
Ajustements. Bodies and Clothing in Standard Industrial Sizes during the 19th Century

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Version électronique (Pépinière DeVisu)

URL: <https://devisu.inha.fr/modespratiques/218>

DOI : <https://doi.org/10.54390/modespratiques.218>

ISSN : 2491-1453

Éditeur

École Duperré Paris

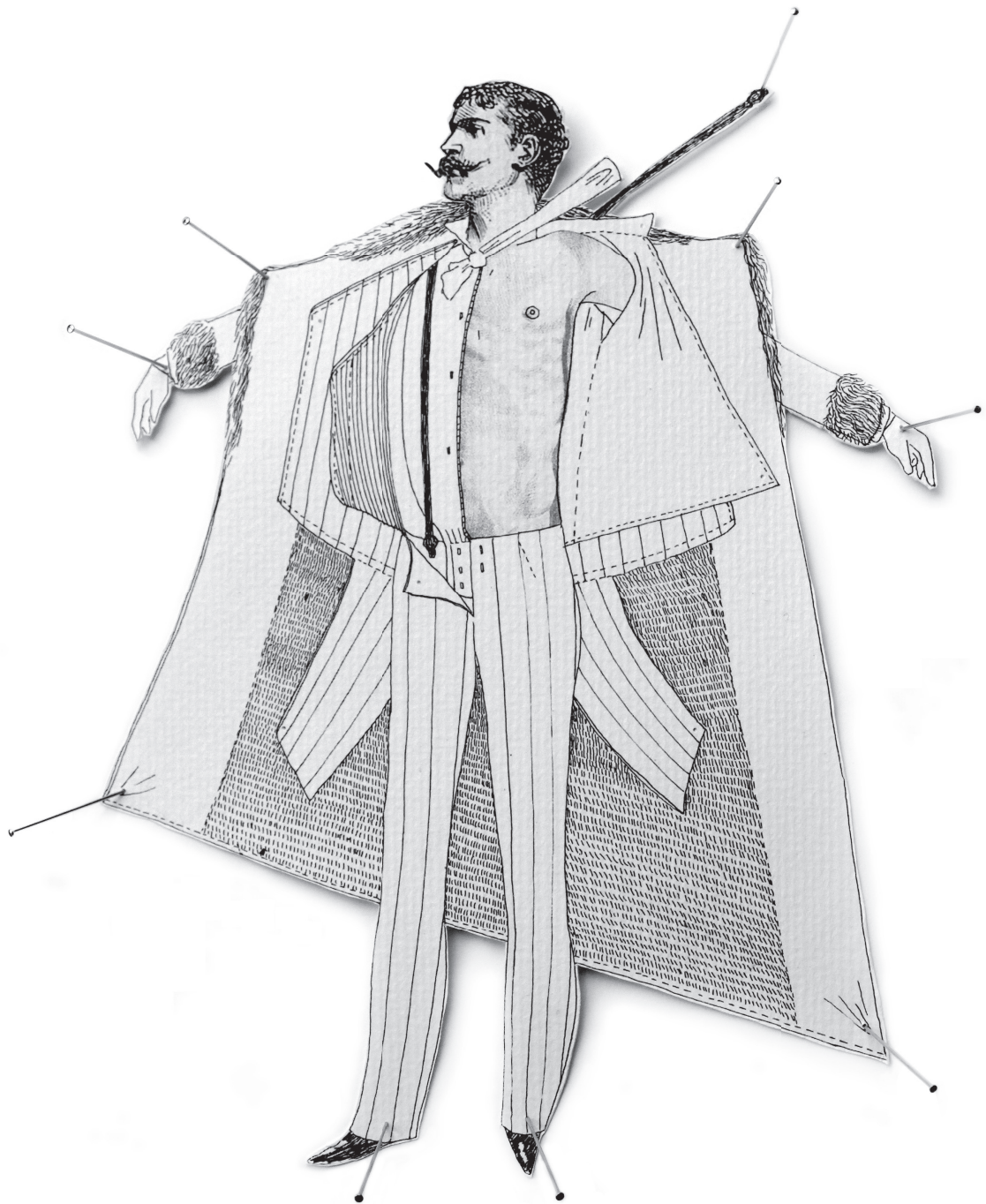
Référence électronique

Manuel Charpy, « Ajustements », *Modes pratiques* [En ligne], | 2018, mis en ligne le 22 mars 2022, consulté le 29 novembre 2022. URL : <https://devisu.inha.fr/modespratiques/218>



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illustration: **Bahia Alecki**



by **Manuel Charpy**

translated from French by Carol Lipton (with Manuel Charpy)

Adjustments

Bodies and Clothing in Standard Industrial Sizes during the 19th Century

“All types of alterations” announced signs on dressmaker shops. “Waistbands, hems, moving buttons: we alter standardized, industrially-produced clothing.” Today our experience with fittings reminds us that standard ready-to-wear sizes often don’t correspond with the diversity of human bodies. When altered inexpensively for people with low budgets or more precisely for the “dressed to the nines” high society, today’s ready-to-wear garments, generally offered in five sizes, tend to float, pocket or pleat ... We are still expected to have an ideal body that corresponds to industrial standards. Having a garment altered – a seasonal topic when summer approaches – means dealing with standard measurements that affect our body image.

This issue arose with the emergence of industrial manufacturing in the 19th century since manufacturing garments in advance meant defining a standard body with fixed proportions based on a series of sizes. Throughout the century, opinions were divided as to whether to favour the ideal body, a desire for comfort (a new value) and the tradition of custom-made, tailored garments.

Defining a standard body to serve as a reference point for manufacturing encountered both theoretical and practical difficulties. On one hand the standard, noted in the 1835 *Le Dictionnaire de l’Academie* (the Academy Dictionary) under “normal” was “that which serves as the rule”. But the same dictionary also said the “normal state” is the “state of an organized being or organ that needs no alteration; an ordinary, regular state.” Thus the man who served as a reference for manufacturing, by abstract definition, oscillated between the model man of ideal, artistic proportions and the average man invented by “new sciences” like statistics and anthropometry. But in this latter case, theoretical or technical discussions and industrial practices were intimately linked: patents filed and instruments used during the period showed that tailors and manufacturers grappled with this theoretical question. And we can surmise that manufacturing standards – as defined by late 19th century treatises – required that a standard be established that could be shared by both manufacturers and consumers.

The individual acceptance of social standards was also at play in each garment. In other words, the question of sizes and establishing a balance between the body and its garments also revealed a social and cultural history. The late appearance of fixed sizes for men’s manufactured clothing at the dawn of the

20th century – and after World War II for women’s clothing – was due to the resistance of various trades and the many detours standard sizes underwent as they meandered through the clothing landscape.

THE RESISTANCE OF TRADESMEN

Conformity and anatomy... or the art of custom-made

By the mid-19th century, Western societies seemed to have all the necessary elements for the public to embrace the manufacturing of standardized sizes in place. Thanks to cutting dies, sewing machines, the introduction of department stores and an ever-growing consumer population with a hunger for lower-priced clothing. But resistance was strong.

The first reasons were cultural and physical: dressing, when one had money, meant wearing custom-made clothing that had been tried on in expensive fittings and alterations. A garment made by a tailor or dressmaker began

✦ “Sway-back”, “hunchback”, “stooped”, “partially stooped” body types ... in F. Ladevèze’s book, *Cours de coupe du tailleur de Paris ou l’Art d’apprendre à couper... les habits d’après le système actuel de mesurage* (A Paris tailor cutting classes or the art of learning to cut garments and ... frock coats that used the current system of measurements...), Paris, Musée du tailleur illustré, 1874.

with a patternmaker who took measurements and cut the garment, a piecemaker (for “big pieces” – overcoats, redingotes, frock coats, blazers and jackets) or pant-and-waistcoat maker (for “small pieces”) who worked at home, a finisher who sewed in linings and attached buttons and an ironer who pressed everything.¹ Then apprentice tailors did the final alterations in the shop. Thus the standard for any particular individual was unique, handmade clothing. The 1833 Roret manual (a series of manuals with technical information on various trades published by Nicolas Roret in the first half of the 19th century), after giving information on patternmaking for “individuals of different sizes, but always

fairly well-proportioned”, pointed out in the “Exceptions” chapter: “We see that many of these body deformities are variable and common so it is impossible to class them by rules: it is only with habit that they can be appreciated and addressed individually”.²

And still be able to propose patterns for a “wide waist”, “hunchback”, “tilted bearing” or even children who “are not a precise reduction [...] of adults”.

The following year, the tailor Barde noted in his treatise that “the shape of different parts of the body give each individual a specific appearance” and because of this, “the tailor must study his model as an artist studies his subject”.³ In reality, this meant taking at least 32 measurements.

But the art of tailoring was an art of compromise between a unique and an ideal body. One tailor noted: “A frock coat made according to the rules of the trade in 1828 must expand the chest and shoulders while giving the waist

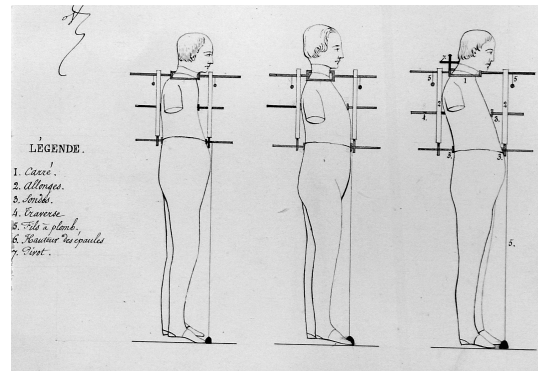


a conical shape”.⁴ Thirty years later Gautier emphasized the paradox: “Antinous would seem ridiculous today [...] since heaviness, vulgarity and ugliness can be hidden under an envelope that is neither too wide nor too fitted”.⁵ Clients expected that their tailor shape their body to conform to a collective standard while preserving their individuality, a feat similar to that performed by portrait painters. In 1832 Barde attempted to rationalize this question by patenting an *épaulimètre* (shoulder measurer) and *dossimetre* (back measurer) to measure the body plus a series of “model patterns” with which “it becomes possible to cut more than a thousand different garments [...] to dress individual, undistorted anatomies of every age and size”.⁶ This dizzying diversity seemed impossible to standardize.

This attention to each body’s unique qualities was present in all layers of society. The many patents filed by working-class tailors show this: in 1839 an *Acribometre* (small size measurer) recorded “the shape of bodies, however imperfect they might be” and in 1864 a *conformateur-tailor* (tailoring adapter) “gave perfect measurements with the differences in each person and their endless variations since patternmaking would not be confusing if all men had regular proportions, but that’s just the way it is”.⁷ *Le Cours de coupe du tailleur de Paris* (cutting classes for the Paris tailor), used even by working-class tailors, had anatomy boards that explained bad personal habits, various sicknesses and accidents.⁸ Similar attention was paid to these differences in the early days of haute couture: model garments, presented on live models since 1860, were adapted to each client’s body.⁹ The only novelty introduced to avoid that an elegant, often foreign client could avoid fittings, were Stockman’s personalized busts “molded from nature OR molded directly on the body”.¹⁰

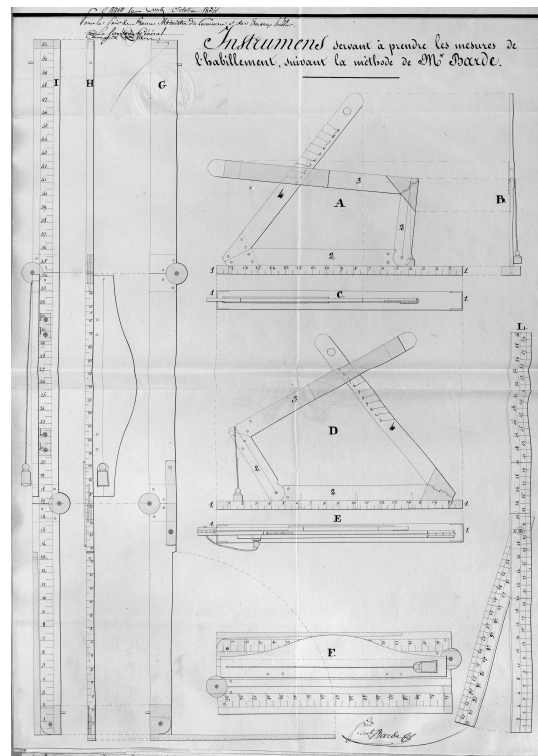
Intimate measurements

If having custom-made clothing was normal for both men and women of the bourgeoisie, this was true for the working class as well where homemade clothing remained the standard. *Le Manuel des dames* (Women’s manual), destined for the petite-bourgeoisie, emphasized this in 1833: at home there was no need to have actual fittings for dresses “it’s good [...] to make alterations until one is sure the dress fits perfectly. [...] Pay special attention to the



↑ Patent taken out by Charles Chevallier, “Device for measuring a man’s body, known as a neometer”, 1844 (1BA3707), detail © INPI

↓ Mechanism for precise measurements: Fulerand-Antoine Barde, “Three instruments for taking clothing measurements that the inventor called the triple decimeter, epaulimetre (shoulder meter) and dossimetre (back meter)”, 1832 (1BA3874) © INPI



If sewing machines appeared in every home, either at bourgeois residences where servants sewed for their employers or in working class homes where people sewed for themselves, they were usually bought to make fitted garments or alter already-made ones.¹³ This was true for both visible “outer pieces” that had to be perfect and for women’s undergarments. “Generally custom-made remains the rule for women”, noted the manufacturer Dusautoy in 1867 for a series of pieces that had to be fitted on the body – almost the entire wardrobe except for short capes and shawls.¹⁴

French society was as attached to custom-made clothing, associated with “handmade”, as it was mistrustful of machine sewing, reputed to be less sturdy and durable. As late as 1906, Lille law professor and social researcher Aftalion noted that the production of undergarments was rarely industrialized “since women want lingerie pieces that are exclusively hand-sewn. And Parisian department stores systematically refused to sell machine-sewn “linen” items in their lingerie departments.”¹⁵

The arrival of more working class or bourgeois department stores barely deviated this practice. Even the most Proletarian of these stores that offered garments in fixed sizes sold more custom-made or semi-custom-made clothing. Until the 1920s, ordering in department stores often meant taking almost 30 measurements at home with the help of a *guide-feuille* (measurement guide). These personal measurements – taken by a

↓ “Page of measurements to be filled in and sent by the post”,
La Belle Jardinière catalogue,
1870s. © Private collection

MAISON DE LA BELLE JARDINIÈRE

FEUILLE DE MESURES A REMPLIR, AFFRANCHIR & JETER A LA POSTE

NOTA. — Pour éviter tout malentendu, nous insistons auprès de nos clients sur ce point important, que les prix inscrits sur nos feuillets sont pour *honnêtetés* pour les tailles moyennes que nous déterminons page 7 du catalogue. Les prix des vêtements livrés pourront donc être diminués ou augmentés selon que la taille du client sera inférieure ou supérieure à ces tailles moyennes.

Quand on a épuisé des éléments sortent de notre Maison, on des plus sûrs moyens d'obtenir une taille exacte est de nous fournir, de la première demande, d'habillants, les numéros, chiffres et lettres, qui se trouvent dans les manches des vêtements, sur la ceinture du pantalon et au dos du gilet.

REDINGOTE, JAQUETTE, HABIT, VESTON

PARDESSUS, ETC. (ALBUM, fig. 1, page 9)

- I** Longueur du dos, de la couture du col à la taille de la personne à la hauteur de la ceinture.
- I K M** Longueur totale du vêtement, de la couture du col à l'extrémité inférieure.
- O P L** Largeur de la moitié du dos.
- P R S** Longueur de la manche, de la couture de l'épaule au poignet, en suivant la couture derrière la manche et passant sur le coude.
- T** Grosseur du corps sous les bras, prise sur le gilet, même pour le pardessus.
- V** Grosseur du corps à la ceinture, prise sur le gilet, même pour le pardessus.

NOTA. — Les mesures pour vêtements d'été et de femme sont données (sur prise de la même manière que celles pour vêtements d'homme) et doivent être de 10 cm. au-dessus de la taille réelle.

Nous nous réservons de modifier la longueur totale des Redingotes, Jaquettes, Vestons, Pardessus, etc., suivant la mode et la taille des clients.

GILET (ALBUM, fig. 5, page 11)

- A B** Longueur du gilet, prise de la nuque à l'endroit où l'on veut qu'il descende.
- C** Grosseur du corps sous les bras, prise sur le gilet.
- D** Grosseur du corps à la ceinture, prise sur le gilet.

PANTALON & CULOTTE (ALBUM, fig. 5, page 11).

- Pour pantalons et culottes: **D** Grosseur de ceinture sous le gilet.
- Pour pantalons et culottes: **E F** Longueur de cote, prise de la hanche à la semelle de la chaussure.
- G H** Longueur d'en-trè-jambes.
- Pour la culotte longue: donner en plus la grosseur de la jambe prise un peu au-dessus de la cheville.
- Pour la culotte courte, donner la grosseur de la jambe immédiatement au-dessus du genou.

CHAPELLERIE (ALBUM, fig. 4, page 10)

- T** Tour de la tête.
- O P** Premier diam. int. du chapeau.
- R S** Second diam. int. du chapeau.

GANTERIE

Nous indiquons la pointure. A défaut de ce renseignement, nous donnons le tour de la main (fig. 9) et la longueur des doigts; nous dire s'ils sont longs, courts ou moyens. Nous faire savoir, de plus, si les gants sont pour homme, femme ou enfant.

COLONNES
A REMPLIR
M. C.

AMAZONE (ALBUM, fig. 2, page 10)

- A B** Longueur du dos, prise de la hauteur du col à la taille de la personne à la hauteur de la ceinture.
- A B C** Longueur jusqu'à la terre (la queue non comprise).
- D E** Largeur de la moitié du dos.
- E F G** Longueur de la manche, de la couture de l'épaule au poignet, en suivant la couture derrière la manche et passant sur le coude.
- H** Grosseur du corps sous les bras, en passant sur la poitrine.
- I** Grosseur du corps à la ceinture.

CHEMISES (ALBUM, fig. 3, page 10)

- Z** Grosseur du cou.
- Z U L** Longueur de l'épaulette.
- Z U L** Longueur totale du bras, poignet compris.
- R S** Largeur des poignets.
- R S** Largeur de poitrine, d'une épaulette à l'autre.
- V** Grosseur du corps sous les bras.
- V** Grosseur du corps à la ceinture.
- Z X** Longueur du devant de la pièce d'épaule à la ceinture.

CHAUSSURES (ALBUM, fig. 6, 7 et 8, page 11)

- A** Grosseur du pied à l'endroit des doigts.
- B** Grosseur du pied à l'endroit du cou-de-pied.
- D** Grosseur du bas de la jambe, un peu au-dessus de la cheville.
- C** Mesure de l'empreinte, c'est-à-dire mesure du tour du pied obtenue en appliquant le centimètre par-dessus, sur le point du talon, et par devant, sur le haut du cou-de-pied, à la jointure de la jambe. — Tracer l'empreinte du pied sur une feuille de papier et nous l'adresser avec les mesures ci-dessus.
- Pour les bottes les hussards, les moutardes et les guêtres montantes, nous donne la grosseur G du mollet.
- Pour les guêtres montantes, fig. 7, donner en plus les mesures:

- E F** Tour du milieu du talon au talon et à milieu du cou-de-pied.
- H** Tour de la jambe au-dessus du genou.
- H** Grosseur de la jambe à la hauteur du genou et à la hauteur de la cheville. — A H et celle de H à F en faisant suivre exactement au centimètre la courbe de la jambe.
- Donner en plus la mesure C de la figure 6.

Pour les Guêtres ordinaires, donner les mêmes mesures: que pour les Chaussures.

COLONNES
A REMPLIR
M. C.

FIG. 1.

FIG. 5.

FIG. 4.

FIG. 9.

tailor (on a customer who was still wearing his or her own clothes) until the middle of the 20th century – and the subsequent fittings guaranteed a quality garment.

Bad fit: a social stigma and a rallying symbol

In contrast, bad fit was synonymous with poverty or marginality. Before the male blouses that were produced inexpensively, cut was a social marker that contrasted the fitted, elegant garments of the rich and fairly well-off with second-hand clothing – generally in fixed sizes – worn since the turn of the century by most of the population.¹⁶ Originally found in government services – re-cut military uniforms, garments left in hospitals, ... — they familiarized the population with the idea of pre-made, unfitted garments. Even in the 1860s, people still confused new “manufactured garments” with old “used garments”.¹⁷ At Paris’ Carreau du Temple market and thousands of markets or shops throughout France, clients rummaged around to find the best-fitting garments and tried them on over their clothes. Even when they had been altered at home later, they pocketed, gaped or were tight since they had been distorted by other bodies that had worn them previously.¹⁸

Bad fit also indicated a modest – often provincial – origin.¹⁹ A novelist remembers his embarrassing, mid 19th-century arrival in Paris dressed in a redingote “cut by the family tailor from my grandfather’s overcoat [...] that was too short in the waist and too long in the skirt so it swallowed me up”.²⁰ “He looked like a worker in his Sunday best”, wrote another author in 1861 about a peasant who arrived in Chalons. “He wore a tall stovepipe hat that was too small, a redingote [...] with too-short sleeves and plaid trousers that were also too short”.²¹ Short or hemmed trouser legs or sleeves and droopy or skimpy shoulders were signs of poverty. And many of the poor found clothes in locker rooms or asylums where before uniforms “the sick had to wear badly-cut, badly-fitted garments that offended their dignity and sense of respectability. They often took their clothes from poor people who had died.”²² But even for the petit-bourgeois, skimpy garments became a metaphor for having trouble making ends meet, seen in purchases of second-hand clothes or industrially made and cheap clothing offered in limited sizes.

The uniformity of men’s garments meant that their distinction relied on details of cut. “There was nothing theatrical about it”, wrote Gautier in 1858 about the bourgeois suit. “The fine cloth, perfect cut, finishes and final result on the body gave it distinction. These nuances escaped [...] most people, but it would be like asking why all gondolas in Venice are black. But nothing is easier than distinguishing, amidst an apparent uniformity, a nobleman’s gondola from a bourgeois gondola.”²³



↑ “At the Carreau du Temple: fitting”, *L’Illustration*, November 23, 1901.

→ Perfected measuring stick:
Mornas, "System for cutting
garments using a real person",
1852, (1BB13873) © INPI

→ Measuring sticks, plumb lines
and compass: from the tailor
Bassie, "Instrument for mea-
suring men's clothing known as
a basimeter", 1848 (1BB7705)
© INPI

The development of manufacturing in the 1850s introduced the standardized "sack coat" and saw an "Americanization" that menaced the elegant French suit.²⁴ It is important to note that both developing categories: smocks, blouses and overalls ("junk" produced in Northern France) and sack coats (or pea coats)

had no real shape. Du Marrousem wrote in 1896 that "English styles" had "disastrous effects. The fashion of wide, unfitted garments seems to have been created to encourage an industry that tends to envelop a few body types calculated in widths to try and capture the infinite diversity of the human body."²⁵ The bourgeoisie had a condescending view about the clumsy look of manufactured garments. Thus Lacroix wrote in 1878 that "while the number of sizes multiply, each corresponds to a rational average without being absolutely appropriate for every body; but the buyer does save money [...] and is instantly served by a garment that suits him 'well enough'."²⁶

Even with their stigma, badly-fitted garments could be provocative. Beginning in the 1830s, students and artists intentionally wore too-short or too-long redingotes and trousers, turning up their noses at bourgeois custom-made clothing.²⁷ Jules Lecomte thus rallied Hugo "whose trousers were too short and hair was too long".²⁸ If in *Sentimental Education*, the mediocre bailiff clerks had "redingote sleeves that were too short", students in the Latin Quarter wore "a redingote whose cuffs were too short" on purpose.

It wasn't surprising to see early 20th century ruffians wearing too-short trousers and skimpy jackets that rejected both bourgeois and workers' clothing. This association between badly-fitted garments, poverty and marginality also had a role in slowing down the acceptance of garments in fixed sizes.

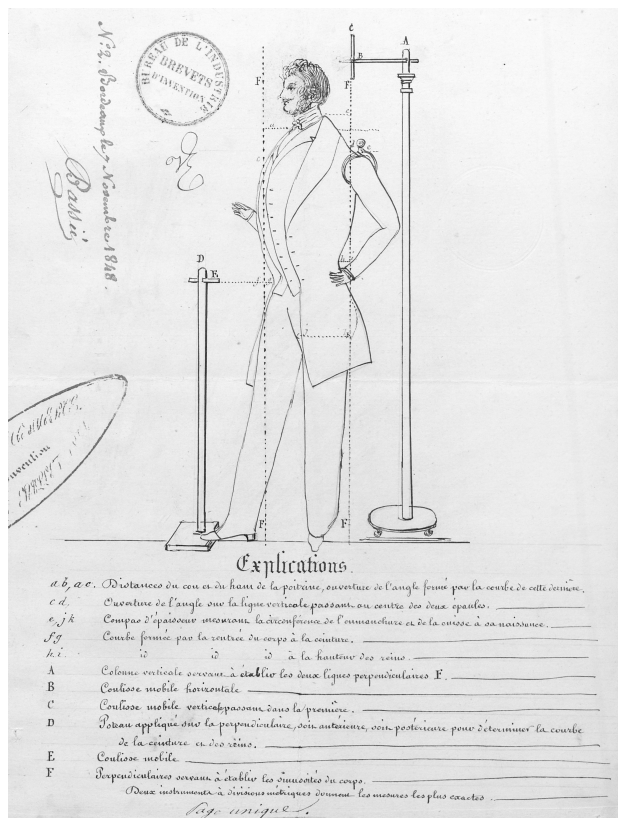
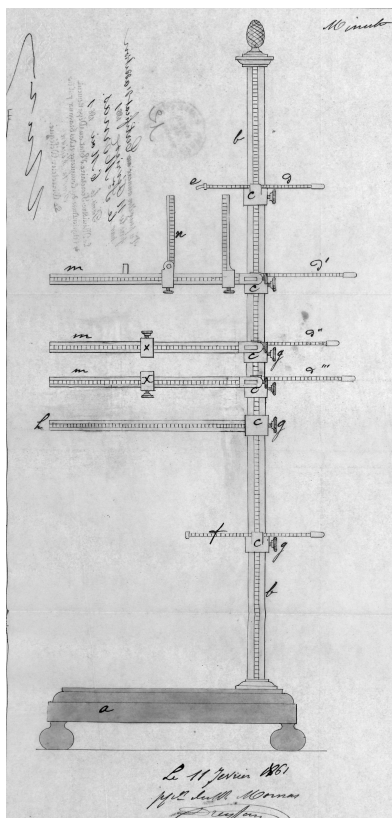
THE INDUSTRY OF NON-STANDARD CLOTHING

Measuring sticks and imprints

If fixed sizes arrived slowly, it was also because more precise, rapid systems for taking measurements were being developed. The tape measure, which used the metric system, first appeared in the early years of the 19th century. Flexible and marked with familiar numbers – one side in new centimeters, the other in inches – it quickly replaced the bands of marked paper used in workshops and homes. It thus became possible to archive and communicate measurements, even through the mail, and the tailor could calculate the relationship of proportions and make patterns that could be reduced or enlarged with the help of "reduction tables".²⁹

This numeric objectification showed that the art of tailoring was becoming mechanized, not industrialized. As "portrait machines" began to appear – first *physionotracés* and daguerreotypes, then photographs – tailors dreamed of devices that would prevent them from having to ask a subject to stand in a "tiring pose while being measured" but instead take their measurements in a quick movement and transpose the result into lines.³⁰ By contrast with a "tailor's eye", mechanical methods seemed infallible and practically instantaneous.³¹

By adapting measuring rods used by the army, the medical profession and the new science of anthropometry – "the science of human body proportions" according to 1830 dictionaries – many tailors filed patents in the first half of

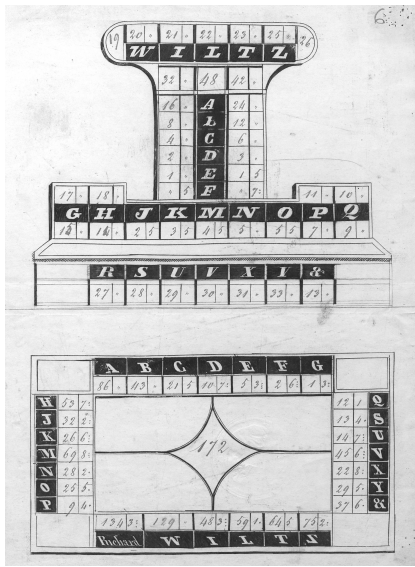


the century for measurement-taking devices. Inspired by precision engineers and surveyors, these systems combined rulers, compasses and plumb lines to measure the three-dimensional body, whether they were “abnormal” ones or those that were more common.³² Dozens of patents were filed for instruments that became commonplace in workshops.

Tailors dreamed of a machine that would condense everything to take measurements immediately like Mornas’ “machine-measurement-posture” that could capture the “jut of a hip, the waist, back or even the nape of a neck”. It took measurements “quickly with such precision that any deformity, even invisible to the naked eye, could be reproduced”.³³ Systems of this type were patented throughout the century: for example Ogliastro patented the “Corporismètre” (body meter) in 1888, an “instrument that captured the exact form of the body, essential for making garments that didn’t need to be altered [...] from size 38 to size 64”.³⁴ Even in 1900, mechanical devices “to assess people’s variable measurements” were based on sliding, articulated measuring sticks.³⁵

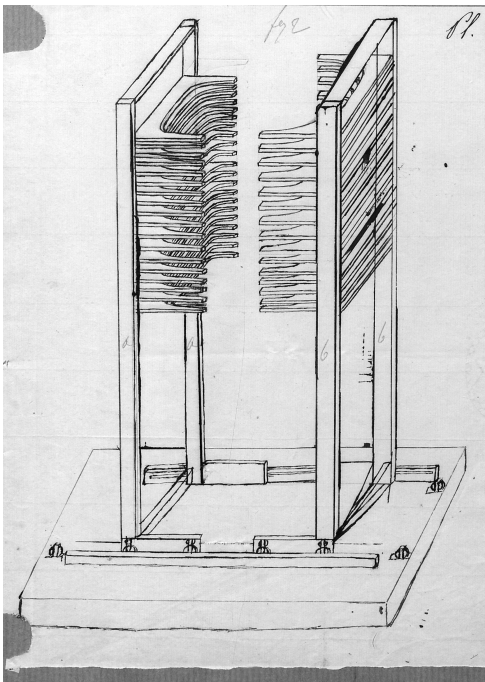
These systems were accompanied by charts. Mornas proposed “a chart of numbers showing the proportional differences attributed to each measurement taken by the machine”. The number became the pivot for tailoring so it was possible to make proportional charts.³⁶

Machines took inspiration from “portrait machines” that, like the *physionotype*, attempted to record the three-dimensional body instantly. Tailors and dress-makers dreamed of these machines, a cross between mechanics and the fine



◆ System of number charts: Richard Wiltz, "Improving the art of tailoring" 1837, (1BA6483) © INPI

◆ Fournier, "Device named a saumamètre by the author that was designed to reproduce the body's shapes and proportions and can be used for men's and women's garments...", 1827 (1BA2826) © INPI



arts. For example the corsetmaker Fournier proposed the *Saumamètre* in 1827, a frame with 24 mobile plates that helped obtain "the body's shape and proportion to make cardboard or plaster models from the measurements taken".³⁷

Many orthopedic companies, drawing inspiration from life molds, offered to mold the body in plaster to make a fitted, comfortable corset.³⁸

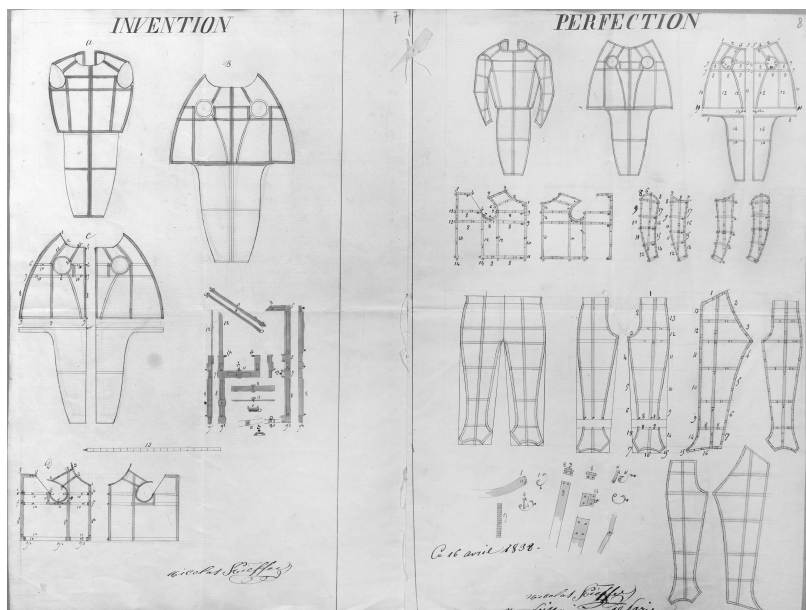
To get beyond making uncomfortable molds, enveloping forms were perfected. These systems offered a garment that imitated a real body, either stiff like a measuring stick or more mechanical. In most cases, a set of measured ribbons formed a kind of garment that could be put on "to mathematically capture the body's shape".³⁹ Many patented systems guaranteed that they could take exact measurements "instantly".⁴⁰ Another advantage of these systems, unlike measuring sticks or plumb lines that required know-

ing basic geometry, was that they could be used by unqualified, even illiterate workers.⁴¹

Because beyond taking measurements, the idea was to transpose these measurements as precisely and quickly as possible onto the fabric to be cut. While with measuring sticks and calculation charts let tailors trace shapes, the "skin" of these measuring garments could be placed directly on a fabric and traced.⁴² Fontaine's "*rapide-essayeur*" (rapid-fitter), patented in 1880, streamlined the expectations for these devices: "we can put the fitter on the client and button the rubber pieces in front so the jacket takes on the body's form immediately. It can then be traced with

chalk [...] and the pattern is reproduced, fitted and completely corrected. The operation takes only three minutes".⁴³ At the same time, tailors tried to find machines that could draw cutting lines.⁴⁴ These devices, associated with the efficient sewing machine since the late 1840s⁴⁵, meant that it was possible to cut and construct a custom-made garment almost immediately. By obtaining quick, precise measurements taken by barely-skilled workers using mechanical devices, tailors sought to apply this industrial method to custom-made clothing.

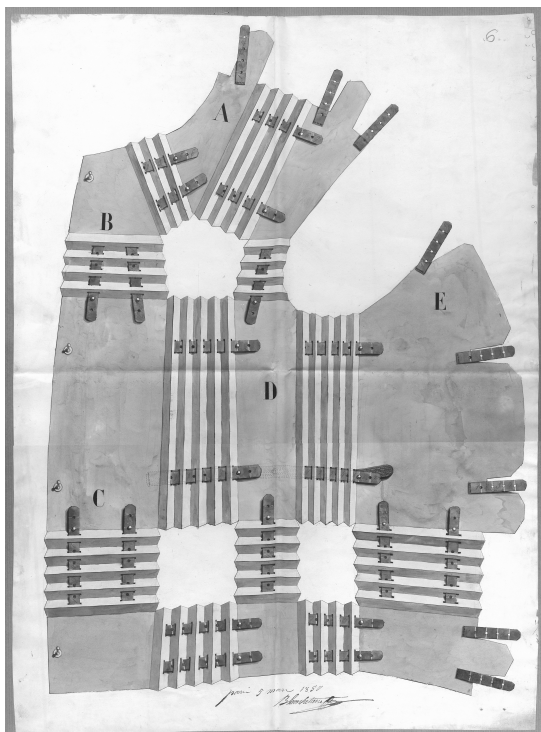
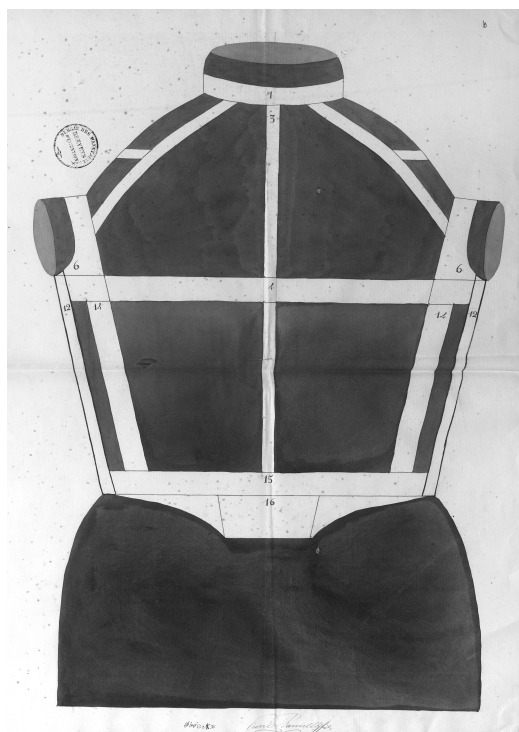
To all appearances, these "size-takers" could not just be made in paper.⁴⁶ In the 1850s, the shirtmaker Claude advertised that he used the "Cutting *Patronomètre*" so "shirts would neither hike up nor pull". Many patents in the second half of the century – including three for the *Himamometre-Janet* that took "the exact shape of a man's chest" seemed to have been fairly successful. And by 1855, every World's Fair

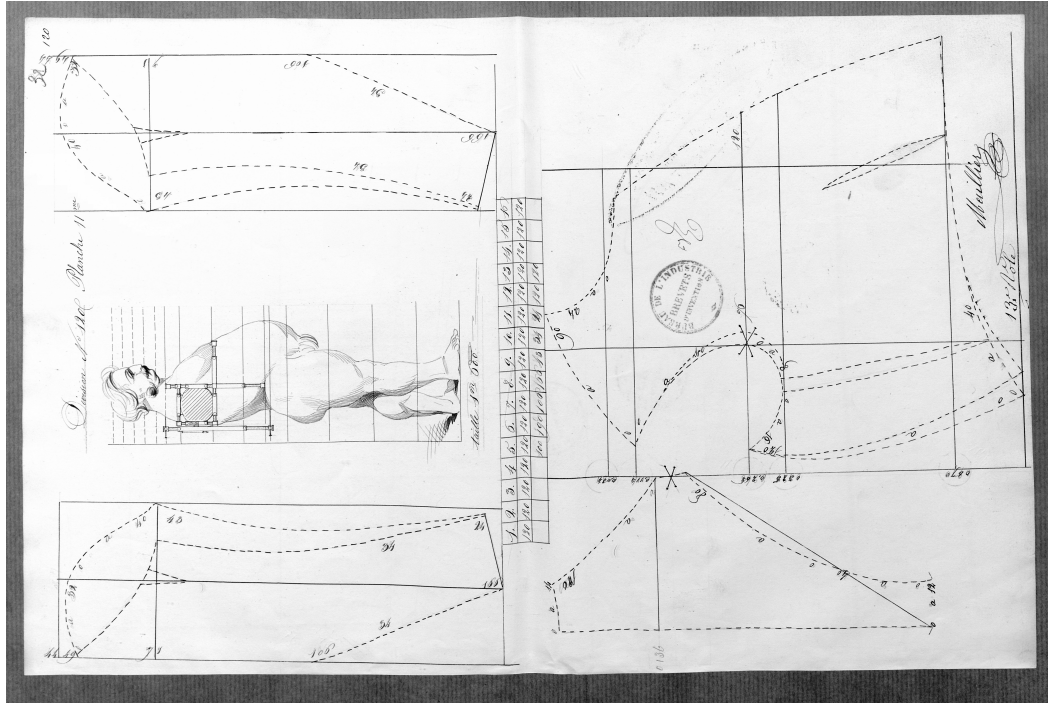
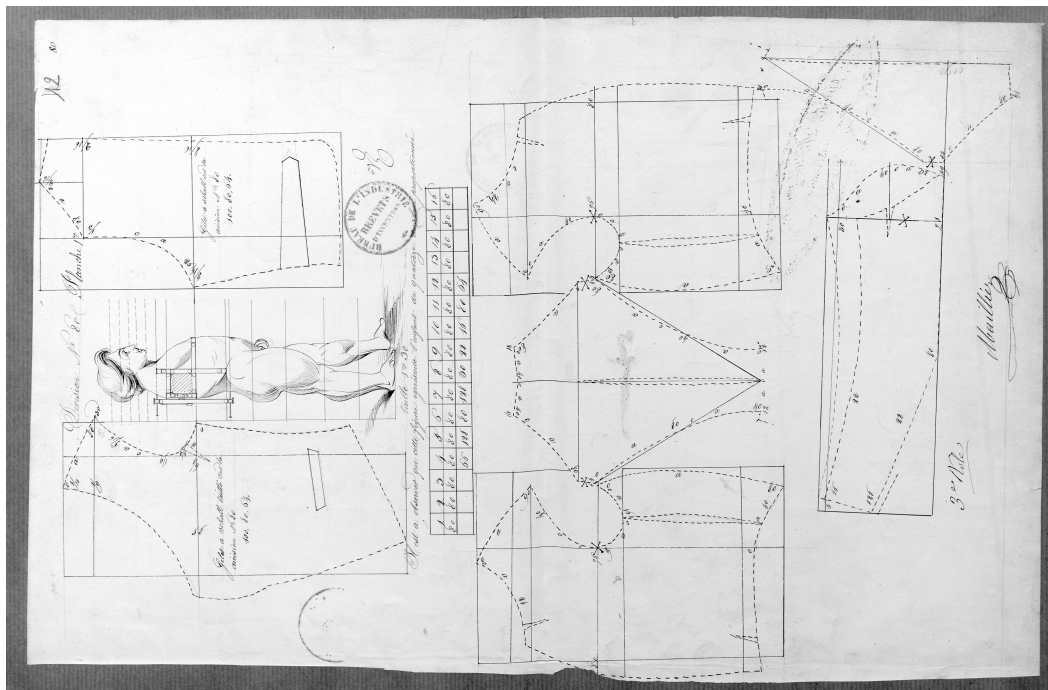


✦ Dirieckx & Bonnely, "Device used to take measurements and cut garments that the company calls: Precise device for all bodies", 1840 (1BA8052) © INPI

✦ Nicolas Kieffer, "New measurements and new garment cuts", 1838 (1BA6633) © INPI

✦ Julien Blanchetière, "Measurement to be used by tailors called a Mesureotype", 1850 (1BB9637) © INPI





← Pages of patents taken out by Mailier, a Bordeaux tailor. Examples of body types and a "corporimetric scale" that helped calculate size proportions. His tables were based on military data and "proportions of the perfect man based on Le Poussin, David and Jean Cousin". He filed two patents: "an instrument he called the acrobometer that mathematically measured a man's body, however imperfect it might be", 1839 (1BA7451) and "an instrument known as the corporometer-conformator needed for tailoring", 1849 (1BB7880). He also filed a patent for a "military clothing" version of the latter in 1851 © INPI



↑ Advertisement for shirtmaker Claude, Faubourg Saint-Denis, *L'éventail* newspaper, 1854.

→ De Dunin modular dummy, "Mechanical procedures for taking and conserving measurements for men's and women's garments", 1850 (1BB9912) © INPI

had an area featuring measurement devices, which showed their importance. Though in 1878 these "still complicated" systems were not yet widely used, the dream of finding a way to mechanize custom-made clothing continued and patents were filed up to the 1930s.⁴⁷ La Belle Jardinière even advertised its "Bodygraph" in the 1960s that photographed the body in "three dimensions".⁴⁸

If they couldn't mechanize measurement-taking, manufacturers relied on alterations. In 1910, "The automatic fitting machine" could "alter skirts, dresses and garments by quickly folding and automatically pinning a hem at an equal distance from the ground"⁴⁹

This industrialization of custom-made clothing, in contrast with manufacturing fixed sizes, helped keep custom-made a "must" for a long time. In this way social and cultural standards and professional traditions won out over industrial standards.

Industrial alterations: semi-manufacturing

At the crossroads between industry and custom-made clothing, large dress-making companies and department stores developed "semi-manufacturing" or partial manufacturing. The client could order boxes containing pre-cut pieces of fabric, trimmings, a pattern and a colored engraving that showed the final result.⁵⁰ There was a considerable industrial advantage to this practice: the pieces were cut in series based on a few sizes. Approximations did not matter since the alterations were done when the client's dressmaker or servant sewed the garment.

Department stores adopted this idea for men and women. Clients chose their model in a catalogue or from the store window and ordered it by giving their measurements by mail or in person. This system lasted a long time, particularly at La Belle Jardinière, since garments could be cut in advance in a series. Thanks to the adjustable – but not personalized – dress forms invented in the 1830s to "let clothes be fitted with-

out the client actually being there", piecers could alter pieces to a client's measurements.⁵¹ The "Squelette" (skeleton) could be adjusted with screws and another dress mannequin with inflatable parts converted measurements into "an exact replica of the person's body" using metric reference points.⁵² The garment's construction was thus done mostly for individual users at home. In 1896, Du Marrousem pointed out: "Paris manufacturers noted [...] that garments made in advance, in a series, [...] often did not correspond to most customers [...]. So they got into the habit of giving their clients (shopkeepers) books of samples [...] which meant there was a slight price increase for ordinary suits made in a series but they could [...] send in a customer's measurements so he could receive, fairly quickly, a suit cut to his size".⁵³

This system also allowed for the development of international networks: German manufacturers sent "their cloth to England out of which were made trousers, waistcoats and jackets that arrived in France almost finished except for

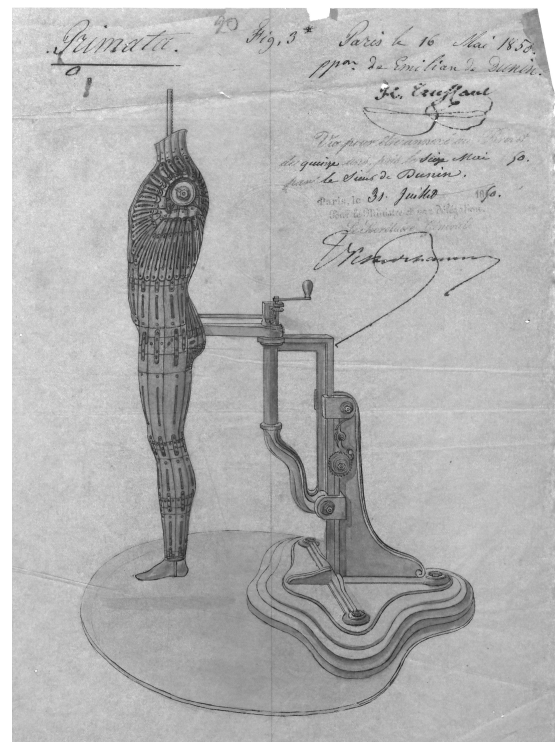
essential parts that were altered to the client's size [...]. A client would go to one of these companies, [...] have his measurements taken and a piece nearest to his measurements would be found in the semi-manufactured stock. The garment was then finished in Paris but the manufacturer benefitted from English workmanship at a lower price".⁵⁴ In the end, the division of work between prefabrication and mechanization – reducing production costs by two-thirds – conquered the custom-made garment market.

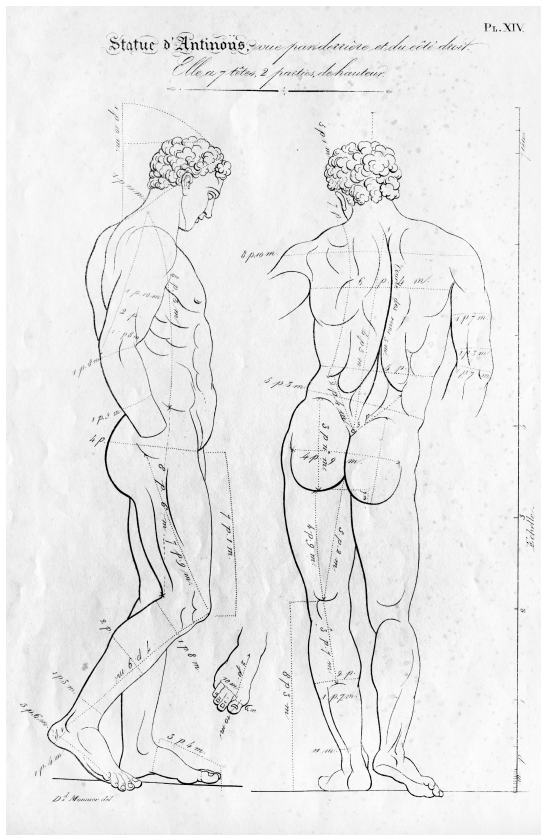
FROM THE IDEAL TO AVERAGE MAN

Cutting based on an ideal

The tension between a body's uniqueness and a quest for standardization continued throughout the century, jeopardizing a practical, theoretical way to imagine the body. Both tailors and artists tried to conserve these ideals when confronted by contradictions between ideal and real bodies. In the Neo-Classical culture, the painter, as a draftsman, needed to envision the geometric order underlying an imperfect body. Artists' dictionaries advised against using live models and recommended studying plaster molds based on antiquity to learn "the most perfect proportions of the human body" and avoid the "miserable details of nature's true distortions".⁵⁵ Thus drawing methods focused on the relationship of stable proportions.⁵⁶ *Les proportions du corps humain mesurées sur les plus belles figures de l'Antiquité* (Human body proportions based on antiquity's most beautiful figures), published in the 17th century and re-published – even plagiarized – in the early 19th century, served as a model.⁵⁷ The initial explanation said that by honoring "precise, noble proportions" and not "making crippled or monstrous figures" artists were encouraged to focus on antique figures with "correct proportions".⁵⁸ These ideal systems offered "normal" relationships of proportions, real world "accidents" were left to artists.

But the differences between new practices of anthropometry, medical anatomy and the ideal body influenced theoreticians. In 1829 *L'Anatomie des formes extérieures du corps humain, appliquée à la peinture, à la sculpture et à la chirurgie* (the Anatomy of human body forms applied to painting, sculpture and surgery) reused measurements from antiquity with a new perspective: "The proportions of an adult man show big differences among individuals but there are limits to these variations in well-proportioned men [...]. Thus artists must study the extent of these variations to choose the most beautiful and, at the same time, most general proportions."⁵⁹ In other words, "normal" man became the basis for an ideal. This was seen in a treatise by Schadow, a neoclassical sculptor, engraver and son of a tailor who detailed male





♦ Measurements of a sculpture of Antinous.
Les proportions du corps humains mesurées sur les plus belles statues de l'Antiquité, vingt-six planches dessinées par De Rinmon, pour l'usage des peintres, sculpteurs et dessinateurs (Human body proportions taken from measurements of the most beautiful antique statues, twenty-six pages drawn by De Rinmon to be used by painters, sculptors and illustrators), Paris, Delarue et Lille, Castiaux, 1810, pl. XIV. © Private collection

Alongside Fine Art references, numbered proportions, proposed on charts, interested tailors and artists. Tailoring treatises appeared that focused on an abstract, “universal” man since clothing cuts increasingly conformed to geometric figures. An ambiguous treatise by Compaing in 1828 was dedicated to “Using geometry in garment cutting”.⁶⁴ Bodies were reduced to solid, boxy, abstract geometry that could be covered by geometric shapes. If “looks and good taste” are essential, “the principle of geometry, applicable to sculpture and painting, is also an art that interests us”. Even if the author specifies that “the tailor has to deal with many disadvantages [...] like distortions or deformities”, he believes it possible to define geometric “principles” and proportions and proposed a series of equations – “upper body thick-

ness – shoulder width = length of forearm” – or spelled out formulas in a drawing treatise. This vision of a geometric body built on fixed proportions continued throughout the century.⁶⁵ Tailors dreamed of a “golden number that allowed, by taking a single measurement, most often “upper body thickness”, to decipher all other measurements, opening the way for custom manufacturing.⁶⁶

In the end the Ideal Man, with a physical reality sought by craftsmen, artists or even new machines dedicated to “abnormal bodies”, served as a reference point for both the tailor and the sketcher.⁶⁷ But even if this abstraction of a “platonian body”⁶⁸ was ineffective, it made acceptable the idea of fixed sizes defined on an abstract, standard body.

proportions in all stages of life for Greek statues, the average contemporary man and unique cases – a Lithuanian Jew, a Brandenburg soldier,...⁶⁰ To the end of the 19th century, treatises tried to define ideals that reconciled the teachings of antiquity, anatomy and anthropometry.⁶¹

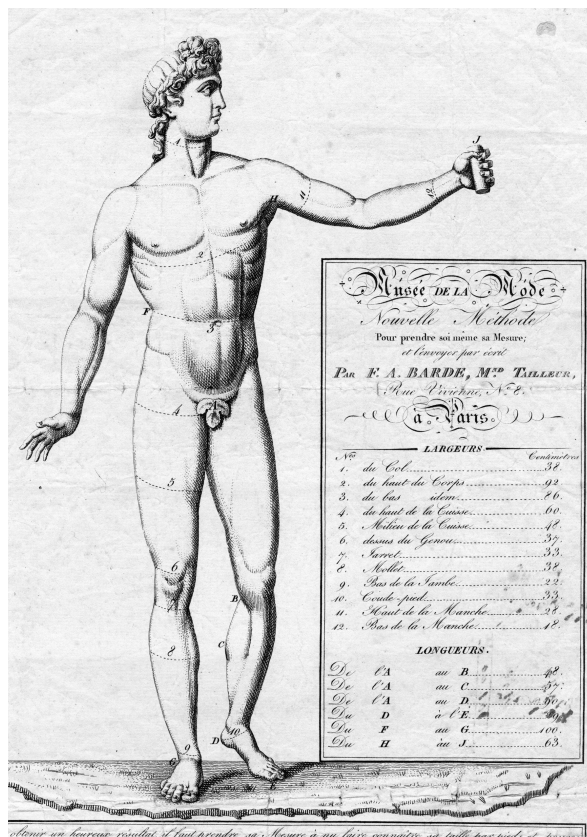
This practice was found with tailors and artists and became essential for sketching garments. Thus the *Journal des tailleurs* began a “Normal Proportions” column in 1838 to resolve the paradox between ideal proportions and real bodies: “we take Apollo or Antinous as models [...], a thirty-year-old man at the height of his physical faculties who stands 5 foot, 3 inches tall [...]. Starting at this point, it will be easier for intelligent artists to realize the different sizes they encounter”.⁶² Many patents used ideal measurements from Antiquity or the Renaissance. The tailor Maillier proposed a “Corporimetric Scale [...] that gave the proportions of a perfect man according to Poussin, David or Jean Cousin” and illustrated more realistic, bourgeois bodies.⁶³

The average height of a normal man: between anthropometry and statistics

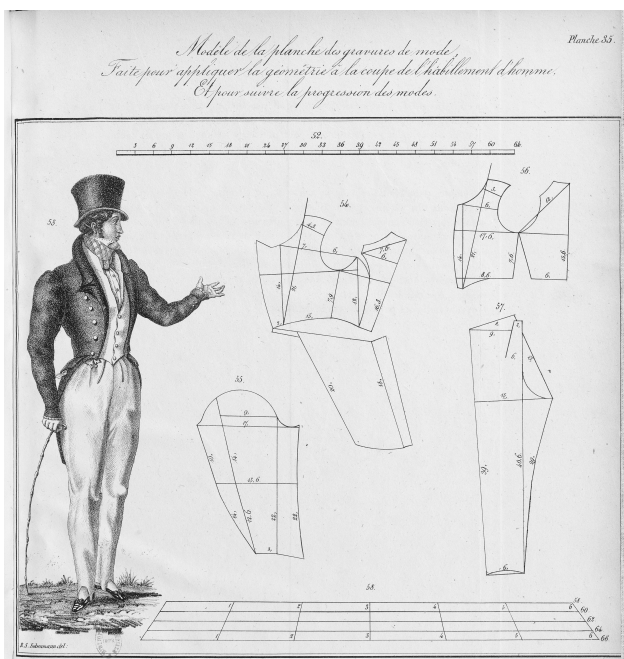
In the art and clothing worlds, definitions that veered from the normal were in play. In contrast with an idealistic approach where “normal” required a series of numbered rulers to copy reality, a standard of statistical averages was sought among the multitude of information gleaned. At the beginning of the century, Laplace and Gauss defined a “normal law” for statistics – the Gauss curve – that gave the phenomenon a “normal” body proportion and helped spot “irregularities”. Logic was quickly applied to sizes, and massive amounts of data were available thanks to the army that began measuring recruits under the Empire. This question was so important that doctors and statisticians questioned “normal” growth and sought to identify factors that would influence size.⁶⁹ The statistician Quetelet’s essay *Sur l’homme et le développement de ses facultés ou Essai de physique sociale* (*On man and the development of his faculties or an Essay on social physique*), published in 1835, that sought reasons for size variations based on climate, diet, work and sexual activity, became a reference.⁷⁰ It tried to categorize national types by size – so an “average” Frenchman, Italian or Englishman served as a reference to observe an entire population. This new abstraction where “all that is fortuitous or individual” was eliminated, became the average where a “social body” replaced an ideal standard.

In the wake of this, men’s sizes – with data that came from the Army – became for statisticians, doctors and anthropologists the clue to assessing the effects of living conditions on the population. Conversely, male sizes became for *racialists* the way to find “people” and “types” like Paul Broca who discovered the “Armorican” or “Breton” who both deviated from an “average man” of 1,649 cm...⁷¹

The book that created a considerable stir in public opinion was Quetelet’s *Anthropométrie ou Mesure des différentes facultés de l’homme*, published thirty years after his first books⁷². He wrote about the history of average sizes and noted the paradox that “the anthropometry or theory of human proportions belongs to [...] both science and art”, quoting Dürer to define the German type, Alberti and da Vinci for the Italian type and Jean Cousin and Poussin for the French type...⁷³ In a comparison between Farnèse’s Hercules and Belgian conscripts, he defined “scientifically” as being compared to the “arbitrariness of artists” and “a fixed human type despite the variety of individuals”⁷⁴. Thus,



↑ Tailors and ideal, antique bodies: “A new method for taking one’s own measurements and sending them to F. A. Barde”, a tailor on the rue Vivienne in Paris around 1840 © BnF



♦ M. Compaing, *L'art du tailleur, ou Application de la géométrie à la coupe de l'habillement ; ouvrage précédé d'un cours élémentaire de géométrie...* (The art of tailoring or how to use geometry to cut garments; book preceded by a basic geometry lesson), Paris, Dondey-Dupré father and son, 1828, page 35 © BnF

→ The average man for artists: D' Paul Richer, *Anatomie artistique. Planches / description de formes extérieures du corps humain au repos et dans les principaux mouvements* (Artistic anatomy. Pages/description of the exterior shape of the human body at rest or doing key movements), Paris, Plon et Nourrit, 1890. © Private collection

a new body-type was drawn that purported to condense the proportions of an average, contemporary man. Quetelet, known for his work in probability, observed the “admirable consistency of size distribution” in the population⁷⁵. From this point, he thought about body proportions: “Men, seen as individuals, are so different that it seems needless to seek a type or module for normality”. However, “this type existed” if we eliminate “their particularities by comparing the Belgians, French, Indians, Egyptians, Greeks, Romans...”⁷⁶

This thinking extended through all those who worked on body type research. Jacques Bertillon, a statistician for the City of Paris and brother of the inventor of legal anthropom-

etry, condensed the knowledge about sizes in the 1880s, compiling available data about “adults with normal bodies”, like the height of Swedish conscripts, Negroes from Guinea, Iroquois Indians, American soldiers or the Fribourgeois...⁷⁷ From standards and their deviations, Bertillon created a social theory of sizes by correlating body size with the level of education.

At the end of the century, other data sought besides that of the Army focused on men between 19 and 21 years old. A “series of 5,584 measurements of prisoners in the Police Préfecture of Paris’ jail” or corpses from the École de Médecine (School of Medicine) – except for foreigners or corpses with pathological defects – should help establish the “average French man”⁷⁸. This survey was one of the rare ones that measured women, the “average man” was usually a male that was socially and politically downtrodden so industrial clothing was mostly for poor men.

This “average man” infiltrated the Fine Arts: in the 1880s, doctors and anthropologists suggested the “ideal, average, European adult man” to artists based on “numbers roughly strung together” by anthropologist Paul Topinard⁷⁹. Anatomy handbooks recorded the change of paradigms, like Paul Richer’s successful books where he claimed to “combine artistic ideals and precise scientific research”⁸⁰.

This “average man” was soon used by tailors and clothing manufacturers. From 1839, the *Dictionnaire technologique* presented tables entitled “Clothing measurements for a well-proportioned size of a 1.75M man” considered “ordinary”⁸¹. Most patents filed by tailors that included tables with proportional scales of the average man confirmed these standards. These patents created the possibility of thinking about a limited number of well-chosen average sizes. In 1864, an anonymous entrepreneur in Paris’ Sentier neighborhood, probably

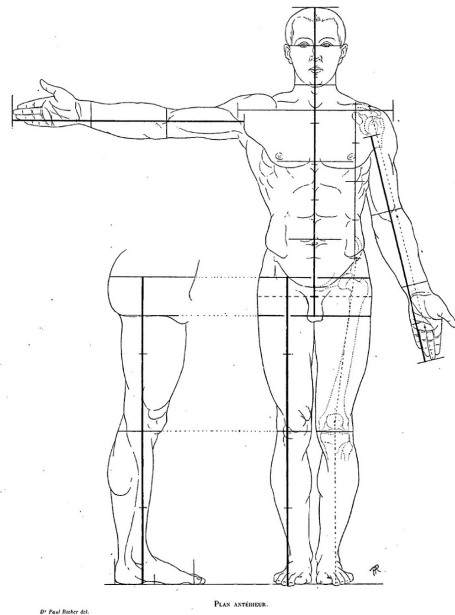
a tailor, published details on the “Ordinary proportions of the human body” classified by sex from birth to adult height according to three types grouped as “slender”, “ordinary” and “stocky”⁸². “Ordinary” was an average that became the standard. These considerations quickly caught the attention of clothing manufacturers who tried to find a set of sizes with fixed proportions that covered most of the population. Not surprisingly, working class stores that sold industrially-made clothing offered models in 5 sizes or *quintiles*, a system derived from statistics and probabilities. Alongside artists’ models made from ideal, antique bodies and adjustable tailor’s dummies, the dummies were made in five sizes based on “anthropological standards or principles”⁸³.

Standardized bodies

This definition of the average body thus helped mold body types for the masses. But at the same time the opposite was going on: the standardization of bodies attempted to make ideal bodies coincide with new averages. First, the progress made in treating infant diseases and surgery marked bodies less. Then after the Napoleonic wars, bodies during the century were generally less injured. Finally, the development of orthopedics modeled bodies on clothing and clothing on “well-proportioned bodies”⁸⁴. Infant corsets became more prevalent, they helped straighten and correct bodies (like making limbs longer with special instruments) during development, the period when body distortions first appeared and could be corrected⁸⁵. In their handbooks, several tailors spoke about the role of clothing in the body’s formation. Barde wrote in 1834 that, for young people who “have an awkward posture”, “the tailor can pull the cloth tighter in back and ease it on the chest so the person who wore the garment would be aware of his stooped posture and automatically correct it.”⁸⁶ So orthopedic clothing could correct bodies. Tailors sold clothes that “corrected posture deficiencies and bad habits”⁸⁷. This orthopedic logic was also used in clothing for daily life: among the bourgeoisie, the top hat, buttercup yellow gloves and patent leather shoes prevented using certain gestures, as did corsets. Outer garments and underwear prevented the bourgeois from stooping or arching their backs. This technique was increased in high society by lessons in carriage – plus dance, gymnastics, etc. – as well as in schools to help create homogeneous, disciplined bodies.

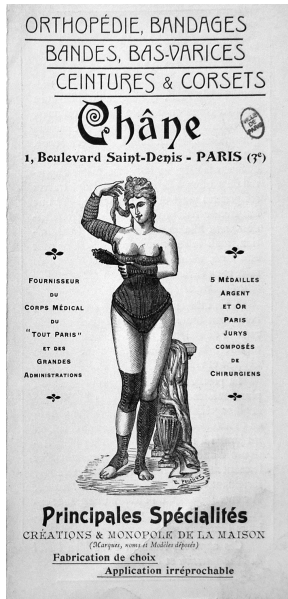
These orthopedics were also aesthetic: from the beginning of the 19th century, several manufacturers of surgical appliances marketed clothes that modeled bodies on ideals. For example Bienaimé sold, a “day corset that holds the body straight” in 1839 along with a “band that, thanks to its soft, graded pressure on the pelvis and hypogastric zone, reshapes the silhouette”⁸⁸. After the 1850s, corsets for women and stomach belts for men became standard⁸⁹.

After the 1820s, “natural” paddings, toupées and hairpieces had great success: fake breasts, fake calves, small cushions, shoulder pads and heel pieces



Dr Paul Bacher del.

PLAN ANTERIEUR.



↑ Corrective garments. Advertisement for the Châne company that made orthopedics, bandages, bands, stockings for varicose veins, belts & corsets, boulevard Saint-Denis, around 1900.

↑ Advertisement for patented “orthomorph suspenders” sold by Cahun, rue Taitbout, 1907. This type of garment was sold starting in the mid-19th century by companies that sold bandages and undergarments.
© Private collection.



all helped redesign bodies⁹⁰. Housekeeping handbooks recommended, when lacking a bust, that women fashion fake breasts with cotton or whalebone scrapings and bathing suits had to be “discreetly padded to compensate for natural imperfections”⁹². Unlike 18th century prostheses, these aesthetic prostheses had to appear “natural” in the same way as dentures or wigs.

Medical prostheses became more natural and, since they were made with dyed rubber, were often confused with the body itself. These completed “bodies” had to appear “normal”. Orthopedics was approaching the work of tailoring to bridge the distance between real and ideal bodies. By modeling bodies on medical or aesthetic standards, orthopedics made it possible to imagine a standard body dressed in normal clothes.

SERVILE BODIES AND FASHION FOR AVERAGE PEOPLE: THE GROWTH IN FIXED SIZES

The order of sizes: “normal” for military uniforms

If multiple cultural resistances explained the fact that it was difficult to sell fixed sizes, it was also because they were established for “dominated” people who usually were part of administrations: children, prisoners, boarders or soldiers. In England as of the 18th century, outfitters produced a huge number of uniforms – up to 120,000 pieces a year – for the Army, Royal Navy and sometimes the merchant navy⁹³. At the end of the 18th century in Europe, the Army manufactured fixed sizes on a large scale. Needs were enormous because of regime changes – and uniform changes, particularly in France – plus a large, active military. The Army considered that conscripts’ bodies were malleable and they had nothing to say about their clothing. Moreover, thanks to a height gauge, the Army had data that defined size groups. It was easier since conscripts under 1m55 cm were eliminated and the Army accepted “no hunchbacks and men with all their limbs”⁹⁴. The distribution of men by assignment – the artillery for

tall men, etc. – facilitated the definition of averages. Social distinctions remained: clothes for foot soldiers were made in three sizes but they were made-to-measure for officers⁹⁵.

From the 1820s on, people complained about the Army's "badly-fitted clothing"⁹⁶. An 1824 handbook about military administration noted "we must measure each man but [...] this is an illusion because of supplies, particularly when a made-to-measure uniform is given to a new person"... and concluded that three sizes were enough⁹⁷. The logic was similar for all uniform wearers: Paris firemen were dressed in two or three sizes by manufacturers⁹⁸. They also supplied the national Gendarmes, the Republican Guard and the Municipal Guard...⁹⁹ Still at mid-century, the issue was not dealt with for troops, the "masses" who couldn't complain: "ready-made garments are made in three sizes and that is enough; sometimes, the master tailor measures bodies but this is more complicated than useful"¹⁰⁰ During the 1860s and faced with the huge demand from army "campaigns" – the Crimean War plus interventions in Italy, Mexico, Cochin China, Algeria¹⁰¹ – three fixed sizes dominated, especially since the Army required manufacturers to have about ten thousand garments in stock¹⁰².

Since tailors that worked for the administration couldn't meet the demand: the Army made deals with civilian workshops. For them, uniforms were specifically made in 3 or 5 sizes. Anthropometry helped both administrations and the industry: thanks to a statistical analysis of measurements, they defined the "average" or "typical" soldier and main groups of sizes and "corpulences" to, according to the War Ministry in 1865, "perfectly dress all men in the Army. [...] These types are numbered 1, 2, 3, 4, etc. [...] Clothes will be made in appropriate proportions"¹⁰³. If the administration still recommended dozens of measurements, the practice was simpler: "types" were a combination of height and underarm chest size.

But, their use made the Army aware that badly-fitted clothes and shoes created problems. Thus, administrations kept tailors and shoe-repairers in every military unit to make "alterations and do fittings for sub-officers and men with unusual body types"¹⁰⁴. For shoes, doctors noted that over a third of soldiers were unable to fight because of injured feet, the administration extended the size range – Godillot took orders in 24 sizes¹⁰⁵.

A survey right after the 1870 conflict shed light on these problems¹⁰⁶. In Rennes, an officer reported: "trousers were not wide enough so soldiers couldn't put them on. [...] We were forced to give small and mid-sized men trousers in a larger size and cut them at the bottom". In the Landes region, "clothes were in small sizes so soldiers were more "rigged out" than dressed, making any movement uncomfortable". And concerning walking shoes in northern France, "out of a hundred pairs [...], over thirty were unusable because of a lack of proper sizes". Imposing sizes had a physical cost. At the end of the century,

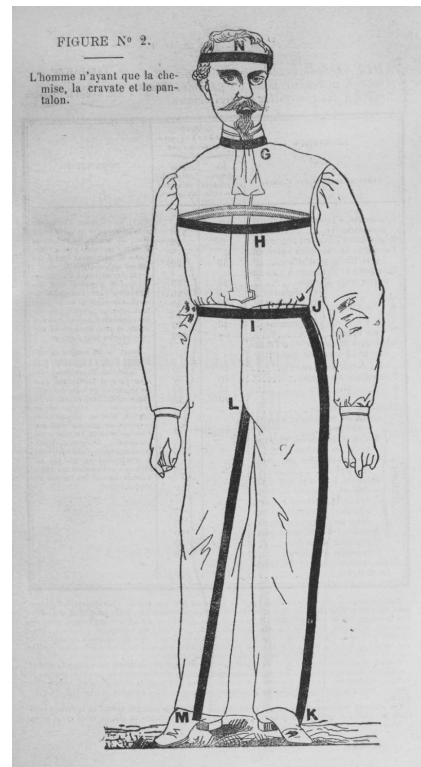


FIGURE N° 2.
L'homme n'ayant que la chemise, la cravate et le pantalon.

◆ Measurements of a soldier at the dawn of the 20th century: *Service de l'habillement (masse): administration et comptabilité intérieures des corps de troupe (Clothing service (mass): administration and accounting information for a troops)*, Paris, R. Chapelot et C^{ie}, 1907, p. 137.

the Army extended the “variety of sizes” to 40 sizes just for tunics to “dress a man respectably when he joined the army”¹⁰⁷. Outside the three-size system, all clothes had to be “marked with their size number” for the supply office¹⁰⁸. The sewing captain specified: “each piece of clothing has two rectangles on the lining that gives the measurements [...]: the top rectangle indicates the type” and the bottom the chest size. The system continued throughout the 20th century, a “*typomètre* [type gauge]” could measure and determine both types. The Army recommended taking 14 measurements: two for fixed sizes, 8 for body type (a synthesis of arm width, waistband, collar size and shoulder breadth – while five letters indicated height from A/48 to E/40. Combining these parameters in 40 or 45 models, the Army could dress the entire troop without making alterations¹¹⁰. But, still in 1900, an observer noted that “people do not pay attention to size and prefer making it longer or shorter with unfortunate results”¹¹¹. So each soldier applied his own *do-it-yourself* method to standard sizes.

These huge orders created a new industry by its scale and organization. From the 1820s, manufacturers tried to introduce “a better division of labor in workshops” and base them on the army’s Bordeaux factory with “three thousand workers where each type of piece was the exclusive domain of a group of workers”¹¹².

First attempts to use sewing machines were done in the 1830s to “machine-produce all military trousers”¹¹³. From the 1860s, civilian factories that made uniforms changed the industry that had been made up previously of small or home workshops. Since the Army required factories to group production in a single place to prevent theft, enormous factories appeared, especially the Dusautoy and Godillot factories on rue Rochechouart in Paris¹¹⁴. The Crimean War in 1854 showed the need for large factories capable of manufacturing quickly, and the campaigns of the Second Empire and colonial wars confirmed this¹¹⁵. Orders were colossal: the Dusautoy factory made 300,000 uniforms in 1859 and Godillot, that had almost the entire market in the 1860s, committed to supplying 300,000 shoes and 400,000 garments to the French army. The army had to dress 350,000 men, meaning 870,000 pieces just for trousers and jackets. And the phenomenon became more pronounced because of the accelerated cycle of replacement – 12 months for long leggings, 6 months for shirts, 4 months for boots¹¹⁷... Some manufacturers exported hundreds of thousands of uniforms each year to “Turkey, Egypt, Italy and many South American republics”¹¹⁸. These factories had a new scale: Godillot asked the army ministry to buy a minimum of 60,000 pieces a year to “keep their 2,000 workers busy”¹¹⁹.

Thanks to the “subdivision of work [...] with extreme limits” and steam-powered bandsaws or cutters that cut several pieces at once – 12 in the 1860s, over 200 layers in the 1880s¹²⁰ – and sewing or finishing machines, mechanization and standardization were going strong¹²¹. Doing away with “imperfect” hand-cutting, Godillot advocated “mechanical cutting and sewing” that could be made by “the first worker that comes along”¹²². Standardization was more advanced because the Army wanted to make “standard exchanges” of clothing pieces for repairs according to a concept established around 1900.

The transition from the Army to the civilian sphere was also concretized: these factories made their equipment and workers profitable by producing uniforms for “post office workers, customs officers, railway workers from various companies, and students”¹²³.



As a place for experimenting with standards, concentrating production and grading sizes for receptive bodies: the Army was the ideal place for using fixed sizes. Besides bringing the industrial model of manufacturing into the civilian world, the Army familiarized masculine society with standardized sizes.

Fixed sizes for servile bodies

In addition to uniforms, a market expanded from the 17th century onwards for people, like conscripts, for whom adjustments were not as important in the eyes of society. They were dressed by their masters or wore basic professional clothes.

In 1664, *Nouveau théâtre du monde* indicated sales of “prefabricated shirts” for slaves and the poorest Portuguese in Goa¹²⁴. A century earlier, Savary des Bruslons reported the trade of “prefabricated shirts” by European travellers in the “French islands of America, Canada, Senegal & coasts of Guinea from the Cape Verde Islands to the Cape of Good Hope”¹²⁵. In the United States at the end of the 18th century, not surprisingly, standard sizes were set for slaves. The phenomenon was accentuated during the 19th century: tradesmen and travellers sold “ready-made clothes” in trading posts and the colonies. The French maker Lémann noted in 1857: “our ready-made clothes reach regions where many people believe there are cannibals.” And he added: “we are now exporting our French clothes to the entire world, [...] all along the West African coast, savages want our clothes and the Régis company of Marseilles exchanges ready-made clothes for natural products”. Being practical, he added: “so our clothes will sell quickly abroad, I requested a survey about the typical dress of people who might buy our clothes and I extended the size range”¹²⁶. But Western people believed savages didn’t need tailored clothes since decency – or being civilized – was enough.

The budding industry of ready-made clothes in the 1840s grew thanks to exports. The *Dictionnaire du commerce* in 1859 noted: “in South America taste, elegance of cut, and public opinion, whether it was justified or not, implied that these clothes were the latest fashions from Paris that made them extraordinarily popular. Orders [...] expanded a hundred-fold. Manufacturers sent travellers, opened branches, and their business increased considerably”. Figures from Customs confirmed this: in 1859, the top export zones, ahead of Europe, were Algeria, Brazil, the Caribbean Islands, Egypt, Turkey...¹²⁷ At the same time, the export of second-hand clothes was massive to these zones and also sub-Saharan Africa, a phenomenon intensified by colonization. For European people, the clothes of “indigenous” workers as well as the clothes of the elite who seemed “disguised” as bourgeois, were associated with fixed sizes. In colonized countries, Europeans wore tailored clothes or uniforms.

The phenomenon was the same in France: fixed sizes spread for customers who couldn’t afford made-to-measure, who were obliged to buy professional clothes and who, like conscripts or slaves, had no choice. All department stores with ready-made clothing – La Belle Jardinière, Le Bonhomme Richard... –, had opened “professional clothing” departments by the 1830s. Workers could find blouses in three sizes that were roomy enough to be worn in cold weather over other clothes, and smocks in three sizes with a back belt or elastic so they could be adjusted. If from the 1850s onwards, blouses were on the decline, the specialization and professionalization of clothes increased.

In their catalogues, La Belle Jardinière featured bourgeois clothes but most items were work clothes: butcher, typographer or laboratory assistant blouses, cooper and coalmen smocks, wine merchant and carpenter bodices, chimney sweep and tapestry-maker overalls, engineer and pastry chef coats ... and all kinds of aprons¹²⁹. From 1889, the firm distributed a catalogue dedicated to “ready-made and made-to-measure work clothes” because of the opening of several specialized shops in Paris.

Untailored clothes could also be used to hide bodies behind social and professional functions. This was the case of servants: they had to wear uniforms that evoked the livery outfits of the Ancien Régime. La Belle Jardinière, like other department stores, sold frock coats and jackets for livery and grooms, waistcoats for stableboys, valet jackets, white aprons... usually in 5 sizes¹³⁰. It was the same for public services. Besides the Police, manufacturers dressed “officers of the Post office, Customs and railway employees”, or people who represented institutions: the uniform had to hide each body’s unique qualities. Other bodies that had to disappear were those of clergymen. The cassock, unfitted by definition, was produced in fixed sizes. While the outfits of the higher clergy were made-to-measure, “ecclesiastical items” for parish priests and altar boys were in fixed sizes and came in three lengths¹³².

The other bodies that had to endure the wearing of standardized were children, especially boys from 12 to 18. While a unisex dress clothed very young children, miniature versions of adult clothes appeared. These were the only fixed sizes mentioned in tailors’ handbooks, but they specified, as in drawing treatises, that children did not have the same proportions as adults. Children, said one handbook, “had to be dressed with full clothes that correct their body heaviness”¹³³. Society imposed fixed sizes on children easily since these clothes had an orthopedic function. From the 1860s, clothing manufacturers invested in this new market for secondary school and boarding school uniforms¹³⁴. They used terms from anthropometry that attempted to define growth phases and terms: until age 16, sizes were defined by two-year age brackets – ages 6, 8, 10, 12, 14 and 16¹³⁵. Children’s bodies, when dressed, had to fit these sizes for dresses, uniforms and, after 1880, miniature suits.

“Average fashion” for the middle class?

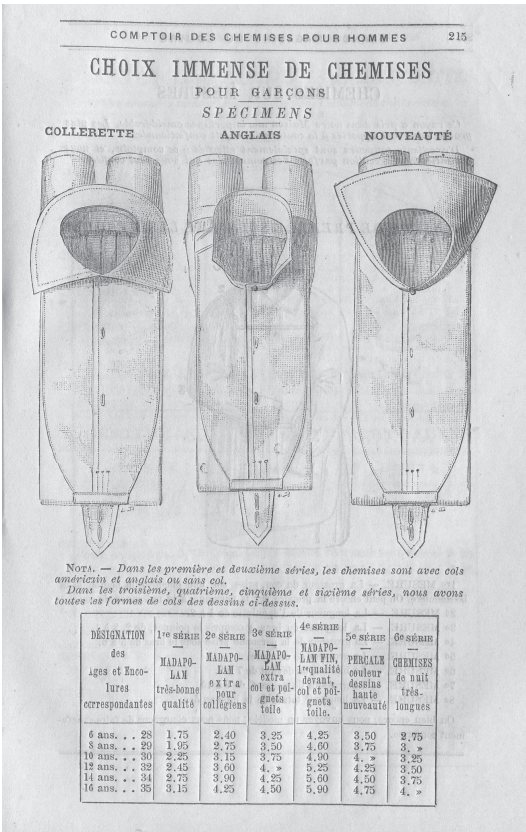
From the 1830s onwards, journalists and tailors condemned the “baggy cardigan” or “bag-with-sleeves” as the products of ready-made clothing manufacturers. But in reality, it may have been the opposite: the new physical culture meant these new comfortable clothes were easier to produce in advance. Despite these comments, the untailored reefer coat, unfitted at the waist, caught on throughout society¹³⁶. For the ever-increasing numbers of employees, jackets — and suits — replaced tailored frock coats. The uniform served as an example to manufacturers: “The reorganization of the Garde Nationale in 1830, wrote Lémann in 1857, meant that patriotic fervor drove people to wear clothes that resembled uniforms [...] which helped expand the ready-made clothing industry”¹³⁷. The Garde nationale uniform – a specialty of La Belle Jardinière – introduced fixed sizes to male civilians. Thus, people were nostalgic in 1867 for the “time of [...] the tailored frock coat. The cardigan-sack eliminated it. There were no measurements, only sizes¹³⁸”. So the clothing landscape changed at that time because of the expanding clothing industry: there

were 270 companies that made men's clothing in Paris and 1,500 in France¹³⁹. Just for civilian clothing in Paris, there were 190 firms in 1846 and over 420 by 1866¹⁴⁰. But untailored clothing dominated in companies that made reefer coats and trousers since the 1830s in a few sizes. They were easy to make because they were roomier and always in the same color¹⁴¹.

Critics confused cut, size and aesthetic. An aristocratic reporter at the 1867 International Exhibition lamented that: "we are not a customer, we are just a 'number'. Hundreds of factories give us an indifferent, defining uniform". And he went on: "This clothing industry has atrocious aspects. No measurements. Instead of your foot, there are units, we wear size 9 or 9.5 shoes. The roles are reversed, today flesh has to adapt to leather. [...] Machines can be beautiful but cruel. [...] The industry needs types, are you a type? The machine has its own taste, you must model yourself on it and the majority reigns"¹⁴². The condemnation was the same in 1878: department

stores "gather collections of ready-made clothes [...] following the average fashion of the day"¹⁴³. But the same critics defended, condescendingly, the improvements of popular conditions, thanks to standardized clothing. Lémann, who wanted to dress cannibals as well as workers, wrote enthusiastically: "I think the clothing industry moralizes the masses; in the past a worker dressed in coarse linens or mended rags but now he puts on a morning coat to elevate him and oblige him to have more self-respect."¹⁴⁴ Lacroix in 1878 delighted over workers dressed in frock coats, thanks to the clothing industry that "has given self-respect to workers dressed in overalls"¹⁴⁵. Workers' social orthopedics could accept unformed clothing once they could wear average fashions after work.

More discreetly, fixed sizes appeared for underwear, especially men's shirts. The market of "white-collar" employees increased from the 1830s with the multiplication of administrative officers and office workers in the public and private sectors. Bank employees or shop assistants were obliged to look good and usually had to buy their own shirts. While there was a distinction between town and working clothes for the lower middle classes, the white shirt in three or five sizes became the standard¹⁴⁶. Elasticized waists and gathers helped adjust them. Household and hygienic handbooks observed this new contact between bodies and fixed sizes. One book denounced, from 1838 onwards, "ready-made shirts" whose "diameter is not wide enough or that have shoulders that are too far forward and which could even cause a stroke"¹⁴⁷. But for



♣ Shirt in fixed sizes, catalogue of the Grands Magasins du Louvre (department store), 1878.

several doctors, ready-made clothes encouraged improvements in personal hygiene¹⁴⁸ and, because of the popularity of caring for collars and cuffs, white shirts became a standard among the bourgeoisie¹⁴⁹. All department stores offered ready-made shirts, “undershirts, blouses, bodices, camisoles, undershirts and skirts”¹⁵⁰. And when employees took off their camisoles, they put on a nightshirt, a large, chaste sack made in three sizes¹⁵¹.

The military culture impregnated this new clothing culture. Catalogues specified models and prices for an average “girth” of 88 cm at the waist, the same size set by the Army¹⁵². But in examining department store catalogues, the logic was not clear. Semi-ready-made clothing dominated the market. Moreover, a new system emerged: clothes were produced in fixed sizes and an army of “alteration experts” could dress people in “five minutes” (it actually took a half-hour)¹⁵³. These industrial choices were also economic and social: while popular department stores reduced the range of sizes to lower prices, luxury department stores cut costs but offered a large range of sizes. *L’Illustration* wrote about La Belle Jardinière that for the consumer it “was rare [...] that he could not find clothes to fit him”. There was a similar logic for shoe sizes ranging from “tiny baby feet” to “size 47”. The big houses offered models made using combinations. It became normal to give sizes based on the chest measurement, but each size had variations expressed by a system that combined letters and numbers as in the Army. La Belle Jardinière, from 1875, explained that its great success came from “a broader range of graduated sizes”¹⁵⁴. By 1900, the department store offered key pieces in 40 sizes. But alterations were still required. We can understand why an observer of the clothing industry wrote that in 1906, the ready-made industry of fixed sizes “dressed about two-thirds of France’s male population”¹⁵⁵.

Women still resisted wearing fixed sizes. Their bodies seemed impossible to standardize and no administration had developed a series of measurements that imagined the female body in average sizes. Besides work clothes – overalls, blouses... –, the first clothes made in fixed sizes were clothes that “don’t require exact measurements” like shawls, short capes, long skirts..., prefabricated by almost 2,500 ladies’ “clothing manufacturers” at the beginning of the 20th century¹⁵⁶. We can add corsets “made in advance in a small range of sizes”. If they were often badly cut, rubber bands or lacings made them adaptable¹⁵⁷. For many working class customers, fixed sizes hugged the body for intimate apparel, while regular clothes were made-to-measure by dressmakers or at home. The subcontracting system with home pieceworkers meant, especially in Paris, that made-to-measure dresses could be made in 24 hours or ready-made dresses could be altered in the shop or at home after they were bought¹⁵⁸. Paradoxically, it would be a long time before an “average woman” would be analyzed to create an ideal body that could be used as a reference for a small range of fixed sizes.

Conclusion

The history of standard sizes was a long, often difficult, negotiation between manufacturers and actual bodies, sometimes willing, sometimes unruly. Thus, the advent of industrial standards was not dependent on technical progress. To be effective, fixed sizes had to be created from an “average man” and applied to submissive bodies, or at least people in low social positions. This

new kind of clothing threatened social hierarchies and the culture of physical standards. The 20th century was marked by the imposition of these standards and their transgressions. While the clothing industry dominated menswear by the 1920s and womenswear from the 1960s, several subcultures and counter-cultures played with untailored clothing to reject clothing standards for social, cultural and industrial reasons. This was the case of the loose clothing worn by the Zoot-suiters: they rejected manual labor and the standard social order. Their baggy pants obliged them to walk slowly and nonchalantly. In contrast, the Teddy Boys, Mods and Punks rejected the system with their tight clothes, especially their “high-riding”, tight-fitting pants. All these groups – and we can add hippies who rejected the white-collar uniform – refuted certain types of professions, the overall social order and the industrial standards of ready-to-wear. They refused fitted clothing and a system that modeled bodies on fixed, industrial sizes.

In the few centimeters that might make a garment too short or too long or in its creases and hems, we can discover a complex discussion about fashion, clothing, social standards and ultimately, the body itself. ■

Notes

1 For its starting point, this article was based on discussions with Patrick Verley. I would also like to thank Corinne Legoy and Isabelle Paresys who reread it.

2 Ali Coffignon, *Paris-vivant: les coulisses de la mode*, Paris, Librairie illustrée, 1888.

3 Vandael, *Manuel théorique et pratique du tailleur...*, Paris Roret, 1833, p. 137-139. About technical issues in Great Britain, see W. Aldrich, “History of sizing systems and ready-to-wear garments” in S. P. Ashdown, *Sizing in clothing: developing effective sizing systems for ready-to-wear clothing*, Woodhead Publishing, 2007 and for France the wonderful paper of Alison Matthews David, “Made to measure? Tailoring and the ‘normal’ body in nineteenth-century France” in Ernst Waltraud (ed.), *Histories of the Normal and the Abnormal: Social and Cultural Histories of Norms and Normativity*, Oxon & New York, Routledge, 2006.

4 Fulerand-Antoine Barde, *Traité encyclopédique de l’art du tailleur*, Paris, Chez l’auteur, 1834, p. 57-60, p. 85 et p. 141.

5 Guillaume Compaing, *L’art du tailleur, ou Application de la géométrie à la coupe de l’habillement; [...] précédé d’un cours élémentaire de géométrie*, Paris, Dondey-Dupré, 1828.

6 Théophile Gautier, *De la mode*, Paris, Poulet-Malassis, 1858, cité par Alison M. David, *op. cit.*

7 Institut national de la propriété industrielle (INPI), 1BA3874, Barde, “Trois instruments destinés à prendre la mesure des habits, nommés triple décimètre, épaulimètre et dossimètre”, 1832.

8 INPI, 1BA7451, Maillier, “Acrobimètre”, 1839 and 62098, Berthelon, “Instrument propre à la coupe des vêtements dit le conformateur du tailleur”, 1864.

9 F. Ladevèze, *Cours de coupe du tailleur de Paris...* Paris, Musée des tailleurs illustré, 1874; voir les inventaires après faillites des tailleurs, Archives de Paris, D11U3.

10 “Mannequins”, *Dictionnaire du commerce, de l’industrie et de la banque*, Paris, Guillaumin, 1898-1901.

11 Eugène Lacroix, *Étude sur l’Exposition de 1878...*, Paris, Librairie scientifique, industrielle et agricole, 1878, “Machines servant à la confection des vêtements”, p. 468; INPI, 262738, Stockman frères, “Système perfectionné de mannequin pour atelier et étalage”, 1896.

12 “Examen des robes essayées” in M^{me} Celnart, *Manuel des dames, ou L’art de l’élégance, sous le rapport de la toilette, des honneurs de la maison, des plaisirs...*, Paris, Roret, 1833, p. 174.

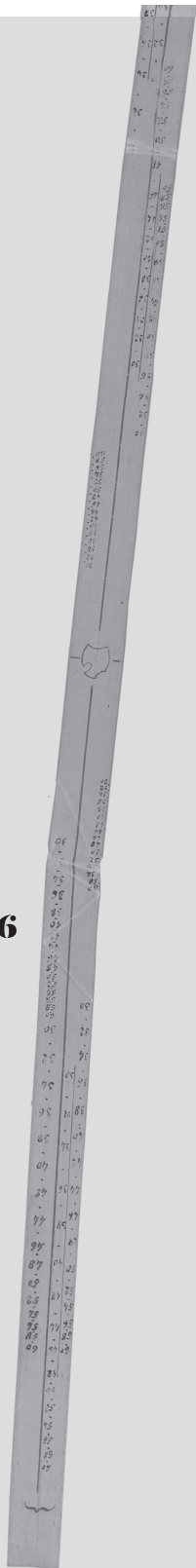
13 Eugène Lacroix, *op. cit.* and Émile Bariquand, *Rapport sur le matériel et les procédés de la couture et de la confection des vêtements, exposition universelle de 1878*, Paris, Impr. nationale, 1880 and Alexis Godillot, “Matériel et procédés de la couture et de la confection des vêtements” in *Rapports du Jury International. Exposition Universelle internationale de 1889*, Paris, Imp. nationale, 1891, p. 412. In the 1880s, Singer only produced more than 700,000 sewing machines by year.

14 Auguste Dusauroy, *Exposition universelle de 1867, 35^e classe*, Paris, Dentu, 1867, “Vêtements d’hommes et de femmes”.

15 Albert Aftalion, *Le développement de la fabrique et le travail à domicile dans les industries de l’habillement*, Paris, Larose & Tenin, 1906, p. 125.

16 Manuel Charpy, “Formes et échelles du commerce d’occasion. L’exemple du vêtement à Paris”, *Revue d’histoire du XIX^e siècle*, 24-2002, p. 125-150.

17 “Introduction”, Léman, *De l’industrie des vêtements confectionnés en France...*, Paris, Dupont, 1857 and “Vêtements confectionnés” in *Dictionnaire du commerce et de la navigation...*, Paris, Guillaumin, 1859-1861.



Patented tapemeasure by Lavigne, "Device for tailors to take measurements", 1845 (1BB1872) © INPI

- 18 "Au carreau du Temple: l'essayage", *L'illustration*, 23/11/1901, p. 322-325.
- 19 Léman, *op. cit.*, p. 13 et sq.
- 20 André Theuriot, *Souvenirs des vertes saisons...*, Paris, Paul Ollendorff, 1904.
- 21 Ernest Serret, *Le prestige de l'uniforme*, Paris, Hachette, 1861, p. 160-161.
- 22 Girard de Cailleix, "Rapport sur les aliénés de la Seine traités dans les asiles de Bicêtre et de la Salpêtrière...", *Gazette hebdomadaire de médecine et de chirurgie...*, 30/08/1861, p. 554.
- 23 Théophile Gautier, *op. cit.*
- 24 Auguste Luchet (dir.), *L'art industriel à l'Exposition universelle de 1867*, Paris, Librairie internationale, 1868, p. 379 and Léon de Laborde, *De l'union des arts et de l'industrie*, Paris, Impr. impériale, 1857, p. 317, quoted by Nancy Green, "La confection en comparaison, Paris-New York, 1880-1980" in Louis Bergeron (dir.), *La Révolution des aiguilles. Habiller les Français et les Américains, XIX^e-XX^e siècles*, Paris, EHESS, 1996, in particular "Regard croisé: les Français et le 'style américain'".
- 25 Pierre Du Marrousssem, *La petite industrie: salaires et durée du travail. Le vêtement à Paris*, Paris, Impr. nationale, 1896, p. 210.
- 26 Eugène Lacroix, *op. cit.*, p. 468; see Paul Poiré, *La France industrielle*, Paris, Hachette, 1880, p. 490.
- 27 Jules Vallès, *Le Bachelier*, Paris, Charpentier, 1881, p. 208 and sq. et Jean-Claude Caron, "Uniforme(s) étudiant(s)?" in *Généralisations romantiques. Les étudiants de Paris et le Quartier latin (1814-1851)*, Paris, Armand Colin, 1991.
- 28 Jules Lecomte, *Lettres sur les écrivains français*, Brussels, s.n., 1837.
- 29 Fulerand-Antoine Barde, *op. cit.*, p. 73 and "Tailleur" in *Dictionnaire technologique, ou Nouveau dictionnaire universel des arts et métiers, et de l'économie industrielle et commerciale*, vol. 20, Paris, Thomme et Fortic, 1832.
- 30 INPI, 412293, Schmid, "Appareil pour la prise des mesures destinées à la coupe des vêtements", 1910.
- 31 INPI, Théophile Bouthéourd, "Nouveau conformateur pour vêtements", 1919. This confidence appeared, as Alison M. David noted, in the pseudo-technical terms that designated these in-

- ventions: himatomètre, saumètre, corporismètre, machine-mesure-statuaire...
- 32 Fulerand-Antoine Barde, *op. cit.*, p. 78 et 84.
- 33 INPI, 43953, Mornas, "Machine-mesure-statuaire", 1861.
- 34 INPI, 193872, Ogliastro, "Instrument donnant exactement la forme du corps dit: Corporismètre", 1888.
- 35 INPI, 366969, Maia, "Instrument pour prendre les mesures de la confirmation variable des personnes", 1906.
- 36 INPI, FR377986, Couplet, Belgique, 1907. Its device used a central point from tailor measured the distance of all the other points.
- 37 INPI, 1BA2826, Fournier, "Appareils nommés par l'auteur saumètres destinés à reproduire les formes et les proportions du corps, et applicables à la confection des vêtements d'hommes et de femmes...", 1827.
- 38 M^{me} Celnart, *op. cit.*, p. 171: "When you don't want that someone measure the imperfection of your waist, and try on and try on again several times the corset [...], you could cast your chest in plaster and send it to the dressmakers".
- 39 INPI, 1BA7451, Maillier, "Instrument qu'il nomme acrobomètre, propre à prendre d'une manière mathématique les formes du corps de l'homme, quelque imparfaites qu'elles soient", 1839.
- 40 INPI, 1BB583, Duret de Brie, "Moyen de confectionner les habits en quinze minutes", 1844; 1BB5213, Duteil, "Mécanisme propre à prendre les mesures sans tâtonnements et sans rectification", 1847; 1BB5297, Poidvin-Deshayes, "Perfectionnement à l'appareil dit Homomètre Poidvin propre à prendre exactement les mesures d'habit", 1847; 1BB15849, Rieupayroux-Janet, "Mécanisme destiné à donner aux tailleurs la forme exacte du corsage de l'homme, dit himatomètre Janet", 1853; 1BB52949, Lagrave, "Appareil mesurateur à l'usage des tailleurs", 1862; 1BB72390, Fereol Masgran, "Appareil à l'usage des tailleurs, dit configurateur", 1866; 188998, Maire, "Système d'appareil conformateur donnant la coupe précise du vêtement", 1888; 104478, Maury, "Conformateur centimètre pour tailleurs et confections", 1874; 424889, Astorri, "Dispositif pour prendre les mesures pour la coupe dans la confection des vêtements", 1911; 455941,

- Morge, "Conformateur destiné à relever la conformation exacte du corps humain pour la confection de tout vêtement", 1913...
- 41 INPI, 1BA7451, Maillier and 1BB13444, Pierre, "Méthode de coupes géométriques d'habillements à l'usage de celui qui sait ou ne sait ni lire et ni écrire", 1852.
- 42 INPI, 188998, Maire, "Système d'appareil conformateur donnant la coupe précise du vêtement", 1888 et Berthelon, *arch. cit.*
- 43 INPI, 139976, M^{me} Fontaine, "Appareil à l'usage des tailleurs appelé le rapide essayeur", 1880.
- 44 INPI, 1BB4202, Chalumeau, "Appareil dit traceur mobile universel, destiné à tracer, sur le drap ou toute autre étoffe, les coupes des différentes parties des habillements civils ou militaires...", 1846; 1BA5672, Heintz, "Procédé économique de coupe de drap, applicable spécialement aux pantalons des troupes", 1838. Several inventors indicated that tailors could reduce the fabric's losses - until 25% - with a new and rational way of cut.
- 45 INPI, 1BA3587, Thimonnier et Ferrand, "Métier propre à la confection des coutures dites à points de chaînettes...", 1830 and 1BB1825, Thimonnier, "Machine perfectionnée dite métier à coudre au point de chaînette", 1845.
- 46 INPI, 104478, Maury, "Conformateur-centimètre pour tailleurs et confection", 1874.
- 47 Émile Bariquand, "Machines à prendre mesure des vêtements", *op. cit.*, p. 36.
- 48 *France Illustration*, 1952, "The Belle Jardinière has the exclusivity of a revolutionary process for clothes: the bodygraph, and before United States that just start to be interested in it"; François Faraut, *Histoire de La Belle Jardinière*, Paris, Belin, 1987, p. 131-132.
- 49 INPI, 424064, The Greenberg automatic fitting machine company, USA, 1910.
- 50 The musée Galliera in Paris keeps some examples.
- 51 INPI, 1BA3256, Von Oven, "Mannequin fashionable destiné à essayer des vêtements d'hommes", 1829; and Alexis Godillot, "Bustes et mannequins pour essayer les effets" in *Rapports du Jury international, Exposition Universelle internationale de 1889 à Paris*, Paris, Impr. nationale, 1891, p. 419.
- 52 INPI, M^{me} Eavestaff, "Système de mannequin extensible pour

tailleurs", 1880. It "allowed the fitting without the presence of body when we took exactly the measurements"; thanks to "an airtight wrapping", tailor obtained "a exactly representation of the body"; 140386, Ebner, "Perfectionnements aux mannequins transformables à l'usage des tailleurs pour dames, confectionneurs, etc.", i. e. "a skeleton which, with a handle [...], could change its form and it could covered with clothes", 1880.

53 Pierre Du Marrousem, *op. cit.*, p. 210.

54 Ali Ciffignon, *op. cit.*, p. 131.

55 "Modèles", Aubin-Louis Millin, *Dictionnaire des beaux-arts*, Paris, Desray, 1806.

56 Voir Claire Barbillon, *Les canons du corps humain au XIX^e siècle. L'art et la règle*, Paris, Odile Jacob, 2004.

57 Gérard Audran, *Les proportions du corps humain mesurées sur les plus belles figures de l'Antiquité...*, Paris, Joubert, 1801 [published in 1683 and 1785]. See the plagiarism, *Les proportions du corps humain mesurées sur les plus belles statues de l'Antiquité...*, Paris, Delarue et Lille, Castiaux, 1810 and "Dessein. Proportions de l'Appolon Pythien" in *l'Encyclopédie et Charles-Antoine Jombert, Méthode pour apprendre le dessin: ou l'on donne les regles générales de ce grand art, & des préceptes pour en acquérir la connoissance, & s'y perfectionner en peu de tems: enrichie de cent planches représentant différentes parties du corps humain d'après Raphael & les autres grands maîtres, plusieurs figures académiques dessinées d'après nature par M. Cochin, les proportions & les mesures des plus beaux antiques qui se voient en Italie...*, Paris, Chez l'auteur, 1755.

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60 Johann Gottfried Schadow, *Polycèle ou théorie des mesures de l'homme: selon le sexe et l'âge; avec indication des grandeurs réelles d'après le pied du Rhin*; about Schadow, see the essential book of Daniela Döring, *Zeugende Zahlen Mittelmaß und Durchschnittstypen in Proportion, Statistik und Konfektion*, Berlin, Kadmos Verlag, 2011.

61 See for example, Charles Rochet, *Mémoire sur la loi des proportions du corps humain et l'emploi*

qu'en ont fait les artistes grecs..., Paris, Juteau, 1876.

62 *Journal des tailleurs*, "Proportions normales", octobre 1838.

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64 Guillaume Compaing, *L'art du tailleur... op. cit.*

65 Auctor et De Méautis, *La costumétrie: art de vêtir mis en corps de science*, Paris, Lépagnez, 1859, p. 4.

66 INPI, 1BA9015, Bailly, "Procédé à l'aide duquel toute personne peut se prendre la mesure d'un habit, d'un pantalon, etc", 1826. He measured the weight of the chest and cut all the parts from the sixth of this measure. See also, Henry Wampen, *Anthropometry or Geometry of human figure*, Wampen, 1864, cité par Daniela Döring, *op. cit.*

67 INPI, Gertie Esch, FR427722, "Procédé pour prendre mesure pour la confection de vêtements", 1911.

68 Christopher Beward, "Manliness, Modernity and the Shaping of Male Clothing" in *Body dressing. Dress, body, culture*, Oxford, Berg, 2011, p. 166.

69 *Les Annales d'Hygiène et de Médecine légale* published from 1829 onwards, notes about "la stature et au poids de l'homme" du médecin Tenon (1833, t. X p. 27), the "Mémoire sur la taille de l'homme en France" from doctor Villermé (1929, t. I, p. 581) or works titled "Sur la taille moyenne de l'homme dans les villes et dans les campagnes et sur l'âge ou la croissance est parfaitement achevée" form the statistician Quetelet (1833, t. III, p. 24). See moreover, Adolphe Quetelet, *Recherches sur la loi de la croissance de l'homme*, Brussels, Hayez, 1831.

70 Adolphe Quetelet, *Sur l'homme et le développement de ses facultés, ou Essai de physique sociale*, Paris, Bachelier, 1835.

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92 Alice de Laincel, *L'art de la toilette chez la femme: bréviaire de la vie élégante*, Paris, Dentu, 1885, p. 129.

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94 Paul Broca, *Mémoire d'anthropologie*, *op. cit.*, p. 436-445 et p. 469. Army kept 60 to 70% of conscripts; in 1864, out of 10,000 conscripts, 533 were exempted because of lack of height and 2 762 because of disabilities.

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96 François Le Couturier (sic), "Habilleme[n]t", *Dictionnaire portatif et raisonné des connaissances militaires...*, Paris, Blanchard, 1825, p. 272-273.

97 Pierre Agathange Odier, *Cours d'études sur l'administration militaire*, Paris, Anselin et Pochard, 1824, t. 7, p. 112 and sq.

98 APP, DA271, Ville de Paris, Corps des Sapeurs-pompiers (firemen), 3/08/1826, Grebert ("fournisseur d'effets militaires et d'équipements, 21 rue de Richelieu") supplied on three sizes pair of trousers, and sale by auction the 3/03/1829 in Maugéy, on three sizes. The mission statement of the 10/06/1842 specified that shirts were on two sizes and pair of trousers in five sizes.

99 APP, courrier du 14/07/1842, Dret-Rousselet, "Fabrique générale et fournitures d'équipements militaires, fournisseur de la Gendarmerie nationale et des régiments de toutes armées", rue St-Germain-l'Auxerrois, 86; 6/11/1835, Maison Aymard & fils in Lyon supplied ordinary firemen (Sapeurs-pompiers ordinaires) and the municipal guard. The City of Paris managed straight Republican guard, firemen and the guard

(31/05/1849). See INPI, 1BB13444, Pierre, "Méthode de coupes géométriques d'habillements à l'usage de celui qui sait ou ne sait ni lire et ni écrire", and in particular for "canteen women's uniforms, National guard's uniform and military tunic", 1852.

100 Général Bardin, *Dictionnaire de l'armée de terre...*, Paris, Corréard, 1851, vol. 3.

101 Only for the Crimean War, it was more than 700,000 men; Paul Broca, *Mémoire d'anthropologie...* *op. cit.*, p. 488.

102 "Habilleme[n]t" in Comte de Chesnel, *Encyclopédie militaire et maritime*, vol. 2, Paris, Le Chevalier, 1864. See SHAT, XS535 1864-1867, markets (marchés) and APP, File of 10/06/1842, Corps des Sapeurs-pompiers, Cahier des charges pour la fourniture d'effets d'habillement confectionnés en drap à l'usage des sous-officiers du corps des Sapeurs-pompiers de Paris (Specifications for supplying of clothes made in sheet for non-commissioned officers of the Parisian fire brigade).

103 SHAT, XS533, lettre du 29/06/1865, Réorganisation de la Commission des modèles... Army used the "average size" from 1850 to the 20th century; see SHAT, Ministère de la guerre, *Description des effets d'habillement, de coiffure, de grand et de petit équipement... à l'usage des corps de troupe*, Paris, Dumaine, 1879.

104 SHAT, XAF7, Garde impériale, Habillement, équipement, ouvriers, 1854-1870; XS535, letter of the 3/11/1867; GR 9 Ng, 31/03/1911 et "Habilleme[n]t" in Comte de Chesnel (dir.), *op. cit.*

105 Charles Viry, *Principes d'hygiène militaire*, Paris, Bataille, 1896, p. 392-395.

106 Alfred Monnet, *Rapport fait au nom de la Commission de Marchés sur l'habillement...*, Paris, Cerf, 1872.

107 M. D. Hubert de Vautier, *Exposition internationale de Saint-Louis, 1904, section française, rapport du groupe 59*, Paris, Comité français des expositions à l'étranger, 1906, p. 96.

108 SHAT, XS533, lettre du 29/05/1865, Réorganisation de la Commission des modèles..., Ministère de la Guerre; see Philip Scranton, "La confection à Philadelphie: entreprises et marchés, 1890-1930" in Louis Bergeron (dir.), *La*

Révolution des aiguilles... op. cit.

109 Capitaine Couture, *Conférence sur les diverses opérations administratives d'une compagnie territoriale en cas de période d'exercices*, La Flèche, Besnier-Jourdain, 1890, p. 10-12.

110 *Service de l'habillement (masse): administration et comptabilité intérieures des corps de troupe*, Paris, Chapelot, 1907. The only evolution in the 1920s was the reduction of the number of "types" from 45 to 25, certainly because of standardization of the bodies and because of a new culture of ready-made clothes. In the same time, clothing industry tried to set new sizes and proportions for "natives" (indigènes).

111 M. D. Hubert de Vautier, *op. cit.*, p. 96.

112 Pierre Agathange Odier, *op. cit.*, t. 7, Chap. IV "Service de l'habillement", p. 112-115.

113 "Tailleur" in *Dictionnaire technologique... op. cit.*; Thimonnier itself worked in military uniforms (INPI, 1BA3587, Thimonnier and Ferrand, "Métier propre à la confection des coutures dites à points de chaînettes...", 1830).

114 Julien Turgan, "Établissements Alexis Godillot: fournitures pour l'armée" in *Les grandes usines, études industrielles en France et à l'étranger*, Paris, Calmann Lévy, t. XIII, 1881.

115 SHAT XS535, Alexis Godillot au Ministère de la Guerre, letter of the 11/03/1867. Only for Crimean War, Army raised 140,000 men; Du Marrousem, *op. cit.*, fixed the starting point with Italian war.

116 *Le Monde illustré*, "Travaux d'équipement militaire: ateliers de M. Dusautoy", 28/05/1859 and SHAT, XS535, Ministère de la guerre, Bureau de l'habillement, 14/12/1864.

117 SHAT, XS535, décembre 1864. In 1867, Godillot supplied around 1,100,000 pairs of walking shoes and 1,200,000 articles of clothing (Julien Turgan, *op. cit.*); *Projet de règlement sur les services du petit équipement et de la masse individuelle dans les corps de troupes*, Paris, Impr. nationale, 1873.

118 SHAT, XS535, letters of Gouéry, Canat & C^{ie} and ministerial inquiry about the company, April-May 1867; Auguste Dusautoy, *op. cit.*, p. 345-358 and "Vêtements confectionnés", *Dictionnaire universel théorique et pratique du commerce... op. cit.*

- 119** SHAT, XS535, Alexis Godillot au Ministère de la guerre, Bureau de l'habillement, May 1864.
- 120** Tresca, "Compte rendu de la soirée scientifique du 29 octobre 1864", *Annales du Conservatoire des arts et métiers*, Paris, Lacroix, 1864, p. 206 and p. 217-219; Julien Turgan, "Établissements Godillot", *op. cit.* and Émile Bariquand, "Machines à découper les étoffes", *op. cit.*, p. 36.
- 121** M. D. Hubert de Vautier, *op. cit.*; *Le Monde illustré*, 28/05/1859, "Atelier de coupe à vapeur, M. Dusautoy"; see Henry d'Aligny, "Matériel et procédés de la couture et de la confection des vêtements", *op. cit.*, and Émile Bariquand, *op. cit.*; the button maker machines allowed to make 6 buttonhole by minute against one in 10 minutes with hand.
- 122** SHAT, XS535, Alexis Godillot au Ministère, letter of the 11/03/1867.
- 123** M. D. Hubert de Vautier, *op. cit.*, p. 93.
- 124** Pierre d'Avity, *Nouveau théâtre du monde contenant les estats, empires, royaumes et principautés...*, Paris, Chez Pierre Rocolet, 1644, p. 1164.
- 125** "Du Commerce des Ifles Françaises..." in Jacques Savary des Bruslons, *Le Parfait Negociant Ou Instruction Generale Pour Ce Qui Regarde Le Commerce des Marchandises de France, & des Pais Etrangers...*, Paris, Janson, 1726.
- 126** Léman, *op. cit.*, p. 16 and 54. See also, Shane and Graham White, "Slave Clothing and African-American Culture in the Eighteenth and Nineteenth Centuries", *Past and Present*, n°148, August 1995, p. 149-186.
- 127** "Vêtements confectionnés", *Dictionnaire universel théorique et pratique du commerce...*, *op. cit.*
- 128** INPI, 1BA10019, Parissot, confectionneur d'habillements, "Élastiques perfectionnés pour gilets et pantalons", 1842.
- 129** La Belle Jardinière catalogue, 1881-1882, p. 38-39.
- 130** *Ibid.*, p. 31-33 et ANMT, 66AQ, La Belle Jardinière, from 1888 onwards and then, every year.
- 131** Hubert de Vautier, *op. cit.*
- 132** Jacquard Fils, Besançon, *Catalogue de vêtements ecclésiastiques*, 1885.
- 133** Voir "Cinq vêtements d'enfants" in Fulerand-Antoine Barde, *op. cit.*, p. 201 et Vandael, *op. cit.*, p. 140.
- 134** La Belle Jardinière, specialized catalogues from 1887 onwards for "Enfants et jeunes gens" and in 1900 for "Vêtements tout faits pour collèges et lycées". See M. D. Hubert de Vautier, *op. cit.*, p. 87.
- 135** "Chemises", Samaritaine and Grands magasins du Louvre's catalogues, 1878.
- 136** François Faraut, *op. cit.*, p. 14.
- 137** "Introduction", Léman, *op. cit.*
- 138** Auguste Luchet (dir.), *op. cit.*, p. 379.
- 139** "Vêtements confectionnés", *Dictionnaire universel théorique et pratique du commerce...*, 1861, *op. cit.*
- 140** Auguste Dusautoy, *op. cit.*, p. 345 and sq.
- 141** Farid Chenoune, *Des modes et des hommes: deux siècles d'élégance masculine*, Paris, Flammarion, 1993, p. 68.
- 142** Auguste Luchet (dir.), *op. cit.*, p. 379 et 386.
- 143** Eugène Lacroix, *op. cit.*, p. 417-418 et 468.
- 144** Léman, *op. cit.*, p. 34.
- 145** Eugène Lacroix, *op. cit.*
- 146** INPI, 1BB16399, Madore et Neuburger, "Machine à tailler les chemises" (three sizes), 1853; 1BB20447, Besse, "Machine à découper les chemises", 1854; 1BB18364, Gronard, "Système de confection des chemises", 1853; 1BB21336, Beyney, "Perfectionnements apportés dans la coupe et la confection des chemises", 1854; 1BB25622, Michon, "Procédé de coupe de chemises pour homme", 1855...
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- 150** Jules Rengade, *Les besoins de la vie et les éléments du bien-être...*, Paris, Librairie illustrée, 1887, p. 502.
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- 152** See Belle Jardinière's catalogues, 1870-1880 and INPI, 1BB13444, Pierre, "Méthode de coupes géométriques d'habillements à l'usage de celui qui sait ou ne sait lire et écrire", 1852 and Maillier's patents, 1849 et 1851.
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- 155** M. D. Hubert de Vautier, *op. cit.*
- 156** *Ibid.*
- 157** Prince Napoléon, *Exposition universelle de 1855. Rapports du jury mixte international*, Paris, Impr. impériale, 1856, p. 502.
- 158** Albert Aftalion, *op. cit.*

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