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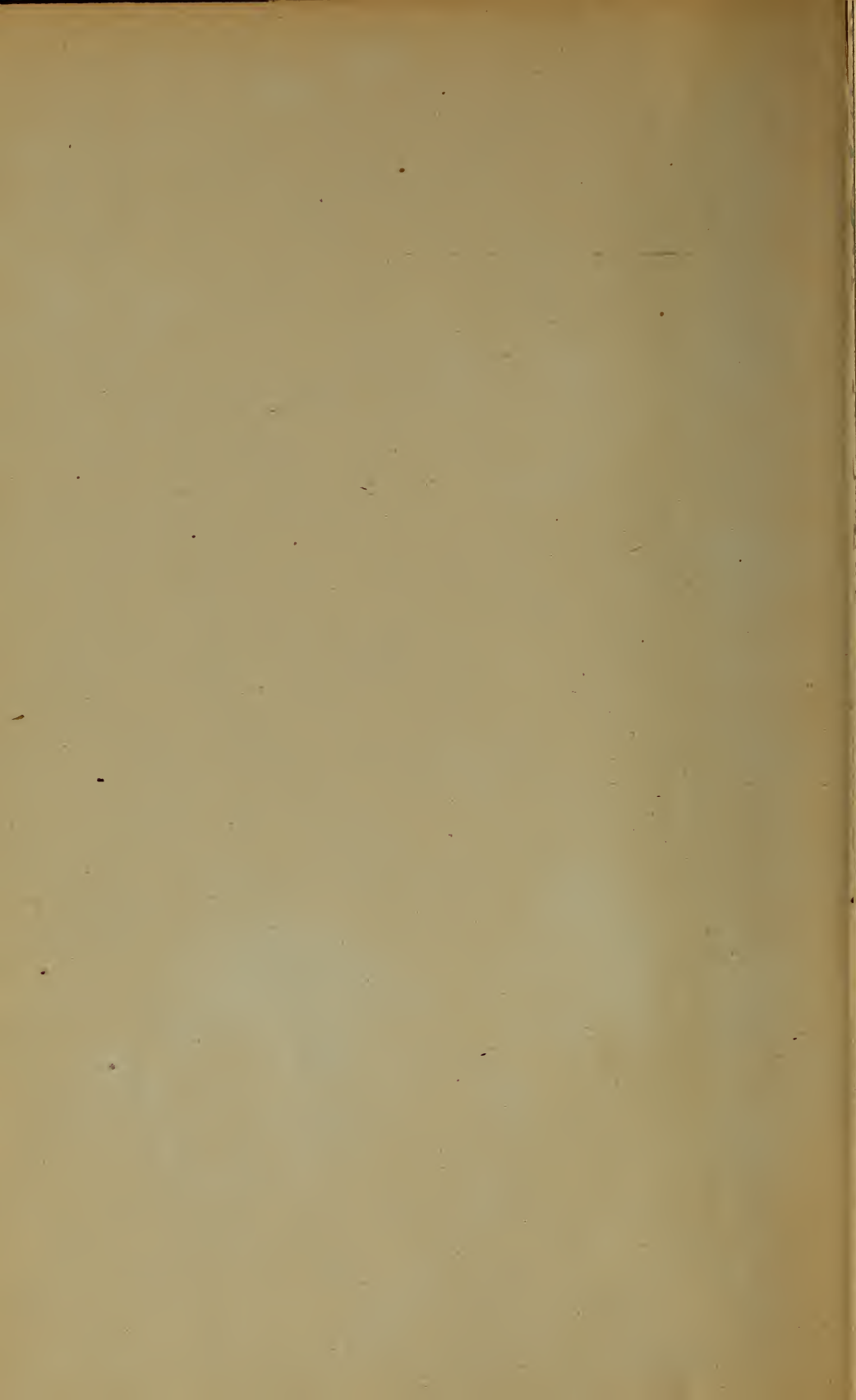
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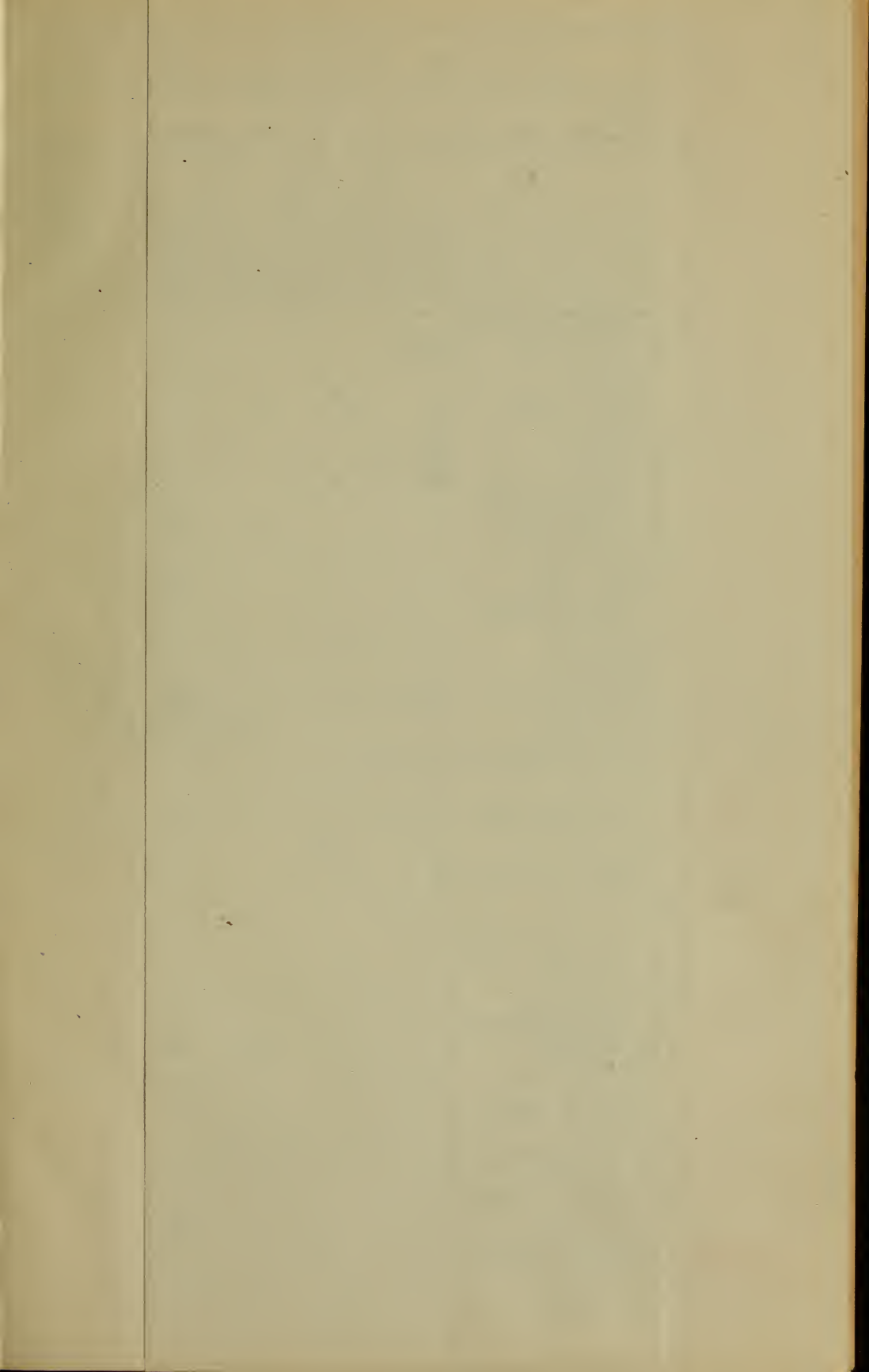
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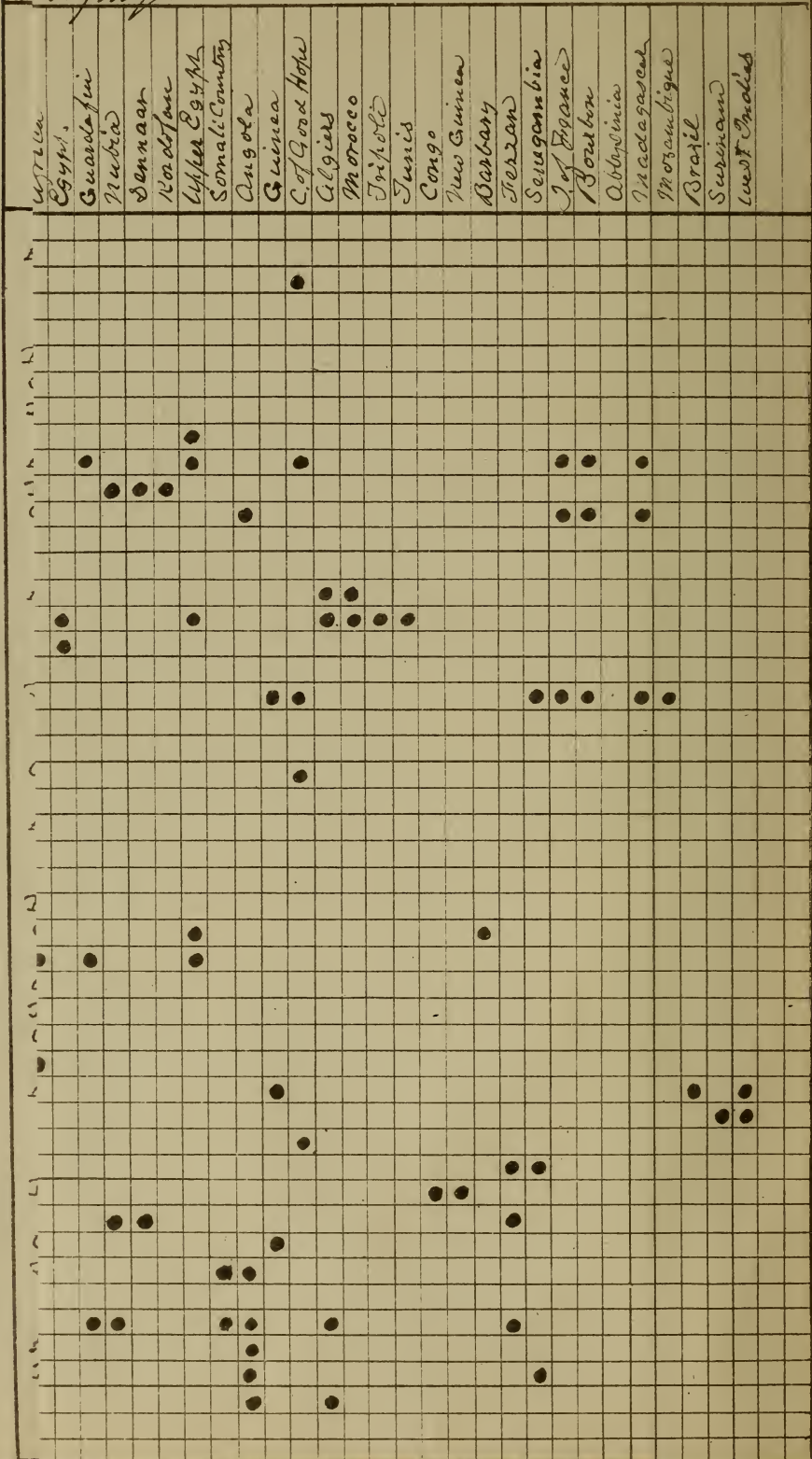
CLASSIFICATION OF WOOL.





Asiatic & African races of Sheep

Fitzinger



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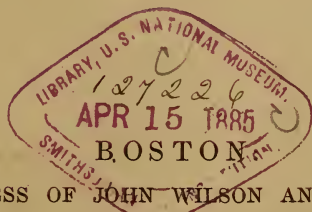
CLASSIFICATION OF WOOL.

A Report

ACCOMPANYING STANDARD SAMPLES.

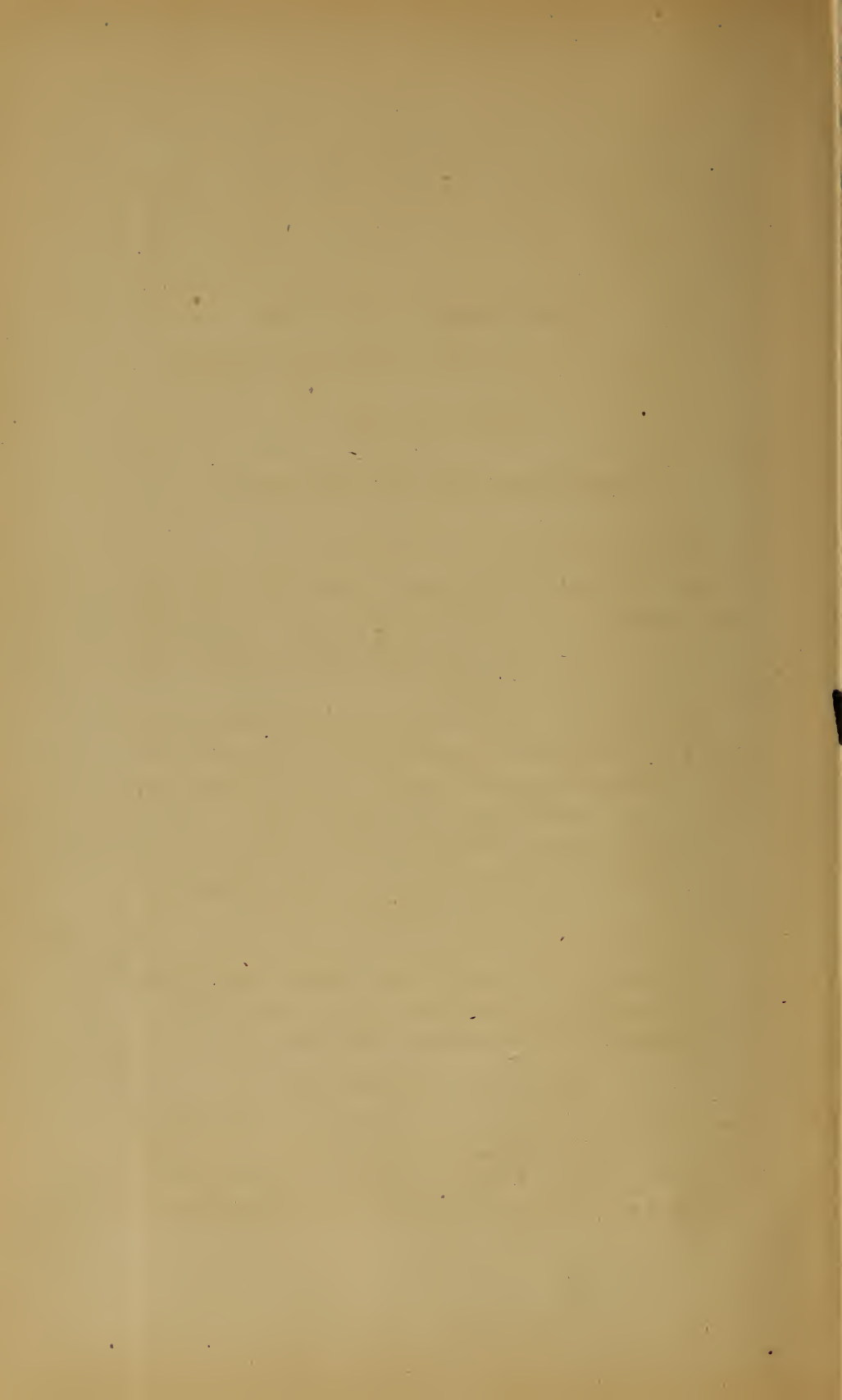
By GEORGE WILLIAM BOND.

REPRINTED FROM THE BULLETIN OF THE NATIONAL ASSOCIATION
OF WOOL MANUFACTURERS.



PRESS OF JOHN WILSON AND SON.

1873.



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CLASSIFICATION OF WOOL.

A REPORT ACCOMPANYING STANDARD SAMPLES.

BY GEORGE WM. BOND.

Published by consent of the Secretary of the Treasury.

TO HON. GEORGE S. BOUTWELL, *Secretary of the Treasury.*

SIR,— In offering for your approval the Cabinet of Samples, supplementary to that prepared in 1867, under the instructions of your honored predecessor, I beg to present to your consideration the principles by which I have been governed in the preparation of these two cabinets.

When my attention was first called to the bill referred to, and I read the classifications indicated therein, it seemed no easy task to illustrate the classes by samples. A careful study of it, however, soon convinced me that the division was by race or blood, and that no other practicable division could be made: the lines of quality so subtly run into one another, wools for all three uses—viz., clothing, combing, and carpet—being frequently found in the same flock, and even in the same fleece, it would be impossible so to represent them by samples as to secure uniformity of decision with different administrative officers, even were they all special experts in wool.

The following is the classification referred to:—

FIRST CLASS, CLOTHING-WOOLS.

“That is to say, merino, mestiza, metz, or metis wools, or other wools of merino blood, immediate or remote; Down clothing-wools, and wools of like character with any of the preceding, including such as have been heretofore usually imported into the

United States from Buenos Ayres, New Zealand, Australia, Cape of Good Hope, Russia, Great Britain, Canada, and elsewhere, and also including all wools not hereinafter described or designated in classes two and three.”

SECOND CLASS, COMBING-WOOLS.

“That is to say, Leicestershire, Cotswold, Lincolnshire, Down combing-wools, Canada long wools, or other like combing-wools of English blood, and usually known by the terms herein used ; and also all hair of the alpaca, goat, or other like animals.”

THIRD CLASS, CARPET AND OTHER SIMILAR WOOLS.

“Such as Donskoi, native South American, Cordova, Valparaiso, native Smyrna, and including all such wools of like character as have been heretofore usually imported into the United States from Turkey, Greece, Egypt, Syria, and elsewhere.”

These classifications, you will perceive, are not simply clothing-wools, combing-wools, and carpet-wools, leaving the classification of wools imported to be decided by the well-known uses to which each lot of wool should be best adapted under the ordinary use of these terms. Instead of this, it carefully describes, after the designation of each class, what wools are intended to be included in it ; and to this description, in preparing the Standard Samples ordered under the law, I have felt bound closely to adhere, without considering the question whether any given kind of wool could be used for any other purpose than that named in the title of the class in which, under this system, it would be placed.

This careful designation of the kinds of wool embraced in the several classes was undoubtedly intentional, and was very wise, as without it the classification would be left to the discretion of those who had to administer the law, which would lead to endless disputes, as even the best experts would frequently differ in opinion upon the subject. The classification would likewise be liable to vary with the varying state of the market, as what at

one time would be taken for clothing or combing wool, when fashion demands very coarse materials, at other times would be taken for no purpose but carpets, or coarse blankets. Such is just now the difference in the demand from what it was in 1867, when the first cabinet was prepared. Then every wool of a low nature was salable only for the purposes last above named.

Now, the combers are glad to eke out their stock of wools of the second class, which are very scarce and high, with any portion of the third-class wool that they can make available. The scarcity of medium and low clothing-wools makes clothiers also ready to take such as can in any way serve their uses.

As, moreover, you can find in almost all wools portions that can be used for more than one of the purposes named, and as in many of the carpet-wools you can find portions that can be used for each of the three classes, the wisdom of this minute division is apparent.

The description of the first class is sufficiently definite, being confined to merino wools, pure and mixed, Down clothing-wools, and finally embracing such as are not described in classes two and three.

The second class is, if possible, more clear, as it distinctly indicates combing-wool of English blood and Canada long wools.

The third class was much more difficult to fix; and I am happy to report that a careful study of all the acknowledged authorities has not shaken my confidence in the classification of samples adopted in 1867.

Few subjects have received so little scientific attention as sheep and wool. This has hitherto rendered it very difficult to fix with accuracy, in many countries, the races of sheep from which the wools of those countries have been obtained. This is a point most important to establish, in order to decide their classification under the tariff of 1867. I had searched all the recognized authorities, and many books of travels published in France and England, without obtaining that complete information requisite, when my attention was called to a paper presented by Dr. L. T. Fitzinger to the Imperial Academy of Sciences in Vienna, upon the races of domestic sheep, and published in

the reports of their sittings in 1859 and 1860. The scientific character of this society, second perhaps to none in the world, and the position which Dr. Fitzinger has long held in it, give to this, the only complete classification of sheep of the present day, an authority that will nowhere be denied. Of course, in a work requiring such extensive research, there will be found some minor details, for which the author, of necessity, must rely, not upon his own actual knowledge, but upon such authorities as can be found, and which, as has before been stated, are, for some countries, very meagre. For instance, in Spain, a country which in earlier times has given more attention than any other to the improvement of sheep and wool, the descendants of whose flocks are now scattered over the greater portion of the world, and supply by far the largest part of the wool used by civilized man, I could not learn of a single book in print upon the subject, even of its own races.

I would here remark that all references to sheep, in the Old World, that I have found in the writings of scientific men and travellers, confirm the habitat of the different races given by Dr. Fitzinger. On what he says about the New World I shall have occasion to comment hereafter.

Therefore, in performing the duty assigned to me, I have adopted the classification of Dr. Fitzinger. He doubts the idea long since advanced by leading naturalists, that all domestic sheep are descended from the Mufflon (*Ovis Musimon*), but divides them into ten distinct original races, as follows:—

The Fettsteisschaf, or fat-rumped sheep, coarse, hairy wool, with more or less down, according to climate.

The Stummelschwanzschaf, or stump-tailed sheep (*Ovis pachycerca*), coarse, hairy wool, some very bright, with little down.

The Kurzschwänzige Schaf, or short-tailed sheep (*Ovis brachyura*). The short-tailed sheep have all coarse, hairy wool: those from the most northern climates, with much fine down; the Shetland, with fine, long hair.

The Zackelschaf, or Zackel sheep (*Ovis strepsiceros*), all hairy, with more or less undergrowth, some very bright-haired.

The Fettschwanzschaf, or fat-tailed sheep (*Ovis platyura*), all coarse wool, varying with climate.

The Langschwänzige Schaf, or long-tailed sheep (*Ovis dolichura*), all coarse wool; and, to my knowledge, all of the sub-races described, except the Tarentine, have been imported for carpets.

The Hängohr Schaf, or pendent-eared sheep (*Ovis catotis*), original race, coarse hair, crosses of medium character.

The Hochbeinige Schaf, or long-legged sheep (*Ovis longipes*), all coarse, most of them very hairy.

The Mahnen Schaf, or maned sheep (*Ovis jubata*), all coarse wool, similar to the last.

The Landschaf, rustic or common sheep (*Ovis aries*), original sub-varieties, all bear coarse wool.

Dr. Fitzinger gives a description of each of these original forms of sheep, and of their sub-varieties or sub-races, numbering in all one hundred and six. Of these, as before named, ten are ranked as original races, or direct descendants from the wild stock. These one hundred and six different races he ranks as follows:—

7 Fat-rumped.	5 Stump-tailed.
10 Short-tailed.	4 Zackel.
50 Rustic.	8 Fat-tailed.
5 Long-tailed.	4 Pendent-eared.
9 Long-legged.	4 Maned.

Of these he finds forty races which appear to owe their peculiarities to the influence of climate and soil; viz.,—

4 Fat-rumped.	7 Short-tailed.
2 Zackel.	16 Rustic.
4 Fat-tailed.	3 Long-legged.
4 Long-legged.	

The stump-tailed sheep and the pendent-eared sheep give, as far as yet known, no climatic varieties. Of the remaining forms, he regards only one as the result of special breeding,—the Mauchamp, or silky merino sheep. The remainder he classes as undoubtedly hybrids. The wool of the original races, and of their inter-crosses, with that of those that have changed only from climate and soil, belongs, properly, to the third class,

unless they are specially designated in classes one or two, provided they may be regarded as "carpet, or other similar wools" of like character, as have been imported into the United States from Turkey, Greece, Egypt, Syria, and elsewhere.

Nine of the ten original races of sheep named by Dr. Fitzinger are still to be found pure, or crossed with one another, in the ancient wool countries of Asia, Africa, and the south-eastern part of Europe, whence we have heretofore, and do now, obtain most of those wools described in class three. These, as we have before shown, are all described by him as bearing coarse wool. In Tartary, China, and Siberia, all the sheep reported by Dr. Fitzinger, or that are mentioned by any travellers ancient or modern that I have consulted, and they are numerous, are of the fat-rumped, fat-tailed, long-tailed, and the short-tailed, which last was introduced into Siberia from the north of Europe, except, perhaps, a peculiar species found in Thibet, and there used for beasts of burden.

In Arabia and Persia, the same races; also the long-legged, the stump-tailed, and the long-tailed races.

In South Africa (Cape of Good Hope), the fat-rumped, fat-tailed, stump-tailed, and long-legged, and in later days the merino, which has been bred pure, and crossed upon one or more of the above races.

In Central Africa, and on the eastern and western coasts, the fat-tailed, stump-tailed, long-tailed, pendent-eared, long-legged, maned, or goitred, and crosses between these.

In Egypt, the fat-tailed, long-tailed, stump-tailed, and pendent-eared sheep.

In Madagascar, Bourbon, and Isle of France, the stump-tailed and fat-tailed.

In the East Indies, the fat-tailed, stump-tailed, long-tailed, long-legged, and maned.

In Morocco, the fat-tailed, long-legged, and maned.

In Syria, Anatolia, and Palestine, the long-tailed and fat-tailed.

In none of the countries before named, is there any report of sheep of the merino or English races having been introduced,

except in Southern and Northern Africa, and of an attempt to introduce them into India, which failed long since. The common wool of the Cape of Good Hope is easily distinguished from the merino or the mestiza. In some parts of Barbary, and in Morocco, it is not so easy to make that distinction. France has sent so many merino sheep to Algiers, that it is very difficult to decide, in many cases, whether there is, or is not, a mixture of merino blood. The same is true of Morocco, where for ages there has been such an interchange of races with Spain, that it is difficult to say where one race begins, or the other ends.

We next come to the countries of Europe, and find throughout the south-eastern portion, widely scattered, sheep of primitive races, unmixed with merino or English blood, or with any blood different from that which has produced the wools always heretofore imported into this country for carpet uses.

In Georgia, we find chiefly the wools of the long-tailed class (*Ovis dolichura Colchica*), whose wool has been continually imported for carpets, though sometimes used for other coarse fabrics. It is a coarse wool, rather short, and admired for its whiteness. North of that, throughout the south of Russia, another species of the same race, the Kabardan or Circassian (*Ovis dolichura Cabardinica*), which furnishes some of the wools most sought after by the carpet manufacturers; the Circassian, Crimea, and Donskoi, the last of which, for its length, brilliancy, and whiteness, is in great favor. The Zackel sheep, which originated in the Island of Crete, we find spread abroad over Greece, Turkey, Moldavia, Wallachia, Transylvania, Hungary; also into Austria and Bohemia.

The Macedonian fat-tailed sheep (*Ovis platyura Macedonica*), which is a cross of the Bucharian fat-tailed sheep, with the Colchican long-tailed sheep, is found in Greece, Southern and Middle Italy, Sicily, Dalmatia, Croatia, Illyria, and Hungary. The Macedonian sheep (*Ovis aries Parnassica*), which is found in Greece, Turkey, and even in Slavonia, has coarse, long wool, fit for carpets and other coarse goods. There are two cross-breeds of the last-named sheep, — viz. the Wallachian,

a cross of the Macedonian with the Wallachian Zackel sheep, found in Wallachia, Bosnia, Servia; and the Moldavian, a cross of the Wallachian with the Turkish Zackel sheep, found in Moldavia, Bessarabia, Turkey, and Wallachia.

In Italy, Sicily, Sardinia, and Corsica, besides those before named, is the common Italian sheep (*Ovis aries Italicus*), with very coarse wool, used only for mattresses and very coarse fabrics. A cross of this (with the long-tailed Colchican) is found in Naples, Sicily, and Tuscany. It is doubtful if many pure flocks of this race can be found.

Another cross of the Italian sheep is the Bergamo sheep, — a hybrid with the African pendent-eared sheep (*Ovis catotis*), — found in Bergamo and Como, and neighboring parts of Lombardy and Switzerland, the wool of which is described as fit only for carpets and other coarse fabrics, or mattresses. Also a cross of this with Spanish sheep (*Ovis aries Hispanicus*), found in Padua and Venice, and other parts of Italy, wool somewhat finer than the last, and used for yarns and medium fine goods, though much of it is still used for mattresses.

The third class of sheep of Dr. Fitzinger, the short-tailed sheep, or heath sheep (*Ovis brachyura*), only appears incidentally in the preceding pages as having found its way from the north of Europe into Russia and Siberia. It has its home in all the heath-growing walks of Europe, but especially in all the northern parts. It is said to differ less in its characteristics from the influence of climate and soil than almost any other race. It is covered with a coarse hairy coating, in some cases almost bristly, underlying which is fine wool or down. These coarse hairs have prevented its being generally used for any purposes but carpets or coarse goods, until recently, when the improvements in combing-machines have enabled manufacturers to separate the long hairs, and leave fine, soft noils from the fine and downy bottom.

The short-tailed or heath sheep is divided into ten sub-races.

1. The northern, which is found in Iceland, Norway, Sweden, Russia, Finland, Gothland, Faroe Islands, &c.

2. The Hebrides, found in the islands of that name.
3. The Shetlands, which differ so much from the others as to deserve a different classification.
4. The German, inhabiting the heath-covered, sandy portions of all Northern Germany.

5. The Danish.

6. The Holstein.

7. The French.

8. The Spanish.

9. The Scottish, which includes the Highland and the English black or dun-faced sheep. This resembles the Spanish heath sheep so much, as to lead some naturalists to believe that it must have originated in Spain at a remote period; some have supposed from sheep which escaped from the wreck of the Spanish Armada, in 1588, but of this there is no evidence. Professor Owen says there is not a particle of evidence that any living animal reached land from the Armada. It is much more likely that it was introduced, if at all, at a much earlier period.

10. The Orkney. This may be only a hybrid of the Scotch and Shetland. With the exception of the Shetland, carrying with it perhaps the Orkney, the wool of these sub-races, when found pure, belongs to the third class. Many of them have, to my knowledge, been from time to time imported for carpet manufacture; among these the Iceland, Highland, English black-face, and the wools of Northern Russia, and some of the mountain wools of Spain. The Danish, Holstein, French, and German have become so mixed with other races, that probably it is a rare thing now to find them pure. If, however, any wool should appear from any sheep of these races, unmixed or mixed with other third-class bearing sheep, it too should receive the same classification.

The Spanish heath sheep may be that referred to by Lasteyrie as *aconchada*, found in the mountains; and there can be but little doubt that sheep of this race found their way to the Spanish Colonies of South America with the other coarse Spanish sheep.

The tenth race of sheep, the Landschaf, of Fitzinger (*Ovis aries*), or common sheep of Europe, which embraces fifty out of the one hundred and six known varieties, remains to be considered. Seven of these Dr. Fitzinger classes as original forms developed in the various countries from which they take their names.

The Macedonische or Macedonian sheep (*Ovis aries Parnasicus*).

The Italienische Schaf, or Italian sheep (*Ovis aries Italicus*).

The Spanische Schaf, or Spanish sheep (*Ovis aries Hispanicus*).

The Französische Schaf, or French sheep (*Ovis aries Gallicus*).

The Deutsche Schaf, or German sheep (*Ovis aries Germanicus*).

The Englische Schaf, or English sheep (*Ovis aries Anglicus*).

The Irlandische Schaf, or Irish sheep (*Ovis aries Hibernicus*).

These several races undoubtedly, in their unmixed state, all yield wool properly belonging to the third class; but some of them under peculiar influences of breeding, with climate and soil favoring, or by intercrossing, have developed races which may be rightly placed in the first class.

The Macedonian sheep has already been described. It and its sub-races, the Wallachian and Moldavian, bear wool of the third class.

The Italian sheep likewise, in its pure state I think, also the Halbedle Italienische Schaf (*Ovis-aries Italicus subnobilis*), may be put in the same category where it can be shown to be unmixed with finer races; but in the portion of Italy where it exists, there have been such frequent introductions of other races, that the pure race is difficult to be found. It is a cross of the Italian sheep with the Tarentine long-tailed sheep, both of which bear third-class wool.

The Spanish common sheep, embracing the churros and the

aconchada, or mountain sheep of Spain and Portugal, the parent stock of the native sheep, so called, of South America; and a still coarser race, the basta or burda, yet found in some parts of Spain (unless the latter may be the Spanish short-tailed sheep), in like manner may be considered as yielding wool of the third class. The churro race I found in its purity in Catalonia, Aragon, and some parts of Castile. The aconchada is found in the Pyrenees and other mountainous portions of Spain and Portugal; and the basta, with wool too poor for almost any use, in Andalusia, and perhaps other parts of Spain. The merino sheep, long the pride of Spain, is no longer extensively found in its ancient purity; and over the most of Spain, even in the grounds of the Escorial, where once ranged the noblest flocks of the world, nothing is seen but a degenerated hybrid race.

The wools of South America, specially described in the third class of the tariff as native South American, Cordova, and Valparaiso, have nearly all descended from the (Landschaf) rustic sheep of Europe, generally regarded as the native sheep of the several countries of that quarter of the globe. The wools of all the primitive sub-varieties of this race, Dr. Fitzinger describes as coarse; and most of them, if not all, when found pure, belong to the third class.

I think there can be no doubt that these original South American races are the descendants of the churro and aconchada races of Spain (*Ovis aries Hispanicus rusticus*), with the exception perhaps of those of Brazil, Columbia, and the Dutch settlements, as it is well-known that, at the time sheep were first introduced into Peru, the Spanish Government was so jealous of the merino races, that they would not allow them to be exported even to their own colonies. At a later period however, but not until sheep had been distributed from Peru to Chili, and thence to Paraguay, merino sheep were from time to time smuggled into Peru, which accounts for the superiority which the wool of that country exhibited to that of other parts of South America, to a period within the present century, when they also were improved by the introduction of the merino races

there also. In a previous report, I have shown that Garcilaso de la Vega found sheep in Peru in 1556, but could not ascertain when they were first brought there, or by whom; that various writers speak of horses, cows, bulls, goats, and other European animals, having been first brought across the Isthmus of Darien from St. Domingo and Cuba; that, at a date unknown, they were transported from Peru to Chili; that they were carried from Chuquisagua, by Don Domingo Martinez de Yrala,* then Governor of Paraguay, to that country; and that others were carried in 1590, by Juan Torres de Vera y Aragon, from Charcas and divided between the provinces of Santa Fé, Corrientes, and Buenos Ayres. Mr. Carrow, in his article in the report of the Department of Agriculture for 1864, on "Sheep Farming in the Pampas," says: "The general supposition is, that flocks introduced at that time were of the churros breed of Spain, the fleece of which, as the name indicates, was coarse, long, and of inferior quality."

Dr. Fitzinger evidently has bestowed but little attention upon the sheep of the New World. He adds to his elaborate article a short appendix on the sheep of America and Australia, which he says he has compiled from the reports of various travellers and scientific men. He writes thus: "In South America, the sheep are, almost throughout, of Spanish origin, without, however, being everywhere of like quality with the nobler race of the mother country. In Paraguay, the sheep, as all the original domestic animals, were introduced therein from Spain, and probably originated from the Spanish or churro sheep. Should they be supposed to be the offspring of the noble Spanish or merino race, they must be admitted to have entirely degenerated, inasmuch as every trace of such an origin has entirely disappeared. They are of smaller stature, and only covered with a short and exceedingly coarse wool. The sheep of Peru appear to have descended from the nobler Spanish or merino sheep, although, through want of care, they have very much degenerated; yet they appear clearly of noble origin, so that, in spite of this

* Or, according to Azara, by Capt. Nuño de Chaves.

degeneracy, they appear like a fine Spanish race." This is probably owing to the early infusion of merino blood before referred to. Dr. Fitzinger further states: "As in almost all the other countries of South America, the sheep was introduced into Chili through Spain, and undoubtedly originated from the nobler or merino sheep of Spain, which Cardinal Ximenes introduced into the mother land. It is owing to the special peculiarities of climate and soil, that the domestic animals introduced there from Europe have experienced no detrimental influence, as they have degenerated and grown coarser, to a greater or less degree, in all the other countries of South America. They have generally remained unchanged in Chili, and have to this day continued in the best condition; so that even the sheep, since its introduction into this country, has lost neither in size, figure, nor in the quality of its wool, and this last is equally long, fine and delicate, with that of the high-bred Spanish merino, and has even retained the beautiful white color which is peculiar to the wool of the merino sheep."

Dr. Fitzinger has, I think, here been led astray by his authorities. He probably took this account from the "Geographical, National, and Civil Histories of Chili," by Abbé Don J. Ignatius Molina, Middletown, Conn., 1808, vol. i. p. 231: "The sheep imported from Spain have lost nothing in Chili: they are of the same size, and their wool is as beautiful as the best Spanish merino. Each sheep yields annually from ten to fifteen pounds of wool."

Azara (with whom Dr. Fitzinger is undoubtedly familiar, though he does not quote him), in his "Quadrupeds of Paraguay," makes a similar statement, but adds, "I am an indifferent judge of its quality." Claudio Gay, who, in five volumes upon the Zoölogy of Chili, devotes about two pages to sheep, in his "Historia Fisica y Politica de Chili Zoologia," vol. i. p. 164, says: "The sheep belong to that beautiful Spanish race so much prized for its beautiful wool, which forms one of the richest industries of Spain. Unfortunately, to the present time, it has been very much neglected in Chili, so that this lucrative product of agriculture has not reached the degree of beauty and improvement of

which it is susceptible." In another place, however, he writes ; "It is generally believed that the he-goat is the progenitor of the domestic sheep." It is not worth while here to discuss this point, but the existence of such a belief does not indicate a fine wool, especially as the goat of Chili is described by the same author thus : "Its hair covering is coarse, composed of short, stiff hairs, never woolly." It is fair to conclude that, like Azara, Mr. Gay is an indifferent judge of wool. From a personal familiarity with the wool of Chili for nearly forty years, I can state that it has been the most uniformly coarse of that from any country of South America ; and during that period it has undergone no appreciable change. The fleeces have never averaged five pounds ; and experiments recently made to verify this, at the mills of two of the largest consumers, prove the average to be less than four pounds each. Merino sheep have, from time to time, been introduced there ; but very little merino or mestiza wool has been brought from there.

I have no doubt that the animal flourishes and attains a good size in Chili ; but from the merino and mestiza wool that has been brought from there to this country, as well as that sent to Europe, which has come under my observation, I should judge that, while it retains its vigor and brilliancy, the tendency of the climate and soil is to cause it rapidly to deteriorate in the delicacy of its fibre.

Dr. Fitzinger says : "Brazil obtained the domestic sheep through the Portuguese, who, about the commencement of the seventeenth century, introduced there the long-legged Guinea sheep from the west coast of Africa. This race is the most wide spread of any in the country, and flourishes well, as do likewise the goat and the cow, which were also brought from West Africa. Spanish and other sheep races are also found in Brazil ; and at the present day in Southern Brazil, also the better German races. In Surinam and the Antillès, the West-India long-legged sheep — a race which breeding in these islands has produced — is chiefly found, which appears to have come from the long-legged Guinea sheep introduced by the Spaniards, from the west coast of Africa, about the commencement of the

seventeenth century, and to have been developed there by the influence of climate and soil. This race thrives so excellently under this hot climate that it alone is worth considering there. The European races are ill fitted for it, and generally in a very short time begin to grow poor and sick. The hybrid, formed by crossing these with the acclimated race, proves much stronger. The sheep that were introduced into Columbia were not of the merino race, but of the churro."

It is worthy of remark that a striking change takes place in the hair of the sheep of this last-named country, if the woolly fleeces of the lambs are not shorn at the accustomed time. When this is omitted, the wool becomes matted, and falls off in pieces; while from the skin rendered bald, without any sign of disease about it, instead of wool, short, shining, smooth, close-lying hair springs, which very much resembles that of the goat of the country; and where this hair once comes, the wool never grows again. This statement, which rests upon the observation of Roulin, makes it almost certain that the sheep of Columbia is a hybrid race formed by the crossing of the churro with the long-legged West-India sheep.

The French rustic or common sheep (*Ovis rusticus Gallicus*), like the French short-tailed or heath sheep, has been in all parts of France so crossed with other races that it is rarely met with in its pure state. The Norman sheep, however, is a hybrid of this race with the Friesland or Schleswig-Holstein race, which is a hybrid of the English Durham breed and the Guinea sheep. It bears a combing-wool.

The common German or Zaupeel sheep (*Ovis aries Germanicus*) is still found in almost all the German States either in a pure or mixed form, and extends even into Hungary and the north of Italy. It has two forms, one bearing short, and the other long wool. The wool is described as tolerably coarse, and fit only for coarse yarns, coarse cloths, and carpets, and mixed with an undergrowth of hair.

The Hanoverian sheep is a hybrid of the above with the German heath sheep. It is represented by Dr. Fitzinger as a small sheep with coarse wool mixed with hair. This description

differs from what has been imported into this country for Hanoverian wool.

The Pomeranian, a hybrid of the two last, has coarse wool, fit for carpets and coarse fabrics.

The German French sheep (*Ovis aries Germanicus Francicus*) is a cross of the common sheep of the two countries, described as bearing very coarse wool, fit only for coarse yarn and peasant clothing, and as of the same value as that of the common German sheep.

The sleek, or smooth-woolled German sheep (*Ovis aries Germanicus lanosus*) is one of the varieties of the common German sheep, and is also widely scattered over Germany. The wool is longer, more fit for combing, but still chiefly used for coarse yarns and carpets.

The Mecklenberg is a cross of the latter with the Hanoverian, still described as coarse-woolled. Fitzinger says it has in some places been improved by crossing with the Paduan and Bergamo sheep. It must be coarse if this improves it. Besides these races before named, there are many crosses with French and German, merino and mestiza sheep, which consequently bear first-class wool, and do not need description.

There have also been many crosses with the Friesland, Holland, and other similar races, which are all hybrids of the long-legged Guinea sheep and various races of English long-woolled sheep; and though the law describes the second class as combing wools of English blood, I think that all wools of such crosses, that may be profitably used for combing purposes, and in which only English blood has been mixed with races bearing third-class wool, should be admitted to entry as second class; and when English blood is mixed with that of first-class races, as first class.

Dr. Fitzinger gives twenty-three races of English sheep; but he includes in these five races formed in Continental countries by crossing English sheep with the long-legged Guinea sheep transplanted to the low countries. The Friesland sheep (*Ovis aries Anglicus Frisius*) is either a race by itself from Norman sheep transplanted to Friesland, or a cross with some of the Dutch races.

The Holland sheep (*Ovis aries Anglicus Hollandicus*), which is a cross of the Durham and the long-legged Guinea sheep; the Flanders or Texel sheep (*Ovis aries Anglicus Flandricus*), a cross of the Lincoln with the Guinea; the Schleswig-Holstein (*Ovis aries Anglicus Slesvicensis*), a cross of the Flanders with the Dittmarsh; the Dittmarsh sheep (*Ovis aries Anglicus Dittmarsiensis*), a cross of the Holland with the Lincoln.

This leaves eighteen races of pure English sheep, viz. : —

The Welsh sheep (*Ovis aries Anglicus Cambriacus*).

The English heath sheep (*Ovis aries Anglicus campestris*).

The Norfolk sheep (*Ovis aries Anglicus Norfolciensis*).

The Cheviot sheep (*Ovis aries Anglicus Zevioticus*).

The Lincoln sheep (*Ovis aries Anglicus Lincolnensis*).

The Durham sheep (*Ovis aries Anglicus Dunelmensis*).

The Devon sheep (*Ovis aries Anglicus Devoniensis*).

The above-named seven races Fitzinger regards as original types; the following eleven, as hybrid races : —

The Welsh mountain sheep (*Ovis aries Anglicus montanus*).

The Cornwall sheep (*Ovis aries Anglicus Cornubicus*).

The Somerset sheep (*Ovis aries Anglicus Sommersetiensis*).

The Wilt sheep (*Ovis aries Anglicus Wiltoniensis*).

The Dorset sheep (*Ovis aries Anglicus Dorcestriensis*).

The Cumberland sheep (*Ovis aries Anglicus Cumbriacus*).

The Hereford sheep (*Ovis aries Anglicus Herefordiensis*).

The Sussex sheep (*Ovis aries Anglicus Sussexiensis*).

The Gloucester sheep (*Ovis aries Anglicus Glocestriensis*).

The Kent sheep (*Ovis aries Anglicus Cantiensis*),

The Leicester sheep (*Ovis aries Anglicus Licestriensis*).

Of these eighteen races, the English heath or black-faced sheep has before been named as bearing third-class wool.

The wools of the other races — except the short South-Down wools and the Welsh sheep, the first named in the list of English races, and which produces a short wool particularly adapted to flannels and similar goods — belong to the second class, if they are suitable for combing purposes. The tariff of 1867 places Down clothing-wools by name in the first class; and this has

been by your predecessor decided to mean not only short-woolled fleeces, but all sorts or selected qualities of these wools specially adapted for clothing purposes. Other short wools from English races are not named there, but find their places in the first class as wools not described or designated in classes two and three.

The Irish sheep, of which there are at least three races more or less mixed with English blood, should be classed under the same rule as the English.

The Cabinets of Standard Samples prepared and accepted in 1867 contained many descriptions of wool both sheared and pulled, and some samples of wool sorts.

At the time they were prepared there was but one sample of foreign-made wool noils to be found in the country: that, by the committee of examination, was laid aside for further consideration.

Since that time, large importations of noils have been made prepared from wools of all the three classes.

At the request of the appraisers of New York and Boston, you have directed me to prepare and classify samples of these. It was suggested by me at the previous examination that noils, being a portion of the wool automatically sorted from the rest, should, in their classification, be ranked with the wools from which they were made.

Instructions, I understand, have since that time been given to the appraisers of the different ports, to pass them upon this principle. This has been an easy matter with the noils of the 3d class; not so easy, however, with those of the other classes.

This has arisen not only from the fact that English wools are, by the tariff, placed in both the 1st and 2d classes, but from the further fact that the worsted manufacturers of Europe are largely in the habit of mixing with wools of the 2d class those of the other two.

The English Down wools, which are thus placed in the two classes, form, it is true, only a small portion of the combing-wools of England; but it is very difficult to decide in many cases whether the noils were made from Down or other comb-

ing-wools. It is also frequently difficult to decide whether there is a mixture of the wools before referred to of class 1. It was decided at the first examination that when Down wools were imported in sorts, either from the fleece or the skin, those properly clothing sorts should be placed in the 1st class, and such as were of a combing character in the 2d.

As the operation of combing is an automatic sorting, I see no reason why the sorts thus prepared should not follow the same rule.

As before stated, the classification of these wools has been attended with some difficulty: this, however, has arisen from what, on mature consideration, I deem to be an erroneous estimate of the condition of these noils. It has been the custom, with few exceptions, to pass them as washed wools. This, with noils of the 2d and 3d classes, would subject them to no higher rate of duty than if classed as unwashed, while with those of the 1st class the duty would be doubled. It is, however, well known to be the universal custom to scour all wools of the 1st and 2d classes before combing them. Wools of the 3d class are, in some cases, treated in the same manner; but this is the exception rather than the rule, the nature of these wools being such that cold water washing removes nearly all the yolk and other impurities, and the difference in appearance of the noils is so slight that it is difficult to decide whether the wool has been scoured.

They have been called washed, because, to prepare the wools for the combers, it is customary to oil them, a portion of which oil remains in the noils, subjecting them to a slight shrinkage when scoured anew. If noils once scoured and oiled may be entered as washed wools, it seems to me that with equal propriety the scoured wools, after the oiling process, should be admitted as washed wools, which I consider contrary alike to the letter and the spirit of the law.

I therefore deem that all noils of the 1st and 2d classes should be rated as scoured wool, which would make it of no importance, so far as the revenue is concerned, whether they are passed as the 1st or 2d class, as, in either case, they will be

liable to a threefold duty. On the other hand, it being so difficult to decide whether noils of the 3d class have been made from wool scoured, or washed, I think no interest will suffer from rating them all as washed. Based upon the foregoing considerations, I have prepared, according to your instructions, eight cabinets of standard samples, a schedule of which is hereto annexed, which I present, with this report, for your acceptance.

These cabinets are far from being as perfect as I had hoped to be able to make them. I was hindered from making them as complete as I hoped to have done, by the disturbed condition of Europe when I was abroad, and by other circumstances to which I have alluded in previous communications, but it will be my pleasure to add to them hereafter as opportunities occur. I have carefully studied, compared, and classified all the samples in the cabinets, except that I have been obliged to still feel a doubt about No. 150, which I obtained in Barcelonette as from pure Bergamo sheep, a race much prized in that region.

I am, very respectfully,

Your obedient servant,

GEO. WM. BOND.

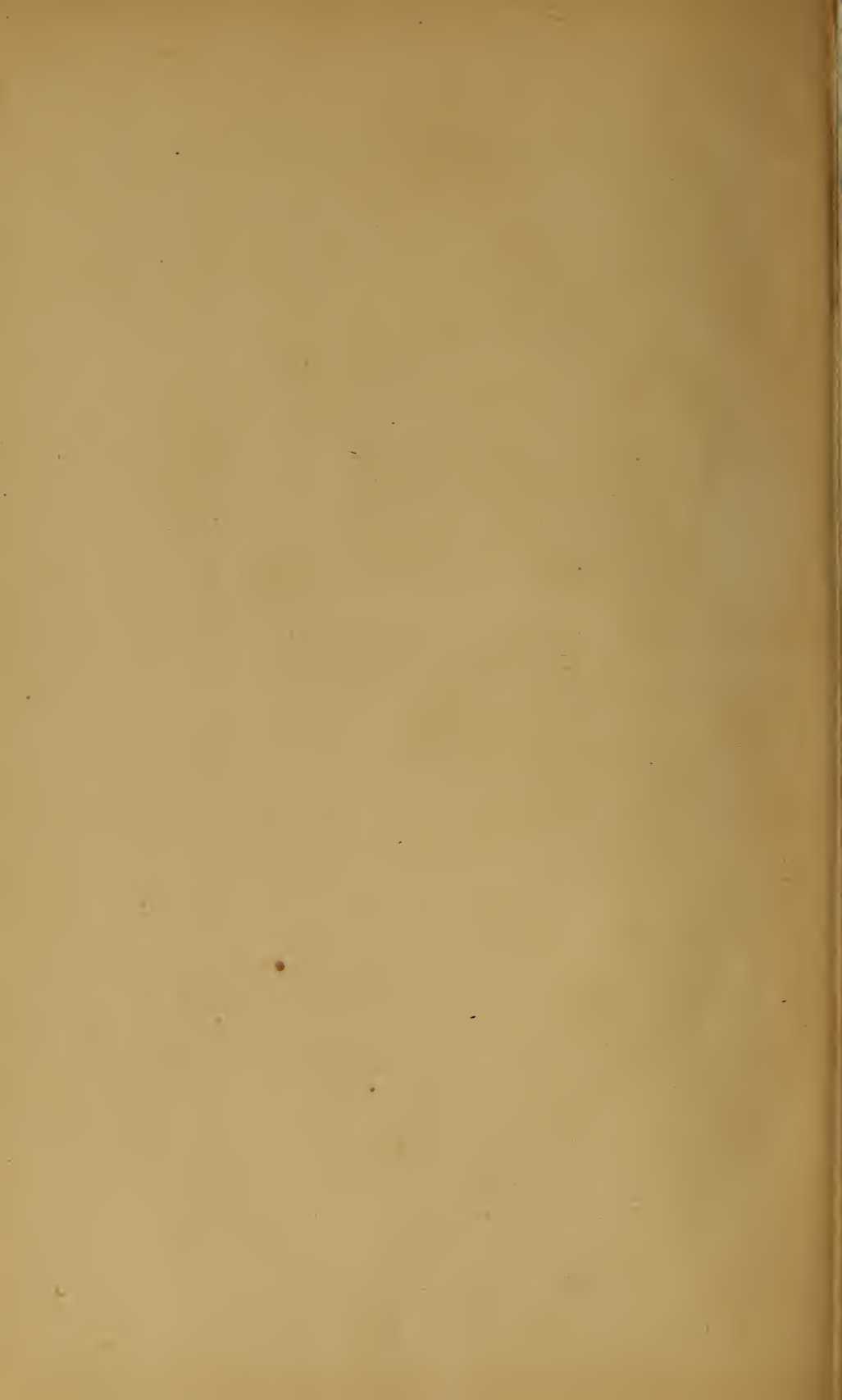
LIST OF STANDARD SAMPLES IN CABINET NO. 2.*

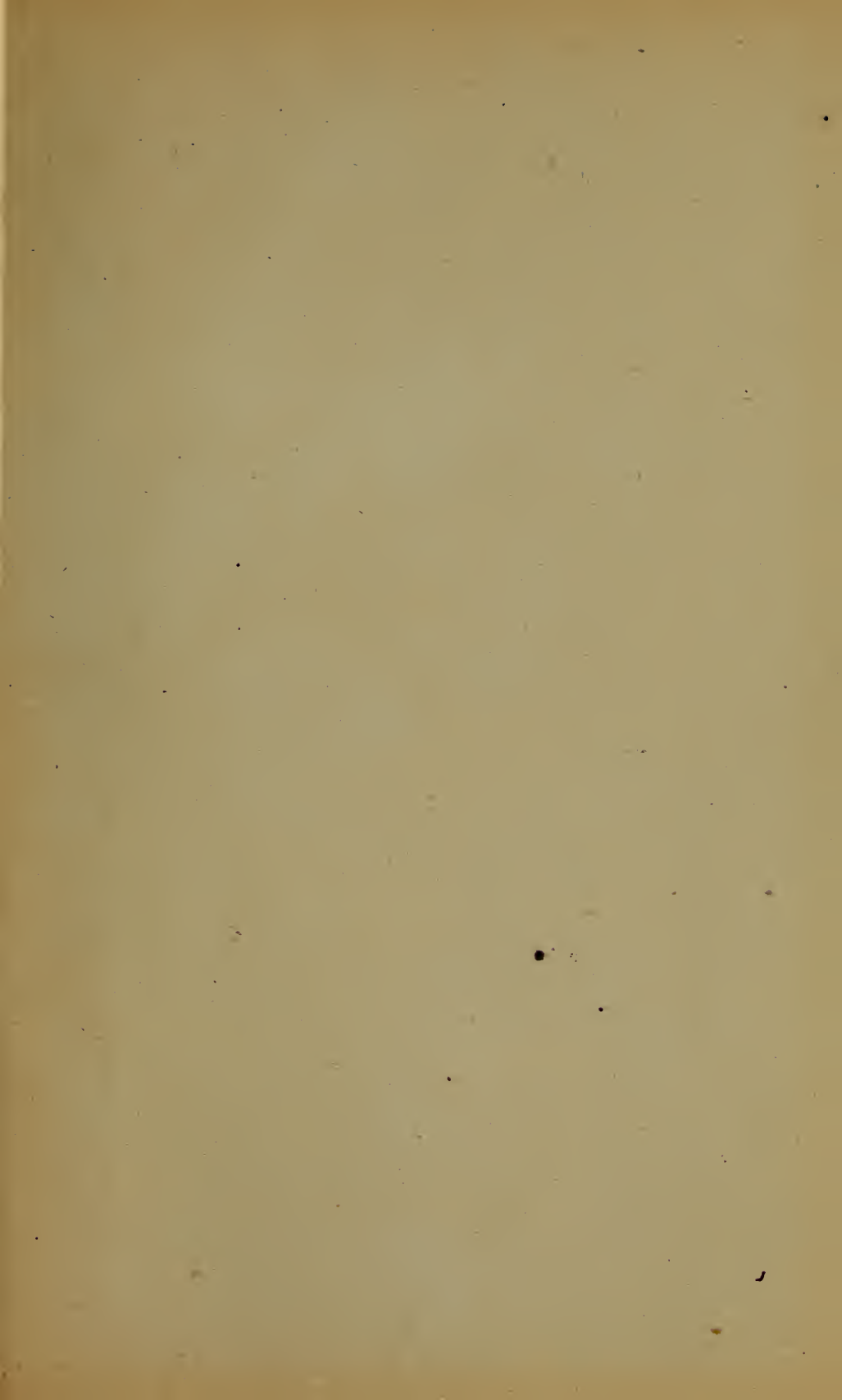
Class	No.		
3	85	East Indies	} Joria.
3	86	"	
3	87	"	
3	88	"	} Pathan.
3	89	"	
3	90	"	
3	91	"	} Marwar.
3	92	"	
3	93	"	
3	94	"	} Candahar.
3	95	"	
3	96	"	
3	97	"	
3	98	"	
3	99	"	
3	100	China	
3	101	Spain	Aragon and Navarre.
3	102	"	Catalan Mountains.
3	103	"	Toledo.
3	104	Portugal	Castel Branco.
3	105	"	Oporto.
3	106	Turkey	Soria or Syrian.
3	107	Persia	Washed.
3	108	"	Unwashed.
3	109	Egypt	
3	110	Tunis	
3	111	France	Pyrenees.
3	113	Turkey	Scutari.
3	114	"	Servia.
3	115	Austria	Istria.
3	116	Turkey	Scopia.

* It is very unfortunate that all the Cabinets of Standard Samples referred to in this report were destroyed by the late fire, as was also the extensive private cabinet of the writer. This last contained many valuable specimens, among which was one which was very remarkable. It consisted of fibres from a lock of Turkish gray wool from 48 to 51 inches in length. The lock from which they were taken did not appear to be more than 14 or 15 inches long, but on examination the fibres were very much crooked, interlaced, and matted, so that it was exceedingly difficult to draw them out without breaking. The three longest drawn were severally 48, 49½, and 51½ inches long, and were undoubtedly of four or five years growth.

CLASSIFICATION OF WOOL.

Class	No.		
3	117	Scotland	Highland Laid (laid).
3	118	„	Unwashed Highland.
3	119	England	Black-faced.
3	120	Russia	Caucasian or Colchican.
3	121	Turkey	Volo.
3	122	„	Salonica.
3	123	„	Adrianople.
3	124	Russia	Bessarabia.
3	125	Italy	
3	126	„	
3	127	Iceland	Noils.
3	128	Turkey	„
3	129	Scotland	Highland Noils.
3	130	Russia	Donskoi Noils.
All of the above are of the Third Class.			
2	133	England	Noils.
2	134	„	Monmouth.
2	135	„	Somerset.
2	136	New Zealand	Leicester.
2	137	England	Hereford.
2	138	„	Devon.
2	139	New Zealand	Leicester and Cheviot.
2	140	Holland	
2	141	Falkland Island	Evidently a cross of English and Native S. American.
2	142	Ireland	Irish Hoggets.
1	148	France	Provence.
1	149	„	Mauchamp.
?	150	„	Barcelonette (supposed Ber- gamo race).
1	151	Morocco	Casablanca.
1	152	Italy	Mixed blood.
1	155	Spain	Talavera.
1	156	Turkey	Galatz Zigay.
1	157	„	Varna Zigay.
1	158	Africa or Morocco	Abudia.
1	159	Algiers	
1	160	Peru	
1	162	Sandwich Island	
1	163	Australian	Sydney.
1	164	„	Port Philip.
1	165	„	Adelaide.
1	166	New Zealand	Leicester & Merino $\frac{3}{4}$ blood.
1	167	„	„ „ $\frac{1}{2}$ blood.
1	168	Yarn Waste.	





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