	100.0[3]	23.5[3]	14.1[3]	52.2[3]		15.5[3]
1640	99.0[3]	23.9[4]	14.2	46.4[4]		14.2[2]
1641	100.0[3]	26.1[2]	10.1[3]	72.2[3]	15.8	13.7[3]
1647	100.0	27.1	3.1	78.0		9.3
1656-57..	100.0	36.6	10.0	87.5	17.5	
1658	100.0	27.4	6.8	82.2	11.7	10.9
1659	100.0	29.2	9.0	126.2	16.2	22.2
1660	100.0[2]	29.7[2]	12.2[2]	88.9[2]		18.8[2]
1666	100.0	32.2	11.3	58.0		
1667	98.4		6.9	45.0		
1668	100.0	30.2	15.1	75.5		22.6

TABLE 4 (Continued)

Year	2	3	4	5	7	8
1678	97.5	33.3	15.4	33.4	10.2	
1679	97.6[2]	23.3	11.6	40.0[2]		
1680	96.2	31.5	14.8	40.8	9.3	16.7
1683	97.3[2]	29.1[2]	12.3	30.1[2]	12.4[2]	
1685	100.0		13.1	63.7	11.9	
1686	99.2	29.1		48.7		
1710-16..	99.4[9]	24.9[7]	13.7[5]	52.6[6]	13.6[4]	13.6[3]
1711	96.5	29.0	15.3	73.8	11.9	14.5
1714	97.5[2]	25.3[2]	10.0	25.5	10.0	10.0
1715	100.0[2]	26.7[2]		46.4[2]	17.4	13.0
1716-18..	98.7[2]	25.7[2]	12.1	58.3[2]	10.7	
1717	96.4	21.4	14.3	50.0		
1719	100.0			46.5		
1720	100.0[2]	29.4	15.0[2]	97.0	14.7	14.7
1721	89.6			62.3		
1726	100.0	26.6	18.3			15.0
1728	100.0		10.5	57.9		
1731	92.8[2]		12.9	61.3[2]		
1734	98.0[3]	26.1[3]	15.3[2]	76.4	12.5[2]	13.2
1735	96.2[2]	28.8[3]	13.5[2]	66.6	12.8	13.8
1738	96.4[5]	27.9[5]	16.4[5]	54.2[4]	16.7	10.9[3]
1739	97.0	28.2	13.4		13.4	23.9
1740	99.0	28.6	14.3	64.3	13.4	11.6
1742	93.8[2]	25.6[2]	7.7	134.5	10.8	
1743		27.5	13.3		14.2	10.0
1744	100.0	24.3	14.2	70.0	11.4	
1744-45..	96.4		12.5	91.0		7.1
1749	95.6	28.6	14.2	102.9	12.9	20.0
1750	97.2[2]	25.2	15.4[2]	101.0		18.7
1751	96.5	30.1	15.1	100.7	12.3	21.2
1752	98.5[2]	26.2[2]	14.4[2]	44.9	14.3	12.3
1753	93.5[2]	26.9[2]	10.9	31.8[2]	10.0	
1755	95.2[2]	30.3[3]	16.7	59.0[3]	13.0	8.8
1757	91.4	27.5	14.7	58.4		14.3
1758	97.2	31.2	12.2	39.7		
1759	98.0	30.2	17.4	80.3	14.5	13.0
1761	89.5	25.0	16.8	65.1	14.5	12.2
1762-64..	92.3	25.0	15.6[2]	72.3	12.7[2]	11.5
1765	94.5[3]	27.3[3]	13.1[3]	65.9	12.3[2]	10.9[3]
1766	97.6		14.9	35.6		
1767	95.5		11.5	48.4		
1769	95.5	31.4[2]	15.2[2]	59.0		9.6
1770	98.4	22.1	11.6	34.8		8.8
1771	98.5	30.8	19.2	40.0		
1772	95.0	28.9	16.5	101.0	16.5	
1773	91.8[7]	24.8[6]	11.8[6]	46.4[7]	13.6	9.8[2]
1775	96.5[5]	26.3[2]	13.8[5]	57.6[4]	12.9	6.8
1776	95.9[3]	27.9[3]	16.0[3]	72.5[2]	10.3[2]	12.4[2]
1777	95.4[5]	26.8[4]	12.8[5]	77.0[3]	10.7[3]	9.9[4]
1778	92.4[2]	33.5[2]	18.4[2]	55.3[2]	10.9	8.7
1779	92.3[2]	30.8[2]	16.5[2]	41.6[2]		
1780	90.3[3]	26.6[3]	15.5[3]	57.9[3]	8.6	8.3[2]
1781	92.2[2]	23.9	16.4	57.5		10.5
1784	93.3[4]	24.4[4]	11.0[3]	50.0[2]	9.2	11.0[2]
1786	97.4	23.7	8.8	36.8		

for example the moving average of waist length for 1923-32, which runs, slightly rounded from table 8: 33, 34, 35, 36, 35, 34, 33, 30, 28, 26,

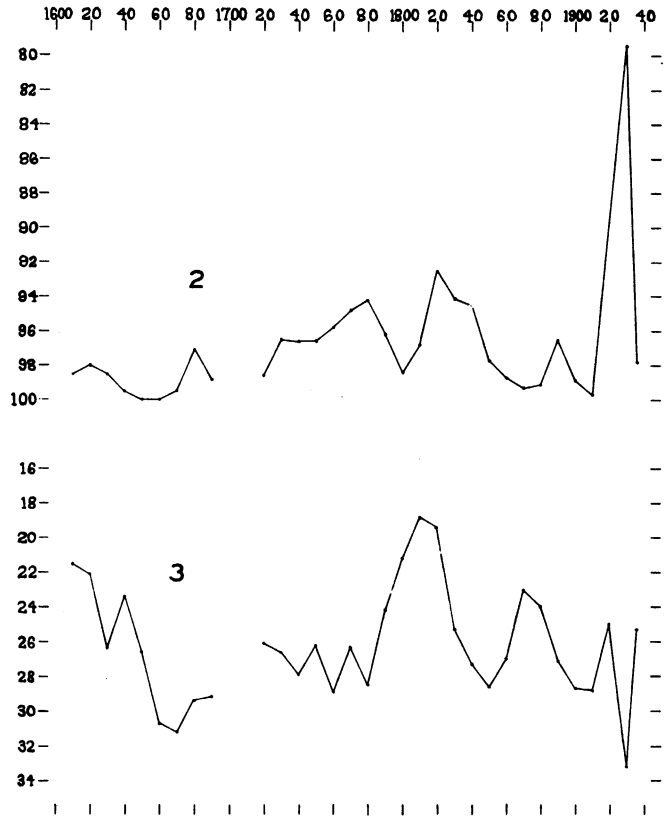

Fig. 3. Skirt length and waist length, dimensions 2 and 3, by ten-year means, 1605-1936.

as against the year-by-year values of 30, 38, 36, 32, 38, 36, 33, 28, 27, 24 of table 3. The smoothed or idealized moving-average series

brings out 1926 as the peak of the curve. In the actual figures this is, however, low year for the series of six from 1924 to 1929, and the

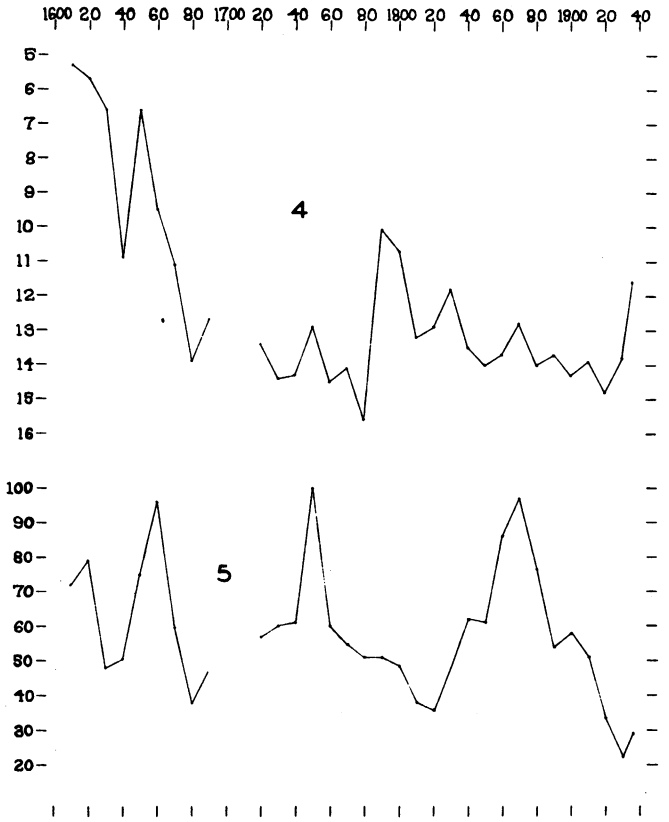

Fig. 4. Decolletage depth and skirt width, dimensions 4 and 5, by ten-year means, 1605-1936.

peak is left double and indeterminate between 1924 and 1927. We assume that there are statistical techniques expressing the probability or

TABLE 5

Ten-Year Averages, 1605-1936*

Period	2	3	4	5	7	8
1605-10	98.6^{3}	21.5^{3}	5.3^{3}	72.3^{2}	11.6^{2}	5.8^{2}
1611-20	98.0^{2}	22.1^{2}	5.7^{2}	78.9^{1}	13.6^{2}	7.1^{2}
1621-30	98.5^{8}	26.4^{7}	6.6^{9}	47.6^{4}	13.3^{5}	6.2^{6}
1631-40	99.5^{21}	23.4^{22}	10.9^{18}	50.5^{17}	14.8^{1}	13.0^{19}
1641-50	100.0^{4}	26.6^{3}	6.6^{4}	75.1^{4}	15.8^{1}	11.5^{4}
1651-60	100.0^{5}	30.7^{5}	9.5^{5}	96.2^{5}	14.0^{2}	17.4^{5}
1661-70	99.5^{3}	31.2^{2}	11.1^{3}	59.5^{3}		22.6^{1}
1671-80	97.1^{4}	29.4^{3}	13.9^{3}	38.1^{4}	9.8^{2}	16.7^{1}
1681-90	98.8^{4}	29.2^{3}	12.7^{2}	47.5^{4}	12.2^{3}	
1691-1700 ..						
1701-10						
1711-20	98.6^{20}	26.1^{16}	13.4^{11}	56.3^{15}	13.1^{9}	13.2^{7}
1721-30	96.5^{3}	26.6^{1}	14.4^{2}	60.1^{2}		15.0^{1}

*To 1780, all the percentaged means within a decade have been averaged, irrespective of the year means in table 4. From 1781, the values are averaged from the year means for each decade as given in tables 4 and 3.

TABLE 5 (Continued)

Period	2	3	4	5	7	8
1731-40	96.6^{14}	27.9^{13}	14.3^{12}	60.7^{9}	13.8^{6}	14.7^{7}
1741-50	96.6^{7}	26.2^{6}	12.9^{7}	99.9^{5}	12.3^{4}	14.0^{4}
1751-60	95.8^{10}	28.9^{11}	14.5^{8}	60.2^{10}	12.8^{5}	13.9^{5}
1761-70	94.8^{9}	26.3^{8}	14.1^{11}	54.4^{7}	13.2^{5}	10.6^{7}
1771-80	94.2^{29}	28.5^{24}	15.6^{28}	50.9^{26}	11.9^{10}	9.3^{12}
1781-90	96.2^{29}	24.2^{25}	10.1^{24}	51.1^{21}	12.3^{12}	9.5^{8}
1791-1800 ..	98.4^{57}	21.2^{58}	10.7^{54}	48.3^{49}	12.2^{47}	9.3^{32}
1801-10	96.8^{104}	18.8^{98}	13.2^{87}	37.8^{82}	14.0^{57}	13.6^{54}
1811-20	92.5^{36}	19.4^{35}	12.9^{29}	36.2^{36}	12.5^{28}	16.0^{27}
1821-30	94.1^{39}	25.3^{38}	11.8^{27}	47.9^{38}	11.0^{31}	20.5^{26}
1831-40	94.5^{91}	27.3^{86}	13.5^{80}	62.3^{75}	10.0^{70}	20.5^{63}
1841-50	97.7^{136}	28.6^{125}	14.0^{130}	61.1^{87}	8.7^{92}	19.6^{107}
1851-60	98.7^{99}	27.0^{98}	13.7^{96}	86.3^{61}	8.2^{70}	19.9^{90}
1861-70	99.3^{98}	23.0^{90}	12.8^{85}	97.1^{86}	8.5^{82}	17.4^{82}
1871-80	99.1^{99}	24.0^{98}	14.0^{82}	76.4^{75}	9.5^{52}	15.4^{52}
1881-90	96.6^{96}	27.1^{100}	13.7^{84}	53.8^{83}	8.5^{83}	14.6^{78}
1891-1900 ..	98.9^{100}	28.7^{100}	14.3^{91}	57.5^{96}	9.0^{89}	13.8^{85}
1901-10	99.7^{100}	28.8^{98}	13.9^{85}	51.2^{99}	10.3^{84}	12.9^{74}
1911-20	89.7^{103}	25.0^{103}	14.8^{88}	33.5^{104}	13.3^{100}	12.4^{77}
1921-30	79.5^{140}	33.2^{104}	13.8^{140}	22.6^{140}	15.1^{140}	12.7^{140}
1931-36	97.8^{85}	25.3^{81}	11.6^{83}	29.4^{79}	11.9^{71}	11.6^{70}

TABLE 6

Five-Year Averages, 1788-1936

Period	2	3	4	5	7	8
1788-91	97.7	*24.5	†9.2	53.3	12.3	8.7
1792-96	*98.3	21.7	9.6	50.0	12.9	8.4
1797-1801 ..	98.0	19.2	12.5	44.3	12.9	10.3
1802-06	97.6	†18.8	*13.6	43.3	13.3	13.9
1807-11	95.6	19.5	12.3	†29.3	*14.1	13.9
1812-16	†91.9	18.9	12.2	35.0	13.2	17.2
1817-21	93.5	19.9	12.9	40.5	11.2	15.5
1822-26	95.0	24.1	†11.9	45.4	10.8	19.0
1827-31	93.1	26.7	12.2	50.3	11.6	*22.4
1832-36	92.3	27.1	13.1	63.9	9.9	20.7
1837-41	96.7	28.5	14.3	65.1	9.1	19.9
1842-46	97.6	*28.7	14.1	59.0	8.8	19.3
1847-51	98.2	*28.7	13.6	62.5	8.5	20.3
1852-56	98.0	27.5	13.5	78.4	8.4	20.7
1857-61	*99.6	25.7	13.6	*102.7	†7.9	18.5
1862-66	99.5	23.6	13.4	101.2	8.4	17.7
1867-71	99.0	†21.8	12.6	87.1	8.9	16.7
1872-76	99.4	23.1	14.1	82.1	10.1	16.1
1877-81	98.6	26.0	14.2	66.1	8.7	14.4
1882-86	†96.5	26.6	13.5	55.1	8.4	15.4
1887-91	†96.5	27.8	13.8	52.8	8.8	13.3
1892-96	98.5	28.0	13.9	58.1	9.2	14.4
1897-1901 ..	99.7	29.9	14.3	59.1	8.8	13.4
1902-06	*99.9	*30.8	*14.6	55.1	9.6	13.1
1907-11	99.3	25.8	13.4	38.9	11.4	12.5
1912-16	91.6	†24.9	15.2	37.1	13.4	12.7
1917-21	84.6	25.4	14.2	30.4	13.9	12.5
1922-26	82.3	*33.9	13.8	†21.7	*15.5	13.2
1927-31	†79.0	32.3	14.1	23.4	14.3	11.8
1932-36	98.4	25.0	†11.0	30.1	11.8	†11.3

*High points. †Low points.

improbability of 1926 really being a year of temporary recession near the climax of the curve, or on the contrary of its low value being merely a by-product of the unrepresentativeness of the small number of pictures measured. But these techniques are cumbersome, and the issues involved are small. Whether the waist line over a period of one hundred and fifty years reached its lowest position (highest percentage) precisely in 1926 or perhaps rather in either 1924 or 1927, can be of no great moment. The essential truth seems sufficiently expressed, and certainly much more vividly, by the moving average.

For this reason we have graphed the moving averages in figures 1 and 2 (pp. 114-115). These should be considered our basic diagrams. We have shown in these diagrams also the actual values for each year, from table 3; but these values have been indicated by disparate points or dots, whereas the moving-average values are connected by a continuous line.

Earlier than 1787, the data are too scattered for a satisfactory moving average, and it has not been attempted. Its place is partially taken by the means of means in ten-year blocks in the first part of table 5.

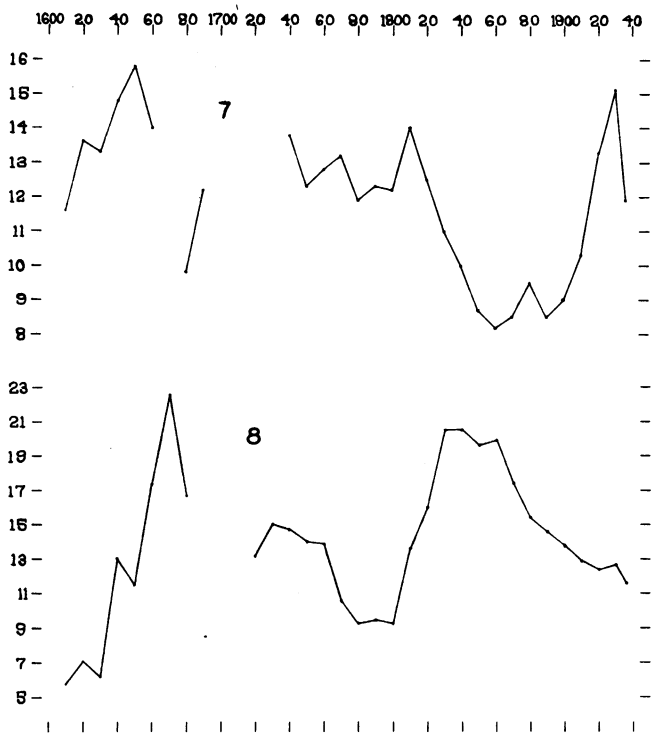

Fig. 5. Waist width and decolletage width, dimensions 7 and 8, by ten-year means, 1605-1936.

TABLE 7

Ten-Year Averages, 1788-1936, By Decades Ending in 6

Period	2	3	4	5	7	8
1788-96	98.3	23.1	9.4	51.7	12.6	8.5
1797-1806 ..	97.8	19.0	13.1	43.8	13.1	12.1
1807-16	93.7	19.2	12.3	32.2	13.7	15.5
1817-26	94.1	21.8	12.4	42.6	11.0	17.0
1827-36	92.7	26.9	12.6	56.3	10.9	21.6
1837-46	97.2	28.6	14.2	62.0	8.9	19.6
1847-56	98.1	28.1	13.6	70.5	8.5	20.5
1857-66	99.5	24.7	13.3	102.0	8.1	18.1
1867-76	99.2	22.5	13.4	84.6	9.5	16.4
1877-86	97.6	26.3	13.9	60.6	8.6	14.9
1887-96	97.5	27.9	13.9	55.5	9.0	13.8
1897-1906 ..	99.8	30.3	14.4	57.1	9.2	13.2
1907-16	95.5	25.4	14.3	38.0	12.4	12.6
1917-26	83.4	29.7	14.0	26.1	14.7	12.9
1927-36	88.7	28.6	12.5	26.8	13.0	11.5

TABLE 8

Five-Year Moving Average of Dress Diameters, 1788-1934

Year	2 L.Sk.	3 L.Wai.	4 L.Dec.	5 W.Sk.	7 W.Wai.	8 W.Dec.
1788	97.5	24.2	†8.6	50.1	12.5	
1789	97.7	24.5	9.2	53.3	12.3	8.7
1790	97.7	24.1	9.8	53.8	11.9	8.9
1791	98.1	*24.7	9.0	*54.0	10.7	8.9
1792	*98.7	23.8	9.0	51.6	10.6	8.6
1793	98.4	22.7	10.0	51.9	11.1	8.4
1794	98.3	21.7	9.6	50.0	12.9	8.4
1795	98.5	20.8	10.3	48.2	14.0	†8.2
1796	98.6	20.0	11.6	46.7	14.0	8.8
1797	98.2	20.1	11.9	46.6	13.4	8.7
1798	98.4	19.7	11.4	44.6	13.3	9.9
1799	98.0	19.2	12.5	44.3	12.9	10.3
1800	98.2	18.9	13.1	46.4	12.2	11.7
1801	98.0	18.8	13.3	45.2	12.7	12.2
1802	97.5	18.8	13.4	45.6	13.1	13.2
1803	97.3	18.8	*14.2	44.9	13.7	13.7
1804	97.6	18.8	13.6	43.3	13.3	13.8
1805	96.9	18.6	12.6	38.9	14.1	11.8
1806	96.4	18.6	12.4	37.7	14.4	14.0
1807	96.6	18.2	12.3	33.7	*14.7	13.9
1808	96.2	18.7	12.1	31.6	14.3	13.5
1809	95.6	19.5	12.3	29.3	14.1	13.9
1810	95.8	20.0	12.7	27.6	13.8	14.4
1811	93.3	20.0	12.5	†26.9	13.8	15.6
1812	93.0	20.5	12.8	28.2	13.4	16.3
1813	92.4	19.8	12.5	32.5	13.5	16.8
1814	†91.9	18.9	12.2	35.0	13.2	17.2
1815	92.3	18.7	12.9	37.7	13.3	15.7
1816	93.5	19.0	13.0	39.7	12.6	15.0
1817	92.6	†18.1	13.0	41.6	12.1	14.8
1818	92.5	19.0	13.2	39.9	11.4	15.2
1819	93.5	19.9	12.9	40.5	11.2	15.5
1820	93.2	19.8	12.0	39.9	10.7	16.9
1821	93.9	20.8	12.2	41.8	10.4	17.4
1822	94.5	22.3	12.3	41.0	11.0	17.9
1823	95.3	23.3	†11.7	43.9	11.0	19.2
1824	95.0	24.1	11.9	45.4	10.8	19.0
1825	94.5	25.0	12.0	46.9	10.9	19.8
1826	93.2	25.4	12.0	47.6	10.8	20.4
1827	93.5	26.5	†11.7	51.1	10.6	21.1
1828	93.2	27.0	11.9	51.1	11.0	21.5
1829	93.1	26.7	12.2	50.3	11.6	22.4
1830	92.7	26.3	12.3	50.5	11.6	22.5
1831	93.3	26.2	12.4	50.7	12.0	22.8
1832	92.2	26.3	12.8	54.9	11.6	*23.4
1833	92.0	26.2	12.9	57.5	10.9	21.5
1834	92.3	27.1	13.1	63.9	9.9	20.7
1835	93.5	27.3	13.3	65.9	9.4	19.5
1836	94.2	27.6	13.4	66.9	9.4	19.6
1837	95.7	28.0	13.6	66.8	9.3	18.9
1838	96.5	28.0	13.9	66.1	9.2	19.6
1839	96.7	28.5	14.3	65.1	9.1	19.9
1840	97.0	*28.9	14.5	64.6	9.1	19.7
1841	97.0	*28.9	*14.6	62.4	9.1	19.9
1842	97.3	*28.9	14.5	61.4	9.0	19.6
1843	97.4	28.8	14.4	60.5	8.9	19.4
1844	97.6	28.7	14.1	59.0	8.8	19.3
1845	97.9	28.6	14.2	60.0	8.7	19.6

*High points. †Low points.

TABLE 8 (Continued)

Year	2 L.Sk.	3 L.Wai.	4 L.Dec.	5 W.Sk.	7 W.Wai.	8 W.Dec.
1846	98.1	28.4	14.0	59.9	8.6	19.5
1847	98.0	28.3	13.7	60.8	8.5	19.6
1848	98.1	28.5	13.5	61.7	8.5	19.8
1849	98.2	28.7	13.6	62.5	8.5	20.3
1850	98.0	28.3	13.5	63.6	8.4	20.7
1851	98.0	28.3	13.4	65.7	8.2	20.9
1852	98.0	27.9	13.5	69.1	8.3	21.0
1853	98.1	27.8	13.6	72.8	8.4	21.1
1854	98.0	27.5	13.5	78.4	8.4	20.7
1855	98.2	27.4	13.5	81.6	8.4	20.3
1856	98.5	27.2	14.0	87.6	8.4	19.8
1857	98.9	26.9	14.0	94.9	8.3	19.4
1858	99.2	26.3	13.8	99.7	8.0	18.8
1859	99.6	25.7	13.6	102.7	7.9	18.5
1860	*99.8	25.2	13.5	104.7	†7.8	18.2
1861	99.6	24.8	13.1	*104.9	8.0	17.8
1862	99.5	24.5	12.9	101.8	8.1	17.8
1863	99.5	24.1	13.0	102.1	8.3	17.7
1864	99.5	23.6	13.1	101.2	8.4	17.7
1865	99.1	23.0	12.8	101.8	8.5	17.5
1866	99.2	22.5	12.7	99.1	8.5	17.3
1867	99.4	22.4	12.7	96.2	8.6	16.9
1868	99.1	21.9	†12.6	92.1	8.7	17.1
1869	99.0	†21.8	†12.6	87.1	8.9	16.7
1870	99.3	22.2	13.3	82.9	9.4	16.7
1871	99.4	22.7	13.5	82.2	9.7	17.2
1872	99.2	22.8	13.6	82.0	9.8	17.0
1873	99.4	22.8	14.0	80.2	10.0	16.7
1874	99.4	23.1	14.1	82.1	10.1	16.1
1875	99.3	23.3	13.8	81.9	9.6	15.5
1876	99.2	23.3	13.9	79.1	9.4	14.8
1877	99.1	24.1	13.8	74.6	9.3	14.8
1878	98.9	25.2	14.0	72.6	8.9	14.2
1879	98.6	26.0	14.2	66.1	8.7	14.4
1880	98.2	26.4	14.0	62.0	8.6	14.7
1881	97.7	26.7	13.7	58.8	8.5	15.3
1882	97.3	26.7	13.7	56.8	8.4	15.2
1883	96.9	26.6	13.4	54.2	8.4	15.4
1884	96.5	26.6	13.5	55.1	8.4	15.4
1885	96.3	26.8	13.5	54.1	8.5	15.2
1886	†96.1	27.1	13.8	55.7	8.5	14.3
1887	96.2	27.4	13.9	55.6	8.8	14.1
1888	96.2	27.6	13.9	53.4	8.7	13.8
1889	96.5	27.8	13.8	52.8	8.8	13.3
1890	96.9	28.1	13.9	52.9	9.0	13.3
1891	97.5	28.0	13.8	52.3	9.2	13.4
1892	97.8	28.2	13.9	53.1	9.1	13.5
1893	98.1	28.1	13.9	55.2	9.1	13.8
1894	98.5	28.0	13.9	58.1	9.2	14.6
1895	99.0	28.0	14.1	59.9	9.1	14.7
1896	99.2	28.5	14.3	59.5	8.8	14.4
1897	99.5	28.7	14.4	61.5	8.8	14.1
1898	99.6	29.3	14.6	59.8	8.9	13.8
1899	99.7	29.8	14.3	59.1	8.8	13.4
1900	99.8	30.1	14.0	58.9	9.1	12.4
1901	99.8	30.7	14.1	58.4	9.4	12.7
1902	99.8	*31.2	14.0	56.6	9.5	13.1
1903	*99.9	*31.2	13.9	56.9	9.6	13.5
1904	*99.9	30.8	14.6	55.1	9.6	13.1

*High points. †Low points.

TABLE 8 (Concluded)

Year	2 L.Sk.	3 L.Wai.	4 L.Dec.	5 W.Sk.	7 W.Wai.	8 W.Dec.
1905	99.8	30.4	14.7	53.5	9.6	13.3
1906	99.7	29.0	14.0	53.3	9.8	13.3
1907	99.6	27.4	14.1	49.7	10.4	12.8
1908	99.5	26.3	13.8	45.5	10.9	12.3
1909	99.3	25.8	13.4	38.9	11.4	12.5
1910	99.0	25.1	13.4	34.2	12.1	12.3
1911	97.7	25.1	14.2	31.1	12.7	12.4
1912	96.1	25.3	14.1	29.3	12.9	13.0
1913	94.5	25.1	14.7	31.9	13.3	12.7
1914	91.6	24.9	15.2	37.1	13.4	12.7
1915	89.6	24.9	*15.4	43.1	13.4	12.7
1916	88.1	24.6	15.1	40.5	13.3	12.1
1917	86.6	†24.4	15.1	41.3	13.2	11.7
1918	84.8	24.8	14.8	35.4	13.4	12.0
1919	84.6	25.4	14.2	30.8	13.9	12.5
1920	84.2	27.2	14.1	24.5	14.6	12.8
1921	85.2	28.5	14.0	25.0	15.0	13.7
1922	85.5	31.3	13.8	22.6	15.5	13.8
1923	84.5	33.1	13.3	23.6	*15.7	13.7
1924	82.3	34.9	13.8	21.7	15.5	13.2
1925	79.0	34.8	13.5	20.0	15.0	12.8
1926	74.9	*35.9	13.9	†19.8	14.8	12.3
1927	†72.0	34.8	13.9	20.7	14.3	11.9
1928	74.4	33.3	14.3	21.5	14.5	11.7
1929	79.0	32.3	14.1	23.4	14.3	11.8
1930	84.5	29.6	13.8	25.0	13.7	11.6
1931	90.2	27.4	13.0	25.9	13.4	11.8
1932	95.8	25.9	12.3	26.0	13.5	12.0
1933	97.6	25.3	11.6	28.5	12.1	11.9
1934	98.4	25.0	†11.0	30.1	11.7	†11.3

*High points. †Low points.

III. DESCRIPTIVE HISTORY OF THE PROPORTIONS OF DRESS

Each dimension of dress appears to have a more or less independent history. At least it can be considered independently. It seems advisable to treat the histories of the six diameters in two ways: first, descriptively, herewith; and again quantitatively, in the following section on Periodicity.

The problem of the relations of the several dimensions to each other, as they integrate into a whole style of dress, or the structural skeleton of a style, will be touched on in still another section, VI, on Interrelations of Dimensions; and again in the interpretation attempted in section VII on Variability and Stability.

WIDTH OF SKIRT

The series begins with a fairly wide skirt, exemplified by the smooth, padded cone-shaped skirt of the Spanish fashions of the late sixteenth century, or the squarer Queen Elizabeth dress. However, the year 1605 lies in the midst of a gradual tendency toward narrowing. The farthingale (vertugarde, crinoline), which is very wide about 1570,[6] is completely out by 1625-30,[7] when skirts attain a relative minimum of width. Increasing diameters then follow until about 1660. This is reflected in the court styles painted by Rubens under Marie de Medici, by Callot, and in Van Dyck's regal portraits. Holland's wealthy bourgeois women in black satin with white lace, painted by Codde, Rembrandt, and Terborch, are also typical of the scene. The Spanish Hapsburg portraits of Velasquez illustrate a court dress of extraordinary uniformity and enormous width.

After 1660, a fine series of fashion plates by Bonnard shows a narrowing skirt. As early as 1665 the farthingale is ousted from general wear, but not at court.[8] For a while there is in France, as elsewhere, considerable discrepancy

[6] C. Köhler and E. von Sichart, A History of Costume (New York: G. Howard Watt, 1933), 237. Cited hereafter as Köhler.

[7] Köhler, 314.

[8] Köhler, 288.

between court regulations and the freer flowing currents of general fashion, but in the end it is court dress that has to yield to the pressure of the narrowing trend. In the latter part of the reign of Louis XIV, beginning about 1680, the farthingale starts a long slow recovery. In Watteau, then Hogarth, and later in the magnificent Versailles galaxy including Boucher and Nattier, we see a gradual approach to the maximum of skirt width reached about 1750. The Paris gowns that find their way to the American colonies corroborate, though with less luxury, the fashions seen in the portraits of Mme. de Pompadour.

After 1750 or so, the trend of the eighteenth century, though still hampered by court regulations, is a steady narrowing. A jog in the decade 1771-80 coincides with Marie Antoinette's reintroduction in 1774 of the wide flat farthingale, exquisitely depicted in the engravings of Moreau-le-Jeune. In general, though, what is lost in width is made up in the train. The works of Chodowiecki, Reynolds, Romney, and Gainsborough, and the fine engravings of France and England of the later eighteenth century recall the general picture. By the time of the French Revolution the farthingale is discarded, and a mere pillow at the back gives the necessary fullness. One would have said that the imitation of classic dress during and after the Directoire was a novel idea, symbolizing, perhaps, the beginning of a new and "natural" life. Instead we see that the clinging skirts are merely the culmination of a drift that had its inception fifty years before. The years up to 1800-08 derive fullness from the trains that are occasionally found. 1810-11 is the bottom of the curve, with a trainless, short skirt.

Then the trend turns slowly to rise. Its peak in 1859-61 (figs. 2, 4, 6) was the result of the adoption of the farthingale again, now called crinoline. Afterward a gradual narrowing set in, destined to attain its limit of possibility in the middle twenties of our century. Since then, skirts seem to be gradually widening. A return, several decades hence, to a crinoline wider than the wearer might be difficult in this day of automobiles, but the effect could be achieved with a train.

With peaks of fullness at about 1570, 1660, 1750, 1860, and of narrowness around 1625, 1680, 1810, and 1925, the full period is therefore about a hundred years. Oscillations within these huge curves now seem somewhat dwarfed. Many of them are due to the temporary introduction of the train, which seems to have little effect on the general drift.

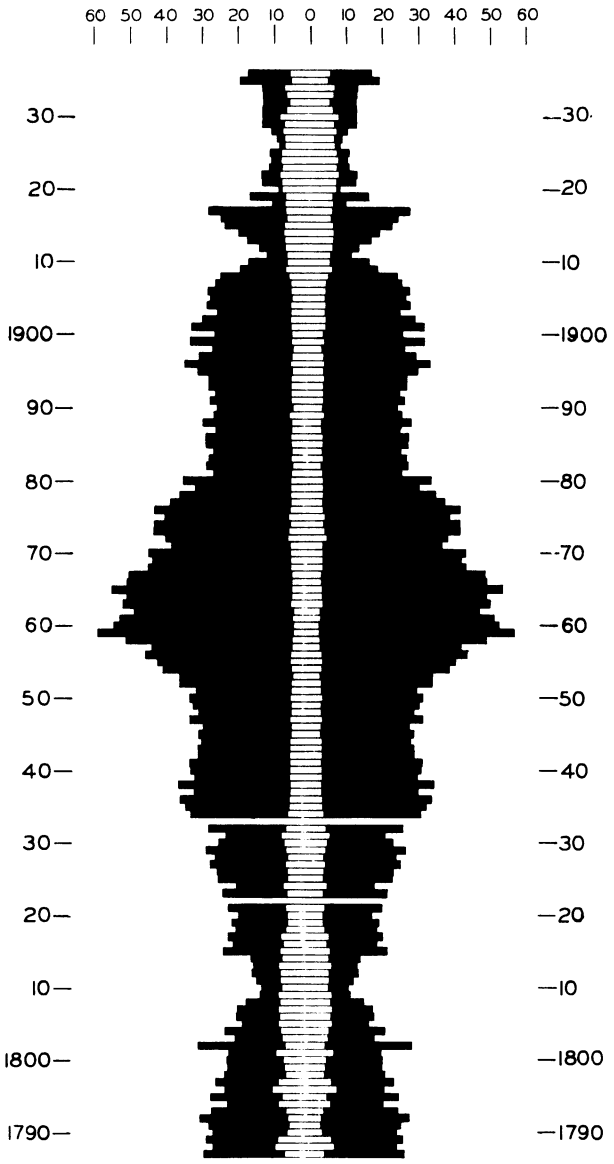

Fig. 6. Skirt width and waist width, dimensions 5 and 6, showing generally inverse relation, 1787-1936.

LENGTH OF SKIRT

This dimension is also analyzed in terms of cycles, each being the time within which the hem leaves and returns to the ground. The periods of maximum length are the double decade 1641-60, 1794, 1860, and 1902-05, with a near-approach in 1934-36. These suggest a diminishing wave length. This curve has several special features, too. The 1860 and 1905 maxima are separated by a recession that remains rather small, and they may have to be counted together. A similar doubleness occurs in the minima. It is difficult to decide whether 1813 or 1833 represents the true extreme of skirt brevity in the early nineteenth century. Moreover, the eighteenth-century minimum falls around 1780, only a decade and a half before the century's maximum under the Directoire of 1794. Similarly, the recent minimum of 1927 is preceded by a near-minimum only eight years earlier. At this time skirts nearly reach their upper limit of possibility, and probably our less definable limits of decency. Glib explanations of the acting forces range through such things as war-time emergency, relaxing of sex morals, driving of motor-cars, a passing tendency toward non-femininity to emphasize equality with men. But even a superficial consideration of the whole trend, of dress-function and other aspects of the silhouette, reveals the inadequacy of these phrases. The violent increase in variability within the years themselves in the late nineteen-twenties will be recalled, the result of the conflict between the knee-length dress and the long "robe de style." Since then the styles have been more homogeneous.

These peculiarities of the periodic curve for the skirt length and its variability will also be discussed more fully in the statistical sections IV, V, and VII.

POSITION OF THE WAIST

Since the beginning of the intensive year-by-year record in 1787, there have been crests of short-waistedness in 1807, 1869, 1917, and 1936 or still to be reached; and intervening maxima of low waists in 1842, 1903, and 1926. The period thus shortens as time goes on. This tendency holds also if the more intermittent pre-1787 data are included.

However, the extreme minima and maxima are fewer. The curve begins around 1605-10 with a very high waist, but sinks with the advent of the corseted V-waist. Its rise again to the apex in 1807 is slow except at the very end. This gives a period of about two hundred years. The pendulum then swings back. A slow drift toward long-waistedness sets in. Our previously established swings prove but oscillations in a greater cycle. One hundred nineteen years after 1807, in 1926, the lowest point is reached. The tide has probably now turned into the second half or upswing. One would have said that the long waists of 1926 were another cultural abnormality following the war: they prove to be the normal trough of a tremendous curve. Moreover, one recalls with interest the similarly long-waisted, girdled frocks of 1450-1550, pictured for example in the early Gobelins and in the court of Maximilian I.

DIAMETER OF THE WAIST

Inasmuch as it is impossible to perceive the trend in this dimension from the 1844-1919 data alone, Kroeber's former estimates prove to relate chiefly to minor irregularities.

In 1605 a sturdy corset[9] achieves the tiny waist that for some time has been de rigueur on every formal occasion. One may call to mind some of the portraits of Queen Elizabeth. This corset goes out gradually in the next few decades. Voluminous sleeves make it hard to get waist diameters for the seventeenth century. Our few measurements are supported by an impression gained from the Van Dyck and Dutch portraits that waists are amply wide up to 1660 or so. The sharp drop soon after is the result of the re-introduction in 1670[10] of the corset. After 1680 the trend changes. The considerable width for most of the eighteenth century is surprising, because one has the feeling that waists are quite slender. Though court dress is undoubtedly more exacting in this respect, the effect of slimness is achieved without real constriction partly by the slenderizing V of the corsage, and partly by juxtaposition to full skirts. A minimal extreme seems only to have been reached just before the fall of the French monarchy, after which diameters increase. A loose sash tied in the back is typical of the Revolution itself. With "Greek" dress as a pattern during and after the Directoire, the waist is wide. Following to a certain extent anatomical exigencies, though this we well know is not always so, waists increase in diameter as they shorten. The widest are those of Empire dresses, directly under the breasts.

There now starts a very gradual constriction. At the turn of the trend during the eighteen-fifties and sixties, the diameter approximates Queen Elizabeth's famous edict (fig. 6). The breathing spell of 1872-75 is negligible. Not until the opening of the twentieth century does the enlarging of the waist show itself in earnest. The maximum comes in 1923, just one hundred and sixteen years from the previous peak.

---

[9] Köhler, 320: "invented (by the Spanish) in the first half of the 16th century."

[10] Köhler, 320.

DECOLLETAGE

It is difficult at first to see major significant movements in this endlessly fluctuating line. The longer span of three centuries reveals a more significant form of the curve. The ruffed high neck of the Spanish sixteenth-century mode persists briefly in France. French decolletage is mostly low during the seventeenth and eighteenth centuries, under the particular influence of court dress. The fichued throat of the French Revolution is the apex of height, then a new decline ensues. For 1844-1919, "the most striking event in the history of decolletage depth is its increase in recent years."[11] This reaches its maximum around 1915. A reverse culminates in the rather high necks of 1934-35. The evidence is not wholly satisfactory, however, on which to base a periodicity.

WIDTH OF DECOLLETAGE

It is indeed true that "this trait appears to have a very long periodicity."[12] The high ruffed necks of 1605 open the series at one limit of possibility. Wide lace collars lead to a more open decolletage, and the outer limit of possibility, a point several inches down the arm, is reached about 1670. A gradual narrowing ends in the close kerchief of the Revolution. It should be noticed that the width of decolletage of eighteenth-century dress and even court dress is not great. It is depth that is emphasized, so the general effect is that of a deep square. A rapid widening in the early nineteenth century brings a peak around 1832. Since then for a hundred years the trend has been toward less exposure of the shoulders.

IV. PERIODICITY

It seems worth inquiring in how far there may be any more or less constant duration to the swings of the fashion pendulum just described; whether there is any period of years within or near which such swings tend to accomplish themselves. There is, of course, no necessary reason why even in one feature or dimension the time for change from one extreme to the opposite and back again should be constant over several centuries, nor why the rate of change should be the same in separate features within a given century. At the same time there might be a cause or causes tending to operate toward uniformity; and in so far as there might be, the first step toward its recognition would be determination of the degree of uniformity which exists, and of the time value expressing the uniformity.

On the whole, the style changes are so long in their range, and so progressive, that there is no great difficulty, as soon as data are sufficiently ample, in determining recurrent maxima and minima. We call a full wave length the time interval from one crest to the next, or from trough to trough. For instance, skirts were clearly at minimum width in 1811 and again in 1926; at their fullest, not far from 1749 and about 1860. This gives wave lengths of 115 and 111 years respectively; or half wave lengths--one-way swings--of 62, 49, and 66 years. For waist width, correspondingly alternating maxima and minima fall at about 1780, 1807, 1860, 1923,[13] giving wave lengths of 72 and 116 years, and one-way swings of 27, 45, 71 years.

Actually the situation is often less simple, because of minor crests and troughs. Say a dimension of 20, the lowest in a century, changes gradually over fifty years to a value of 40, which is the highest reached in a century or so. If about halfway up the climb there is a recession which in five or six years carries the value from say 31 back to 28, after which the upward march is resumed, this recession is obviously a minor fluctuation. It is no doubt stylistically and historically significant, but less so than the longer and larger swing from 20 to 40 on which it is superimposed. Suppose, however, that in twenty years the value of 35 has been reached, that the recession lasts ten years and carries down to 25, and that in the following twenty years the value mounts again and reaches 40. What have we then? Still a secondary fluctuation, although an accentuated one? Or three swings of 20, 10, 20 years duration and 15, 10, 15 points amplitude? Obviously, if the answer is to be not wholly subjective or arbitrary, it has to be rendered, so far as possible, in terms of all known values for the trait in question; also in comparison with the trend of durations of undeniable swings; and in some degree with reference to high and low values and durations in other traits. At that, there are likely to remain some cases difficult to adjudge, and others dubious because of insufficient data; but enough may emerge clear-cut to justify the inquiry.

SKIRT LENGTH
(Dimension 2)

The first half of the seventeenth century is a time of full-length skirts. From 1605 to 1640, half of the dress pictures measured have a length

[11] Kroeber, 257.

[12] Kroeber, 256.

[13] The moving-average figures are used.

of 100; for only one of the years on which there are data does the average fall below 96. From 1641 to 1660 full length is even more unanimous: all of nine specimens available are full 100 per cent. We can take the midpoint of this double decade, namely 1650-51, as the moment of climax of length.

Thereafter there is slow shortening. From 1661 to 1690, three years show 100; six years, values of 96 to 99. Then there is a twenty years' gap in data. From 1711 to 1730 the length is still about the same as before the gap.

From 1731, however, shortening increases progressively to about 1780: successive decades average 96.6, 96.6, 95.8, 94.8, 94.2. The peak is evidently comprised in 1778-81: 92.4, 92.3, 90.3, 92.2.

Now follows a rapid lengthening, expressed in higher percentages. The 1784 value is up (skirt longer), 1787 reaches nearly 99, 1790-93[14] are all over 98, Directoire styles of 1794 touch 100. The moving-average crests are 1792, 98.7, and 1796, 98.6.

This full length is only momentarily held, in contrast with the long persistence around 100 the century before. The years 1795-1803 oscillate between 97 and 100. Length decreases progressively from 97.6 in 1804 to 91.9 in 1814.[15] It is, however, not certain that 1814 is the true crest of the wave, because a second peak of shortness comes at 1833 with 92.0.[16] Between lies a swell of partial lengthening of the hem. This whole double decade 1814-33 is something of a unit: it has shorter skirts than any period in the preceding two centuries.

At any rate, skirts lengthen progressively after 1833. By 1836 the moving average has reached 94; by 1841, 97; 1846, 98; 1858, 99; 1860, 99.8. The first individual year to show full 100 per cent length for every dress examined is 1859; thereafter three more such years occur sporadically until 1875; then no others until 1899. Between 1875 and 1899 there is a minor shortening, reaching 96.1 in the moving average for 1886 and 95.5 actual mean in 1887. This temporary recession is steady from year to year, both up and down, but is modest. The real maximum of length comes in 1903-04, with 99.9 in the moving average, and the four successive years 1902 to 1905 showing actual averages of 100.

Since 1905, no year has shown a full 100. For about a quinquennium, the shortening was timid and barely perceptible. But by 1911, the moving average has fallen below 98; by 1914, below 92; by 1919, below 85. This, the year in which Kroeber's first study terminated, seemed the limit. However, by 1925 the moving average fell below 80, and in 1927 dipped to the minimum of 72 (year figure 69.7).

Once this corner was turned, the lengthening was rapid: 1929, 79; 1930, 84; 1931, 90; 1934, 98.

If now we summarize, these are the maxima and minima:

TABLE 9

Dates of Maximum and Minimum Skirt Length*

Years	Maximum	Minimum
c. 1650	100	
1780		90
1792-96	99	
1814		92
1823	95	
1833		92
1860	100	
1886		96
1903-04	100	
1927		72
? 1934	98	

*Moving-average values after 1788.

It will be seen that two extremes have been double peaked: the short skirt of 1814 and 1833, the long one of 1860 and 1903-04. Passing over the recessions within these as minor, we have: *1650, †1780, *1794, †1833, *1903, †1927. The resulting wave lengths, crest to crest and trough to trough, are 144 (1794 minus 1650), 53, 109, and 94 years. The average of these four is 100 years--the empirically found value of the skirt-length cycle in modern European history.

TABLE 10

Summary of Periodicity in Skirt Length

1650	Max.		
1780	Min.		
1794	Max.	Max.-Max.:	144 years
1833	Min.	Min.-Min.:	53 years
1903	Max.	Max.-Max.:	109 years
1927	Min.	Min.-Min.:	94 years
	Average of four waves:		100 years

SKIRT WIDTH
(Dimension 5)

Skirt width shows three cycles in three centuries: four peaks of slimness, three of fullness.

[14]From here on, moving-average maxima and minima are used.

[15]The lowest individual year is 1813, with 87.9.

[16]No data for 1833; minimum year is 1834, 89.3.

TABLE 11

Dates of Maximum and Minimum Skirt Width

Years	Maximum	Minimum
1629		42
1651-60	96 (1659, 126)	
1678-80		39
1749-51	101	
1811		27
1861	105 (1859, 116)	
1926		20

These convert as follows:

TABLE 12

Summary of Periodicity in Skirt Width

Year	Extremes	Intervals, years
1629	Narrow	
1655±.....	Full	
1679±.....	Narrow	50
1750±.....	Full	95
1811	Narrow	132
1861	Full	111
1926	Narrow	115

The average is a fraction over 100 years.

The histories of costume give 1570 as the maximum of farthingale expansion. This date lies about eighty-five years before the 1655 peak of fullness. The inclusion of this earlier wave length would reduce the average from 101.3 to 98 years. So far as the periodicity of this skirt width has changed during the last three and a half centuries, it seems to have slowed.

WAIST LENGTH
(Dimension 3)

From here on, we are concerned with smaller measures--waist and shoulders--and our values, which are percentages of the body height, run lower. For our first dimension, length of waist, the periodicity is also somewhat less.

It must be remembered that this measure refers to the vertical height of the narrowest part of the middle of the silhouette figure. The belt, or demarcation of blouse and skirt, may fall lower, especially in front, but has been disregarded because it is not always present.

The minimum position found (lowest percentage, highest position on the body) is 18, or less than a fifth of the body height;[17] the maximum, 36, or over a third. These are moving-average values; the actual means for particular years are somewhat more extreme: 17 for 1809 and 1815-16, 38 in 1927. The several minima--or high-waist peaks--fall between 18 and 25; the maxima of low-waistedness between 29 and 36.

These are the indicated crests:

TABLE 13

Periodicity in Waist Length

	High waist	Low waist	Intervals, years Min.-Min.	Max.-Max.
1605-10	21			
1661-70		31		
1711-20	26		108	
1751-60		29		90
1817	18		101	
1842		29		86
1869	22		52	
1902/03		31		60
1917	24		48	
1926		36		24
Average ...			77	65

The average of 77 and 65 gives 71 years as the mean duration of a complete wave.

The decrease of wave length is steady and notable.

WAIST WIDTH
(Dimension 7)

Waist width or diameter fluctuates between about 8 and 16 per cent of figure height, in fashion plates. The duration of its swings--contrary to that of waist position--does not appear to be shortening. Early data are unusually few, on account of arm interference and art conventions. (See table 14 on opposite page.)

The mean full wave length is 93 years, with rather low variability from 72 to 116.

DECOLLETAGE
(Dimension 4)

For the first thirty years of our record there was no decolletage in the modern sense. For the next thirty, it alternates with mere neck opening. Thereafter, we can properly speak of breast exposure as standard in court or formal dress. However, there is a long period from about 1670 to 1780 in which shifts of trend are difficult to define, although depth of cutout grows gradually greater. Around 1784 there is a swift change: decolletage as such almost disappears, and stays out for a decade. 1794-96 bring it back, and a maximum is reached in 1803, with a moving-average

[17] As body height has been calculated from the mouth, the place of the waist line at its highest would be a full fifth down from the real body height at its highest position (lowest percentages); probably two-fifths when lowest on the body (highest percentages).

percentage of 14. Twenty years later, around 1823-27, there is a minimum just below 12. By 1834, the figure is back above 13;[18] and for a century, to 1931 inclusive, the moving average (and very few actual year values) does not fall below 12.5. During this century, the moving average several times goes above 14, with minor peaks in 1841, 1874, 1879, 1898, 1905, and a final and highest one in 1915 at 15.4. The intervening dips in the curve--decolletage shortenings--are, however, so slight that they cannot fairly be construed as basic waves. They are only oscillations in a slowly deepening trend, which climaxes around 1915. From this 1915 climax the raising of the decolletage (smaller values) is gradual, with even a recession to more than 14 as late as 1928. With 1932, however, the break comes: the decolletage is transferred to the back, the neck-line rises sharply in front. A seeming minimum is reached within three years: 1934, 11.

It is clear that after decolletage once was accepted (or reaccepted) as a feature of formal dress, in the early seventeenth century, it tended to remain established with only minor fluctuations, except for three sharp but temporary crises. The first of these was in 1784-94, when decolletage proper simply went out. The second was a longer period, marked in 1806-13, and even more so in 1820-28, with peak about 1823, when decolletage remained in force, but partially sacrificed depth in order to obtain an effect of breadth. The third was the recent years, when the breast was covered to expose the back.

The situation as regards this proportion, and the factors at work in its changes, are therefore of a somewhat different order from those concerned in the proportions so far considered. It must be remembered also that the dimensions of skirt and waist length and breadth express the outline of the dress or figure as a whole, but decolletage really refers to a feature internal to the figure. As regards dress, in the literal sense, it is negative instead of positive.

[18] In view of the tendency toward inverse relation between depth and width of decolletage, discussed in sections III and VI, it should however be noted that the minima and maxima of the two dimensions do not coincide in time. Depth, minimum in 1823-27; width, maximum in 1832.

TABLE 14

Periodicity in Waist Width

Decades	Extremes (10-yr.av.)	Extreme value of year	Extreme year	Approx. max.	Approx. min.	Interval	
1641-50	15.8		c.1645	16			
1671-80	9.8		c.1675		10		
1731-40	13.8		c.1735	14		90	
1771-80	11.9	1780: 8.6	c.1780		9		105
1801-10	14.0	1807:14.7	1807	15		72	
1851-60	8.2	1860: 7.8	1860		8		80
1921-30	15.1	1923:15.7	1923	16		116	
Average						93	93

TABLE 15

Periodicity in Decolletage

Period	Value	Year	Approx. max.	Approx min.	Intervals	
1605-10	5.4					
1631-40	10.8	1635±	11			
1641-50	6.6	1645±		7		
1771-80	15.2	1778	18		143	
1788	8.6	1788		9		143
1803	14.2	1803	14		25	
1823, 1827..	11.7	1825±		12		37
1841	14.6	1841	15		38	
1868-69	12.6	1869		13		44
1915	15.4	1915	15		74	
1934	11.0	1934		11		65
Average...					70	72

If we consolidate the second and third waves with the fourth, as there is possible warrant for doing because their extremes are less accentuated, we have left two crest-to-crest waves of 143 and 137 years respectively, and two trough-to-trough ones of 143 and 144--a mean of 142, instead of 71 as in the table.

These mean wave lengths do not signify too much. What we can also see is two long spans, 1645-1778 and 1788-1915, in which decolletage gradually deepens to a maximum; punctuated by several brief reversals, c.1635-45, 1778-88, 1803-23, 1841-69, 1915-34. This gives for the periods of deepening of decolletage an average of 140 years, for those of raising, 18 years. In other words, the wave profile is markedly skew. The cutout creeps slowly downward, then jumps back up rapidly.

DECOLLETAGE WIDTH
(Dimension 8)

Decolletage proper does not exist in our series, for width any more than depth, before 1630. After that date, it gets established rather more rapidly, however, and reaches a peak, with nearly full shoulder exposure or percentage value of about 21, around 1659-68. Our data are blank between 1680 and 1710. After that, the value declines gradually through the eighteenth century, at any rate during its second half; the trend in the first half is not quite clear. The minimum width is reached with a value of 8 in 1795, a few years after the sudden minimum of decolletage depth in 1788. From here there is a climb of nearly forty years to above 23 in 1832. Thereafter the record is one of slow narrowing to the present. The last year of the moving average, 1934, is lower, with 11.3, than any year since 1800, 11.6. The last actual year, 1936, shows 9.8. The long swing toward narrowing of neck-opening may thus be not yet completed.

There are several temporary recessions in the century of drift: 1847-53, 1878-83, 1890-95, 1900-03, 1917-22. But these add only one to two points, each time, while the century-long decrease drift is from 23 to 11; so they clearly are superficial oscillations. As with depth, there is a tendency toward slow creep--in this instance toward narrowing; broken by definitely briefer and sharper-curve reversals.

TABLE 16

Periodicity in Decolletage Width

Years	Value	Intervals	
1659-68	21.2		
1795	8.3		
1832	23.4	168	
1936	11.3		141+

It is evident that the wave profiles are again skew. But decolletage width mounts rapidly to its maximum and then shrinks gradually, whereas decolletage depth is reduced suddenly and then increases again for a long time. This inverse relation is reflected in the ratio of the two dimensions, as shown in table 18. The ratio (4/8) sinks rapidly for 30 years to 1827-31, then climbs slowly for 85 years to 1912-16.

COMPARISON

If now we bring our six sets of periodicity findings together, we have the following:

TABLE 17

Comparison of Six Periodicities

Dimensions	Mean wave lengths, years
No. 2 Skirt length	100
No. 5 Skirt width	100
No. 3 Waist length	71
No. 7 Waist width	93
No. 4 Decolletage length	71
No. 8 Decolletage width	154
Mean of six.....	98

We are not wholly clear how much weight should be attached to this clustering of the wave lengths of change in our six dress dimensions around a value approximating a century. The question is in how far the significance lies in the intrinsic fact of a century-value, or, on the other hand, in the nearly synchronous clustering of peaks in certain periods, which might be due to a common cause. This problem is discussed further in section VII.

One thing, however, is certain--whether or not the six mean wave lengths do or do not bear relation to one another--namely, that women's dress fashions change slowly, as regards the fundamental proportions of the silhouette or contour. On the average, any one proportion is a half-century swinging from its extreme of length or fullness to extreme of brevity or narrowness, and another half-century swinging back. This is more than would usually be supposed, in view of the civilized world's general assumption that women's dress fashions are in their nature not only unstable but capriciously and rapidly unstable.

It also seems worth while to try to estimate the average duration of minor fluctuations or transient oscillations over and above the major swings or trends so far considered. This would require first of all the reliable determination of the long-time trends. The deviations from this of the actual averages for each of a series of years would then give the periods for which the actual style, with respect to any one trait, remained above or below its underlying trend.

As regards statistical execution, however, the matter is not so simple. On account of the small number of measures, no mean for a particular year is very reliable; and its probable error would have to be taken into account. Moreover, the basic trend can be differently expressed; for instance by three-, five-, nine-, or fifteen-year moving averages; or by more elaborate methods. A moving average from its very nature produces certain apparent fluctuations in the actual annual means, even when the latter are proceeding in a regular curve in rounding a peak. Suppose for instance successive annual values run 69, 70, 71, 72, 73, 75, 78, 82, 87, 82, 78, 75, 73, 72, 71, 70, 69. As the sharper rise begins, the moving average climbs ahead of the actual values; at the peak it is considerably lower; then falls more slowly so that it is higher for a while. In other words, in the rounding of such a corner, we get three departures of the two lines from each other: that is, of the year-by-year graph and the moving-average graph; though each is a perfectly symmetrical curve. In short, three apparent fluctuations are due merely to the mathematical properties of the technique used.

Since the fewness and variability of the primary measurements thus appear to render an elaborate treatment hardly worth-while, we shall proceed to see cursorily what the surface results are.

Dimension 3 shows 38 full oscillations of annual means from the five-year moving average in the one hundred and forty-seven years from 1788 to 1934; that is, 38 periods when the actual value moves from above the moving average to below it and back above again (see tables 3, 8). This gives an apparent mean of 3.87 years, σ=4.11.[19]

Dimensions 4, 5, 7, 8 show 40, 38, 38, 41 oscillations in the same one hundred and forty-seven years; the mean for these dimensions is 3.77 years.

Dimension 2 cannot be directly compared with these, because the measured values often reach 100, but cannot pass it: a dress as worn may surpass the distance to the ground, but in the fashion plate, as soon as the toe becomes invisible, the measurement has to be read: skirt length = 100. The range of variation is therefore small when dresses are near the limit of length, and the number of oscillations would rise to 55 and the mean duration fall to 2.5 years. If we count only fluctuations passing from below 99.5 to above 100.5 of the moving average, or vice versa,[20] the number of oscillations is 40, and their average duration 3.68 years.

The average length of oscillation, between 3.5 and 4 years, is not far from the average duration generally assumed for the business cycle. This is probably a coincidence. The value will scarcely be very significant until there are more individual measurements available for each year and until more technical statistical consideration is given the moving-average "trend" which forms one of the two variables whose relation expresses the oscillations.

The <u>size</u> of deviation of the actual average for each year from the moving-average trend is, however, almost certainly significant for stability of style, as discussed below in section VII.

---

[19] For one-way fluctuations (intervals between crossings of the two lines), M = 1.95, σ = 2.13.

[20] That is, the year-to-year line not only crosses the moving average, but crosses it with a motion of at least 1.0.

VI. INTERRELATIONS OF DIMENSIONS

We have computed about half the relations between dimensions, and present them herewith in summary. (Table 18.) The variations come out very much like those for diameters considered alone. This is due largely to the fact that the six separate dimensions mostly show significant maxima or minima in the decades around 1810 and 1920, so that these tend to be repeated, sometimes with accentuation, in the ratios. Also, skirt length varies so little, proportionately to the other dimensions, that any ratio into which it enters becomes largely a function of the other measure. On the other hand, waist length, which shows five crests instead of the usual three since 1800, produces five crests in those ratios into which it enters. (Table 19.)

TABLE 18

Interrelations of Certain Dimensions, by Five-Year Periods, 1788-1936

Period	5/2	7/3	4/8	4/3	7/5	8/5	7/8
1788-91	54.6	50.2	105.7	37.6	23.1	16.3	141.4
1792-96	50.9	59.4	114.3	44.2	25.8	16.8	*153.6
1797-1801	45.2	67.2	*121.4	65.1	29.1	23.3	125.2
1802-06	44.4	70.7	97.8	*72.3	30.7	32.1	96.4
1807-11	†30.6	*72.3	88.5	63.1	*48.1	47.4	101.4
1812-16	38.1	69.8	70.9	64.6	37.7	*49.1	76.7
1817-21	43.3	56.3	83.2	64.8	27.7	38.3	72.3
1822-26	47.8	44.8	62.6	49.4	23.8	43.9	56.8
1827-31	54.0	43.4	†54.5	†45.7	23.1	44.5	51.8
1832-36	69.3	36.5	63.3	48.3	15.5	32.4	47.8
1837-41	67.3	31.9	71.9	50.2	14.0	30.6	45.7
1842-46	60.5	30.7	73.1	49.1	14.9	33.7	45.6
1847-51	63.6	†29.6	67.0	47.4	13.6	32.5	41.9
1852-56	80.0	30.5	65.2	49.1	10.7	26.4	†40.6
1857-61	*103.1	31.5	73.5	52.9	†7.9	18.0	43.8
1862-66	101.7	35.6	74.0	55.5	8.3	†17.5	47.5
1867-71	88.0	40.8	75.5	57.8	10.2	19.2	52.9
1872-76	82.6	*43.7	87.6	*61.0	12.3	19.6	62.7
1877-81	67.0	33.5	98.6	54.6	13.2	21.8	60.4
1882-86	57.1	31.6	87.7	50.8	15.2	27.9	54.5
1887-91	54.7	31.7	103.8	49.6	16.7	25.2	66.2
1892-96	59.0	32.9	96.5	49.6	15.8	24.8	63.9
1897-1901	59.3	†29.5	106.7	48.0	14.9	22.7	65.7
1902-06	55.2	31.2	111.5	†47.4	17.4	23.8	73.3
1907-11	39.2	44.2	107.2	51.9	29.3	32.1	91.2
1912-16	40.5	53.8	*119.7	*61.0	36.1	34.2	105.5
1917-21	35.9	*54.7	113.6	55.9	45.7	41.1	111.2
1922-26	†26.4	45.7	104.5	40.7	*71.4	*60.8	117.4
1927-31	29.6	44.3	119.5	43.7	61.1	50.4	*121.2
1932-36	30.6	47.2	97.3	44.0	39.2	37.5	104.4

TABLE 19

Periodicity of Dimension Interrelations

Horizontal and Vertical Ratio of Same Part of Dress:
- 5/2: Minima, 1807-11, 1922-26 (interval, 115 years)
- 7/3: Maxima, 1807-11, 1872-76 (interval, 65 years)
- Maxima, 1872-76, 1917-21 (interval, 45 years)
- Minima, 1847-51, 1897-01 (interval, 50 years)
- 4/8: Maxima, 1797-01, 1912-16 (interval, 115 years)

Vertical Diameters inter se:
- 4/3: Max., 1802-06, 1872-76 (70 years)
- Max., 1872-76, 1912-16 (40 years)
- Min., 1827-31, 1902-06 (75 years)

Horizontal Diameters inter se:
- 7/5: Max., 1807-11, 1922-26 (115 years)
- 8/5: Max., 1812-16, 1922-26 (110 years)
- 7/8: Max., 1792-96, 1927-31 (135 years)

VII. VARIABILITY AND STABILITY OF STYLE

The question of when, under what circumstances, and why traits of fashion are relatively stable and unstable is approached by us in two ways.

One is a year-by-year comparison of the standard deviations of the means for each trait; that is, the variability inter se of the actual measurements which go into the annual average. This is probably the most satisfactory expression of stability and instability.

The second method is to compare each annual average with the "trend" or moving average for the same year. If the latter is held constant at 100, how many per cent above or below 100 is the actual average for the year? Thus for skirt width, the moving average for 1801 is 45.2, the yearly mean 42.1, or 6.9 per cent less. For 1802, on the other hand, the moving average has gone up only to 45.6, but the year's mean is 59.6, or 31 per cent higher. For 1803 the deviation is 10.3 per cent under. Obviously this is a period in which the style for skirt width was highly variable from year to year, even though the trend is pretty consistently in one direction for two decades. By contrast, the years 1854-58, which also show a strong one-way trend in this dimension, run 101.1, 101.7, 101.8, 90.8, 100.3; and 1839-43, with the trend change mild, show 97.8, 99.1, 103.5, 98.2, 99.8. It is plain that the year-to-year fluctuation was much more marked in 1801-03 than in 1839-43 or 1854-58. In other words the fashion, with respect to this trait at least, was much less stable in its trend in the earlier period than in the two later.

The objection which can be made against this second measure is that it expresses the relation of an actual year average to a short moving average to which it contributes; also that the moving average, our base, possesses properties, in relation to the actual sequence of events, which vary according to the nature of the sequence of events. It behaves somewhat differently when it is steadily progressing in one direction and when it is turning a corner; and again, in different parts of its curve around the turn. It is for this reason that the series of simple percentaged standard deviations, or variability coefficients, is probably sounder. However, these coefficients directly express only the variability or instability within one year: how much the several fashion plates for 1801 differ from one another, for example; instability over several years must be inferred by comparison. The annual deviations from the moving average express variability within a span of years directly. We therefore use this measure also. On the whole, the two measures give results fairly in agreement. Those by the method of deviation from the trend will be presented first.

YEAR-TO-YEAR VARIABILITY
(Percentage Deviations of Annual Mean from Moving Average)

The percentages by which each annual mean deviates from the five-year moving average for the same year--the basic data for this section--are given in table 20. More convenient are tables 21 and 22, which express the same values averaged for five- and ten-year periods respectively. We have thought it unnecessary to diagram these results separately; in substance they are shown in figures 1 and 2 (pp. 114,115), where the line represents the moving average, and dots the annual means.

TABLE 20

Percentage Deviations of Actual Year Means from Trend, 1788-1934

Year	2	3	4	5	7	8
1788 ..	1.4	14.0	3.5	2.0	32.0	
1789 ..	.8	5.3	12.0	3.4	21.1	23.0
1790 ..	.9	7.1	19.4	5.2	16.8	14.6
1791 ..	.2	2.8	32.2	1.5	15.9	4.5
1792 ..	.2	6.7	8.9	13.2	12.3	
1793 ..	.3	4.4	47.0	.4	4.5	
1794 ..	1.7	13.4	3.1	13.4	11.6	15.5
1795 ..	1.6	3.4	25.2	9.1	12.1	14.6
1796 ..	.4	3.0	12.1	6.2	28.6	
1797 ..	1.2	3.0	11.8	5.8	11.2	8.0
1798 ..	.2	1.0	.9	.4	21.1	4.0
1799 ..	.3	1.0	7.2	3.6	13.2	7.8
1800 ..	.1	4.2	19.8	7.5	1.6	1.7
1801 ..	1.6	4.8	16.5	6.6	26.0	2.5
1802 ..	2.6	3.2	21.6	30.7	13.7	12.9
1803 ..	.4	1.1	11.3	12.5	6.6	5.1
1804 ..	2.6	3.2	9.6	3.2	1.5	2.9
1805 ..	.4	1.6	14.3	10.0	5.0	21.2
1806 ..	1.3	3.8	.8	2.1	.7	8.6
1807 ..	.1	.5	10.6	12.2	3.4	5.8
1808 ..	.6	1.1	2.5	3.2	1.4	2.2
1809 ..	.2	10.8	4.9	15.4	6.4	1.4
1810 ..	.8	5.0	6.3	12.3	6.5	14.6
1811 ..	1.2	8.5	6.4	1.1	2.2	3.8
1812 ..	.3	2.0	1.6	4.3	.0	4.3
1813 ..	4.8	3.0	11.2	11.1	6.7	17.9
1814 ..	2.5	4.8	8.2	10.6	3.0	.0
1815 ..	.7	7.5	7.8	21.5	2.3	3.2
1816 ..	2.0	9.5	7.7	.3	4.8	10.7
1817 ..	2.3	11.0	26.9	3.1	11.6	35.1
1818 ..	1.5	8.4	14.4	3.3	.9	7.9
1819 ..	3.6	22.1	2.3	1.5	9.8	5.2
1820 ..	1.1	8.1	10.0	7.3	6.5	1.8
1821 ..	2.7	4.3	17.2	2.2	7.7	2.3
1822 ..						
1823 ..	1.7	4.7	3.4	5.5	6.4	4.7
1824 ..	2.6	10.8	16.0	16.1	14.8	4.7
1825 ..	1.1	1.6	9.2	3.6	7.3	13.6
1826 ..	1.9	.8	10.0	1.9	3.7	16.7

TABLE 20 (Continued)

Year	2	3	4	5	7	8
1827 ..	.7	7.2	4.3	4.7	5.7	10.0
1828 ..	3.0	1.1	2.5	2.9	9.1	.9
1829 ..	.6	.0	.0	10.5	2.6	4.5
1830 ..	1.1	6.1	.8	3.6	4.3	9.8
1831 ..	1.6	9.5	2.4	12.8	12.5	7.0
1832 ..	1.5	.4	.8	2.8	5.2	1.7
1833 ..						
1834 ..	3.1	.4	6.9	.6	1.0	15.6
1835 ..	.6	2.6	4.5	1.7	.0	12.8
1836 ..	1.8	2.5	3.7	4.6	.0	8.7
1837 ..	.0	2.5	1.5	6.7	2.2	1.1
1838 ..	.5	3.2	.7	7.3	1.1	1.5
1839 ..	.4	.7	3.5	2.3	4.4	4.0
1840 ..	.0	1.7	1.4	1.1	1.1	4.6
1841 ..	.1	.7	1.4	3.5	3.3	3.0
1842 ..	.4	1.0	.0	2.3	1.1	8.2
1843 ..	.1	.7	.0	.7	2.2	6.7
1844 ..	.6	.3	2.1	1.4	2.3	.5
1845 ..	.4	2.4	.7	1.0	3.4	1.0
1846 ..	.2	.0	6.4	4.3	3.5	4.1
1847 ..	.4	2.1	8.0	6.6	3.5	.0
1848 ..	.1	2.5	.7	3.4	.0	1.0
1849 ..	.3	.0	2.2	.3	1.2	1.5
1850 ..	.2	1.1	5.9	.9	1.2	.0
1851 ..	.7	3.9	3.7	6.7	2.4	1.4
1852 ..	.4	3.2	4.4	1.7	.0	1.9
1853 ..	.0	.4	5.9	3.6	7.1	.5
1854 ..	.1	1.8	4.4	1.1	.0	.5
1855 ..	.0	1.8	1.5	1.7	7.1	3.4
1856 ..	.2	1.8	4.3	1.8	2.4	3.5
1857 ..	.5	.7	.7	9.2	3.6	1.0
1858 ..	.4	1.9	10.1	.6	1.2	.0
1859 ..	.4	1.6	5.9	12.6	1.3	1.1
1860 ..	.0	1.6	8.9	2.3	2.6	.5
1861 ..	.4	.4	6.1	.6	.0	.0
1862 ..	.1	1.6	2.3	5.6	6.2	.6
1863 ..	.8	3.3	.8	.5	8.4	3.4
1864 ..	.0	1.3	3.1	1.1	1.2	2.3
1865 ..	.7	.9	.8	6.7	1.2	.0
1866 ..	.6	.4	.8	.7	3.5	4.0
1867 ..	1.5	3.6	7.9	2.6	5.8	1.2
1868 ..	.3	.5	.8	4.0	3.4	5.8
1869 ..	1.0	.0	9.5	1.8	1.1	4.2
1870 ..	.2	.0	9.8	6.2	2.1	10.8
1871 ..	.1	3.1	3.7	8.9	7.2	4.6
1872 ..	.1	.4	10.3	5.4	12.2	.6
1873 ..	.2	7.5	1.4	5.7	1.0	9.6
1874 ..	.2	3.9	.0	2.9	5.9	6.8
1875 ..	.7	4.3	2.2	3.5	8.3	9.7
1876 ..	.0	1.3	3.6	7.2	1.1	8.8
1877 ..	.4	1.2	2.2	2.4	6.5	7.4
1878 ..	.1	1.6	3.6	2.3	.0	2.8
1879 ..	.1	.4	6.3	6.2	1.1	4.2
1880 ..	.6	4.5	10.0	11.0	2.3	4.1
1881 ..	.0	3.4	3.6	11.1	.0	3.9

TABLE 20 (Concluded)

Year	2	3	4	5	7	8
1882 ..	.7	2.6	6.6	1.4	7.1	.7
1883 ..	.0	2.3	4.5	.9	2.4	12.3
1884 ..	.1	1.5	3.0	5.3	2.4	6.5
1885 ..	.7	2.2	3.7	3.5	2.4	.0
1886 ..	.3	.7	8.0	3.5	4.7	3.5
1887 ..	.6	.7	7.2	6.8	5.7	.7
1888 ..	.5	.0	1.4	8.2	4.6	5.1
1889 ..	.2	.4	.7	2.5	9.1	.8
1890 ..	.4	.4	1.4	5.1	5.6	1.5
1891 ..	.2	1.1	4.3	2.7	.0	6.0
1892 ..	.4	2.1	3.6	3.8	1.1	5.9
1893 ..	.7	3.9	2.2	.4	2.2	3.6
1894 ..	.3	2.9	.7	4.5	.0	4.1
1895 ..	.3	2.1	.7	1.3	5.5	2.0
1896 ..	.0	2.1	.0	14.8	9.1	5.6
1897 ..	.4	.7	.0	2.4	2.3	12.1
1898 ..	.2	.7	.7	11.4	9.0	13.8
1899 ..	.3	.3	2.1	10.5	5.7	6.7
1900 ..	.5	1.3	7.9	10.9	4.4	8.1
1901 ..	.1	.7	11.3	11.0	.0	4.7
1902 ..	.2	3.5	6.4	4.1	4.2	15.3
1903 ..	.1	4.5	9.4	11.4	.0	3.7
1904 ..	.1	4.9	4.1	2.5	3.1	13.0
1905 ..	.2	.3	.7	.4	4.2	15.0
1906 ..	.1	.7	15.7	5.1	3.1	15.8
1907 ..	.0	2.2	5.7	3.0	6.7	3.9
1908 ..	.2	3.4	15.2	7.7	.0	4.9
1909 ..	.4	5.8	9.0	1.3	12.3	3.2
1910 ..	.2	.4	.7	3.8	3.3	5.7
1911 ..	1.0	4.0	.0	25.4	5.5	1.6
1912 ..	2.3	4.0	5.0	6.5	2.3	11.5
1913 ..	2.0	1.6	4.8	5.6	2.3	4.7
1914 ..	.2	1.6	5.3	21.6	3.7	19.7
1915 ..	1.7	2.0	5.2	7.0	2.2	11.8
1916 ..	4.3	1.6	8.6	21.2	5.3	1.7
1917 ..	1.7	.4	2.0	39.7	1.5	2.6
1918 ..	.6	2.4	7.4	42.7	.0	11.7
1919 ..	.5	5.1	.0	7.8	5.0	3.2
1920 ..	2.4	2.6	6.4	31.4	.7	.8
1921 ..	2.5	2.1	4.3	4.0	1.3	7.3
1922 ..	.6	6.4	3.6	16.8	6.5	5.1
1923 ..	7.3	6.6	.0	5.1	1.9	8.0
1924 ..	4.0	12.1	5.8	1.8	2.6	.8
1925 ..	2.5	2.0	6.7	10.0	4.0	1.6
1926 ..	3.6	11.1	13.7	16.7	4.1	.0
1927 ..	3.2	8.9	6.5	13.0	3.5	5.9
1928 ..	5.9	8.7	4.9	1.4	1.4	3.4
1929 ..	9.9	.6	7.8	11.1	6.3	5.9
1930 ..	5.3	5.1	5.8	3.6	20.4	.9
1931 ..	5.4	2.2	14.6	.4	3.0	8.5
1932 ..	1.6	5.8	7.3	.8	18.5	14.2
1933 ..	.7	1.2	3.4	9.1	8.3	10.9
1934 ..	.9	.0	15.5	13.0	17.1	4.4

First of all, it is clear that the proportionate amount of deviation varies among the six dimensions dealt with. On the whole, the large diameters have low variabilities. Thus, skirt length, the absolutely largest dimension, has 5.9 as its highest five-year-mean percentage deviation (table 21), while 19 out of 30 values

TABLE 21

Five-Year Averages of Annual Deviations from Trend, 1788-1934

Period	2	3	4	5	7	8
1788-91	.8	7.3	16.8	3.0	21.5	14.0
1792-96	.8	6.2	19.3	8.5	13.8	15.0
1797-1801 ..	.7	2.8	11.2	4.8	14.6	4.8
1802-06	1.5	2.6	11.5	11.7	5.5	10.1
1807-11	.6	5.2	6.1	8.8	4.0	5.5
1812-16	2.1	5.4	7.3	9.6	3.4	7.2
1817-21	2.2	10.8	14.2	3.5	7.3	10.5
1822-26	1.8	4.5	9.6	6.8	8.1	9.9
1827-31	1.4	4.8	2.0	6.9	6.8	6.4
1832-36	1.8	1.5	4.0	2.4	1.6	9.7
1837-41	.2	1.8	1.7	4.2	2.4	2.8
1842-46	.3	.9	1.8	1.9	2.5	4.1
1847-51	.3	1.9	4.1	3.6	1.7	.8
1852-56	.1	1.8	4.1	2.0	3.3	2.0
1857-61	.3	1.2	6.3	5.1	1.7	.5
1862-66	.4	1.5	1.6	2.9	4.1	2.1
1867-71	.6	1.4	6.3	4.7	3.9	5.3
1872-76	.2	3.5	3.5	4.9	5.7	7.1
1877-81	.2	2.2	5.1	6.6	2.0	4.5
1882-86	.4	1.9	5.2	2.9	3.8	4.6
1887-91	.4	.5	3.0	5.1	5.0	2.8
1892-96	.3	2.6	1.4	5.0	3.6	4.2
1897-1901 ..	.3	.7	4.4	9.2	4.3	9.1
1902-06	.1	2.8	7.3	4.7	2.9	12.6
1907-11	.4	3.2	6.1	8.2	5.6	3.9
1912-16	2.1	2.2	5.8	12.4	3.2	9.9
1917-21	1.5	2.5	4.0	25.1	1.7	5.1
1922-26	3.6	7.6	6.0	10.1	3.8	3.1
1927-31	5.9	5.1	7.9	5.9	6.9	4.9
1932-34	1.1	2.3	8.7	7.6	14.6	9.8

are under 1.0. Waist length rises to a maximum of 10.8, and only thrice falls below 1.0. Decolletage depth, on the other hand, rises as high as 19.3, and never goes below 1.4. The transverse diameters, which of course average lower than the longitudinal, run about like decolletage depth.

Next, it is clear that while 1835-1910 is a time of small deviations or high year-to-year stability for all six traits, these traits vary considerably among themselves as to whether their greatest instability falls in the period before or after the long quiet span, and whether early or late in 1788-1835. Thus, skirt length and width (Nos. 2 and 5) attain their greatest variability in post-World War years; the waist and decolletage dimensions vary most before 1821 --in fact, all except waist length (No. 3), before 1803. These dozen early years 1788-1799, in the moving-average record, are only fairly conspicuous for number of maxima or minima attained, in spite of their high deviations. 1802-16 show more wave crests, but the year-to-year variability averages lower in four of the six dimensions (tables 20, 21, 22).

TABLE 22

Ten-Year Averages of Annual Deviations from Trend, 1788-1934

Period	2	3	4	5	7	8
1788-96	.8	6.8	18.1	5.8	17.6	14.5
1797-1806 ..	1.1	2.7	11.4	8.3	10.1	7.5
1807-16	1.4	5.3	6.7	9.2	3.7	6.4
1817-26	2.0	7.7	11.9	5.2	7.7	10.2
1827-36	1.6	3.2	3.0	4.7	4.2	8.1
1837-46	.3	1.4	1.8	3.1	2.5	3.5
1847-56	.2	1.9	4.1	2.8	2.5	1.4
1857-66	.4	1.4	4.0	4.0	2.9	1.3
1867-76	.4	2.5	4.9	4.8	4.8	6.2
1877-86	.3	2.1	5.2	4.8	2.9	4.6
1887-96	.4	1.6	2.2	5.1	4.3	3.5
1897-1906 ..	.2	1.8	5.9	7.0	3.6	10.9
1907-16	1.3	2.7	6.0	10.3	4.4	6.9
1917-26	2.6	5.1	5.0	17.7	2.8	4.1
1927-34	3.5	3.7	8.3	6.8	10.8	7.4

Figure 7 shows graphically all deviations of the year from the trend, above a certain magnitude. This magnitude has been chosen so that the number of large deviations represented would be about the same for each of the six dimensions. Convenient values are 3 per cent for No. 2, skirt length; 6 per cent for No. 3, waist length; and 12 per cent for the others. These are designated in the figure as "fluctuation units." For instance, for trait No. 4, decolletage depth, the year-from-trend percentage deviations beginning in 1788 (table 20) are 3.5, 12.0, 19.4, 32.2, 8.9, 47.0. In terms of 12-per-cent units, these equal 0, 1, 1, 2, 0, 3; and they are entered by as many crosses on the vertical line denoting dimension No. 4 in the figure.

The number of crosses in this figure is approximately the same for the six traits. Thus:

	Number of fluctuation units	Number of years in which these occur
Dimension 2 ...	16	13
Dimension 3 ...	28	23
Dimension 4 ...	24	19
Dimension 5 ...	29	22
Dimension 7 ...	21	18
Dimension 8 ...	23	22

That there is a relation between large year-to-year fluctuations and wave crests or troughs is clear from figure 7, as compared with figures 3-6, 8-11. It is also clear that the relation is by no means simple or complete. Sometimes the fluctuations pile up in the years surrounding a peak; thus, dimension 2, 1926-27.[21] In other cases, the fluctuations are most extreme some years before or after: dimension 3, 1807; 4, 1804; 5, 1926; 7, 1811, 1923. Several times the fluctuations cluster continuously between a near-by crest and trough: dimension 4, 1788-1803; 5, 1912-26; 8, 1795-1832. On the other hand, there are crests without any accompanying marked annual fluctuations: dimension 3, 1860, 1903; 4, 1892, 1902/03; 7, 1852; and smaller clusters of fluctuations remote from any peak: dimension 7, 1824-31; 8, 1897-1903.

Essentially, each larger fluctuation represents a one-year reversal of the current five-year trend. Periods of many accentuated fluctuations therefore are periods in which style is as it were two-minded or under strain; even though it may be moving rapidly in a certain direction, the movement is meeting with resistance. Periods of only minor fluctuation, on the contrary, may be construed as times in which style is progressing harmoniously and whole-mindedly, whether the change be rapid or slow. It is clear that 1840-1900 was such a period of harmony, although it attained maxima in fullness of skirt and slenderness of waist and near-maxima in length of skirt and both long and high waistedness. Table 23 summarizes these differences by both five- and fifteen-year intervals.

It will be seen that the pre-1836 period of unsettlement is really double. The fluctuations are most marked and most numerous before 1800, then diminish, to resume again after 1815 and straggle along until about 1835. In historical terms, the Revolution-Directoire epoch was highly unstable, the Empire fairly settled, the twenty years after Moscow and Waterloo unsettled again. By 1830 quiet was impending, and 1848 was well within a long calm.

Unsettlement began again, in one feature, about 1900; became acute in another in 1911; in still others about 1920, 1923, 1930. By 1933 it had definitely diminished, except possibly in one feature: waist width. It is evident that the beginning of the era is pre-World War, its peak post-War. Only in one trait, skirt diameter, do the greatest fluctuations occur during the War itself. The specific cause of this exception seems to be a sharp reversal about 1915 in a narrowing trend which had come to a preliminary peak in 1912, but did not reach its extreme until 1926. This extreme was reached and passed with much less wobbling.

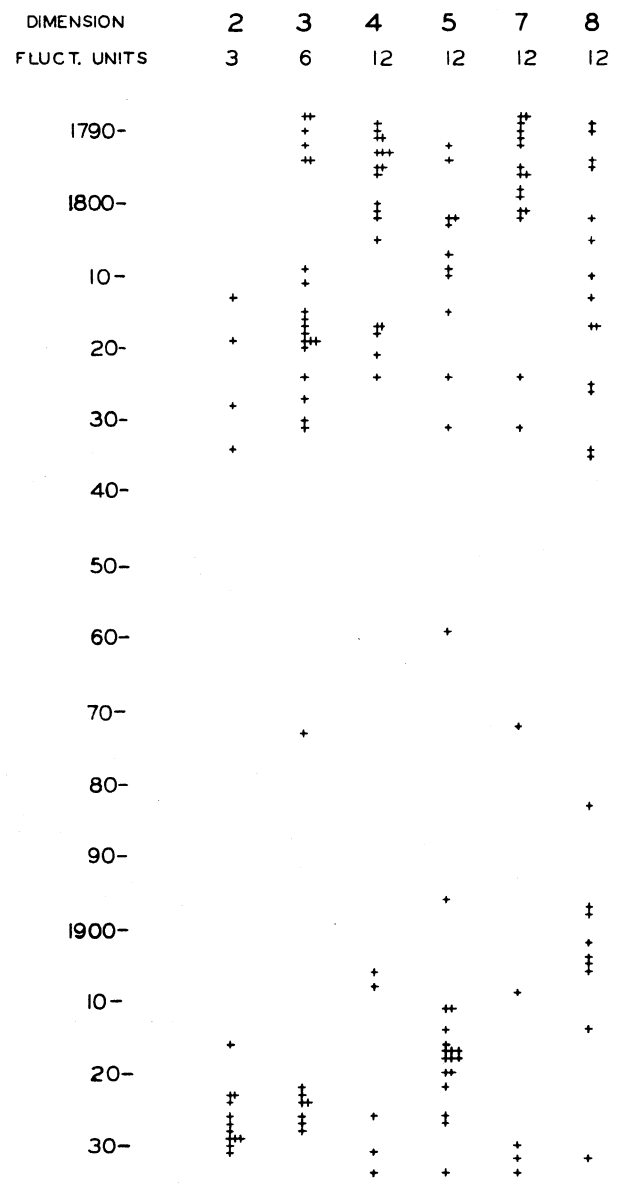

Fig. 7. Frequency of deviations from five-year moving-average trend, by fluctuation units per year, 1788-1934.

[21] This is probably at least in part a function of the moving average rounding a sharp crest.

If we compare the two eras of frequent annual reversals, it is apparent that the earlier, 1788-1837, is more accentuated and may prove to have been longer; at any rate if the quieting down since 1932 continues after 1936. Fluctuations in all waist and decolletage dimensions are definitely more marked during the earlier unsettled era; in skirt proportions, during the later. This difference is of interest because

TABLE 23

Frequency of Fluctuation Units, 1788-1934
(As per fig. 7)

	In 5-year periods	In 15-year periods
1788-91	14	
1792-96	17	37 (14 years)*
1797-1801	6	
1802-06	8	
1807-11	6	19
1812-16	5	
1817-21	13	
1822-26	6	25
1827-31	6	
1832-36	3	
1837-41	0	3
1842-46	0	
1847-51	0	
1852-56	0	1
1857-61	1	
1862-66	0	
1867-71	0	2
1872-76	2	
1877-81	0	
1882-86	1	1
1887-91	0	
1892-96	1	
1897-1901	2	8
1902-06	5	
1907-11	4	
1912-16	4	16
1917-21	8	
1922-26	12	
1927-31	12	29 (13 years)†
1932-34	5	

*At rate of 40 in 15 years.
†At rate of 33 in 15 years.

the Napoleonic period also attained sharp climaxes in shortness and narrowness of skirt; but rather peacefully, so to speak, as compared with the 1926-27 climaxes. It would seem as if 1811-14 manipulated the skirt so far as it could without basically questioning its nature, whereas 1926-27 was calling its very existence into question; temporarily trying to rupture the basic pattern of skirt, so to speak. The earlier era was somewhat similarly, though on the whole less acutely, disturbed about waist and decolletage proportions. In brief, its revolutionizing attempts concerned the bust; the recent ones, the legs.

In connection with the somewhat greater frequency of early fluctuations, a statistical caution must be noted. Before 1834, the average number of observations per year is well under ten; since 1920, above ten. The annual means are therefore less well founded for the early era. Where observations number only five, three, two, or one for a year, fluctuations from the trend may be due to smallness of the random sample used; in other words, they may be apparent rather than real.

However, the long nineteenth-century or Victorian calm of small fluctuations is clearly beyond possibility of doubt.

VARIABILITY WITHIN THE YEAR

This is the standard deviation or sigma of the individual measures around their mean for the year. For uniformity among the six dimensions, these sigmas are expressed in percentages of their means; that is, they have been converted into Coefficients of Variability, $V = 100\ \sigma/M$.

The full list of V's is given in table 24; their five- and ten-year averages in tables 25 and 26.

TABLE 24

Percentage Sigmas of Annual Means, 1787-1936
($V = 100\ \sigma/M$)

Year	2	3	4	5	7	8
1787 ..	1.0	3.4	18.3	14.3		
1788 ..	3.3	2.3	38.2	11.9		
1789 ..	3.3	7.4	34.7	10.6	25.9	56.0
1790 ..	0.9	16.7	65.7	10.6	16.8	
1791 ..	0.7	5.8	11.2	7.1	8.3	23.3
1792 ..		1.8			3.8	
1793 ..	0.3	6.2	59.2	4.1	16.3	
1794 ..	0.0	6.4	7.1	10.2	14.6	21.1
1795 ..	3.3	7.6	24.6	15.8	6.9	10.7
1796 ..	0.5	8.7	44.7	3.8		
1797 ..	0.9	3.6	0.0	16.2	1.7	
1798 ..	0.8	5.2	12.9	7.2	11.1	22.2
1799 ..	1.1	8.1	21.0	14.5	15.3	26.3
1800 ..	0.7	12.4	22.1	14.4	16.1	12.9
1801 ..	1.4	11.8	9.5	29.2	9.4	5.9
1802 ..	0.0	6.7			3.5	
1803 ..	1.3	11.1	17.5	39.1	7.6	16.6
1804 ..	3.6	9.3	36.6	27.9	5.9	18.6
1805 ..	1.1	8.0	8.3	24.7	12.7	12.3
1806 ..	1.1	7.4	18.5	33.6	11.4	21.6
1807 ..	1.9	10.0	18.0	28.8	10.6	10.8
1808 ..	2.0	11.2	11.8	41.7	10.4	28.9
1809 ..	2.5	11.9	16.5	38.0	10.7	19.3
1810 ..	3.1	12.6	13.0	37.6	11.7	18.2
1811 ..	4.0	14.9	11.3	41.1	6.6	12.6
1812 ..	1.7	13.1	7.0	49.6	11.9	12.0
1813 ..	9.0	18.6	17.7	42.2	9.5	16.7
1814 ..	5.5	8.5	4.2	14.3	8.6	15.8
1815 ..	2.9	9.6	7.4	33.9	9.7	17.6
1816 ..	2.8	9.4	31.7	17.1	4.1	12.5

TABLE 24 (Continued)

Year	2	3	4	5	7	8
1817 ..	2.4	5.0	30.3	14.1		19.8
1818 ..	0.5	24.7	1.8	9.0	4.9	6.1
1819 ..						
1820 ..	5.7	7.5	1.9	4.6	5.8	2.3
1821 ..	2.3	7.9	6.9	3.8	4.0	10.0
1822 ..						
1823 ..	1.7	7.2	1.4	1.9	4.4	2.7
1824 ..	6.5	12.6	18.1	33.0	8.9	2.2
1825 ..						
1826 ..	2.1	23.7	0.0	6.2	3.5	12.6
1827 ..	3.9	9.9	9.5	7.4	17.1	5.2
1828 ..	2.9	7.0	8.0	2.8	8.1	10.1
1829 ..	2.5	7.9		11.6	6.7	5.4
1830 ..	2.3	8.2	10.4	6.2	14.9	2.0
1831 ..	2.5	13.9	3.4	9.6	7.1	
1832 ..	1.2	4.5	2.2	12.6	5.5	5.0
1833 ..						
1834 ..	4.5	4.2	13.8	6.8	5.7	12.0
1835 ..	1.4	5.7	19.7	12.0	1.1	37.2
1836 ..	1.7	7.5	14.2	4.6	4.1	12.5
1837 ..	1.4	6.9	16.2	16.1	8.5	22.2
1838 ..	0.9	5.8	12.7	5.5	7.6	12.5
1839 ..	0.5	4.4	12.4	11.2	15.8	6.5
1840 ..	2.0	6.5	14.2	10.3	16.7	15.4
1841 ..	0.7	4.1	11.2	8.5	8.4	15.9
1842 ..	2.9	5.8	12.4	13.6	16.8	21.4
1843 ..	1.4	5.1	12.4	9.0	8.8	10.7
1844 ..	1.2	4.2	11.1	6.2	6.8	5.8
1845 ..	0.5	3.7	9.1	4.7	5.8	4.2
1846 ..	1.1	3.5	8.6	1.6	5.7	5.0
1847 ..	0.8	5.8	10.4	1.7	4.2	6.9
1848 ..	0.0	4.5	10.6	3.9	5.9	7.6
1849 ..	1.0	2.2	8.7	6.7	8.2	6.5
1850 ..	0.4	4.2	8.0	5.7	8.1	6.1
1851 ..	0.9	3.8	10.9	8.5	6.0	5.2
1852 ..	1.3	3.7	9.6	7.4	5.5	10.4
1853 ..	0.7	2.8	10.1	5.4	5.6	11.9
1854 ..	0.3	2.9	9.3	12.7	8.2	7.6
1855 ..	1.0	5.9	9.0	9.6	7.9	8.0
1856 ..	1.3	6.1	15.1	3.5	5.7	5.8
1857 ..	0.8	6.5	13.9	3.7	14.8	13.7
1858 ..	0.8	2.6	15.5	7.2	8.1	7.4
1859 ..	0.0	3.2	14.9	4.1	10.1	19.2
1860 ..	0.6	5.9	2.7	2.7	6.4	7.6
1861 ..	0.0	4.2	11.5	7.0	12.5	4.2
1862 ..	0.8	6.3	14.6	6.2	11.4	7.6
1863 ..	1.4	1.4	7.6	4.7	0.0	9.9
1864 ..	1.0	4.7	3.7	3.9	7.4	9.6
1865 ..	0.4	5.0	12.7	4.7	5.8	8.6
1866 ..	0.6	4.9	13.3	1.5	9.5	7.8
1867 ..	1.5	4.6	15.9	7.2	7.9	12.0
1868 ..	1.5	6.8	8.1	15.1	12.5	12.9
1869 ..	0.0	2.8	10.4	10.7	0.0	9.4
1870 ..	1.3	6.3	10.9	16.3	17.2	17.0
1871 ..	0.9	7.7	12.5	21.8	0.0	17.5
1872 ..	1.1	8.7	16.1	12.6	7.5	7.4
1873 ..	1.3	5.8	9.6	9.5	8.2	22.1
1874 ..	1.0	3.9	4.5	12.4	5.3	14.1
1875 ..	0.0	7.3	8.0	10.2	4.7	3.7
1876 ..	1.2	7.9	10.4	8.9	11.8	25.9

TABLE 24 (Concluded)

Year	2	3	4	5	7	8
1877 ..	1.0	4.2	8.3	13.5	10.8	16.1
1878 ..	1.6	5.9	11.8	15.1	6.5	17.8
1879 ..	1.1	3.6	10.0	13.0	4.9	9.4
1880 ..	1.1	3.3	8.9	25.1	4.1	7.4
1881 ..	1.7	4.9	10.3	30.9	5.9	8.5
1882 ..	2.4	3.8	11.1	39.4	4.7	12.9
1883 ..	0.9	6.4	7.1	34.3	6.1	8.1
1884 ..	1.8	4.5	6.8	25.9	9.9	7.1
1885 ..	1.9	5.3	8.5	33.5	9.6	13.4
1886 ..	1.4	7.5	12.0	27.0	16.5	21.1
1887 ..	1.7	4.3	7.4	23.6	9.1	9.9
1888 ..	1.0	5.9	12.3	32.4	12.0	14.1
1889 ..	2.0	5.6	8.1	26.7	13.8	17.1
1890 ..	1.1	5.2	9.6	21.6	7.9	13.8
1891 ..	1.2	6.9	10.4	27.2	7.0	8.1
1892 ..	0.9	6.4	11.8	22.2	7.7	20.8
1893 ..	1.2	7.8	15.2	27.5	14.2	16.3
1894 ..	1.0	6.9	7.5	15.3	8.2	13.5
1895 ..	1.2	8.5	10.6	15.6	8.5	19.2
1896 ..	1.2	5.4	12.5	7.1	13.5	12.7
1897 ..	0.3	3.3	15.6	9.2	5.8	15.4
1898 ..	0.6	4.8	24.7	9.0	10.1	20.7
1899 ..	0.0	3.7	8.1	11.0	12.7	12.5
1900 ..	0.8	5.0	12.8	8.2	7.3	14.2
1901 ..	0.6	7.1	14.0	6.0	9.4	31.8
1902 ..	0.0	9.1	15.5	14.2	7.9	22.3
1903 ..	0.0	8.3	14.0	18.5	7.1	22.9
1904 ..	0.0	5.0	17.8	10.3	6.8	14.3
1905 ..	0.0	3.0	9.3	7.7	3.6	12.4
1906 ..	0.9	8.3	13.7	5.0	10.5	20.6
1907 ..	0.8	6.2	13.2	20.2	16.5	17.2
1908 ..	1.0	6.2	23.1	11.3	13.8	19.2
1909 ..	0.6	7.4	25.1	15.7	13.5	14.9
1910 ..	1.8	6.8	17.9	24.7	7.8	13.0
1911 ..	1.1	4.3	15.9	24.4	7.8	12.0
1912 ..	2.1	8.4	8.7	19.4	9.3	9.3
1913 ..	4.4	7.3	20.5	37.1	15.0	16.2
1914 ..	2.2	6.1	18.8	46.0	14.5	11.8
1915 ..	3.4	13.1	12.0	51.5	10.8	10.4
1916 ..	4.3	8.0	21.7	27.3	12.4	21.8
1917 ..	5.3	5.7	5.3	36.0	19.1	10.7
1918 ..	1.9	7.6	14.9	40.8	7.6	11.5
1919 ..	6.6	10.6	13.9	64.5	8.6	12.5
1920 ..	3.8	6.2	16.4	44.3	9.3	17.4
1921 ..	5.1	14.8	27.5	35.8	13.5	26.6
1922 ..	3.8	10.7	31.9	54.5	10.2	12.6
1923 ..	3.0	17.6	30.6	52.6	6.9	21.5
1924 ..	4.6	13.3	19.7	44.7	11.4	9.6
1925 ..	3.3	19.8	28.0	30.4	11.3	15.9
1926 ..	3.1	19.2	18.5	17.6	8.3	15.5
1927 ..	1.9	13.2	17.3	19.0	13.8	15.0
1928 ..	5.4	7.7	18.3	52.3	11.3	8.0
1929 ..	4.4	10.8	12.7	23.0	24.2	23.1
1930 ..	6.4	12.1	10.4	19.2	31.0	10.1
1931 ..	3.8	11.3	21.7	19.7	17.4	28.5
1932 ..	2.6	12.4	22.3	29.6	17.3	24.2
1933 ..	3.0	8.8	28.6	27.3	26.2	21.9
1934 ..	1.4	8.1	44.7	23.8	16.4	35.3
1935 ..	2.1	14.1	33.8	29.2	23.5	29.1
1936 ..	2.1	10.0	32.8	39.3	17.3	36.6

TABLE 25

Five-Year Averages of Percentage Sigmas, 1787-1936
(V = 100 σ/M)

Period	2	3	4	5	7	8
1787-91	1.8	7.1	33.6	10.9	10.2	19.8
1792-96	0.8	5.8	27.1	6.8	8.3	15.9
1797-1801 ..	1.0	8.2	13.1	16.3	10.7	13.5
1802-06	1.4	8.5	16.2	25.1	8.2	13.8
1807-11	2.7	12.1	14.1	37.4	10.0	18.0
1812-16	4.4	11.8	13.6	31.4	8.8	14.9
1817-21	2.2	9.0	8.2	6.3	3.0	9.6
1822-26	2.6	10.5	4.9	10.3	4.2	4.4
1827-31	2.8	9.4	6.3	7.5	10.8	4.5
1832-36	2.2	5.5	12.5	9.0	4.1	16.7
1837-41	1.1	5.5	13.3	10.3	11.4	14.5
1842-46	1.4	4.5	10.7	7.0	8.8	9.4
1847-51	0.6	4.1	9.7	5.3	6.5	6.5
1852-56	0.9	4.3	10.6	7.7	6.6	8.7
1857-61	0.4	4.5	11.7	4.9	10.4	10.4
1862-66	0.8	4.5	10.4	4.2	6.8	8.7
1867-71	1.0	5.6	11.6	14.2	7.3	13.8
1872-76	0.9	6.7	9.7	10.7	7.5	14.6
1877-81	1.3	4.4	9.9	19.5	6.4	11.8
1882-86	1.7	5.5	9.1	32.0	9.4	12.5
1887-91	1.4	5.6	9.6	26.3	10.0	12.6
1892-96	1.1	7.0	11.5	17.5	10.4	16.5
1897-1901 ..	0.5	4.8	15.0	8.7	9.1	18.9
1902-06	0.2	6.7	14.1	11.1	7.2	18.5
1907-11	1.3	6.2	19.0	19.3	11.9	15.3
1912-16	3.5	8.6	16.3	36.3	12.4	13.9
1917-21	4.5	9.0	15.6	44.3	11.6	15.7
1922-26	3.6	16.1	25.7	40.0	9.6	15.0
1927-31	4.4	11.0	16.1	26.6	19.5	16.9
1932-36	2.2	10.7	32.4	29.8	20.1	29.4

TABLE 26

Ten-Year Averages of Percentage Sigmas, 1787-1936
(V = 100 σ/M)

Period	2	3	4	5	7	8
1787-96	1.3	7.0	*30.4	8.9	9.3	‡17.9
1797-1806 ..	1.2	8.4	14.7	20.7	9.5	13.7
1807-16	‡3.6	‡12.0	13.9	‡34.4	9.4	16.5
1817-26	2.4	10.0	6.6	8.3	3.6	6.0
1827-36	2.5	7.5	9.4	8.3	7.5	10.6
1837-46	1.3	5.0	12.0	8.7	‡10.1	12.0
1847-56	0.8	4.2	10.2	6.5	6.5	7.6
1857-66	0.6	4.5	11.1	4.6	8.6	9.6
1867-76	0.9	6.2	10.7	12.5	7.4	14.2
1877-86	1.5	5.0	9.5	25.8	7.9	12.2
1887-96	1.1	6.3	10.6	21.9	10.2	14.6
1897-1906 ..	0.3	5.8	14.6	9.9	8.2	18.7
1907-16	2.5	7.4	17.7	27.8	12.2	14.6
1917-26	*4.1	*12.6	20.7	*42.2	10.6	15.4
1927-36	3.3	10.9	‡24.3	28.2	*19.8	*23.2

*Highest value in column.

‡Second highest (other than in adjacent decennia).

It is at once evident that the variability is markedly different among the six dimensions. Dress length, dimension 2, again shows much the lowest variability, and waist length next least. The four other dimensions run about alike; though the two decolletage measures show a strong preponderance of V's between 10 and 20. The little subjoined table (no. 27, based on table 25) shows the distribution of size of five-year averaged V's.

TABLE 27

Distribution of Size of Variability Coefficients (Five-Year Averages) Among the Six Measures

Variability coefficients	2	3	4	5	7	8
1.9 or less ..	19	--	--	--	--	--
2.0-4.9	11	7	1	2	3	2
5.0-9.9	--	17	7	8	14	5
10.0-19.9	--	6	18	10	12	22
20.0-50.0	--	--	4	10	1	1

It can be concluded from this that dress length, and next to it waist length, can be varied least from the ideal norm of a given moment if a dress is to be within fashion. With respect to decolletage and all transverse dimensions, the style is much less strict, and much more variability is exercised, within the year and within a five-year period. What our aesthetic taste assumes as primary in the style norm, and inhibits too great departures therefrom, is the length of the dress as a whole; next, the position of the waist constriction. Skirt fullness, waist diameter, and length and breadth of decolletage are allowed much more individual variation from dress to dress.[22]

The first thing that is evident from tables 25 and 26 is that there are once more an early period of high variability, a middle one of low, and a recent one that is high again. A table could be constructed that would be similar to table 23. Instead, in table 28 we give the maxima of V in five-year means.

[22]These different behaviors of the six dimensions are perhaps partly a function of their absolute size: No. 2 is of course by far the largest measurement, and Nos. 4, 7, and 8 the smallest. With the small dimensions, the probability of error of caliper measurement is greater, presumably tending to increase the variability. However, the differences are not wholly a function of size, because skirt width (No. 5) consistently runs larger than waist length (No. 3), yet has a variability like that of the small dimensions. At least a considerable part of the variability difference between the dimensions therefore represents stylistic quality.

TABLE 28

Maxima of Five-Year Averages of Coefficients of Variability

Period	2	3	4	5	7	8
1787-91			34			40
1792-96						
1797-1801					11	
1802-06						
1807-11		12		37		
1812-16	4					
1817-21						
1822-26						
1827-31					11	
1832-36						
1837-41					11	
1842-46						
1847-51						
1852-56						
1857-61						
1862-66						
1867-71						
1872-76						
1877-81						
1882-86						
1887-91						
1892-96						
1897-1901						
1902-06						
1907-11						
1912-16						
1917-21	5			44		
1922-26		16				
1927-31						
1932-36			32		20	29

Much the same appears from the stars and double daggers in the ten-year table 26.

As before, high variability tends to be associated with extreme of dimension, but not consistently so. The reason for the inconsistency is in this case clear, and will be the next point discussed.

It occurred to us to plot together the dimension means and their variability coefficients on scales calculated to bring out such similarity of course as they might or might not possess. Five-year averages were used to plot skirt and waist, ten-year for decolletage. Figures 8 to 10 show the results.

It is clear that in four cases out of six, and mainly in a fifth, there is a definite and surprising relation between large dimension and low variability; conversely, when the dimension shrinks, the variability goes up. This is very conspicuous for both skirt and both decolletage diameters (Nos. 2, 5, 4, 8; figs. 8, 10). It holds also fairly well for waist length (No. 3; fig. 9), except before 1821 and after 1921, when it reverses.[23] Waist width (No. 7; fig. 9) must be read reversed (low variability accompanying low mean values) throughout, to achieve the best fit.

Now what is the meaning of this relation of dimension magnitude and variability? Evidently that when fashion brings a given trait to a certain magnitude, the style is harmonious and well-knit on that point, and individual productions, or designs, are in close concord. Conversely, when this magnitude is departed from, the style is under strain as regards that feature, and efforts are made simultaneously to recede from the magnitude attained and to advance beyond it. In other words, from the angle of underlying pattern of style, there seems to be an optimum magnitude or proportion for each feature, when variability is low, and the style is concurred in because it is felt to be satisfying.

There appears no reason why this explanation should not be applicable to the minority of cases in which low variability accompanies low mean values. That is to say, in most of our traits the basic style is felt as satisfying, and re-

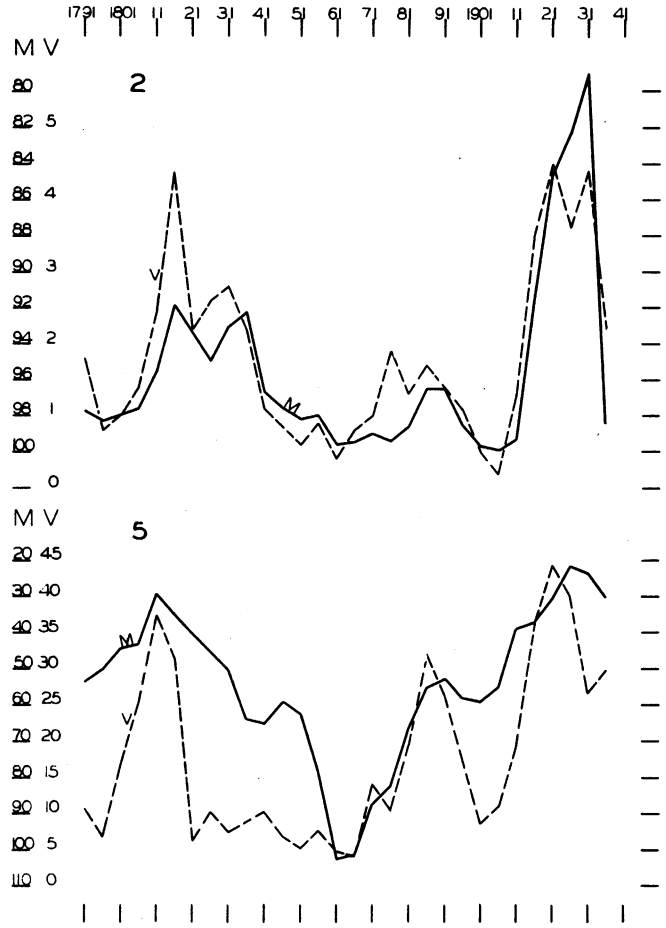

Fig. 8. Relation of variability (V) and amplitude of dimension (M) in skirt length (2) and width (5), 1787-1936.

[23] In No. 3 of fig. 9, V above 10 and M below 20 or above 32 have been indicated by extra blackness of line, to emphasize that before 1821 and after 1921 the variability reacts to extreme means in opposite manner.

mains stable, when the silhouette dimension is ample; but in other traits, when it is small or medium.

On this interpretation we can construct a basic or ideal pattern of Occidental women's evening or formal dress during the past 150 years. It has a long skirt, ample at the bottom; an expanse of bare breast and shoulders, as deep and wide as possible, although for mechanical reasons only one diameter can well be at maximum at the same time; as slender a waist as possible; and a middle or natural waist-line position, between 22 and 30 by our scale; when the waist line gets beyond these limits, and crowds either the breasts or the hips, the basic pattern is violated, resistance and extravagance are developed, and the variability rises.

To put it differently, a confining corset may be uncomfortable to the wearer, but it is felt as aesthetically satisfying by Europeans of the last century and a half, even if it constricts unnaturally, provided it comes at or near the natural waist. Skirts on the other hand cannot be too full or too long, and breast and shoulder exposure too ample in evening dresses, to satisfy the ideal of the style.

However, we have not only this basic pattern or ideal style, which is aesthetic with a tinging of the erotic, but also a concept of temporary mode or fashion as such, which demands change, and, when it has exhausted the possibilities of material, color, and accessories, goes on to alter the fundamental proportions, in other words the basic aesthetic pattern. With such alteration there comes strain, simultaneous pulling forward and back; violent jumps in opposite directions within one or two or three years, and heightened statistical variability.

The several proportions are successfully attacked and distorted by fashion at somewhat different times, and hence the picture is complicated. Nevertheless, there emerge periods of a generation or so when fashion is particularly active in its attempts to break up or pervert the basic pattern. Such are the decades 1785 to 1835, and 1910 to the present. Between them, there lies a longer period of essential agreement and stability and low variability, in which

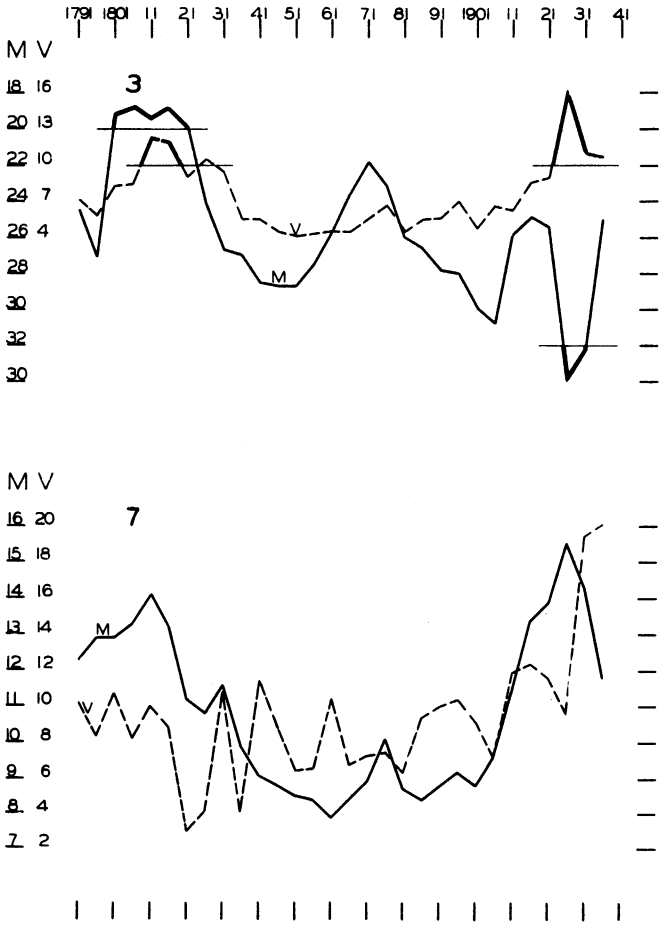

Fig. 9. Relation of variability (V) and amplitude of dimension (M) in waist length (3) and width (7), 1787-1936.

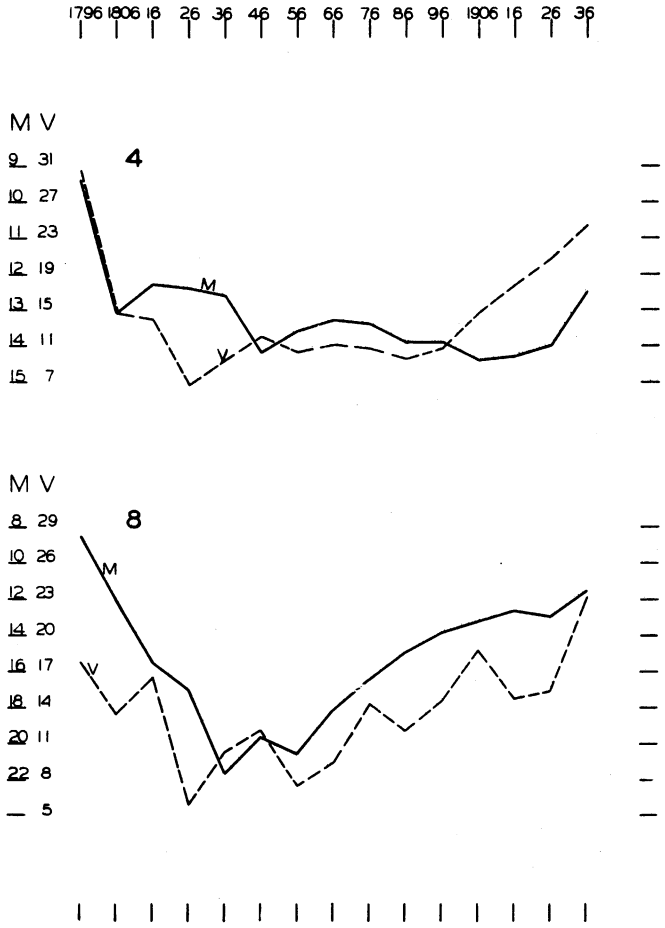

Fig. 10. Relation of variability (V) and amplitude of dimension (M) in decolletage depth (4) and width (8), 1787-1936.

fashion accepted, or fulfilled, the pattern while modifying it in superficial detail.

We have too few data to compute variabilities before 1787. This is unfortunate because most of the eighteenth century evidently resembled the middle and late nineteenth in holding fairly close to what we have determined as the basic pattern: the skirt full and rather long, at least not markedly short; the waist, if not narrow, at least accentuated, and in median position; decolletage considerable. If our hypothesis holds, the bulk of the eighteenth century should accordingly prove to be a period of low variability, on assembly of sufficient data.[24]

However, we can make the trial assumption that the specific associations of variabilities with crests which we have found to hold since 1787 also held before that date, and see how the results plot out. That is to say, while we have no reliably computable variabilities for most of the seventeenth and eighteenth centuries, we do have fair approximations to the points in time at which the maxima and minima of dimensions fall; and by plotting the maxima and minima for the whole three-hundred-odd years, we may hope to discover whether the pre-1787 period shows a tendency toward clustering of crests comparable to that after 1787. The result of the experiment is shown in figure 11. Solid circles show those dimension crests, whether maxima or minima, which since 1787 have been associated with low variabilities and pattern stability; hollow circles, crests with the opposite association.

The diagram makes it evident that there was a clustering of crests between 1630 and 1680. Seven of the ten crests in this period fall between 1645 and 1665.

However, the ten crests are nearly evenly divided between those hypothetically associated with high and with low variability, and the two kinds are interdistributed scatteringly. While we may accordingly infer that the mid-seventeenth century was a period of attainment of style dimension extremes, and rapid alternation between extremes in at least some features, there is nothing to prove that the particular post-1787 associations of one of a pair of ex-

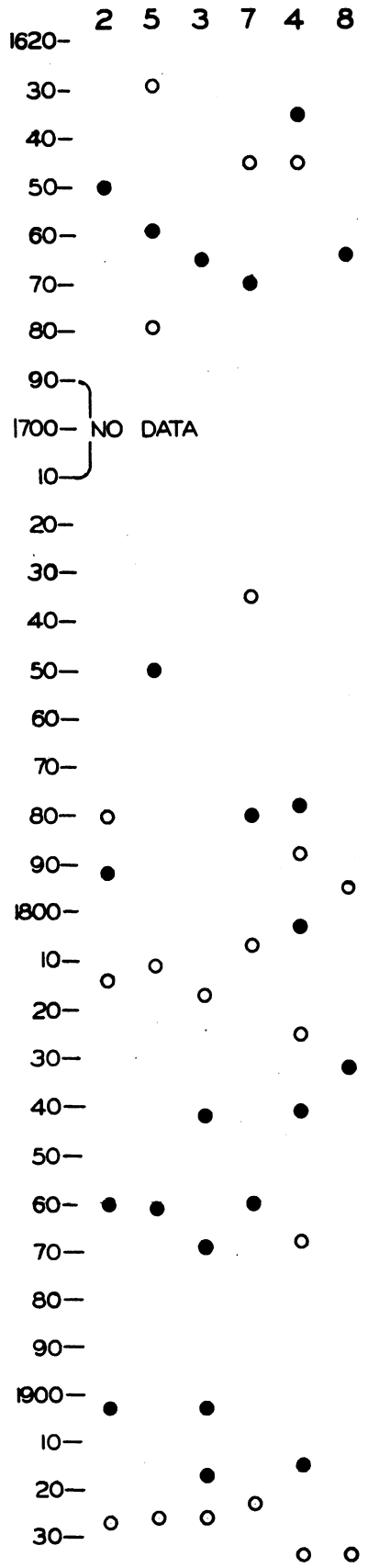

Fig. 11. Clustering of extremes as related to variability.

Solid circles: Maxima in dimensions 2, 5, 4, 8; minima in 7; moderate crests in 3; associated with low variabilities and conformity to pattern since 1787 (no earlier data available on variability).

Hollow circles: Minima in dimensions 2, 5, 4, 8; maxima in 7; extreme crests in 3; associated with high variabilities and pattern strain since 1787 (no earlier data available on variability).

[24] It would also be desirable to try to define the basic pattern of dress by inclusion of more features than the six so far dealt with. The treatment of the arms, bust, and hips, in the basic pattern, have not been considered at all. There are important traits here: sleeves; prominence and position of the bust; proportion of the hips to shoulders, bust, and base of skirt--compare for instance the Grecian bend and bustle fashions with the recent one of hips larger than base of the skirt. But the difficulties are considerable in dealing with these features over longer ranges of times: some disappear and reappear, others require profile views for full measurement. Nevertheless something could no doubt be ascertained by further analysis.

tremes with heightened variability already held in the seventeenth century.

Now follow nearly a hundred years, from 1680 to 1777, with but two peaks, in dimensions 5 and 7. Even on allowance for there being no data for 1690-1710, there remains a three-quarter-century span with but these two crests. Under such pervading stability, variability may be presumed to have been low.

The next forty years, 1778 to 1817, show eleven crests. Four of these are of the type determined as of low variability, seven of high. Moreover, the low-variability ones fall mostly within the first half of the period (mean date 1788), the high in the latter half (mean date 1802).

The following eighty-odd years, to 1900, possess nine crests, seven of them of low-variability type. The period seems to consist of two spans. First, some two decades, 1825-42, of quieting down from the preceding turbulence. Then a long calm, only slightly ruffled by four low-variability crests (and one high) in the 1860-69 decade, and none at all for three decades after. This Victorian era was certainly placid in fashion.

From 1900 to date, there are ten crests, the four earliest of low variability, the last six of high. Or we might say that 1903-17 was a time in which variability was increasing but only low-variability maxima were reached; it was a final phase of the preceding stable period: strain was already manifest but reaffirmations of the dying pattern were being made. The period 1923-34, by contrary, shows in every feature examined a crest which is in extreme opposition to what prevailed during the long Victorian calm and is in each instance accompanied by very high variability. Table 29 summarizes this.

TABLE 29

Extremes of Dimension and Variability by Period

Period (rounded)	Years	Dimension extremes			
		Low var.	High var.	Total	Per decade
1630-1680 ...	50	(6)	(4)	10	2.0
1681-1777 ...	97	(1)	(1)	2	0.2
1778-1817 ...	40	4	7	11*	2.7
1818-1902 ...	105	7	2	9	0.9
1903-1934 ...	32	4	6	10	3.1

*The variability type of three crests before 1787 is not known.

It is clear from this table as well as figure 11 that there occur in European women's dress alternating longer periods in which a basic pattern of style is rather stably adhered to, relatively few extremes of proportion or dimension are sought, and those all in a direction accompanied by only low variability from year to year and dress to dress; and shorter periods in which basic pattern is disrupted or transformed, extremes of proportion are numerous, and high variability prevails.

This differentiation of periods is positive in all respects for the era since 1787. It holds as regards stability of basic pattern and infrequency of extremes for the hundred and eighty years preceding. Whether it also holds for the association of variability with those extremes which conflict with enduring stable patterns, we have not the evidence to prove or disprove; but at least there is nothing in the imperfect pre-1787 picture to argue against such variability association.

CAUSALITY OF CHANGE

We are now in position better to weigh the several possible causes of changes in variability.

The primary factor would seem to be adherence to or departure from an ideal though unconscious pattern for formal clothing of women. The consistent conformity of variability to certain magnitudes of proportion--mostly a conformity of low variabilities to high magnitudes--leaves little room for any other conclusion.

A second possible explanation, that high variability is a function of extremes of proportion, falls as such. It is true for a full waist and a narrow or short skirt, untrue for slender waist or full or long skirt. The explanation holds only so far as it is subsumed in that of the basic pattern.

A third possible explanation, that generic or nonstylistic factors unsettle fashion at certain times, is not eliminated, but is pushed into the background of further investigation. After all, such a cause would be an ultimate, not an immediate one. It may well be that unsettled times make for unsettled styles. Revolution, Napoleonic and World wars, struggles over the rights of man, Communism and Fascism, the motor and jazz, may contribute to fashion's trying to stretch and disrupt its fundamental stylistic pattern. But while such an influence is easily conjectured, it is difficult to prove. In any event, there seems no clear reason for the specific fashion extremes which such a set of causes might be thought to produce. Social and political unsettlement as such might produce stylistic unsettlement and variability as such; but there is nothing to show that it would per se produce thick waists, ultra-high or low ones, short and tight skirts. If there is a connection here, it seems that it must be through alteration of the basic semi-unconscious pattern, through an urge to unsettle or disrupt this; and that when increased fashion variability occurs, it is as a direct function of pattern stress, and only indirectly, and less certainly, of sociopolitical instability. In short, generic historic causes

tending toward social and cultural instability may produce instability in dress styles also; but their effect on style is expressed in stress upon the existent long-range basic pattern of dress, and the changes effected have meaning only in terms of the pattern.

Concretely, it would be absurd to say that the Napoleonic wars, or the complex set of historic forces underlying them, specifically produced high-waisted dresses, and the World War low-waisted ones. They both probably did produce an unsettlement of style, which, however, resulted in extremity of high and low waistedness respectively.[25]

Herewith arises another question: whether the crests and troughs of waves of fashion, its periodicities discussed in section IV, are perhaps also to be sought not in anything inherent in fashion, but rather in more general historic causes. In favor of such a view is the heavier clustering of trait extremes in Revolutionary-Napoleonic, World-War, and immediately subsequent decades. But again there are crests also in the intervening period. What is specifically characteristic of the agitated periods is not so much extremes of dimension or proportion, as extremes of high variability; and these in turn correlate with certain minima and maxima of proportion, but not with their opposites. The significant fact remains that high variability is not associated with <u>any</u> dimensional crest, but always[26] with only one of a pair of opposing extremes. This throws us back on the basic pattern as something that must be recognized.

Now, one can indeed accept this basic pattern, but accept it as something intrinsically tending to remain more or less static over a long period, or the whole of a civilization; and then attribute the more marked variations from it to broader historic disturbing causes, rather than to anything stylistically inherent and tending from within toward swings away from and back toward the pattern. On this view the century-long cycle which we have found to hold for most of our fashion traits would not be a property of style per se, but a by-product of the fact that Europe happened to be generically disturbed in the decades around 1800 and 1920.

VIII. CONCLUSIONS

Our first finding is that the basic dimensions of modern European feminine dress alternate with fair regularity between maxima and minima which in most cases average about fifty years apart, so that the full-wave length of their periodicity is around a century.

By comparison, annual changes, and even those of moderately long periods of moderate length, generally are markedly less in degree or amplitude. This conclusion applies to the major proportions of the total silhouette. Superstructural features have not been examined quantitatively, but appear to develop and pass away completely in briefer cycles. The present study is concerned with the variations in persistent features.

There appear accordingly to be two components in dress fashions. One is mode in the proper sense: that factor which makes this year's clothes different from last year's or from those of five years ago. The other is a much more stable and slowly changing factor, which each year's mode takes for granted and builds upon. It cannot be pretended that these two factors are definably distinguishable throughout. Behavioristically, however, they can mostly be separated by the length and regularity of the changes due to the more underlying component.

It is evident that the basic features of style as distinct from more rapidly fluctuating mode, being taken for granted at any given moment, are largely unconscious in the sense that they are felt as axiomatic and derivations are made from them, but they are not tampered with, except again unconsciously.

This in turn seems to imply that the rôle of particular individuals in molding basic dress style is slight. The influence of creative or important individuals is probably largely exerted on the accessories of transient mode. How great it is there, has never been objectively examined, and would be difficult to investigate. Historians of fashion may be partly right or mainly fictitious in the influence they assign to Marie Antoinette, Recamier, Eugénie, and the various Princes of Wales. The reverse is much more likely, that individuals conform to the style which they find in existence, operate in minor ways within its configuration, and at times of coincidence receive false credit for "causing" <u>one or more</u> of its features.

[25] The Empire mode was consciously Greek or Neo-Classic. It professed to take over from antiquity a full and rather high waist and a falling instead of flaring skirt. It obviously did not take over from antiquity its own short skirt and wide decolletage, nor its ultra-high waist, nor a tight, undraped skirt, nor short puff-sleeves. In brief, Empire dress style fell in with the catchwords of its day, and in consonance with the social currents and political currents of its time, which aimed toward the Classic, accepted just as much of Classic dress style as suited its own trends, and for the rest followed these trends while calmly ignoring or violating all the remaining features of its supposed model.

[26] Excepting dimension 3, waist length, where low variability is associated with medium magnitude.

The long swings of proportion which we have determined seem comparable to what economists call secular trends, which also carry oscillations or lesser cyclic movements on their surface. No one attributes either these larger economic trends or the fluctuations to individual initiative. It is of course conceivable that economic determinants are social in their nature and stylistic ones individual. In fact this is often assumed. However, such an assumption is naïve in the sense of being critically untested. It is rather more likely that what holds in one domain of human culture holds also in another. At any rate, the burden of proof must rest on the contrary view. And this burden has certainly doubled since we have shown that dress-style changes behave historically somewhat like economic ones; in the stateliness of their march, or trend, for instance, and in their superimposed cycles or oscillations.

The evidence to date shows that when a proportion has swung one way to its extreme and gone halfway the other, it may oscillate for a decade or two part way back to the first extreme, but normally it resumes its swing toward the opposite. But this is a behavioristic finding, and a priori may just as well be due to cultural as to personal causes. So far as individuals are concerned, the total situation seems overwhelmingly to indicate that their actions are determined by the style far more than they can determine it.

No generic significance can be claimed for the value of a century found for the average periodicity or wave length of dress proportions. It is only a mean, though it is rather closely adhered to in three of our six features. Obviously, other features, or styles other than modern European ones, may possess quite different periodicities. In fact, there is no reason why style in general, or even dress style, should necessarily swing rhythmically back and forth. Our findings apply only to the material analyzed.

Definitely significant is the fact that there are periods of high and of low variability of style. These come out much alike whether it is a matter of variations of yearly averages from the five-year moving mean, or of variations of individual dresses from the year's mean. Within the last century and a half, 1787-1835 (especially before 1820) and 1910-36 are periods of high variability. The intervening seventy-five or more years show low variability. The available measures scarcely allow of variability computations for most of the eighteenth century, but the general pattern apparently underwent no very marked alterations in that century until after 1775.

The two high-variability periods also contain more crests or extremes of proportion than the intervening seventy-five years or than the stable bulk of the eighteenth century. There is therefore a relation between extremes and variability.

However, this relation is one-sided. For four of the six proportions examined, variability rises as the proportion or diameter shrinks, becomes low as this reaches ampleness. For a fifth proportion, waist width, the relation is the opposite. For the sixth, variability becomes acute when the measure is either very high or very low.

High variability thus is more completely limited to certain periods than are extremes of the proportions or diameters themselves. Those of the diameter extremes which are accompanied by low variability fall in some cases into the long stable interval.

The best explanation that we are able to suggest for these phenomena is that of a basic pattern of women's dress style, toward which European culture of recent centuries has been tending as an ideal. This pattern comprises amplitude in most dimensions, scantness or medium value in others. As these proportions are achieved, there are equilibrium, relative stability, and low variability. The pattern may be said to be saturated. At other times, most or all of the proportions are at the opposite extreme, which may be construed as one of strain, and variability rises high. This basic or ideal pattern, for Europe of the last two or three centuries, requires a skirt that is both full and long, a waist that is abnormally constricted but in nearly proper anatomical position, and decolletage that is ample both vertically and horizontally.

The periods of computed high variability and therefore of "strain" or perversion of pattern coincide fairly closely with the Revolutionary-Napoleonic and World War-post-War eras. Generic cultural or historic influences can therefore probably be assumed to affect dress-style changes. Sociocultural stress and unsettlement seem to produce fashion strain and instability. However, they exert their influence upon an existing stylistic pattern, which they dislocate or invert. Without reference to this pattern, their effect would not be understood.

While we have no reliable variability measures before 1787, it is clear that in the decades surrounding 1650-60 there was an accumulation of proportion extremes similar to those of 1787-1835 and 1910-36. The mid-seventeenth century may thus have been a third period of pattern strain, rapid change, and variability.

The explanation propounded is not that revolution, war, and sociocultural unsettlement in themselves produce scant skirts and thick and high or low waists, but that they disrupt the established dress style and tend to its overthrow or inversion. The directions taken in this process depend on the style pattern: they are subversive or centrifugal to it. By contrary, in "normal" periods dress is relatively stable in basic proportions and features: its variations tend to be slight and transient--

fluctuations of mode rather than changes of style. In another civilization, with a different basic pattern of dress style, generic sociocultural unsettlement might also produce unsettlement of dress style but with quite different specific expressions--slender waists and flaring skirts, for instance, or the introduction or abolition of decolletage.

It is conceivable that the method pursued in this study may be of utility as a generic measure of sociocultural unsettlement. Also, it provides an objective description of one of the basic patterns characteristic of a given civilization for several centuries, and may serve as a precedent for the more exact definition of other stylistic patterns in the same or other civilizations.

It also seems possible that the correlation with general conditions explains the near-regularity in the periodicities of dress. If these largely express pattern disturbances due to disturbances more general in the culture, there is no need to fall back on assumptions of an unknown factor inherent in dress itself and making for rhythmic change.

We have deliberately avoided explanation of our phenomena in terms of psychological factors such as imitation, emulation, or competition, which are a stock explanation: the leaders want to surpass the mass, so they keep going one step farther, until a physical limit is reached, when they turn about and head the procession back. We do not deny that such psychological motivations may be operative. We do believe that as explanations they are conjectural, and scientifically useless, because, to date at least, they depend on factors which are unmeasurable and undefinable. On the contrary, we think we have shown that through behavioristic and inductive procedures operating wholly within the sociocultural level, functional correlations can be established for such supposedly refractory cultural manifestations as style and fashion changes.

APPENDIX

By A. L. Kroeber

Allport and Hartman[27] have analyzed the method of my paper of 1919, along with Chapin's book on Cultural Change. Some of their criticisms will presumably be raised, by them or others, against the present study. It seems therefore worth while to consider their arguments.

First of all, it is significant that Allport and Hartman call their analysis "The Prediction of Cultural Change."[28] This was certainly not my main purpose. I find only two predictions in my paper; and neither of these is material.[29] Both are affirmations of emphasis of my conviction that there is "order" or "regularity" in style changes. If it will clarify the issue, I shall be glad to withdraw both predictions as having been unnecessary.

Why the emphasis of the analysis is so strong on prediction, is hard to see, especially as Chapin's Cultural Change also is concerned primarily with change and not with prophecy. The probable explanation is that the analysts, in common with most sociologists and economists, are themselves interested in the future, in the practical consequences or applications of study, in short are so committed to what they call the "telic" approach, that they assume it and the historic approach to be the only ones possible in the field of social data.

It seems to me that my approach in the former paper was a "natural science" one in the sense that it was empirical, inductive, objective, and free of any motivation of applicability or social control. It is also a "genetic" approach in the sense that it deals with unique historical phenomena not subject to experimental verification. How far the approach is "stylistic" in the Allport-Hartman sense, other than that the material dealt with concerns style, I cannot say, because I do not understand their definition of this approach. It seems rather a subdivision of the "genetic," in so far as styles are historical phenomena. In fact, is not the primary concern of history and cultural anthropology, so far as they transcend the writing of individual biographies, precisely a dealing with "styles" of human behavior? The one thing that my paper was free from, as I see it, was telic or practical approach. I may be wrong here: one is a poor judge of his own motivations: but it is also possible that Allport and Hartman have started out with preconceptions which have caused them to misunderstand my objectives, underlying and patent. At any rate, so long as theirs is the only formal criticism which my article has evoked, I should like to go on record.

Where I have presumably given provocation is in the loose use of deterministic terms such as law (usually in quotation marks), principle, cause, order, and regularity. If it will clear the atmosphere toward understanding, I will cheerfully retract any of these that are confusing. There is no use quarreling over metaphors. That there is a certain "order" or "regularity" in the phenomena, enough to prevent their being construed as due to the caprices of individual human wills, I continue to believe, and think Dr. Richardson and I have overwhelmingly proved in the present paper. "Determinism" in this sense I adhere to: that the actions of individual persons are determined much more by styles and other sociocultural influences than they determine them. As to "laws," it seems perfectly clear from the context even where there is no explicit qualification, that I was not claiming to have found laws comparable to those of physics. However, let us consider all statements on this score as withdrawn.

The argument about the sense in which winter "determines" spring seems another verbalistic one. We happen to know the astronomical causality of our seasons. If we did not, we would still know empirically the regular order of the swing of the seasons; and if any medicine-man, after spring had followed winter, asserted or was credited with bringing on summer by magic subservient to his personal will, a very limited natural science experience would protect us against such superstition, even if it led us to talk a bit loosely about a "law of the seasons." In the field of cultural happenings, it is patent that we do not know at all what the real causality

---

[27] Floyd H. Allport and Dale A. Hartman, The Prediction of Cultural Change: A Problem illustrated in studies by F. Stuart Chapin and A. L. Kroeber, pp. 307-350 of Stuart A. Rice, editor, Methods in Social Science: A Case Book, 1931.

[28] That this is not a mere matter of an editor's title is shown by the analysts' statement on page 316: "The central question of Professor Kroeber's research concerns the possibility of prediction from this linear stylistic approach"; and by their devoting nine pages to an analysis of the natural-science, genetic, telic, and stylistic approaches with reference to their respective predictive value.

[29] Pp. 249-250: "By 1912 the tide has once more turned--no doubt to continue now for another two or three score years unless the periodicity of the rhythm is accelerated. . . ." This forecast has been proved premature by the events. 1911-12 was indeed a low point for skirt width, and the amplitude increased until 1917, but the narrowing resumed until a still lower point was reached in 1926, which presumably marks the real trough of the wave. P. 258, paraphrased: skirts will be longer about 1928-40 than in 1919. This is correct since 1930. For anyone setting out to be a prophet, one verification out of two would be a sorry record.

is. We also know very little about such order and regularity as there may be. I was trying to make a contribution, at one concrete point where the data looked promising, toward ascertaining what order could be found in cultural phenomena--as did Chapin in his Cultural Change. The alternative to rejecting such endeavors is to hold that history is a series of accidents. This in turn, since most human minds will not remain content with utter negativism, usually results in a reversion to the popular assumption that cultural events are produced by the free volition of personalities. This assumption, again, in twentieth-century scholars, seems nearly as naive as the belief that directed magic can produce summer.

If it is mere philosophy or mysticism to believe that culture determines the actions of personalities, at any rate determines them far more than their uncontrolled volitions determine culture, then I am a mystic. However, the long, persistent swings of style seem an empirical fact which does directly support this belief. How do Allport and Hartman meet the very real and fundamental issue that there is a clear-cut finding here which rests on evidence?

They fall back, tentatively, on a psychological explanation: emulation, which leads each individual to try to outdo the rest until a physical or other limit is reached, when they all race back competitively. Interestingly enough, this very explanation of emulation was adduced nineteen hundred years ago by Velleius Paterculus when he wrestled with the problem of why most high cultural activities seem to come in cyclic bursts. Now, that a view is old does not prove it unsound; but if twentieth-century sociologists can do no better than to speculate like a soldier-historian contemporary of Augustus--well, they also have not traveled much farther than the mystics. Of course there is psychology involved. Every cultural event involves psychological happenings. What my analysts fail to realize is that they do not, just as Paterculus did not, connect their psychological explanation with the cultural phenomena by any evidence. They have made a guess, an unverifiable conjecture. This is fine for after-dinner conversation before the fire, where too much evidence destroys social affability. I may be mystic or telic, but I have at least tried to relate observed phenomena with observed phenomena. I may add--as my conviction which I cannot prove--that my guess is the same: I also believe that emulation or imitation is involved in style changes. But I have deliberately left it out of my interpretation. Paterculus saw a very real and still unsolved problem in a large and important group of phenomena. But if we cannot attack the problem any better than by his nonevidential method, I for one will call it quits and play another game.

The other tentative explanation of the analysts is through such factors as changes in the economic and social position of women, sports, mode of dancing, cost of materials, and such. These are cultural factors, such as I believe should be correlated with stylistic changes before the last ditch of psychological explanation is retreated to. However, they are specific, immediate, and temporary factors whose primary effectiveness seems to be largely precluded by the long range of the swings. Again there is a suspicion of preference for the unordered interpretation: style may not be capricious, but it is accidental; the concept of superindividual pattern is avoided and resisted.

Now why this resistance? Why all this quarreling with my language, the imputation of mysticism to a quantitative investigation such as economists conduct by the thousand, the long and partly irrelevant wind-up about scientific and telic approaches, the near-pedantic picking on the statistical reliability of my data in the last paragraph?[30]

I suspect that the resistance goes back to the common and deeply implanted assumption that our wills are free. As this assumption has had to yield ground elsewhere, it has taken refuge in the collective, social, and historical sphere. Since the chemists, physiologists, and psychologists have unlimbered their artillery, the personal freedom of the will is thankless terrain to maintain. Culture they have not yet attacked; so that becomes a refuge. Whatever the degree to which we have ceased to assert being free agents as individuals, in the social realm we can still claim to shape our destinies. The theologian is piping pretty small, but the social reformer very loud. We are renouncing the kingdom of heaven, but going to establish a near-millennium on earth. Our personal wills may be determined, but by collectivizing them we can still have social freedom.

Of course this is not conscious motivation. But I see no other motivation for the resistance to yielding an inch to any form or degree of cultural determinism.

The amount of determinism shown is really very little, in the original essay: no more than that there are stylistic trends of an amplitude, effectiveness, and duration indicating that they are governed by factors which are un-

---

[30]The tenor of the original article makes it plain that there is no insistence on the reliability of any one figure or group of figures, but only on the duration of swings and persistence of trends. The absence of sigmas and probable errors is cited as "a vital defect." As a matter of fact the changes found are so great that if we had data on only a single dress for each year from 1844 to 1919, instead of four to ten, the fact of notable swing in several dimensions would be convincing to common sense; and, I suppose, provable as statistically significant if one were minded to show his technical virtuosity.

known but which must be superindividual: a random series of free wills could not pull together in one direction so long and decisively. Apart from its presentation and analysis of the data, the 1919 paper is essentially a statement of this thesis--no doubt reiteratively and at times with some looseness; but it is difficult to be concise and exact when one is compelled to swim against the intellectual current.

In the present monograph I believe that Dr. Richardson and I have gone a little farther. We have strengthened the case for authenticity of the swings by considerably enlarging the range of observation. We have also examined the variability of the phenomena and found this to correlate definitely both with certain periods of history and with certain statuses of the swings. From this double correlation we have inferred as probable, for the last two centuries of Europe, a relation between periods of general sociopolitical and cultural unsettlement and periods of extremity of fashion, through the medium of an expressible and approximately definable pattern of dress style. We have not fallen back on emulation as an explanation of specific changes; not because we deny its influence, but because we do not know any specific way of correlating emulation with particular historical phenomena. We also do not deny that sports or the invention of rayon may have an effect on dress styles. We have left them out of the reckoning, for the time being, because their influence is presumably special and limited, and therefore secondary to the major swings of dimension and variability. We are aware that "general historic unsettlement" involves psychological attitudes as much as emulation involves them; but they are attitudes which are at least partially measurable and definable in terms of wars, changes of boundary or form of government, abolition of old institutions, new codes, intensity of class struggles, aesthetic innovations, and the like; and historians are agreed in recognizing these phenomena as having occurred. The stone we have tried to lay on the wall of the understanding of the history of human civilization may be quite small; but we feel that it is at least tangible and weighable as evidence.

I realize that any interpretation which diminishes the range of free personality and enlarges the effectiveness of superpersonal cultural influences is likely to be unpalatable. It will irritate many and it will elicit rejections. But I am compelled to adhere to it--no doubt by the strand of culture of which I am part.