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# THE DEAF

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ERRATA.

Page 65, second column, line 13, instead of 71,795 read 64,763.

Page 65, in table, instead of 89,023 blind (alone) read 61,991, and instead of 158,310 aggregate blind and deaf read 151,278.

# THE DEAF.

By ALEXANDER GRAHAM BELL.

## INTRODUCTION.

This report relates to the deaf of the United States living on June 1, 1900.

In accordance with the census act the enumerators of the Twelfth Census were required to return only the name, sex, age, and post office address of each deaf, or deaf and dumb person, leaving all further details to be ascertained subsequently through correspondence with the deaf persons themselves, or their parents or guardians.

The nature of the instructions to the enumerators is indicated by the extract given on page 3.

Upon receipt of the enumerators' special schedules containing lists of persons reported to be deaf, or deaf and dumb, a circular letter of inquiry, or individual schedule, was sent to each address given, asking whether the person had been correctly returned as deaf, or deaf and dumb, and requesting further information in the form of replies to specific queries.

The special schools for the deaf in the United States were also requested to furnish the Census Bureau with the information contained in their school records concerning deaf pupils admitted between June 1, 1890, and June 1, 1900. Similar information concerning all pupils admitted from the opening of the schools up to June 1, 1890, had been collected in 1890 upon cards which have been preserved. The same form of card was used in 1900, and the complete card catalogue, arranged alphabetically, was employed in checking and verifying the returns made by the enumerators and by the deaf persons themselves in cases where the persons had attended special schools.

The special schools for the deaf were also supplied, upon request, with lists of deaf children of school age within the territory covered by the schools, taken from the enumerators' returns, and the superintendents were requested to inform the Census Bureau of any erroneous returns discovered.

The replies to the circular letter of inquiry, and the correspondence with heads of schools for the deaf, enabled the Census Bureau to eliminate from the enumerators' lists large numbers of persons who were only hard of hearing, or who had been erroneously returned as deaf, leaving a total of 89,287 persons with seriously impaired powers of hearing.

Of these, 51,861 were not totally deaf, as they could understand loudly shouted conversation. The returns

in these cases have been tabulated separately under the head of "partially deaf," although of course they represent only a portion of the partially deaf of the United States, every effort having been made to exclude persons merely "hard of hearing" from the returns.

Persons returned as both blind and deaf numbered 2,772. Since the returns in these cases are included in the report on the blind because they were blind, they are also included in the present report on the deaf because they were deaf.

Comparing the total number in the two afflicted classes, 71,795 persons were returned as blind and 89,287 as deaf; but the aggregate number of blind and deaf is less than the sum of these two figures, because the blind-deaf cases are doubly reported.

Blind (alone).....	69,023
Deaf (alone).....	89,515
Blind-deaf.....	2,772

Aggregate blind and deaf..... 158,310

The present report differs in several important respects from former Census reports on the same subject.

In order to secure as large aggregates as possible upon which to base the statistical analysis, the tables deal chiefly with the deaf of the whole of the United States, rather than with those of the states and territories individually, or of the counties contained in them.

States and territories are the lowest units of geographic distribution employed; county tables are omitted altogether, as they occupy space quite out of proportion to their real importance or value, and the figures are too small to yield statistical results of significance.

Another difference relates to institution statistics: No special inquiry has been made through the Census Office concerning the deaf persons in institutions or schools for the deaf, as such inquiry appeared to be unnecessary in view of the fact that statistics of this character are collected no less than three times every year through other agencies. Such statistics are compiled by:

1. The United States Government, through its Bureau of Education (published annually in the report of the United States Commissioner of Education).

2. The Conference of Superintendents and Principals of American Schools for the Deaf (published annually

in the "American Annals of the Deaf," Kendall Green, Washington, D. C.).

3. The American Association to Promote the Teaching of Speech to the Deaf (published annually in the "Association Review," Mt. Airy, Philadelphia, Pa.).

The published results contained in these three sources of information are utilized in this report.

The assigned causes of deafness are classified by their effect on the ear. All the assigned causes act only indirectly, the true cause of deafness being in every case the injury to the ear and not the cause assigned.

The present classification has been effected through the cooperation of a committee of experts—Dr. Z. T. Sowers, general physician, Dr. Charles W. Richardson, aurist, and the late Dr. Swan M. Burnett, oculist, all of Washington, District of Columbia.

Diseases that produce the same effect upon the ear are grouped together. For example, scarlet fever, measles, disease of ear, etc., operate to produce an abscess in the middle ear. They are therefore grouped together, and the deafness is assigned to a "suppurative condition of the middle ear."

The assigned causes of deafness are also considered in connection with hereditary influences shown by the consanguinity of the parents or the possession of deaf relatives. Deaf relatives are classified into four groups: *a*, deaf brothers, sisters, or ancestors (relatives in the direct line); *b*, collateral relatives (uncles, aunts, cousins, and other relatives not *a*, *c*, or *d*); *c*, deaf children (sons or daughters); and *d*, deaf husbands or wives.

The present report also differs from former reports in its treatment of occupations. In order that the occupations of the deaf may be compared with the occupations of normal persons, the same classification has been adopted as that employed in the Twelfth Census for the general population of the country.

The occupations of the deaf are also considered in connection with sex, race, and education, so that the occupations of the whites can be compared with those of the colored, and the occupations of the educated deaf contrasted with those of the uneducated. In relation to the educated deaf, the kind of school attended is noted, so that the occupations of those who have been educated in special schools for the deaf may be compared with the occupations of those who have been educated in the ordinary public schools of the country, or who have not been educated at all.

Another difference relates to the classification of the deaf themselves.

In the earlier Census reports the attempt was made to enumerate the "deaf and dumb" alone, excluding all of the deaf who could speak. In the Tenth Census all persons who lost hearing before they reached the age of 16 years were classed as "deaf and dumb," whether they could speak or not; and in the Eleventh

Census the deaf were divided into two broad classes based upon their ability to speak, viz, "the deaf and dumb" and "the deaf but not dumb."

In the present report the age or period of life when deafness occurred is adopted as the basis of classification; and the deaf are divided into two broad classes quite independently of their ability to speak—"the deaf from childhood" and "the deaf from adult life."

The ability to speak is an acquired condition, and not, therefore, suitable as a basis for classification. Speech is usually acquired through hearing and imitation, but it may also be acquired (independently of hearing) through special instruction; and, as a matter of fact, many deaf mutes are now taught to speak in a more or less intelligible manner. These cases make their appearance in the census returns as "deaf but not dumb," thus apparently reducing the numbers of the class "deaf and dumb," to which they originally belonged.

It is very desirable that the classification of the deaf should be based upon a natural condition which can not be changed. The age or period of life when deafness occurred is a condition of this kind, and the deaf and dumb, whether they have been taught to speak or not, belong naturally to the class "deaf from childhood," and are thus differentiated from that large class of speaking persons who lost hearing in adult life.

Another noteworthy difference between this and former reports consists in the copious use of graphical diagrams upon a small scale, illustrating the tables. The smallness of the scale employed reduces to insignificance minor details, in which only small numbers are involved, thus bringing out clearly in relief the really salient features of the tables. The diagrams give a sort of bird's-eye view of the general features of the tables, and when closer inspection is desired the tables themselves give the details.

All the information tabulated by the Census Bureau concerning the deaf will be found fully elaborated in the general tables. All other tables used in this report have been compiled from these. Tables 1 to 10 of the general tables are summary tables, giving a survey of the whole scope of the investigation.

#### COMPARISON WITH FORMER CENSUSES.

In taking the earlier censuses (1830 to 1870) the enumerators were instructed to return only those who were actually deaf and dumb; but in 1880 it was recognized that many of the so-called deaf and dumb could speak—imperfectly perhaps, but still sufficiently to enable them to escape enumeration as persons totally deprived of the power of utterance. It was thus seen that the plan of limiting the returns to those who were unable to articulate failed to secure a full census of the class intended to be enumerated; and in taking the census of 1880 the plan was adopted of

considering all persons who lost hearing in childhood as belonging naturally to the class "deaf and dumb," whether, as a matter of fact, they were able to speak or not.

This same plan has been adopted in the present census, but it has been deemed advisable to extend the age limits assigned to "childhood" from 15 years (1880) to 19 years (1900), for the reason that special schools for the deaf and dumb are open to all deaf children of school age. All persons, therefore, who lost hearing before the age of 20 are admissible as pupils, and this quite irrespectively of their ability to speak. It has also been deemed advisable in the present report to designate this class as "the deaf from childhood (under 20)," rather than the "deaf and dumb;" for it is manifestly incorrect to label as "deaf and dumb" a class of persons containing many members who can speak. For this reason the "deaf and dumb" of 1880 would more properly be termed "the deaf from childhood (under 16)."

The inclusion of speaking persons in the returns of the deaf and dumb for 1880 is probably the main cause of the increased ratio per million noted for that census (Diagram 1).

There are other causes, however. Previously to 1880 the accuracy of the census returns depended upon the enumerators alone, for there was no possibility of going behind their returns and correcting errors; but in 1880 the Census Bureau entered into correspondence with physicians residing in all parts of the country, through whose agency the enumerators' returns were checked and verified. Many names of deaf-mutes who had been overlooked by the enumerators were supplied to the Census Bureau by the physicians.

This correspondence revealed the fact, which has been amply substantiated by the experience of the present census, that the returns of the ordinary enumerators regarding the deaf, or deaf and dumb, are erroneous in a large proportion of cases, and need correction and verification before being made the basis of statistical inquiries.

In 1890 a new departure was made. Previously to that year the census returns related to a portion only of the deaf and not the whole, viz, the deaf and dumb (1830 to 1870), or those who were supposed to belong naturally to that class, even though they could speak (1880); but in 1890, instead of relying upon the enumerators to make the distinction desired, the attempt was made to take a census of the whole number of the deaf, and to have the dividing line drawn by experts in the Census Office during the examination of the returns.

In 1890 the enumerators were instructed to make returns of all persons who were so deaf as to be unable to understand loudly shouted conversation, with the object of limiting the inquiry substantially to persons who were totally deaf.

The dividing line was drawn in accordance with the

practice of the earlier censuses and not with that of 1880. The deaf were divided into two broad classes, viz, the "deaf and dumb" and the "deaf but not dumb." Deaf-mutes who had been taught to speak in oral schools were included among the "deaf but not dumb," but comparison was made with former censuses on the basis of the "deaf and dumb" alone.

Under such circumstances we would naturally expect to find a falling off in the ratio per million of population returned as deaf and dumb proportional to the activity displayed by the special schools in imparting speech to their pupils; and by reference to Diagram 1 it will be observed that there was a decrease in 1890 as compared with 1880.

This falling off, however, is more apparent than real, because the returns of the deaf and dumb for 1890 included only persons who were reported as unable to speak; whereas those for 1880 included all persons who lost hearing before reaching the age of 16 years, many of whom possessed some power of speech. The true comparison, therefore, should be made with the earlier censuses, in which the returns were limited to those who were *de facto* deaf and dumb.

In taking the Twelfth Census (1900) the plan of 1890 was adopted of taking a census of all of the deaf who were unable to understand loudly shouted conversation; but in accordance with a special statute of Congress the enumerators were required to report only the name, age, sex, and post office address of deaf, or deaf and dumb, persons discovered, leaving all other details to be ascertained by correspondence with the deaf persons themselves.

After all corrections had been made in the data secured for the present report, it was found that of those who had been correctly reported as deaf, the majority were able to understand loudly shouted conversation, in spite of the specific instructions to the enumerators that such persons were not to be returned. Out of 89,287 deaf, 37,426 were totally deaf and 51,861 could hear loudly shouted conversation. These latter cases were too numerous to be ignored in the tabulation of the results, and the returns have therefore been analyzed under the head of "partially deaf," although of course the cases reported constitute only a small fraction of the partially deaf of the country.

It must be difficult for enumerators, who are usually strangers to the persons they return, to decide definitely whether a person is or is not totally deaf; and we must credit the enumerators of the present census with the intention of fulfilling their instructions to the best of their ability. It is therefore probable that the majority of the partially deaf persons returned were laboring under serious defects of hearing, and were not simply "hard of hearing." They are believed, as a class, to be persons so deaf that it required correspondence with the persons themselves to ascertain the fact that they were not totally deaf.

In the present census the proportion of the popula-

tion reported as deaf and dumb (unable to speak at all) is less than one-half of that returned in 1890 (648 to the million in 1890, 321 to the million in 1900). (Diagram 1.)

In explanation it may be said that many thousands of persons who belong naturally to the class "deaf and dumb" are reported, or rather reported themselves, in the present census as able to speak; so that it is obvious that the increased activity in articulation teaching in our schools for the deaf is responsible for a considerable portion of this result.

It is doubtful, however, whether this explanation alone is sufficient to account for the great difference between the two censuses in this respect; and it is possible that there may have been an overestimate of the deaf and dumb in 1890 or an underestimate in the present census, or perhaps both suppositions may be correct.

The returns of the 1890 census were based upon the reports of the enumerators alone, without verification by correspondence with the deaf persons, as in 1900, or by correspondence with physicians, as in 1880. It is therefore probable that erroneous returns, similar to those discovered in 1880 and 1900 through correspondence, exist uncorrected in the returns for 1890.

On the other hand, several thousands of circular letters of inquiry, sent out to the addresses of persons reported as deaf by the enumerators of the present census, failed to bring any reply, in spite of repeated requests for information. These cases were therefore thrown out of the investigation as resting upon insufficient evidence. They may represent erroneous returns; but, on the other hand, it is possible that the enumerators were correct, and that the deaf persons reported belonged to illiterate families unable to respond by mail.

Whatever may be the deficiencies of the present census, the information actually compiled is authoritative so far as it goes, because it is based upon statements made by the deaf persons themselves, or by parents, guardians, or friends intimately acquainted with the condition of the deaf persons considered.

In addition to the "deaf and dumb" returned in 1890, 80,616 persons, or 1,287 per million of population, were reported as "deaf but not dumb," so that the whole number of deaf returned in the 1890 census was 121,178, or 1,935 per million of population; whereas, in the present census, 89,287 deaf are reported in all, constituting a ratio of 1,175 per million of population, and the number able to speak (including those who speak well and those who speak imperfectly) is 64,918, or 854 per million.

Table I shows the number of deaf and dumb returned at each census since 1830 and the ratio per million of population, the figures for the present census including only those of the deaf who are "unable to speak at all."

TABLE I.—Number of deaf and dumb and the ratio per million of total population: 1830 to 1900.

CENSUS.	Total population.	DEAF AND DUMB.	
		Number.	Ratio per 1,000,000 of population.
1830.....	12,866,020	6,106	475
1840.....	17,069,453	7,665	449
1850.....	23,191,876	9,803	423
1860.....	31,443,321	12,821	408
1870.....	38,558,371	16,205	420
1880.....	50,155,783	33,878	675
1890.....	62,622,250	40,592	648
1900.....	75,994,575	24,369	321

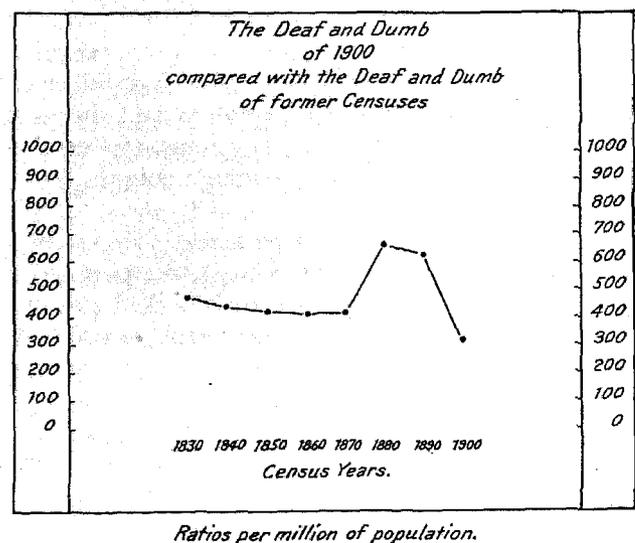
Table II shows the "deaf from childhood" of the present census compared with the "deaf and dumb" of former censuses.

TABLE II.—Comparison of deaf from childhood in 1900 with deaf and dumb of former censuses: 1830 to 1900.

CENSUS.	Number.	Ratio per 1,000,000 of population.
1830, deaf and dumb.....	6,106	475
1840, deaf and dumb.....	7,665	449
1850, deaf and dumb.....	9,803	423
1860, deaf and dumb.....	12,821	408
1870, deaf and dumb.....	16,205	420
1880, deaf and dumb.....	33,878	675
1890, deaf and dumb.....	40,592	648
1900, deaf from childhood.....	50,296	662
1900, deaf from childhood.....	51,871	682

The ratios per million of population given in Tables I and II are shown graphically in Diagrams 1 and 2.

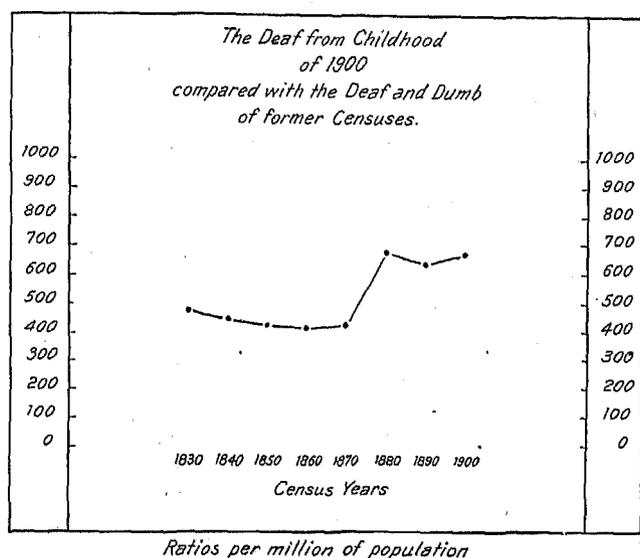
Diagram 1.



It is obvious at once from inspection of the diagrams that the returns of the different censuses are not fully comparable with one another. The earlier censuses (1830 to 1870) differ materially from the later (1880 to 1900).

The returns of the deaf and dumb of the present census are more comparable with those of the earlier censuses than with those of 1880 or 1890 (Diagram 1); and the deaf from childhood of the present census are more comparable with the deaf and dumb of 1880 and 1890 than with those of the earlier censuses (Diagram 2).

Diagram 2.



In 1890 the age or period of life when deafness occurred was noted both in the case of the "deaf and dumb" and the "deaf but not dumb," so that it is possible, by adding the two classes together, to institute a comparison between the 1890 and 1900 censuses upon this basis, as well as on the basis of ability to speak. This is done in Table III.

TABLE III.—Number of deaf and ratio per million of total population, by period of life when deafness occurred and ability to speak: 1900 and 1890.

PERIOD OF LIFE WHEN DEAFNESS OCCURRED AND ABILITY TO SPEAK.	NUMBER.		RATIO PER 1,000,000 OF POPULATION.	
	1900	1890	1900	1890
Total.....	89,287	121,178	1,175	1,935
Period of life when deafness occurred:				
Childhood (under 20).....	50,296	52,827	662	844
Adult life (20 and over).....	35,924	55,728	473	800
.....	3,067	12,623	40	201
.....	64,018	80,616	854	1,287
.....	24,369	40,502	321	648

The deaf from childhood (under 20) constituted 844 to the million in 1890 and 662 to the million in 1900. The deaf from adult life (20 and over) constituted 890 to the million in 1890 and 473 to the million in 1900. The period of life when deafness occurred (whether childhood or adult life) was unknown in 12,623 cases, or 201 to the million, in 1890, and unknown in 3,067 cases, or 40 to the million, in 1900.

The discrepancy between the two censuses is not,

therefore, confined to the deaf and dumb alone, but is manifest on all the points of comparison noted. It is therefore probable that in one or both censuses the returns themselves are defective—probably excessive in 1890 and deficient in 1900.

DISCUSSION OF THE RESULTS.

Age or period of life when deafness occurred.—The period of life when deafness occurred (whether childhood or adult life) was unknown in 10.4 per cent of the cases reported in 1890, but in only 3.4 per cent of the cases returned in 1900. It may be well, therefore, to emphasize the method by which this diminution in the proportion of unknown cases was effected in 1900.

In the circular letters of inquiry sent out by the Census Bureau the deaf persons were requested to state as accurately as possible the exact age when deafness occurred, and if this was unknown, to point out the period of life when it occurred (whether childhood or adult life). The returns showed that in 7,697 cases the exact age when deafness occurred was unknown or indefinitely stated: In 659 cases the persons were less than 20 years of age at the time the census was taken, and therefore lost hearing in childhood (under 20); in 404 cases the persons were reported to have become deaf in "infancy," in 1,227 cases in "childhood," and in 57 cases in "youth," making a total of 2,347 cases deaf from childhood (under 20); while in 1,224 cases the persons became deaf in "adult life," and in 1,059 cases in "old age," making a total of 2,283 cases deaf from adult life (20 and over), leaving a balance of 3,067 cases undetermined.

As the period of life when deafness occurred is adopted as the basis of classification in the present census, it is advisable to determine as accurately as possible the number of deaf from childhood (under 20) and from adult life (20 and over). There are 50,296 cases known to be deaf from childhood (under 20), and 35,924 cases deaf from adult life (20 and over); but it is estimated that the actual number deaf from childhood (under 20) is 51,871, and deaf from adult life (20 and over) 37,416.

In case the present classification is adopted in subsequent censuses, it may be well to point out the method by which this estimate has been made.

In 3,067 cases the period of life when deafness occurred is unknown. In these unknown cases, however, the numbers totally deaf and partially deaf were known, and also the numbers who could speak well, imperfectly, or not at all.

Table IV shows the percentage of the deaf who became deaf at known periods of age, by certain specified classes, and the application of the same in estimating the number of the unknown period who became deaf at the stated ages.

TABLE IV.—Per cent distribution by period of life when deafness occurred of the deaf for whom the age when deafness occurred is known, and estimated number for whom age is unknown, by specified classes.

CLASS.	PER CENT DISTRIBUTION OF THE DEAF FOR WHOM THE AGE WHEN DEAFNESS OCCURRED IS KNOWN.			NUMBER OF THE DEAF FOR WHOM THE AGE WHEN DEAFNESS OCCURRED IS UNKNOWN.		
	Total.	Becoming deaf in—		Total.	Estimated number becoming deaf in—	
		Childhood (under 20).	Adult life (20 and over).		Childhood (under 20).	Adult life (20 and over).
1. Total.....	100.0	58.3	41.7	3,067	1,788	1,279
2. Totally deaf.....	100.0	90.5	9.5	795	719	76
Partially deaf.....	100.0	34.6	65.4	2,272	789	1,486
3. Speak well.....	100.0	34.0	66.0	2,310	785	1,525
Imperfectly.....	100.0	93.3	6.7	254	237	17
Not at all.....	100.0	99.2	0.8	503	499	4
4. Totally deaf:						
Speak well.....	100.0	58.8	41.2	246	145	101
Imperfectly.....	100.0	97.2	2.8	99	96	3
Not at all.....	100.0	99.5	0.5	450	448	2
Partially deaf:						
Speak well.....	100.0	29.7	70.3	2,084	613	1,451
Imperfectly.....	100.0	86.3	13.7	155	134	21
Not at all.....	100.0	92.8	7.2	53	49	4
1. First estimate.....				3,067	1,788	1,279
2. Second estimate.....				3,067	1,505	1,562
3. Third estimate.....				3,067	1,521	1,546
4. Fourth estimate.....				3,067	1,485	1,582
Mean of four estimates.....				3,067	1,575	1,492

The percentages given in Table IV afford us means of estimating, in various ways, how many of these 3,067 cases were deaf from childhood, and how many were deaf from adult life. For example, taking all the cases in which the period of life when deafness occurred was known, 58.3 per cent were deaf from childhood and 41.7 per cent from adult life. Therefore, if these percentages hold good for the unknown cases, 58.3 per cent of the 3,067 cases were deaf from childhood and 41.7 per cent from adult life. This first estimate gives us 1,788 deaf from childhood and 1,279 deaf from adult life.

Again, the percentages in Table IV show that 90.5 per cent of the totally deaf were deaf from childhood. Of the 3,067 unknown cases, 795 were totally deaf, and 90.5 per cent of this number gives us 719 cases as totally deaf from childhood, etc. The percentages in Table IV enable us to make four distinct estimates of this character, and the mean of the four estimates yields the following results:

Out of a total of 3,067 cases in which the period of life when deafness occurred was unknown, 1,575 were probably deaf from childhood (under 20), and 1,492 from adult life. Adding these to the totals known to be deaf from childhood and adult life, we obtain the results shown in Table V.

One of the main objects of comparing one census with another is to determine, from an inspection of returns compiled at different times, whether the proportion of the population deaf, or deaf and dumb,

is increasing or diminishing. Unfortunately the existing censuses are not sufficiently comparable with one another to enable us to do this, since no uniform plan was adopted in the collection of the statistics.

Some light, however, may be thrown upon the subject from the returns of a single census by comparing the present ages of the deaf with the ages of the whole population. If deafness is increasing, we should naturally expect to find a larger proportion of deaf among the younger persons than among the older.

TABLE V.—The deaf, by period of life when deafness occurred.

PERIOD OF LIFE WHEN DEAFNESS OCCURRED.	THE DEAF.		
	Total.	Estimated number becoming deaf in—	
		Childhood (under 20).	Adult life (20 and over).
Total.....	89,287	51,871	37,416
Known.....	86,220	50,296	35,924
Unknown.....	3,067	1,575	1,492

The difficulty in making such a comparison lies in the fact that deafness occurs at different ages, so that it would not be possible to include the whole of the deaf in one determination. It so happens that the great mass of the deaf and dumb lost hearing before the age of 5, so that in their case we have a considerable aggregate with comparatively slight differences in the age when deafness occurred; and in the deaf from birth, we have a large subgroup in which no differences at all exist in this respect.

Table VI shows the present ages of the whole population of the United States in 1900 by five-year periods, and the present ages of the totally deaf from early childhood (under 5)—all of whom are, naturally, deaf and dumb—distinguishing the congenital from the noncongenital cases. The table also shows the proportion deaf per million of population of the same age.

The ratios contained in Table VI are shown graphically in Diagrams 3, 4, and 5.

In these three diagrams the dotted lines represent returns that are known to be incomplete. It is always found to be the case that deaf children under 10 years of age are incompletely returned, and the younger the deaf children the less complete are the returns.

It is obvious from inspection of Table VI that the proportion of the population totally deaf from early childhood (under 5) is greater among the younger persons than among the older (Diagram 3).

Referring to Diagram 4, there seems to be no substantial difference among the older persons in the ratio per million totally deaf from birth, but among the younger the ratio per million is very much greater. For example, the totally deaf from birth constitute

135 to the million among persons 30 to 35 years of age, and 282 to the million among persons 10 to 15 years of age—a ratio more than double the former. This result is probably due to the prevalence of inter-marriages among the deaf and dumb during the latter part of the nineteenth century. Some of these unions have been productive of deaf offspring, who belong largely to the class of totally deaf from birth. The deaf, both of whose parents were deaf and dumb, are mostly young, few of them having reached middle life.

TABLE VI.—The totally deaf from early childhood, by period when deafness occurred and present age, compared with total population.

PRESENT AGE.	Total population.	THE TOTALLY DEAF FROM EARLY CHILDHOOD (UNDER 5).					
		Total.	When deafness occurred.		Ratio per 1,000,000 of population of same age.		
			At birth.	After birth.	Total.	At birth.	After birth.
Total .....	75,994,875	26,152	12,609	13,543	344	166	178
Present age:							
Not stated .....	200,584	94	62	32	469	309	160
Stated .....	75,793,991	26,058	12,547	13,511	344	166	178
Under 5 .....	9,170,628	846	446	400	92	49	43
5 and under 10 ..	8,874,123	3,245	1,674	1,571	366	189	177
10 and under 15 ..	8,080,234	4,399	2,281	2,118	544	282	262
15 and under 20 ..	7,556,089	3,784	1,937	1,847	501	256	245
20 and under 25 ..	7,335,016	2,422	1,128	1,294	330	154	176
25 and under 30 ..	6,529,441	2,424	888	1,536	371	136	235
30 and under 35 ..	5,556,039	1,962	749	1,213	353	135	218
35 and under 40 ..	4,964,781	1,858	696	1,162	374	140	234
40 and under 45 ..	4,247,166	1,297	648	649	305	152	163
45 and under 50 ..	3,454,612	1,024	516	608	290	149	147
50 and under 55 ..	2,942,829	805	402	403	304	167	137
55 and under 60 ..	2,211,172	604	343	321	300	155	145
60 and under 65 ..	1,791,863	483	278	205	270	155	115
65 and under 70 ..	1,302,920	325	198	127	249	152	97
70 and under 75 ..	883,841	214	136	78	242	154	88
75 and under 80 ..	519,857	132	81	51	254	156	98
80 and under 85 ..	251,612	53	37	16	211	147	64
85 and under 90 ..	88,600	19	12	7	.....	.....	.....
90 and under 95 ..	23,992	10	5	5	.....	.....	.....
95 and under 100 ..	6,266	2	2	.....	.....	.....	.....
100 and over .....	3,504	.....	.....	.....	.....	.....	.....

Referring to Diagram 5, relating to the noncongenital cases among the totally deaf from early childhood, the curve is more irregular than in the case of those deaf from birth, as would naturally be expected when we consider these persons became deaf from apparently adventitious causes, some of which are of an epidemical nature, like cerebro-spinal meningitis. Upon the whole, the proportion deaf is greater among the younger persons than the older, and proportionally greater as the age is younger. It is not clear that we can interpret the figures to mean that the proportion of the population noncongenitally deaf (under 5) is increasing more rapidly than the popu-

lation; for a curve of similar character to that in Diagram 5 would be produced upon the assumption that the death rate is greater in these cases than in the population at large, which is not unlikely to be the case when we consider the fact that these persons lost hearing from severe illnesses which must have tried their constitutions.

Diagram 3.

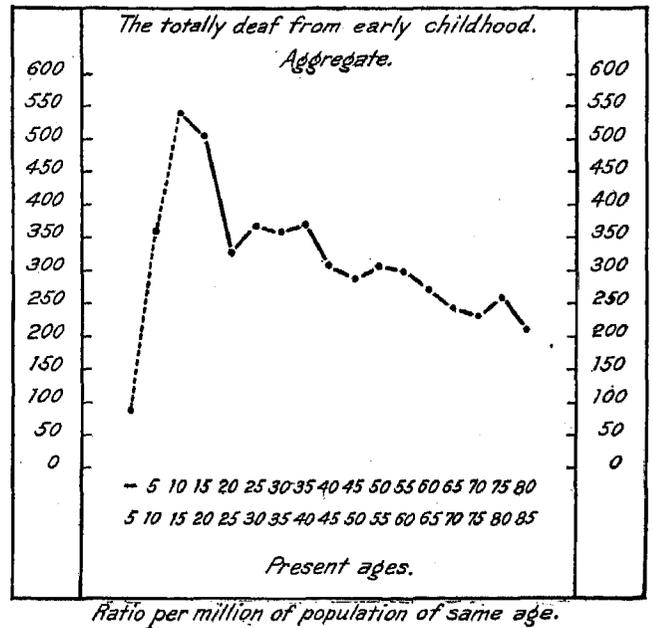


Diagram 4.

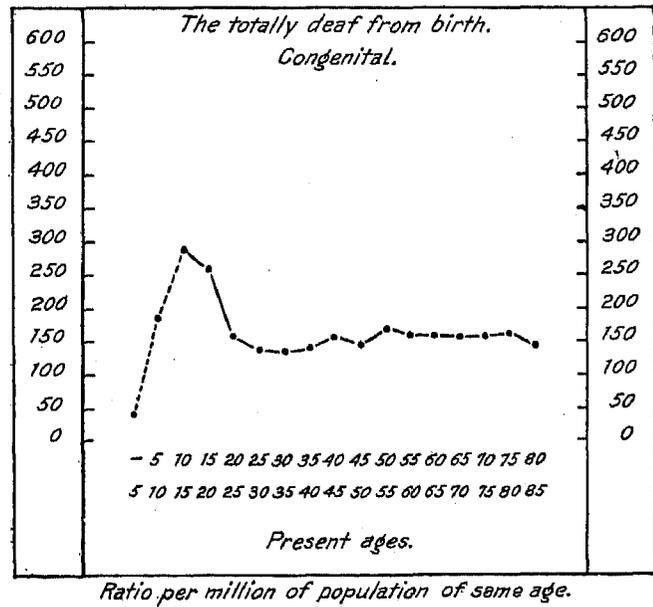
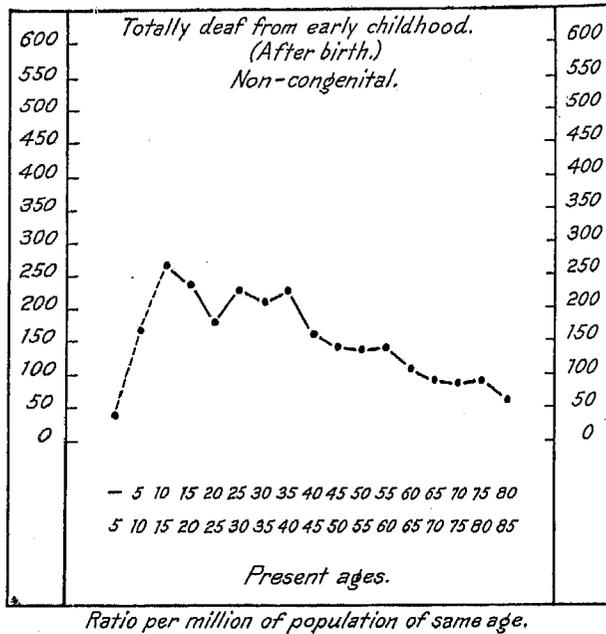


Diagram 5.



Age when deafness occurred for the whole of the deaf.—The age when deafness occurred is definitely stated in 81,590 cases, and of these, 59 per cent became deaf before reaching the age of 20 years, 48 per cent became deaf before reaching the age of 10 years, 40 per cent became deaf before reaching the age of 5 years, and 18 per cent were born deaf. One-half of the deaf lost hearing before they were 11 years old.

Diagrams 6 and 7 illustrate in graphical form the figures contained in Table XI and Table 17.

Diagram 6.

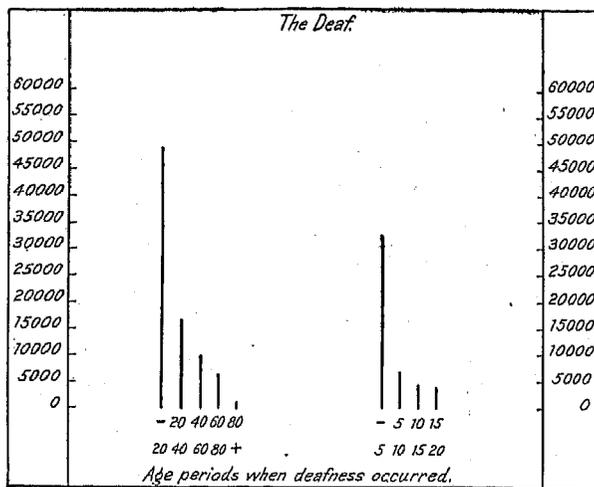
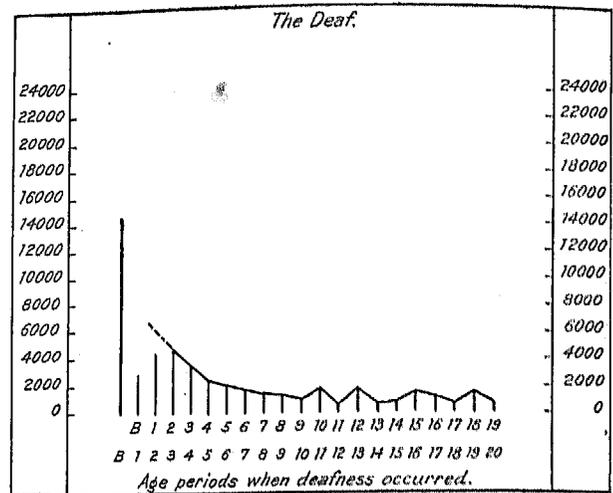


Diagram 7.



The large number returned as deaf from birth and the small number reported deaf during the first and second years of life after birth (Diagram 7), is suggestive of some inaccuracy in the returns; and this is extremely probable, for the reason that in many if not in most cases the fact that an infant is deaf is not discovered, or is not certainly known, until after he is 2 years of age. At or about the age of 2 most children begin to speak, but the deaf child does not. This speechless condition attracts attention and he is then found to be also deaf. If during his infancy he has had some serious illness, the deafness is naturally attributed to that; if not, the natural assumption is that he was born deaf. It is probable that some of those reported deaf from birth really lost hearing in infancy after birth, and that some of those reported deaf from infancy after birth were really born deaf. The irregularity of the figures suggests that, on the whole, too many are returned as deaf from birth and too few as deaf during the first and second years of life after birth.

The deaf from childhood of the census of 1900 compared with the deaf and dumb of former censuses, by states and territories.—In Tables 8 and 9 the deaf from childhood of the census of 1900 are compared with the deaf and dumb of former censuses, by states and territories.

The New England states, and especially Connecticut, show a larger proportion of deaf than the average for the United States as a whole. From 1830 to 1860 Kentucky showed a relatively large ratio of deaf and dumb as compared with the ratios of surrounding states. In 1870 Indiana, Kentucky, and North Caro-

lina became conspicuous in this respect. In 1880 the predominance of Indiana over its neighboring states became very marked, and this predominance has continued up to the latest census (1900).

From 1830 to 1860 the largest ratios appeared in Connecticut, and since 1860, in the District of Columbia. In both cases, however, the ratios are fallacious, because of the existence in these parts of the country of schools for the deaf which draw pupils from the whole of the United States, whereas the ratios are based upon the local population alone. During the first half of the nineteenth century the American School for the Deaf in Hartford, Conn. (then known as the American Asylum for Deaf-Mutes), drew pupils from the whole of the United States; but as special schools for the deaf multiplied the supply of pupils from the more distant states was practically cut off and the school attendance became more local in character. Even to-day, however, the school is by no means representative of Connecticut alone, for it draws pupils from all of the New England states, a portion only coming from Connecticut. The predominance of the District of Columbia since 1860 is due to the existence within the District of the Columbian Institution for the Deaf and Dumb, with its primary and collegiate departments, known as the Kendall School, and Gallaudet College (formerly the National Deaf-Mute College). Both primary and collegiate departments draw pupils from outside the District of Columbia. Gallaudet College particularly, being the only special school in the country for the higher education of the deaf, attracts deaf students from all parts of the United States.

The tables show a large proportion of deaf in the New England states, especially Maine, New Hampshire, and Vermont. Scarlet fever, measles, and other

diseases causing inflammation and abscess in the middle ear are the predominating causes, especially in Vermont and New Hampshire, and congenital deafness is frequent in Maine. Nonsuppurative or catarrhal affections of the middle ear are also frequent in these states, but catarrh, colds, etc., cause deafness chiefly in adults rather than in children, and do not appear as prominent causes of deafness among the deaf from childhood or deaf and dumb. In their case scarlet fever seems to be the principal cause.

The cause of the local congestion of the deaf in Kentucky from 1830 to 1860, and its extension in 1870 to North Carolina and Indiana, is unknown; but the Indiana congestion of 1880 appears to have been due chiefly to an epidemic of cerebro-spinal meningitis. This seems to be the same disease formerly known as spotted fever, and it is not improbable that brain fever is another name for it. The persistence of the Indiana congestion up to the present census year, 1900, appears to be due, in part at least, to the same cause.

*Geographic distribution of the deaf.*—Tables VII, VIII, and IX relate to the geographic distribution of the deaf, by states and territories.

Table VII shows the deaf, by age or period of life when deafness occurred, for states and territories.

Table VIII shows the deaf by degree of deafness, also the deaf from childhood and the totally deaf from early childhood, distinguished as deaf from birth and as deaf subsequent to birth, for states and territories.

Table IX shows the deaf, by race, nativity (of whites), present age, and ability to speak, for states and territories.

Table X gives the ratios per million of total population for the classes of deaf shown in Tables VII, VIII, and IX.

TABLE VII.—THE DEAF, BY PERIOD OF LIFE WHEN DEAFNESS OCCURRED, FOR STATES AND TERRITORIES.

STATE OR TERRITORY.	Total.	PERIOD OF LIFE WHEN DEAFNESS OCCURRED.															
		Child- hood (under 20).	Adult life (20 and over).	Un- known.	Under 20.							20 and over.					
					Birth.	After birth, under 2.	2 and under 5.	5 and under 10.	10 and under 15.	15 and under 20.	Not stated.	20 and under 40.	40 and under 60.	60 and under 80.	80 and over.	Not stated.	
Continental United States.....	89,287	50,296	35,924	3,067	14,474	7,396	10,536	7,018	4,464	4,061	2,347	16,588	9,437	6,595	1,021	2,283	
North Atlantic division.....	28,632	14,161	13,224	1,247	3,468	1,772	3,113	2,261	1,435	1,401	711	5,852	3,387	2,513	427	1,045	
New England.....	8,854	1,111	1,111	1,111	1,111	1,111	1,111	1,111	462	464	209	1,954	1,129	915	180	355	
Maine.....	1,257	305	420	37	1	57	34	84	30	45	34	21	173	106	86	19	36
New Hampshire.....	723	238	467	18	29	29	48	36	40	40	16	183	128	108	16	32	
Vermont.....	4,015	1,838	2,019	158	432	226	358	286	216	223	97	880	477	408	78	176	
Massachusetts.....	583	274	285	24	56	24	60	60	33	26	15	132	75	47	13	18	
Rhode Island.....	1,514	739	709	75	190	80	161	113	70	85	31	286	185	146	34	58	
Connecticut.....	19,778	10,179	8,691	908	2,518	1,304	2,289	1,656	973	937	502	3,898	2,258	1,598	247	690	
New York.....	9,946	5,011	4,499	436	1,178	674	1,189	783	459	445	283	1,908	1,150	914	136	391	
New Jersey.....	2,285	1,066	1,123	96	229	96	203	215	138	132	53	524	309	177	42	71	
Pennsylvania.....	7,547	4,102	3,069	376	1,111	534	897	658	376	360	166	1,466	799	507	69	228	
South Atlantic division.....	10,193	6,510	3,379	304	2,721	718	968	775	559	465	304	1,564	923	593	71	228	
Northern South Atlantic.....	5,400	3,229	1,988	183	1,152	358	553	442	312	251	161	930	527	341	41	149	
Delaware.....	255	119	129	7	36	11	19	20	16	13	4	59	40	20	.....	10	
Maryland.....	1,679	850	676	53	291	66	157	124	88	77	47	329	182	112	13	40	
District of Columbia.....	507	280	212	15	51	31	56	58	35	22	27	82	43	33	3	51	
Virginia.....	1,913	1,193	653	67	527	122	157	132	111	92	52	293	182	119	21	38	
West Virginia.....	1,146	787	318	41	247	128	164	108	62	47	31	167	80	57	4	10	
Southern South Atlantic.....	4,793	3,281	1,391	121	1,569	360	415	333	247	214	143	634	396	252	30	79	
North Carolina.....	1,642	1,197	409	36	646	134	147	89	67	61	53	183	111	84	13	18	
South Carolina.....	952	655	275	22	333	66	73	59	51	50	23	109	78	58	8	22	
Georgia.....	1,817	1,199	565	53	502	128	166	154	111	84	54	276	167	88	8	26	
Florida.....	382	230	142	10	88	32	29	31	18	19	13	66	40	22	1	13	
North Central division.....	34,076	19,358	13,676	1,042	4,603	3,368	4,590	2,760	1,690	1,509	839	6,561	3,589	2,436	379	711	
Eastern North Central.....	21,618	12,021	8,904	663	2,823	2,037	2,872	1,696	1,080	987	526	4,210	2,322	1,607	269	496	
Ohio.....	6,080	3,115	2,744	221	790	440	745	440	287	285	128	1,286	714	503	75	166	
Indiana.....	3,697	2,093	1,421	93	447	431	509	276	157	105	78	667	399	227	55	73	
Illinois.....	6,053	3,439	2,423	191	706	622	831	513	302	291	174	1,164	604	460	59	136	
Michigan.....	3,402	1,883	1,434	85	413	305	462	269	191	170	73	693	391	244	45	61	
Wisconsin.....	2,476	1,491	882	103	467	239	325	198	118	76	73	400	214	173	35	60	
Western North Central.....	12,458	7,337	4,772	349	1,780	1,331	1,718	1,064	609	522	313	2,351	1,267	829	110	215	
Minnesota.....	1,738	1,085	594	59	325	222	227	150	81	54	26	318	140	89	16	22	
Iowa.....	2,952	1,622	1,256	74	336	278	379	245	168	149	67	503	337	227	34	65	
Missouri.....	3,766	2,302	1,367	97	578	412	547	347	177	146	95	658	364	255	23	67	
North Dakota.....	256	176	70	10	48	34	47	21	12	7	7	42	17	10	.....	1	
South Dakota.....	430	261	156	13	52	42	63	44	22	18	20	97	35	19	.....	4	
Nebraska.....	1,220	711	475	34	161	120	171	97	48	61	53	238	114	84	19	20	
Kansas.....	2,096	1,180	854	62	280	223	284	160	101	87	45	405	251	145	17	36	
South Central division.....	12,322	8,131	3,862	329	3,164	1,182	1,401	913	587	477	407	1,748	1,082	730	98	204	
Eastern South Central.....	6,968	4,576	2,178	214	1,832	597	774	526	357	269	221	917	625	463	66	107	
Kentucky.....	2,619	1,719	812	88	630	240	322	210	151	100	66	353	208	187	23	41	
Tennessee.....	2,026	1,331	638	57	554	186	231	135	77	73	75	267	196	134	15	26	
Alabama.....	1,333	866	427	40	370	95	131	107	69	55	39	181	126	81	14	25	
Mississippi.....	990	660	301	29	278	76	90	74	60	41	41	116	95	61	14	15	
Western South Central.....	5,354	3,555	1,684	115	1,332	585	627	387	230	208	186	831	457	267	32	97	
Louisiana.....	1,211	731	444	36	363	63	84	78	53	57	33	209	116	72	13	34	
Arkansas.....	1,317	906	382	29	328	119	190	114	52	45	58	175	110	71	2	24	
Indian Territory.....	228	161	64	3	43	41	31	18	12	10	6	33	24	5	.....	2	
Oklahoma.....	282	198	77	7	51	60	44	20	14	10	9	55	13	7	.....	1	
Texas.....	2,316	1,559	717	40	547	312	278	157	99	86	80	359	194	112	16	36	
Western division.....	4,064	2,136	1,783	145	518	356	464	309	194	209	86	863	456	323	46	95	
Rocky Mountain.....	1,076	589	447	40	149	101	127	75	55	62	20	213	107	86	12	29	
Montana.....	126	87	37	2	16	20	23	11	5	11	1	18	13	5	.....	1	
Idaho.....	146	79	60	7	17	13	20	9	5	12	3	38	9	10	.....	2	
Wyoming.....	29	13	16	.....	2	2	4	3	1	2	.....	14	2	.....	.....		
Colorado.....	472	262	193	17	52	69	55	32	29	25	10	107	46	28	5	7	
New Mexico.....	303	148	141	14	62	8	25	20	15	12	6	36	37	43	6	19	
Basin and Plateau.....	455	260	183	12	64	51	65	32	19	22	7	89	44	41	5	4	
Arizona.....	51	25	24	2	5	6	7	3	2	1	1	14	6	2	1	1	
Utah.....	343	215	123	5	54	43	57	26	12	19	4	60	32	26	4	1	
Nevada.....	61	20	36	5	5	2	1	3	5	2	2	15	6	13	.....	2	
Pacific.....	2,533	1,287	1,153	93	305	204	272	202	120	125	59	501	305	196	29	62	
Washington.....	374	222	145	7	48	39	48	39	19	20	9	82	38	14	5	6	
Oregon.....	410	252	151	7	52	52	62	38	16	20	12	83	40	22	2	4	
California.....	1,749	813	857	79	205	113	162	125	85	85	38	396	227	160	22	52	

GEOGRAPHIC DISTRIBUTION.

TABLE VIII.—THE DEAF, THE DEAF FROM CHILDHOOD, AND THE TOTALLY DEAF FROM EARLY CHILDHOOD, COMPARED WITH TOTAL POPULATION, FOR STATES AND TERRITORIES.

STATE OR TERRITORY.	Total population.	THE DEAF.			DEAF FROM CHILDHOOD (UNDER 20).			TOTALLY DEAF FROM EARLY CHILDHOOD (UNDER 5).		
		Total.	Totally deaf.	Partially deaf.	Total.	Deafness occurring—		Total.	Deafness occurring—	
						At birth.	After birth.		At birth.	After birth.
Continental United States.....	75,994,575	89,287	37,426	51,861	50,296	14,474	35,822	26,152	12,609	13,543
North Atlantic division.....	21,046,695	28,632	10,380	18,252	14,161	3,468	10,693	6,739	3,055	3,684
New England.....	5,592,017	8,854	2,806	6,048	3,082	950	3,032	1,785	845	940
Maine.....	694,466	1,257	456	801	597	186	411	303	172	131
New Hampshire.....	411,588	762	211	551	305	57	245	130	51	88
Vermont.....	343,641	723	158	565	238	29	209	69	25	44
.....	2,805,346	4,015	1,283	2,732	1,838	432	1,406	825	383	442
.....	428,556	583	172	411	274	56	218	105	53	52
.....	908,420	1,514	526	988	730	190	540	344	161	183
Southern North Atlantic.....	15,454,678	19,778	7,574	12,204	10,179	2,518	7,661	4,954	2,210	2,744
New York.....	7,268,894	9,946	3,751	6,195	5,011	1,178	3,833	2,498	1,051	1,447
New Jersey.....	1,883,669	2,285	720	1,565	1,066	229	837	422	209	213
Pennsylvania.....	6,302,115	7,547	3,103	4,444	4,102	1,111	2,991	2,034	950	1,084
South Atlantic division.....	10,443,480	10,193	4,778	5,415	6,510	2,721	3,789	3,561	2,349	1,212
Northern South Atlantic.....	4,464,481	5,400	2,343	3,057	3,229	1,152	2,077	1,663	998	665
Delaware.....	184,735	255	79	176	119	36	83	50	32	18
Maryland.....	1,188,044	1,579	613	966	850	291	559	423	259	164
District of Columbia.....	278,718	507	212	295	280	51	229	111	41	70
Virginia.....	1,854,184	1,913	880	1,033	1,193	527	666	662	459	203
West Virginia.....	958,800	1,146	559	587	787	247	540	417	207	210
Southern South Atlantic.....	5,978,999	4,793	2,435	2,358	3,281	1,569	1,712	1,898	1,351	547
North Carolina.....	1,893,810	1,642	920	722	1,107	646	551	753	548	205
South Carolina.....	1,340,316	952	500	452	655	333	322	390	294	96
Georgia.....	2,216,331	1,817	846	971	1,199	502	697	630	430	200
Florida.....	528,542	382	169	213	230	88	142	125	79	46
North Central division.....	26,333,004	34,076	14,762	19,314	19,358	4,603	14,755	10,237	4,021	6,216
Eastern North Central.....	15,985,581	21,618	9,151	12,467	12,021	2,823	9,198	6,280	2,473	3,807
Ohio.....	4,157,545	6,080	2,431	3,649	3,115	790	2,325	1,615	696	919
Indiana.....	2,516,462	3,607	1,638	1,969	2,093	447	1,646	1,169	413	756
Illinois.....	4,821,550	6,053	2,564	3,489	3,439	706	2,733	1,761	627	1,134
.....	2,420,982	3,402	1,337	2,065	1,883	413	1,470	907	337	570
.....	2,069,042	2,476	1,181	1,295	1,401	467	1,024	828	400	428
Western North Central.....	10,347,423	12,458	5,611	6,847	7,337	1,780	5,557	3,957	1,548	2,409
Minnesota.....	1,761,394	1,738	862	876	1,085	325	760	631	268	363
Iowa.....	2,231,853	2,952	1,200	1,752	1,622	336	1,286	802	267	505
Missouri.....	3,106,665	3,766	1,776	1,990	2,302	578	1,724	1,271	515	756
North Dakota.....	319,146	256	135	121	176	48	128	108	42	66
South Dakota.....	401,570	430	191	239	261	52	209	122	45	77
Nebraska.....	1,066,300	1,220	522	698	711	161	550	358	132	226
Kansas.....	1,470,495	2,096	925	1,171	1,180	280	900	665	249	416
South Central division.....	14,080,047	12,322	5,963	6,359	8,131	3,104	4,967	4,502	2,756	1,806
Eastern South Central.....	7,547,757	9,968	3,362	3,606	4,576	1,832	2,744	2,554	1,605	949
Kentucky.....	2,147,174	2,619	1,257	1,362	1,719	630	1,089	940	545	395
Tennessee.....	2,020,616	2,026	1,042	1,084	1,331	554	777	780	501	279
Alabama.....	1,828,697	1,333	609	724	866	370	490	465	314	151
Mississippi.....	1,551,270	990	512	478	660	278	382	369	245	124
Western South Central.....	6,532,290	5,354	2,601	2,753	3,555	1,332	2,223	2,008	1,151	857
Louisiana.....	1,381,625	1,211	527	684	731	363	368	410	312	98
Arkansas.....	1,311,564	1,317	664	653	900	328	578	499	285	214
Indian Territory.....	392,060	228	94	134	161	43	118	73	28	45
Oklahoma.....	398,331	282	164	118	198	51	147	122	40	82
Texas.....	3,048,710	2,316	1,152	1,164	1,559	547	1,012	904	486	418
Western division.....	4,091,349	4,064	1,543	2,521	2,136	518	1,618	1,053	428	625
Rocky Mountain.....	1,232,642	1,076	391	685	589	149	440	267	111	156
Montana.....	243,329	126	70	56	87	16	71	48	12	36
Idaho.....	161,772	146	51	95	79	17	62	37	12	25
Wyoming.....	92,531	29	9	20	13	2	11	7	2	5
Colorado.....	539,700	472	176	296	262	52	210	119	42	77
New Mexico.....	195,310	303	85	218	148	62	80	56	43	13
Basin and Plateau.....	442,015	455	200	255	260	64	196	147	63	94
Arizona.....	122,931	51	25	26	25	5	20	16	5	11
Utah.....	276,749	343	156	187	215	54	161	125	44	81
Nevada.....	42,335	61	19	42	20	5	15	6	4	2
Pacific.....	2,416,692	2,533	952	1,581	1,287	305	982	639	264	375
Washington.....	518,103	374	168	206	222	48	174	100	30	64
Oregon.....	413,536	410	193	217	252	52	200	141	45	96
California.....	1,485,053	1,749	591	1,158	813	205	608	398	183	215

TABLE IX.—THE DEAF, BY RACE, NATIVITY OF WHITES, PRESENT AGE, AND ABILITY TO SPEAK, FOR STATES AND TERRITORIES.

STATE OR TERRITORY.	Total.	RACE.		NATIVITY OF WHITES.			PRESENT AGE.			ABILITY TO SPEAK.		
		White.	Colored.	Native.	Foreign born.	Un-known.	Under 20.	20 and over.	Un-known.	Well.	Imperfectly.	Not at all.
Continental United States.....	89,287	84,361	4,926	66,865	13,786	710	18,358	70,602	327	55,501	9,417	24,369
North Atlantic division.....	28,632	28,439	173	23,222	5,114	123	4,222	24,335	75	20,376	3,003	5,253
New England.....	8,854	8,815	39	7,291	1,493	31	981	7,849	24	6,843	732	1,279
Maine.....	1,257	1,250	1	1,140	114	2	144	1,110	3	895	125	237
New Hampshire.....	762	762	.....	665	91	6	37	724	1	604	47	111
Vermont.....	723	723	.....	613	106	4	27	693	3	641	22	60
Massachusetts.....	4,015	3,994	21	3,165	817	12	472	3,531	12	3,082	371	562
Rhode Island.....	583	573	10	447	126	.....	83	498	2	490	40	53
Connecticut.....	1,514	1,507	7	1,261	239	7	218	1,293	3	1,131	127	256
Southern North Atlantic.....	19,778	19,644	134	15,931	3,621	92	3,241	16,486	51	13,533	2,271	3,974
New York.....	9,946	9,898	48	7,656	2,202	40	1,713	8,205	28	6,901	1,181	1,864
New Jersey.....	2,285	2,256	29	1,855	394	7	276	2,006	3	1,705	189	391
Pennsylvania.....	7,547	7,490	57	6,420	1,025	45	1,252	6,275	20	4,927	901	1,719
South Atlantic division.....	10,193	8,060	2,133	7,514	406	140	2,745	7,385	63	5,432	1,088	3,673
Northern South Atlantic.....	5,400	4,696	704	4,300	339	57	1,192	4,179	29	3,134	576	1,690
Delaware.....	255	237	18	217	19	1	28	224	3	186	22	47
Maryland.....	1,579	1,364	215	1,194	142	28	255	1,320	4	1,026	158	395
District of Columbia.....	307	436	71	343	92	1	74	430	3	360	72	75
Virginia.....	1,913	1,531	382	1,473	49	1	489	1,410	14	1,007	200	706
West Virginia.....	1,146	1,128	18	1,073	37	18	346	795	5	555	124	467
Southern South Atlantic.....	4,793	3,364	1,429	3,214	67	83	1,553	3,206	34	2,298	512	1,983
North Carolina.....	1,642	1,304	338	1,215	14	75	626	1,000	16	707	199	736
South Carolina.....	952	520	432	506	12	2	302	648	2	423	102	427
Georgia.....	1,817	1,268	549	1,245	20	3	527	1,276	14	948	181	688
Florida.....	382	272	110	248	21	3	98	282	2	220	30	132
North Central division.....	34,076	33,661	415	26,579	6,807	275	6,675	27,301	100	20,771	3,589	9,716
Eastern North Central.....	21,618	21,469	149	16,984	4,315	170	4,013	17,548	57	13,500	2,424	5,634
Ohio.....	6,080	6,021	59	5,026	955	40	951	5,116	13	3,914	656	1,510
Indiana.....	3,607	3,584	23	3,222	345	17	644	2,951	12	2,156	348	1,103
Illinois.....	6,053	6,014	39	4,587	1,335	92	1,238	4,794	21	3,802	789	1,462
Michigan.....	3,402	3,386	16	2,551	820	15	622	2,772	8	2,288	313	801
Wisconsin.....	2,476	2,464	12	1,598	860	6	558	1,915	3	1,400	318	758
Western North Central.....	12,458	12,192	266	9,695	2,492	105	2,662	9,753	43	7,211	1,165	4,082
Minnesota.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iowa.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Missouri.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Dakota.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Dakota.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nebraska.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kansas.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Central division.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Eastern South Central.....	6,968	5,716	1,252	5,494	201	21	2,039	4,890	39	3,542	731	2,695
Kentucky.....	2,619	2,387	232	2,247	136	4	720	1,880	19	1,357	286	976
Tennessee.....	2,026	1,760	266	1,712	41	7	664	1,355	7	1,027	219	780
Alabama.....	1,333	957	376	939	16	3	349	978	6	600	121	522
Mississippi.....	990	612	378	596	9	7	306	677	7	468	105	417
Western South Central.....	5,354	4,511	843	4,074	355	82	1,803	3,518	33	2,681	573	2,100
Louisiana.....	1,211	878	333	749	110	19	328	877	6	656	109	446
Arkansas.....	1,317	1,102	215	1,077	19	6	453	844	20	645	116	556
Indian Territory.....	228	184	44	175	9	.....	74	162	2	125	26	77
Oklahoma.....	282	260	22	190	24	46	110	172	.....	119	32	131
Texas.....	2,316	2,087	229	1,883	193	11	838	1,473	5	1,136	290	890
Western division.....	4,064	3,954	110	2,982	903	60	874	3,173	17	2,699	433	932
Rocky Mountain.....	1,076	1,023	53	841	144	38	289	782	5	697	132	247
Montana.....	126	115	11	91	23	1	48	78	.....	62	13	51
Idaho.....	148	129	17	100	29	.....	38	107	1	96	17	33
Wyoming.....	29	26	3	20	6	.....	6	23	.....	20	4	5
Colorado.....	472	471	1	364	70	37	123	347	2	305	73	94
New Mexico.....	303	282	21	266	16	.....	74	227	2	214	25	64
Basin and Plateau.....	455	430	25	254	175	1	110	343	2	287	45	123
Arizona.....	51	41	10	34	6	1	11	38	2	25	11	15
Utah.....	343	340	3	192	148	.....	90	253	.....	212	30	101
Nevada.....	61	40	12	28	21	.....	9	52	.....	50	4	7
Pacific.....	2,533	2,501	32	1,887	584	30	475	2,048	10	1,715	256	562
Washington.....	374	368	6	285	82	1	94	280	.....	215	62	97
Oregon.....	410	402	8	323	83	16	86	321	3	236	33	141
California.....	1,749	1,731	18	1,279	439	13	295	1,447	7	1,264	161	324

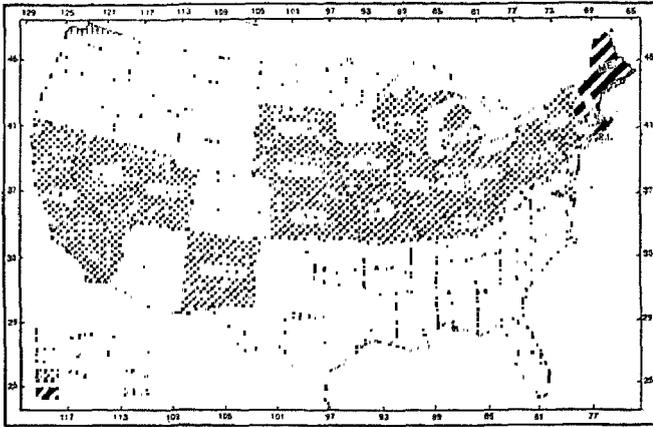
GEOGRAPHIC DISTRIBUTION.

TABLE X.—NUMBER OF THE DEAF FROM SPECIFIED CLASSES PER MILLION OF TOTAL POPULATION, FOR STATES AND TERRITORIES.

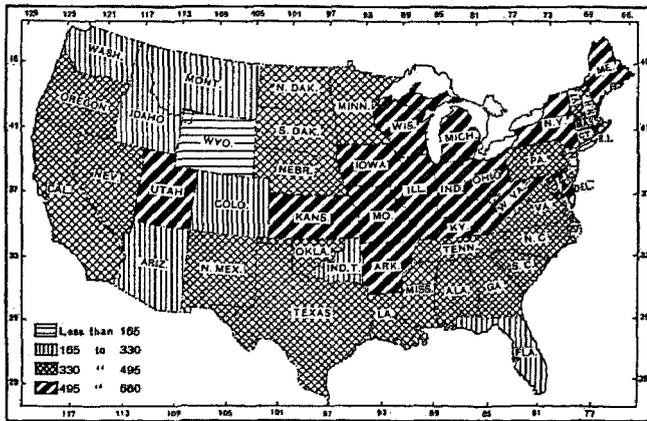
STATE OR TERRITORY.	NUMBER OF DEAF PER 1,000,000 POPULATION.				TOTALLY DEAF FROM EARLY CHILDHOOD (UNDER 5) PER 1,000,000 POPULATION.		Number of native white deaf per 1,000,000 native white population.	Number of foreign born white deaf per 1,000,000 foreign born white population.	
	Total.	Totally deaf.	Partially deaf.	Deaf from childhood (under 20).	Deaf from adult life (20 and over).	Congenitals.			Noncongenitals.
Continental United States.....	1,175	493	682	602	473	166	178	1,234	1,350
North Atlantic division.....	1,360	493	867	673	628	145	175	1,461	1,079
New England.....	1,583	502	1,081	712	811	151	168	1,783	1,039
Maine.....	1,810	657	1,153	860	911	248	189	1,902	1,227
New Hampshire.....	1,851	512	1,339	741	1,020	124	214	2,060	1,035
Vermont.....	2,104	460	1,644	693	1,359	73	128	2,057	2,372
Massachusetts.....	1,431	457	974	655	720	137	158	1,640	972
Rhode Island.....	1,360	401	959	639	665	124	121	1,567	942
Connecticut.....	1,667	579	1,088	804	780	177	201	1,925	1,007
Southern North Atlantic.....	1,280	490	790	639	562	143	178	1,349	1,097
New York.....	1,308	516	852	689	619	145	199	1,453	1,165
New Jersey.....	1,213	382	831	566	596	111	113	1,342	916
Pennsylvania.....	1,198	493	705	651	487	151	172	1,244	1,043
South Atlantic division.....	970	458	518	623	324	225	116	1,157	1,944
Northern South Atlantic.....	1,210	525	685	723	445	224	149	1,328	2,020
Delaware.....	1,380	427	953	644	698	173	97	1,547	1,384
Maryland.....	1,329	516	813	715	509	218	138	1,390	1,525
District of Columbia.....	1,819	761	1,058	1,005	761	147	251	1,994	4,713
Virginia.....	1,032	475	557	643	352	248	109	1,255	2,570
West Virginia.....	1,195	583	612	821	332	210	219	1,202	1,653
Southern South Atlantic.....	802	407	395	549	233	226	91	980	1,632
North Carolina.....	867	486	381	632	216	289	108	965	3,186
South Carolina.....	710	373	337	489	205	219	72	916	2,234
Georgia.....	820	382	438	541	255	194	90	1,065	1,664
Florida.....	723	320	403	435	269	149	87	892	1,091
North Central division.....	1,294	561	733	735	519	153	236	1,229	1,640
Eastern North Central.....	1,352	572	780	752	557	155	238	1,298	1,647
Ohio.....	1,402	585	877	749	600	107	221	1,395	2,086
Indiana.....	1,433	651	782	832	565	164	300	1,391	2,432
Illinois.....	1,255	532	723	718	503	130	235	1,217	1,384
Michigan.....	1,405	552	853	778	592	139	235	1,373	1,518
Wisconsin.....	1,197	571	626	721	426	193	207	1,036	1,608
Western North Central.....	1,204	542	662	709	461	150	233	1,124	1,628
Minnesota.....	992	492	500	620	339	153	207	863	1,307
Iowa.....	1,323	538	785	727	563	133	226	1,209	2,008
Missouri.....	1,212	572	640	741	440	166	243	1,174	1,821
North Dakota.....	802	423	379	551	219	132	207	628	1,021
South Dakota.....	1,071	476	595	650	388	112	192	783	1,438
Nebraska.....	1,144	489	655	667	445	124	212	1,067	1,496
Kansas.....	1,425	629	796	802	581	169	283	1,336	2,512
South Central division.....	875	423	452	577	274	106	128	1,011	1,572
Eastern South Central.....	923	445	478	606	289	213	126	1,109	2,241
Kentucky.....	1,220	586	634	801	378	254	184	1,240	2,713
Tennessee.....	1,003	487	516	659	316	248	138	1,124	2,331
Alabama.....	729	333	396	474	233	172	83	952	1,046
Mississippi.....	638	330	308	425	194	158	80	941	1,180
Western South Central.....	820	398	422	544	258	170	131	904	1,345
Louisiana.....	877	382	495	529	321	226	71	1,105	2,121
Arkansas.....	1,004	506	498	691	291	217	163	1,158	1,339
Indian Territory.....	582	240	342	411	163	71	115	587	1,880
Oklahoma.....	708	412	296	497	193	100	206	540	1,538
Texas.....	760	378	382	511	235	159	137	837	1,087
Western division.....	993	377	616	522	436	105	153	958	1,187
Rocky Mountain.....	873	317	550	478	363	90	127	863	704
Montana.....	518	288	230	358	152	49	148	555	369
Idaho.....	903	316	587	488	371	74	155	754	1,325
Wyoming.....	313	97	216	140	173	22	54	276	302
Colorado.....	875	326	549	485	358	78	143	830	774
New Mexico.....	1,551	435	1,116	758	722	220	67	1,593	1,207
Basin and Plateau.....	1,020	452	577	588	414	120	213	801	2,089
Arizona.....	415	203	212	203	195	41	89	482	268
Utah.....	1,239	503	676	777	444	159	293	874	2,803
Nevada.....	1,441	449	992	472	850	94	47	1,044	2,447
Pacific.....	1,048	394	654	533	477	109	155	1,036	1,236
Washington.....	722	324	398	428	280	69	124	723	803
Oregon.....	991	466	525	609	365	109	232	948	1,170
California.....	1,178	398	780	547	577	123	145	1,177	1,387

Table x is illustrated by Maps 1, 2, and 3, showing the ratios per million of population in each state and territory

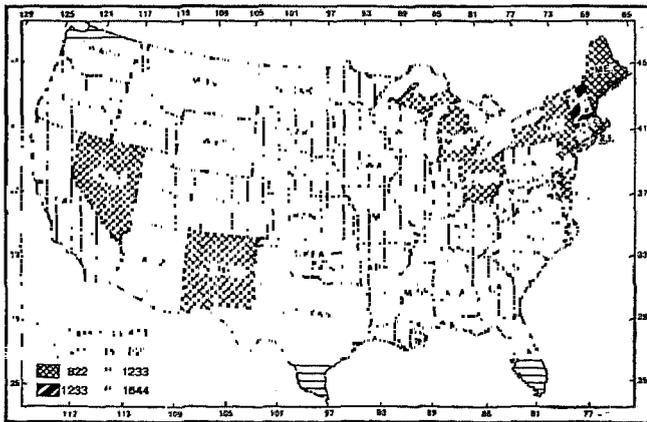
MAP 1.—Number of deaf per million of population, by states and territories.



MAP 2.—Number of totally deaf per million of population, by states and territories.



MAP 3.—Number of partially deaf per million of population, by states and territories.



Map 1 shows the geographic distribution of the total number of deaf reported at the Twelfth Census, from which it appears that, upon the whole, deafness

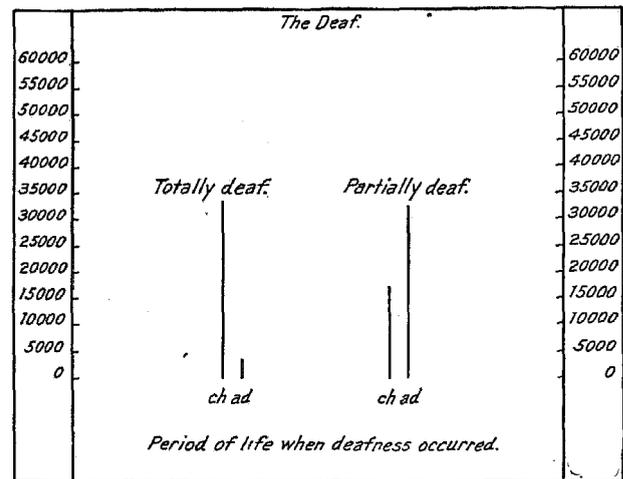
is more common in the northern part of the United States than in the southern. The North Atlantic and North Central divisions show a larger ratio per million than the South Atlantic and South Central divisions, and the largest ratio of all is found in the New England states. The ratios shown in the states composing the Western division, with the exception of California, are of comparatively slight significance, because of the small numbers involved.

Maps 2 and 3 show, in contrast, the geographic distribution of the totally deaf and the partially deaf, and in studying these maps it will be remembered that the totally deaf consist largely of persons deaf from childhood and the partially deaf largely of persons deaf from adult life.

*Degree of deafness.*—Out of an aggregate of 89,287 deaf, 37,426 were reported as totally deaf and 51,861, as partially deaf (Table 1).

Table 1 reveals the fact that the vast majority of the totally deaf became deaf in childhood, before reaching the age of 20 years, whereas the majority of the partially deaf lost hearing in adult life (Diagram 8).

Diagram 8.



In Table xi the totally and partially deaf are analyzed by the age at which deafness occurred.

From this table it appears that out of 35,479 totally deaf cases in which the age when deafness occurred was definitely stated, 91 per cent were totally deaf from childhood (under 20), 52 per cent were totally deaf from infancy (under 2), and 36 per cent were totally deaf from birth. More than half of the totally deaf lost hearing before they were 2 years of age.

Of the partially deaf, about one-third became deaf before they were 20, one-third between 20 and 40, and one-third after reaching 40, approximately.

Table xi is illustrated by Diagrams 9 and 10.

TABLE XI.—The deaf, by degree of deafness and age when deafness occurred.

AGE WHEN DEAFNESS OCCURRED.	Total.	Totally deaf.	Partially deaf.
Total.....	89,287	37,426	51,861
Age when deafness occurred:			
Unknown.....	3,067	795	2,272
Indefinitely stated.....	4,630	1,152	3,478
Definitely stated.....	81,590	35,479	46,111
Indefinitely stated:			
Childhood.....	2,347	988	1,359
Adult life.....	2,283	164	2,119
Definitely stated:			
Birth.....	14,474	12,609	1,865
After birth, under 2.....	7,396	5,998	1,398
Under 2.....	21,870	18,607	3,263
2 and under 4.....	8,259	6,072	2,187
4 and under 6.....	4,277	2,601	1,676
6 and under 8.....	2,955	1,617	1,338
8 and under 10.....	2,063	973	1,090
10 and under 12.....	1,830	626	1,204
12 and under 14.....	1,804	572	1,232
14 and under 16.....	1,915	457	1,458
16 and under 18.....	1,427	344	1,083
18 and under 20.....	1,549	291	1,258
Under 5.....	32,406	26,152	6,254
5 and under 10.....	7,018	3,718	3,300
10 and under 15.....	4,464	1,425	3,039
15 and under 20.....	4,061	865	3,196
Under 20.....	47,949	32,100	15,789
20 and under 40.....	16,588	2,021	14,567
40 and.....	9,437	887	8,550
60 and.....	6,595	374	6,221
80 and under 100.....	1,013	57	956
100 and over.....	8		8

Diagram 9.

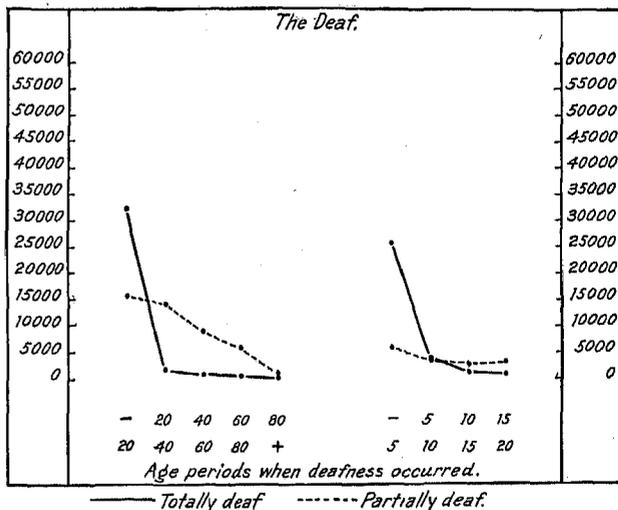
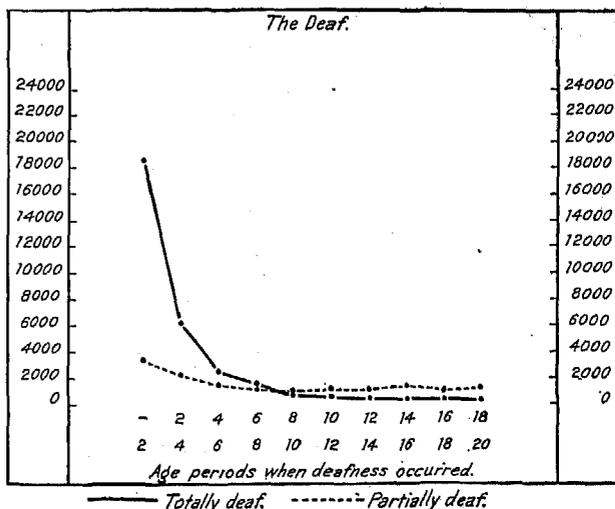


Diagram 10.



Ability to speak.—Out of an aggregate of 89,287 persons returned as deaf, 55,501 were able to speak “well,” 9,417 “imperfectly,” and 24,369 “not at all” (Table 1).

In the case of those who do not speak at all, the period of life when deafness occurred (whether childhood or adult life) is known in 23,866 cases, and of these, 23,687, or more than 99 per cent, became deaf in childhood, before reaching the age of 20 years.

The class “deaf from childhood” thus includes substantially all of the deaf and dumb (Diagram 11). This is true even if we include, as is usually done, “semi-mutes,” who speak imperfectly, as well as “deaf-mutes” proper, who do not speak at all, among the deaf and dumb; for nearly 98 per cent of these two subgroups combined (deaf-mutes and semimutes) became deaf in childhood, before reaching the age of 20 years.

On the other hand, the majority of the deaf who speak well became deaf in adult life.

Diagram 11.

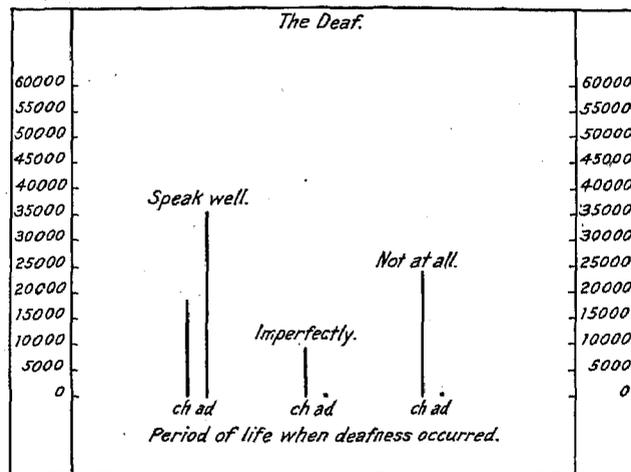


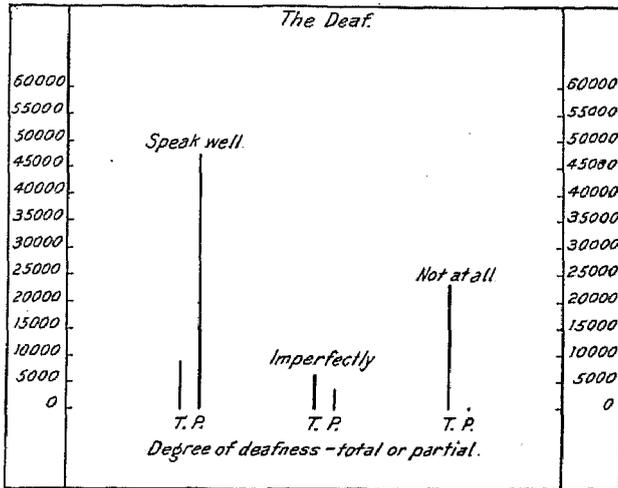
TABLE XII.—Number and per cent of deaf, by period of life when deafness occurred, degree of deafness, and ability to speak.

DEGREE OF DEAFNESS AND ABILITY TO SPEAK.	Total.	PERIOD OF LIFE WHEN DEAFNESS OCCURRED.					
		Un-known.	Known.				
			Total.	Childhood (under 20).		Adult life (20 and over).	
			Num-ber.	Per-cent.	Num-ber.	Per-cent.	
Total.....	89,287	3,067	86,220	50,296	58.3	35,924	41.7
Totally deaf.....	37,426	795	36,631	33,148	90.5	3,483	0.5
Partially deaf.....	51,861	2,272	49,589	17,148	34.6	32,441	65.4
Speak well.....	55,501	2,310	53,191	18,064	34.0	35,127	66.0
Imperfectly.....	9,417	254	9,163	8,545	93.3	618	6.7
Not at all.....	24,369	503	23,866	23,687	99.2	179	0.8
Totally deaf:							
Speak well.....	8,027	246	7,781	4,578	58.8	3,203	41.2
Imperfectly.....	5,917	99	5,818	5,657	97.2	161	2.8
Not at all.....	23,482	450	23,032	22,913	99.5	119	0.5
Partially deaf:							
Speak well.....	47,474	2,064	45,410	13,486	29.7	31,924	70.3
Imperfectly.....	3,500	155	3,345	2,888	86.3	457	13.7
Not at all.....	887	53	834	774	92.8	60	7.2

In Table XII the returns of the deaf who speak "well," "imperfectly," or "not at all," are analyzed by period of life when deafness occurred (whether childhood or adult life) and by degree of deafness (whether total or partial).

Out of 24,369 deaf and dumb who can not speak, 23,482, or more than 96 per cent, were reported as totally deaf; and only 887, or less than 4 per cent, as partially deaf. Table XII is illustrated by Diagram 12.

Diagram 12.



The small proportion of partially deaf is somewhat surprising, in view of the fact that it is a common practice in American schools for the deaf and dumb to summon the pupils in from the playground by the ringing of a bell. In 1888 experiments were made in a number of schools to ascertain the percentage of children who could hear this call, and out of 1,475 pupils tested, 304, or nearly 21 per cent, could hear the ringing of the bell<sup>1</sup>; but in the Census tables less than 4 per cent of the deaf and dumb are reported as partially deaf.

It may possibly be that in the case of the deaf and dumb there has been an overestimate of the number totally deaf, for the test of total deafness adopted, although perfectly applicable to deaf persons who can speak, is not so well adapted to distinguish the totally from the partially deaf among the deaf and dumb. In the Census tables those persons are returned as totally deaf who "can not be made to understand what people say even when they shout;" but the deaf and dumb have no knowledge of spoken language, and so could

<sup>1</sup> See "Education of Deaf Children: Evidence of Edward Miner Galaudet and Alexander Graham Bell presented to the Royal Commission of the United Kingdom on the Condition of the Blind, the Deaf and Dumb, etc.; with accompanying papers, postscripts, and an index. Edited by Joseph C. Gordon, professor of mathematics, etc., in the National College for the Deaf, Washington, U. S. A.: published by the Volta Bureau, Washington, D. C., 1892." Part II, query 21395. Also exhibit entitled "Facts and Opinions Relating to the Deaf in America" in the same volume.

not "understand" even if they heard. Few Americans could be made to understand Chinese, even though the spoken words were shouted into their ears, but it does not necessarily follow that such persons are totally deaf; and spoken English is as unintelligible to the deaf and dumb as Chinese is to us.

On the other hand, the small proportion of partially deaf among the deaf and dumb is explicable without the assumption that the returns of the totally deaf are excessive. Articulation teaching has been pursued for a good many years in American schools for the deaf, and it is known that the partially deaf acquire speech more readily by instruction than those who can not hear at all, and this would result in comparatively few of them being returned as deaf and dumb; they would appear instead among those who speak, either well or imperfectly. This interpretation, upon the whole, seems more probable than the other.

The number of cases in which the period of life when deafness occurred is known (Table XII) forms the basis upon which the following percentages have been calculated: Thirty-four per cent of those who could speak well, 93 per cent of those who could speak imperfectly, and 99 per cent of those who could speak not at all became deaf in childhood, before reaching the age of 20. Sixty-six per cent of those who could speak well, 7 per cent of those who could speak imperfectly, and 1 per cent of those who could speak not at all lost hearing in adult life.

The following percentages have been calculated on the basis of the whole of the deaf who speak well, imperfectly, or not at all (Table XII): Fourteen per cent of those who could speak well, 63 per cent of those who could speak imperfectly, and 96 per cent of those who could speak not at all were reported as totally deaf. Eighty-six per cent of those who could speak well, 37 per cent of those who could speak imperfectly, and 4 per cent of those who could speak not at all were returned as partially deaf.

It will thus be seen that the ability to speak (whether well, imperfectly, or not at all) is largely dependent upon the period of life when deafness occurred (whether childhood or adult life) and upon the degree of deafness (whether total or partial). A correlation exists between these three elements.

In Table XIII the deaf who speak well, imperfectly, or not at all are analyzed by the age when deafness occurred, and the results are shown graphically in Diagram 13.

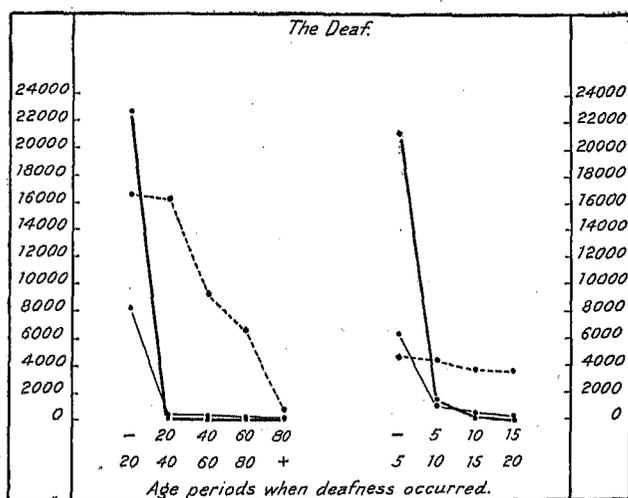
Speaking broadly, about one-third of the deaf who speak well lost hearing before they were 20 years old, one-third between 20 and 40, and one-third after reaching 40.

Of the deaf who speak imperfectly or not at all, most lost hearing at a very early age—before they were 5—and practically all became deaf before they were 20.

TABLE XIII.—The deaf, by ability to speak and age when deafness occurred.

AGE WHEN DEAFNESS OCCURRED.	Total.	ABILITY TO SPEAK.		
		Well.	Imper- fectly.	Not at all.
Total.....	89,287	55,501	9,417	24,369
Age when deafness occurred:				
Unknown.....	3,067	2,310	254	503
Indefinitely stated.....	4,630	3,357	517	756
Definitely stated.....	81,590	49,834	8,646	23,110
Indefinitely stated:				
Childhood (under 20).....	2,347	1,137	468	742
Adult life (20 and over).....	2,283	2,220	49	14
Definitely stated:				
Birth.....	14,474	1,217	2,452	10,805
After birth, under 2.....	7,396	946	1,011	4,839
2 and under 5.....	10,530	2,609	2,228	5,699
Under 5.....	32,406	4,832	6,291	21,283
5 and under 10.....	7,018	4,324	1,279	1,415
10 and under 15.....	4,464	3,908	372	184
15 and under 20.....	4,061	3,863	135	63
Under 20.....	47,949	16,927	8,077	22,945
20 and under 40.....	10,588	16,215	283	90
40 and under 60.....	9,437	9,241	155	41
60 and under 80.....	6,595	6,453	113	29
80 and over.....	1,021	993	18	5
Under 20.....	47,949	16,927	8,077	22,945
20 and over.....	33,641	32,907	569	165

Diagram 13.



..... Speak well — Imperfectly. — Not at all

A more exact statement is contained in Tables XIV and XV, illustrated by Diagrams 14, 15, and 16.

Table XIV shows the number and percentage of the deaf who speak well, imperfectly, or not at all, who lost hearing before reaching certain specified ages.

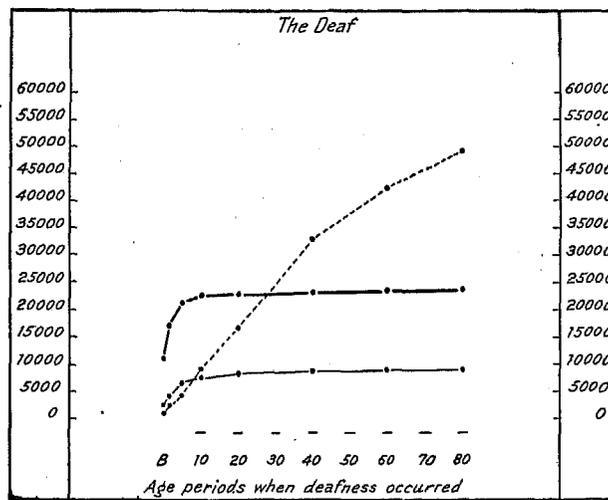
From Table XIV and Diagrams 14 and 15 it appears that substantially all of the deaf and dumb became deaf before they were 20, nearly all (98 per cent) before they were 10, and the vast majority (92 per cent) before they were 5. More than two-thirds lost hearing before they were 2, and nearly one-half were born deaf.

In the case of the semimutes, also, the vast majority (93 per cent) became deaf before they were 20, nearly three-fourths lost hearing before they were 5, nearly one-half before they were 2, and more than one-quarter were born deaf.

TABLE XIV.—Number and per cent of deaf, by ability to speak and age when deafness occurred.

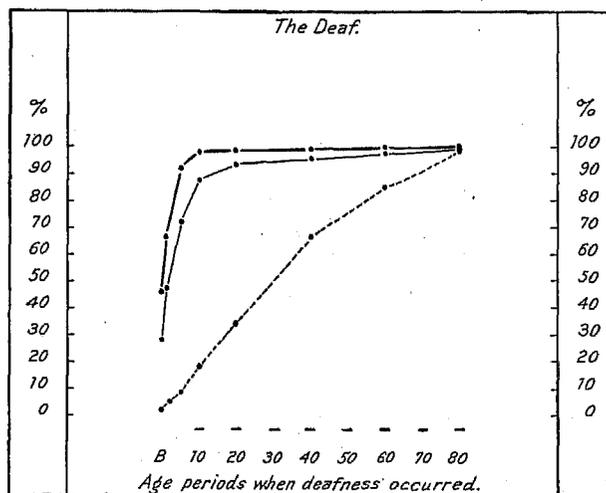
AGE WHEN DEAFNESS OCCURRED.	Total.	ABILITY TO SPEAK.					
		Number.			Per cent.		
		Well.	Imper- fectly.	Not at all.	Well.	Imper- fectly.	Not at all.
All ages.....	89,287	55,501	9,417	24,369			
Age when deafness occurred:							
Unknown.....	3,067	2,310	254	503			
Indefinitely stated.....	4,630	3,357	517	756			
Definitely stated.....	81,590	49,834	8,646	23,110			
All ages.....	81,590	49,834	8,646	23,110	100.0	100.0	100.0
Under 80.....	80,569	48,836	8,628	23,105	98.0	99.8	99.9
Under 60.....	73,974	42,383	8,515	23,076	85.0	98.5	99.9
Under 40.....	64,537	33,142	8,360	23,035	66.5	96.7	99.7
Under 20.....	47,949	16,927	8,077	22,945	34.0	93.4	99.3
Under 10.....	39,424	9,156	7,570	22,698	18.4	87.6	98.2
Under 5.....	32,406	4,832	6,291	21,283	9.7	72.8	92.1
Under 2.....	21,870	2,163	4,063	15,644	4.3	47.0	67.7
Birth.....	14,474	1,217	2,452	10,805	2.4	28.4	46.8

Diagram 14.



..... Speak well — Imperfectly. — Not at all

Diagram 15.



..... Speak well. — Imperfectly. — Not at all.

Table XV shows the percentage of the deaf who lost hearing before reaching certain specified ages—who speak well, imperfectly, or not at all.

TABLE XV.—Per cent of deaf, by ability to speak and age when deafness occurred.

AGE WHEN DEAFNESS OCCURRED.	Total.	ABILITY TO SPEAK.		
		Well.	Imper- fectly.	Not at all.
All ages.....	100.0	62.2	10.5	27.3
Age when deafness occurred:				
Unknown.....	100.0	75.3	8.3	16.4
Indefinitely stated.....	100.0	72.5	11.2	16.3
Definitely stated.....	100.0	61.1	10.6	28.3
All ages.....	100.0	61.1	10.6	28.3
Under 80.....	100.0	60.6	10.7	28.7
Under 60.....	100.0	57.3	11.5	31.2
Under 40.....	100.0	51.3	13.0	35.7
Under 20.....	100.0	35.3	16.8	47.9
Under 10.....	100.0	23.2	19.2	57.6
Under 5.....	100.0	14.9	19.4	65.7
Under 2.....	100.0	9.9	18.6	71.5
Birth.....	100.0	8.4	16.9	74.7

Diagram 16.

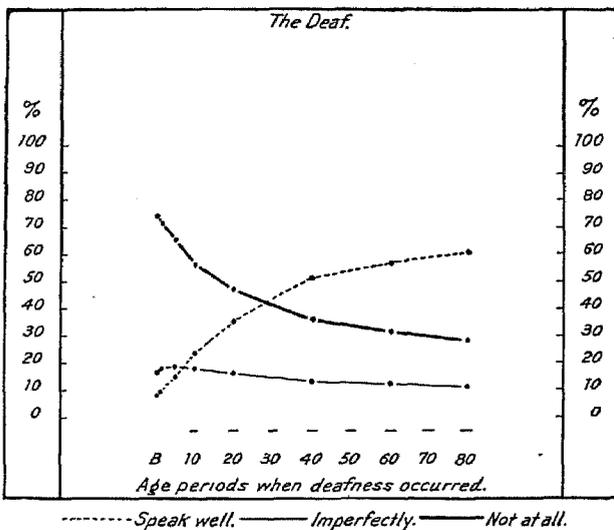


TABLE XVI.—The totally deaf, by ability to speak and age when deafness occurred.

AGE WHEN DEAFNESS OCCURRED.	Total.	ABILITY TO SPEAK.		
		Well.	Imper- fectly.	Not at all.
Total.....	37,426	8,027	5,917	23,482
Age when deafness occurred:				
Unknown.....	795	246	99	450
Indefinitely stated.....	1,152	259	213	680
Definitely stated.....	35,479	7,522	5,605	22,352
Indefinitely stated:				
Childhood.....	988	115	202	671
Adult life.....	164	144	11	9
Definitely stated:				
Birth.....	12,609	402	1,589	10,528
After birth, under 2.....	5,968	281	1,072	4,645
2 and under 5.....	7,545	580	1,489	5,476
Under 5.....	26,152	1,353	4,160	20,649
5 and under 10.....	3,718	1,373	975	1,370
10 and under 15.....	1,425	1,001	251	173
15 and under 20.....	865	736	79	50
Under 20.....	32,160	4,463	5,455	22,242
20 and under 40.....	2,021	1,852	99	70
40 and under 60.....	867	808	34	25
60 and under 80.....	374	346	15	13
80 and over.....	57	53	2	2

Table xv and Diagram 16 show that the proportion of the deaf who are deaf and dumb becomes progressively greater as the age when deafness occurred is younger.

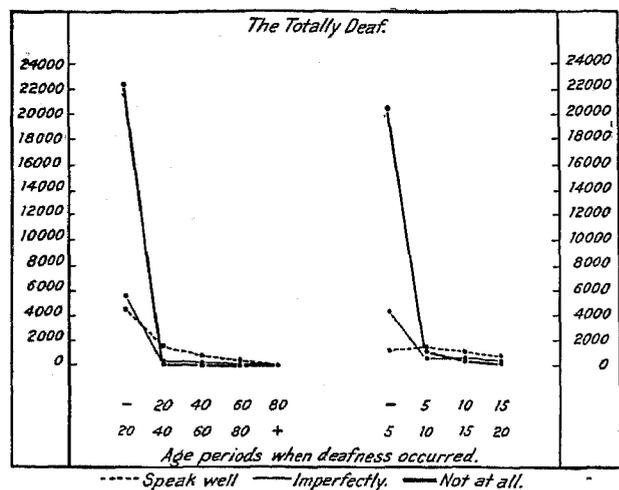
In Table xvi (the totally deaf) and in Table xvii (the partially deaf) the returns are analyzed by the age when deafness occurred, so that it may be seen how far the degree of deafness (whether total or partial) modifies the results disclosed by Table xiii (Diagram 13).

TABLE XVII.—The partially deaf, by ability to speak and age when deafness occurred.

AGE WHEN DEAFNESS OCCURRED.	Total.	ABILITY TO SPEAK.		
		Well.	Imper- fectly.	Not at all.
Total.....	51,861	47,474	3,500	887
Age when deafness occurred:				
Unknown.....	2,272	2,064	155	53
Indefinitely stated.....	3,478	3,098	304	76
Definitely stated.....	46,111	42,312	3,041	758
Indefinitely stated:				
Childhood.....	1,359	1,022	266	71
Adult life.....	2,119	2,076	38	5
Definitely stated:				
Birth.....	1,865	725	863	277
After birth, under 2.....	1,398	665	539	194
2 and under 5.....	2,901	2,089	739	163
Under 5.....	6,254	3,479	2,141	684
5 and under 10.....	3,300	2,951	304	45
10 and under 15.....	3,039	2,907	121	11
15 and under 20.....	3,196	3,127	50	13
Under 20.....	15,789	12,404	2,622	703
20 and under 40.....	14,567	14,363	184	20
40 and under 60.....	8,570	8,433	121	16
60 and under 80.....	6,221	6,107	98	16
80 and over.....	964	945	16	3

Tables xvi and xvii are illustrated by Diagrams 17 and 18.

Diagram 17.



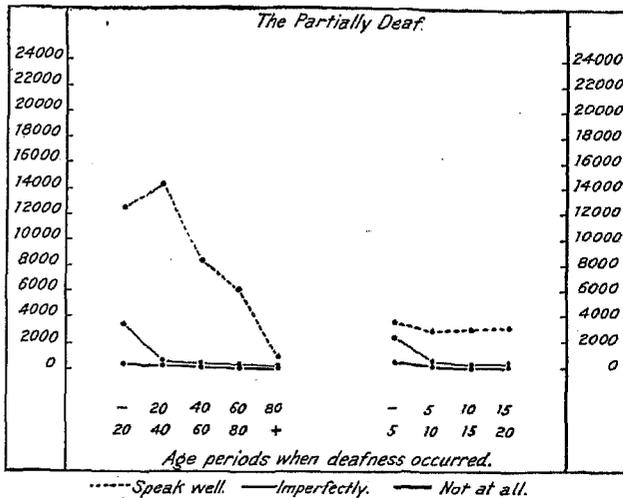
Comparing Tables xvi and xvii, it will be observed that comparatively few of the totally deaf speak well (Diagram 17), and comparatively few of the partially deaf speak imperfectly or not at all (Diagram 18).

The deaf and dumb consist mainly of persons totally deaf from early childhood, under 5 (Diagram 17).

The deaf who speak well consist mainly of persons who became partially deaf in adult life (Diagram 18).

The deaf who speak imperfectly form an intermediate class, more closely affiliated with the deaf and dumb than with those who speak well (Diagrams 11 to 18).

Diagram 18.



*Correlated conditions.*—While it is obvious that inability to speak is associated with inability to hear, where the deafness occurred in childhood, it is equally true that deafness itself, irrespective of the age when it occurred, is not necessarily associated with dumbness, for the majority of the deaf can speak perfectly well (Table XII), including several thousands of cases of persons totally devoid of the sense of hearing.

Neither partial nor total deafness, then, necessarily interferes with the power of speech, the controlling factor being the age or period of life when the deafness occurred. The earlier the age when the deafness occurred the larger the proportion who are deaf and dumb. The largest proportion of deaf and dumb is found among those who are born deaf (Table XV).

*The condition of speech naturally resulting from deafness contrasted with the actual condition revealed by the census returns.*—*Period of life when deafness occurred: Birth.*—A little consideration will show that all persons who are born deaf are naturally also dumb. The dumbness is a necessary consequence of the deafness, and not a defect in itself. We were all born dumb; and no one naturally acquires a language he has never heard. The deaf-born child, then, necessarily remains dumb after the age when others talk, because he has never heard the language the others have acquired.

It is not surprising, therefore, that a large proportion of the deaf from birth should be deaf and dumb. It is only remarkable that any at all should be able to speak. This is the fact that requires explanation.

Table XV shows that less than 75 per cent of the deaf from birth are deaf and dumb; 3,669, or more

than 25 per cent, are reported as able to speak (Table XIII).

We can not attribute this result to inaccuracy on the part of the enumerators of the Twelfth Census, for the information did not come from the enumerators, but from the deaf persons themselves in answer to a circular letter of inquiry.

It may be possible that some of the deaf from birth who were only partially deaf possessed a sufficient amount of hearing to enable them to pick up imperfect speech for themselves by imitation in the natural way, although every effort was made by the Census Bureau to exclude from the returns persons who were only hard of hearing. It is absolutely certain, however, that all those who were totally deaf from birth were deaf and dumb at some period of their lives; and yet no less than 2,081 are reported as able to speak. From Table XVI it appears that of these, 492 could speak well and 1,589 imperfectly.

These are by no means all of the deaf and dumb who appear in the returns of the Twelfth Census as speaking persons, as will be evident from the following considerations:

Speech is normally acquired through the sense of hearing by a gradual process of imitation extending through a series of years. If, then, deafness occurs before or during the formative period of speech, the natural result is that the person either remains dumb or tends to revert to the speechless condition; but once the formative period has been passed and the speech habit fully established, deafness no longer tends to produce dumbness or to materially affect the character of the articulation.

*After birth, under 2.*—Normal children do not begin to speak until they are about 2 years old. If a child becomes deaf before reaching that age, he fails to acquire speech just as though he had been born deaf. All persons who lost hearing before they were 2 years of age are naturally deaf and dumb.

Table XIII shows that 2,557 persons who became deaf after birth and under the age of 2 are returned as able to speak; 1,353 of these were totally deaf (Table XVI) and 1,204 partially deaf (Table XVII).

*2 and under 5.*—If a child loses his hearing after having commenced to talk and before reaching the age of 5, his speech at best is imperfect; and though he continues to speak for some time after he becomes deaf, he soon forgets how to talk. The memory of a little child is very short. No longer able to correct his pronunciation by hearing the speech of others, his articulation becomes more and more imperfect, until finally he becomes a deaf-mute. All persons who lost hearing after they had begun to talk and before reaching the age of 5 naturally belong to the class "deaf and dumb." They were not originally deaf-mutes, but they have become so as time passed.

Four thousand eight hundred and ninety-seven persons who became deaf after 2 years of age and before reaching the age of 5 are reported as able to speak (Table XIII); 2,069 of these were totally deaf (Table XVI) and 2,828 partially deaf (Table XVII).

*5 and under 10.*—Children who become deaf after 5 and under 10 years of age continue speaking in a more or less imperfect manner for a long time after they become deaf, but in process of time their speech becomes more and more imperfect; many become dumb, but most of them retain an imperfect articulation.

From Table XIII it appears that the majority of persons—4,324 out of 7,018—who became deaf between 5 and 10 years of age are returned as speaking well (totally deaf, 1,373; partially deaf, 2,951) instead of speaking imperfectly or not at all, which is the natural condition resulting from their deafness.

*10 and under 20.*—At or about the age of 10 most children have acquired the ability to read and write, and, as a rule, if a child becomes deaf after reaching the age of 10, he is able to read, although unable to hear what others say to him. He speaks perfectly, and the tendency to revert to the speechless condition is much less marked than in the case of those who become deaf at an earlier age. Inability to hear the speech of others naturally leads him to seek the society of books. Reading keeps up the knowledge of language he possessed before he became deaf, and also introduces to his notice multitudes of words that he does not know how to pronounce. Not being able to hear how they are pronounced by others, he naturally attempts to speak them as they are spelled; but, unfortunately, our written language is very unphonetical in its character, and the new words acquired through reading are pronounced in a very imperfect manner. Thus, in the case of persons who lost hearing after the age of 10 and under the age of 20, their speech, though perfect at first, becomes peculiar in process of time, and most of this class, especially the illiterate, gradually become "semimutes."

A smaller proportion, the minority, become absolutely deaf and dumb. This statement reflects the natural condition resulting from deafness occurring at this period of life.

From Table XIII it appears that 7,771 of those who became deaf after 10 and under 20 were able to speak well, only 507 imperfectly, and 247 not at all.

*Adult life (20 and over).*—There is no apparent reason why the speech of those who become deaf in adult life should be materially affected by their deafness, and although the total number reported as unable to speak is small (only 179, Table XIII) it is somewhat surprising to find that any of them are returned as deaf and dumb. We can only conclude that the dumbness in these cases did not result from deafness, but from other causes not specified in the returns.

*General conclusions.*—Deafness interferes rather with the acquisition of speech than with its retention after it has once been acquired, and the speaking habit fully established by usage.

Deafness occurring in adult life, therefore, does not materially affect the ability to speak; but deafness occurring in childhood does. This is well established by the returns of the present census; but it is obvious that in the case of those who became deaf in childhood the condition of the speech, as revealed by the census returns, departs very materially from the natural condition resulting from the deafness. Several thousands of persons are reported as able to speak, who would naturally—without special instruction in the use of their vocal organs—be deaf and dumb.

This result indicates either that the census returns are grossly erroneous regarding the ability of the deaf to speak, or that a great and beneficial work has been accomplished by our special schools for the deaf in imparting artificially, by instruction, the power of articulate speech to large numbers of the deaf and dumb.

The first hypothesis can not be entertained, for whatever errors there may be in the present census, they consist of omissions rather than of inaccuracies in the tabulated material. The information actually compiled is authoritative so far as it goes, because it came directly from the deaf persons themselves in answer to a letter of inquiry, or from parents, guardians, or friends intimately acquainted with the condition of the deaf persons considered, and is thus independent of any errors on the part of the original enumerators. The latter hypothesis is more probable and demands special consideration.

No less than 11,123 persons who became deaf before reaching the age of 5 are reported as able to speak (totally deaf, 5,503; partially deaf, 5,620). All of these, naturally, are deaf and dumb, excepting those of the partially deaf, who may be only slightly deaf, but even these belong to the class "semimutes," who are usually included in the returns of the deaf and dumb. The totally deaf cases certainly—all of them—belong naturally to the class deaf and dumb.

*Totally deaf from early childhood (under 5).*—Twenty-six thousand one hundred and fifty-two persons are reported as totally deaf from early childhood (under 5). Of these, 5,503 are reported as able to speak (1,353 speak well and 4,150 imperfectly) Table XVI.

The obvious interpretation of the figures is that these persons have acquired speech artificially by special instruction.

This conclusion is strengthened by the fact that the vast majority of the totally deaf from early childhood, as shown in Table XVIII, have attended special schools for the deaf where facilities exist for articulation teaching.

TABLE XVIII.—Number and per cent totally deaf from early childhood (under 5), by school attendance.

SCHOOL ATTENDANCE.	Number.	PER CENT OF—			
		Total.	Total, schooling stated.	Total, at-tended school.	Total, kind of school stated.
Total.....	26,152	100.0			
School attendance:					
Not stated.....	502	2.3			
Stated.....	25,560	97.7	100.0		
Stated:					
Did not attend school.....	4,852	18.5	10.0		
Attended school.....	20,708	79.2	81.0	100.0	
Attended school:					
Kind of school—					
Not stated.....	449	1.7	1.7	2.2	
Stated.....	20,259	77.5	79.3	97.8	100.0
Stated:					
Special.....	19,124	73.1	74.8	92.4	94.4
Other.....	1,064	4.1	4.2	5.1	5.3
Both.....	71	0.3	0.3	0.3	0.3

Out of 20,259 cases where the kind of school attended is stated, 19,195, or 94.7 per cent, were educated in special schools (including 71 persons who attended both special and other schools). These constitute nearly three-fourths of the total, or 73.4 per cent of 26,152 cases totally deaf from early childhood (under 5).

The conclusion that we are here dealing with cases of artificial acquisition of speech is still further strengthened and, indeed, rendered certain by an examination of the present ages of the above cases (Table XIX).

It is only within comparatively recent years that articulation teaching on a wholesale scale has been carried on in the United States; so that the majority of the deaf who have acquired speech artificially by instruction in school are comparatively young, few of them having passed middle life.

If, then, our conclusion is correct, we should naturally expect to find, upon examining the ages of the above cases, that the vast majority of the older persons who have passed middle life, and the vast majority of the younger persons who are under the school age, are deaf and dumb; whereas the proportion of deaf and dumb among those of intermediate age should be less—and progressively less, as the age is younger—down to some minimum well within the limits of school life, and this we find to be the case.

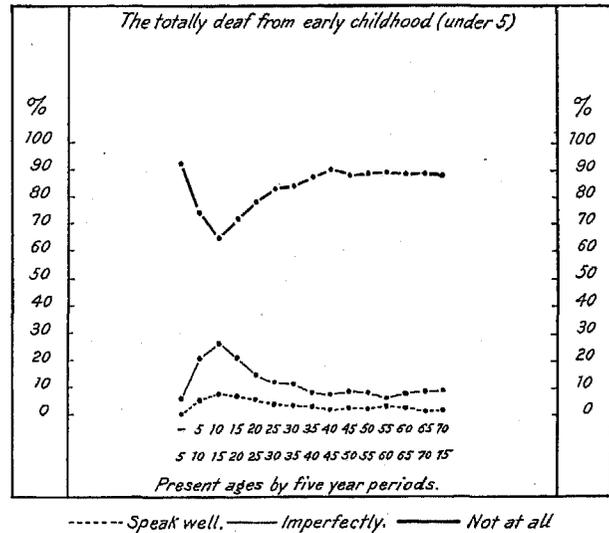
Table XIX shows the present ages of those who are totally deaf from early childhood, by five-year periods, and the number and percentage in each age group who can speak well, imperfectly, or not at all.

The results presented in Table XIX are shown graphically by Diagram 19.

TABLE XIX.—Number and per cent totally deaf from early childhood (under 5), by present age and ability to speak.

PRESENT AGE.	Total.	ABILITY TO SPEAK.					
		Number.			Per cent.		
		Well.	Im-per-fectly.	Not at all.	Well.	Im-per-fectly.	Not at all.
All ages.....	26,152	1,353	4,150	20,649	5.2	15.9	78.9
Present age:							
Not stated.....	94		13	81		13.8	86.2
Stated.....	26,058	1,353	4,137	20,568	5.2	15.9	78.9
Under 5.....	840	5	55	786	0.6	6.5	92.9
5 and under 10.....	3,245	192	651	2,402	5.9	20.1	74.0
10 and under 15.....	4,399	383	1,160	2,856	8.7	26.4	64.9
15 and under 20.....	3,784	281	795	2,708	7.4	21.0	71.6
20 and under 25.....	2,422	150	361	1,911	6.2	14.9	78.9
25 and under 30.....	2,424	96	293	2,035	4.0	12.1	83.9
30 and under 35.....	1,902	73	233	1,656	3.7	11.9	84.4
35 and under 40.....	1,858	49	160	1,649	2.6	8.6	88.8
40 and under 45.....	1,297	26	104	1,167	2.0	8.0	90.0
45 and under 50.....	1,024	22	92	910	2.1	9.0	88.9
50 and under 55.....	895	18	78	799	2.0	8.7	89.3
55 and under 60.....	664	23	44	597	3.5	6.6	89.9
60 and under 65.....	483	14	42	427	2.9	8.7	88.4
65 and under 70.....	325	5	30	290	1.5	9.3	89.2
70 and under 75.....	214	4	21	189	1.9	9.8	88.3
75 and under 80.....	132	6	12	114			
80 and under 85.....	53	3	5	45			
85 and under 90.....	19	1	1	17			
90 and under 95.....	10	2		8			
95 and under 100.....	2						
100 and over.....							

Diagram 19.



Beginning with the older persons referred to in Diagram 19, we find that the proportion deaf and dumb approximates 90 per cent, the curve hovering pretty steadily in the neighborhood of the 90 per cent level down to the age group 40 to 45. From this point the curve descends. The proportion deaf and dumb becomes less (or in other words the proportion able to speak increases) down to the age group 10 to 15, consisting mainly of children yet in school, of whom only 65 per cent are deaf and dumb. Below

this age group the curve again rises, because many of the children under 10 years of age have not yet entered school and are therefore in their natural speechless condition.

Very few deaf children under 5 years of age have been brought under instruction, so that here the proportion deaf and dumb goes up to the normal 90 per cent level and beyond. It is only remarkable that it does not reach 100 per cent.

That these young children are not all deaf and dumb is doubtless due to the fact that some have only recently lost their hearing, and so have not had time to forget their natural speech; while others may have received speech instruction in a kindergarten way in schools receiving pupils under the usual school age. Infant schools for the deaf have recently made their appearance, receiving pupils as young as 3 or even 2 years of age, under the belief that deaf children can most readily acquire speech at the natural age when hearing children learn to talk.

The majority of those noted in Table XIX as able to speak, speak imperfectly; and this is consistent with the conclusion that they have been taught to articulate.

The artificial speech acquired by the deaf is rarely perfect. It is usually peculiar, like the pronunciation of a foreigner, and it has marked characteristics of its own. It is probable, therefore, that most of the deaf who have acquired speech by instruction are returned as speaking "imperfectly" rather than "well," excepting, perhaps, in the case of the partially deaf, many of whom, by instruction, acquire perfect speech.

Table XIX relates exclusively to the totally deaf from early childhood (under 5), which group includes the great mass of the deaf and dumb (84.7 per cent). Those who lost hearing at a later period of life, or who are only partially deaf, respond more readily to articulation teaching, and it is probable that a larger percentage of the deaf and dumb among them have been converted by instruction into speaking persons.

Table XX gives the number and percentage of pupils taught speech in American schools for the deaf from 1884 to 1904.

Of the deaf and dumb admitted to American schools for the deaf, the proportion receiving instruction in the use of their vocal organs increased from 27.2 per cent in 1884 to 41.3 per cent in 1890 and 63 per cent in 1900.

Since 1900, the year to which the census statistics specially relate, the percentage has continued to increase. The latest available statistics from the Annals (those for 1904) show that more than two-thirds of the whole, or 67.2 per cent, were then taught speech. Still later statistics have been published by the Association Review, Volume VII, page 282, showing that in 1905 (March 31) 69.1 per cent were taught speech.

TABLE XX.—Number and per cent of deaf taught speech in special schools for the deaf in the United States for specified years.<sup>1</sup>

YEAR.	Total schools.	Total pupils.	NUMBER TAUGHT SPEECH.			PER CENT TAUGHT SPEECH.		
			Total.	Wholly or chiefly by oral method.	Wholly or chiefly by auricular method.	Total.	Wholly or chiefly by oral method.	Wholly or chiefly by auricular method.
1857.....	30	1,721						
1863.....	22	2,012						
1866.....	24	2,469						
1867.....	24	2,576						
1868.....	27	2,898						
1869.....	30	3,246						
1870.....	34	3,784						
1871.....	38	4,068						
1872.....	36	4,253						
1873.....	38	4,252						
1874.....	44	4,822						
1875.....	43	5,360						
1876.....	49	5,010						
1877.....	49	5,711						
1878.....	49	6,166						
1879.....	51	6,431						
1880.....	55	6,798						
1881.....	55	7,019						
1882.....	55	7,155						
1883.....	58	7,169						
1884.....	61	7,482	2,041			27.2		
1885.....	64	7,801	2,618			33.5		
1886.....	66	8,050	2,484			30.9		
1887.....	69	7,978	2,556			32.0		
1888.....	73	8,372	3,251			38.8		
1889.....	73	8,575	3,412			39.7		
1890.....	77	8,901	3,682			41.3		
1891.....	77	9,232	4,245			46.0		
1892.....	80	9,940	3,924	1,581		49.4	19.9	
1893.....	79	8,304	4,485	2,056	80	54.0	24.7	0.96
1894.....	82	8,825	4,802	2,260	109	54.4	25.6	1.24
1895.....	89	9,252	5,084	2,570	149	54.0	27.7	1.61
1896.....	89	9,554	5,243	2,752	166	54.9	28.8	1.74
1897.....	95	9,749	5,498	2,466	162	56.4	35.6	1.66
1898.....	101	10,139	5,817	3,672	116	57.4	36.2	1.14
1899.....	112	10,087	6,237	4,089	128	61.8	40.5	1.27
1900.....	115	10,608	6,687	4,538	108	63.0	42.8	1.02
1901.....	118	11,028	6,988	5,147	73	63.4	46.7	0.66
1902.....	123	10,952	7,017	4,888	63	64.1	44.6	0.58
1903.....	128	11,225	7,482	5,433	100	66.6	48.4	0.89
1904.....	133	12,534	7,601	5,508	154	67.2	48.3	1.36

<sup>1</sup>From the American Annals of the Deaf.

Subsequent years refer to number of pupils present (15). Before 1892 they indicate the number present including portions of two school years.

The above statistics afford a satisfactory explanation of the fact that several thousands of persons who naturally belong to the class deaf and dumb appear in the returns of the Twelfth Census as speaking persons. The power of speech has been acquired in these cases by instruction in school.

*Ability to read the lips.*—Out of a total of 89,287 persons reported at the Twelfth Census as deaf, 14,474 could read the lips, 13,986 could not, and in 60,827 cases the ability to read the lips was not stated.

The large number of "not stated" cases is remarkable; but the reason becomes intelligible from an examination of Table XXI, in which the ability to read the lips is considered in connection with the period of life when deafness occurred, the degree of deafness, and the ability to speak.

The question relating to lip-reading (or "speech-reading," as it is more correctly termed) was very poorly answered by the partially deaf, and the majority of the answers were in the negative. Too few replies were received to warrant analysis, and the whole of the partially deaf were therefore tabulated as not answering the question. This accounts for the large number of "not stated" cases among the deaf

from adult life, and among those who speak well, for the vast majority of those who speak well, or who became deaf in adult life, were partially deaf.

TABLE XXI.—The deaf, by ability to read lips, period of life when deafness occurred, degree of deafness, and ability to speak.

PERIOD OF LIFE WHEN DEAFNESS OCCURRED, DEGREE OF DEAFNESS, AND ABILITY TO SPEAK.	Total.	ABILITY TO READ LIPS.		
		Can read lips.	Can not read lips.	Not stated.
Total.....	89,287	14,474	13,986	60,827
When deafness occurred:				
Childhood (under 20).....	50,296	12,755	13,211	24,330
Adult life (20 and over).....	35,924	1,516	568	33,840
Unknown.....	3,067	203	207	2,657
Degree of deafness:				
Totally deaf.....	37,426	14,474	13,986	8,966
Partially deaf.....	51,861			51,861
Ability to speak:				
Well.....	55,501	5,140	817	49,544
Imperfectly.....	9,417	4,683	553	4,171
Not at all.....	24,369	4,641	12,616	7,112

Table XXI is illustrated by Diagram 20.

So far as the census returns show, the power of speech-reading is confined to the totally deaf. This does not arise from any natural incapacity on the part

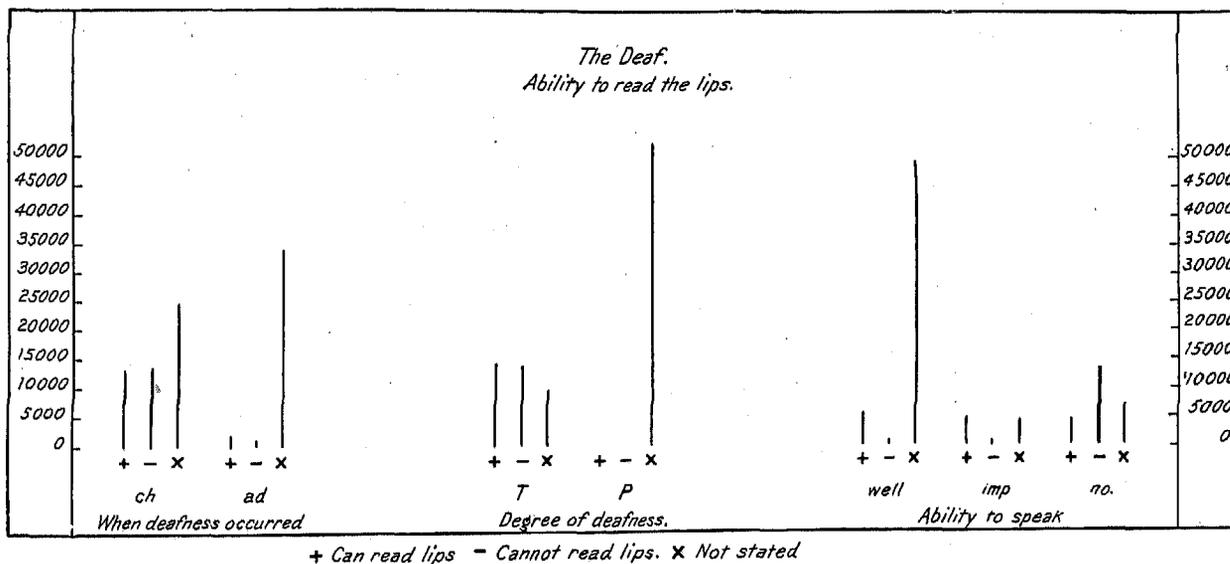
of the partially deaf to acquire the art, but from artificial conditions which interfere with its acquisition.

A person who is only slightly deaf usually turns his head away from the person with whom he converses, to one side or the other, to favor his best ear, often placing his hand to his ear to increase the volume of sound.

The turning away of the head, while it may not perhaps entirely prevent the possibility of speech-reading, is certainly not favorable to it, for the speech-reader must look at the speaker, so as to observe the movements of his mouth and the expression of his face.

Many slightly deaf persons, however, do keep their eyes fixed upon the speaker's face, and in such cases it is probable that what they hear is unconsciously supplemented by something they see. They may not call this speech-reading or know anything consciously about the art, but they recognize the fact that they do not seem to hear so well with their eyes closed. Perhaps it might be more correct to say that they have less difficulty in understanding speech when they are watching the face of the speaker than when their eyes are closed. This means that sight undoubtedly aids them in comprehending what is said.

DIAGRAM 20.



In cases of graver disability, where the degree of deafness is so great as to make it very difficult to carry on conversation by ear, the speaker's mouth is usually applied directly to the deaf person's ear, thus precluding entirely the possibility of speech-reading. It is probable that the partially deaf of the present census belong largely to this class.

Even when resort is had to artificial appliances to aid the hearing, the conditions are not favorable to speech-reading, for the mouth of the speaker is apt to be concealed, in whole or in part, by the mouth-piece of the hearing tube into which he speaks.

On the other hand, the totally deaf, though laboring under a greater natural disability than the partially deaf, are not hampered by these artificial hindrances to speech-reading. They do not turn their

heads away from the speaker in order to hear better with one ear, for they do not hear at all. For the same reason words are never spoken into their ears. Artificial appliances, too, to aid the hearing never impede their view of the speaker's mouth, for they do not use them. They are free to rivet their whole attention upon the visible manifestations of utterance. It is not surprising, therefore, that some of them should have succeeded in acquiring a useful ability to read the lips, even without special instruction, by simple observation and persistent effort. It is only surprising that the partially deaf should not have been equally successful. Better equipped by nature, they are less efficient in this respect. Two senses used together, one supplementing the deficiencies of the other, would seem to be a better equipment for speech-reading than

the one sense of sight alone; but the partially deaf as a class do not read the lips. The special difficulties in their way, however, are all artificial and not inherent in the nature of the case, and could therefore be removed.

Speech-reading is now taught in our special schools for the deaf, so that many of the deaf from childhood have had the opportunity of acquiring the art by instruction. Most of those, however, who lost hearing in adult life have not apparently yet learned of this important means of ameliorating their condition. They fly to hearing trumpets and speaking tubes for relief, but rarely think of "lip-reading" in this connection. Many of them have never even heard the word, or have associated lip-reading with the "deaf and dumb" rather than with themselves.

Failure to reply to the simple question whether the person could or could not read the lips can only be taken as an indication of ignorance as to what is meant by the term "lip-reading." This involves the further point that the persons who failed to reply were, as a matter of fact, unable to read the lips, for if they could do so they would have known the meaning of the question, and no apparent reason exists why they should not have answered it. It is hardly conceivable that several thousands of persons should have failed to answer "yes" or "no" to that particular question, while freely answering others, if they understood it.

We conclude, therefore, that they did not understand it and that they could not read the lips. The answers should have been in the negative.

From Table XXI it appears that the total number of persons reported as able to read the lips was 14,474, all of whom were totally deaf. These constitute 39 per cent of the totally deaf and 16 per cent of the whole of the deaf.

Of these 14,474 cases, 12,755, or 88 per cent, were deaf from childhood, and 1,516, or 10 per cent, were deaf from adult life; 5,140, or 36 per cent, could speak well; 4,693, or 32 per cent, could speak imperfectly; and 4,641, or 32 per cent, could not speak at all. Roughly speaking, about one-third could speak well, one-third imperfectly, and one-third not at all.

It is rather remarkable that 4,641 persons who could not speak at all should have been returned as able to read the lips. The explanation seems to lie in the fact that speech and speech-reading, though always taught together in schools for the deaf, are two separate and distinct arts, and pupils may succeed in one and fail in the other. Many good speakers are poor lip-readers and many good lip-readers are poor speakers. The persons referred to probably acquired their ability to read the lips by special instruction in school, in which case they were also taught speech; and, since they were returned as unable to speak, this means that they failed to profit by their speech instruction sufficiently to be included among those who speak imperfectly or well, while retaining a useful ability to understand the speech of others by watching the mouth.

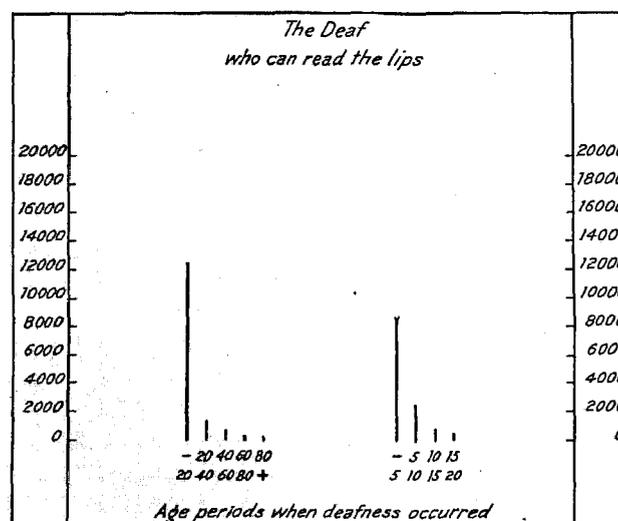
In Table XXII the deaf are analyzed by their ability to read the lips, and by age when deafness occurred.

TABLE XXII.—The deaf, by ability to read lips, and age when deafness occurred.

AGE WHEN DEAFNESS OCCURRED.	Total.	ABILITY TO READ LIPS.		
		Can read lips.	Can not read lips.	Not stated.
All ages.....	89,287	14,474	13,986	60,827
Age when deafness occurred:				
Unknown.....	3,067	203	207	2,657
Indefinitely stated.....	4,630	389	392	3,849
Definitely stated.....	81,590	13,882	13,387	54,321
Indefinitely stated:				
Childhood (under 20).....	2,347	339	369	1,639
Adult life (20 and over).....	2,283	50	23	2,210
Definitely stated:				
Birth.....	14,474	3,535	5,802	5,137
After birth, under 2.....	7,396	2,147	2,045	2,604
2 and under 5.....	10,536	2,877	3,261	4,398
Under 5.....	32,406	8,559	11,708	12,139
5 and under 10.....	7,018	2,333	814	3,871
10 and under 15.....	4,464	984	192	3,288
15 and under 20.....	4,061	540	128	3,393
Under 20.....	47,949	12,416	12,842	22,691
20 and under 40.....	16,588	1,081	282	15,225
40 and under 60.....	9,437	305	173	8,959
60 and under 80.....	6,595	73	78	6,444
80 and over.....	1,021	7	12	1,002

Table XXII is illustrated by Diagram 21.

Diagram 21.



From Table XXII it appears that very few of the deaf who can read the lips lost hearing in adult life (Diagram 21), and that most of them (62 per cent) became deaf in early childhood, before reaching the age of 5.

The deaf who can read the lips thus belong chiefly to the class totally deaf from early childhood (under 5), all of whom are naturally deaf and dumb.

The strange anomaly is here presented, that those who are by nature the least qualified to read the lips (the deaf and dumb who are totally deaf) are most successful in acquiring the art; whereas those who are best qualified by nature (the partially deaf who speak well) are least successful.

The explanation lies in the fact that most of the partially deaf who speak well, became deaf in adult

life and have not received any special instruction in lip-reading; whereas most of the deaf and dumb who are totally deaf, lost hearing in early childhood and were sent to special schools for the deaf, where they were taught speech-reading as a regular part of their curriculum. The difference is due to instruction.

*Usual means of communication.*—Table 1 shows the usual means of communication employed by the deaf. Four methods of communication are noted: Si (sign-language); fg (finger-spelling); sp (speech); and wr (writing).

Some of the deaf use one of these methods alone, others employ two or more, and still others, all of them. It therefore becomes advisable to classify the methods of communication employed, in order to study the combinations intelligently.

We may commence by dividing the deaf into two classes, those who employ the sign-language and those who do not.

Each of these classes may be divided into two broad groups (analogous to genera), viz, those who employ finger-spelling and those who do not.

Each of these broad groups may be divided into two subgroups (analogous to species), viz, those who employ speech and those who do not.

Each of these subgroups may be still further divided into two varieties, those who resort to writing and those who do not.

Diagram 22.

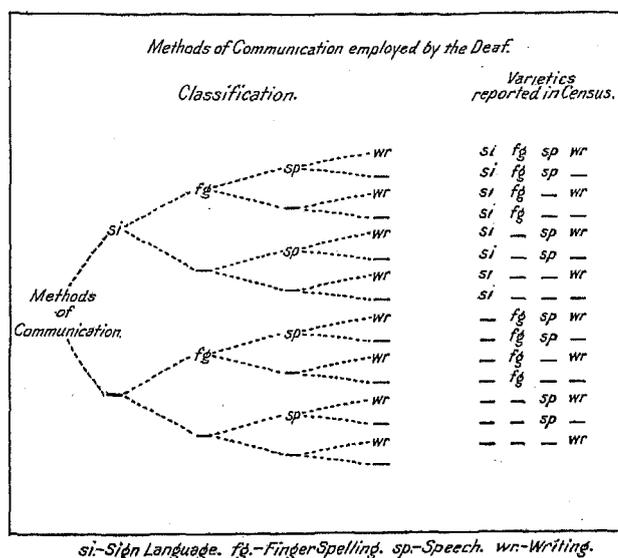


Diagram 22 exhibits the whole scheme of classification, after the manner of a genealogical chart, with the varieties reported in the census returns, arranged in accordance with the classification. Fifteen varieties are reported, and these include all the possible combinations of si, fg, sp, and wr.

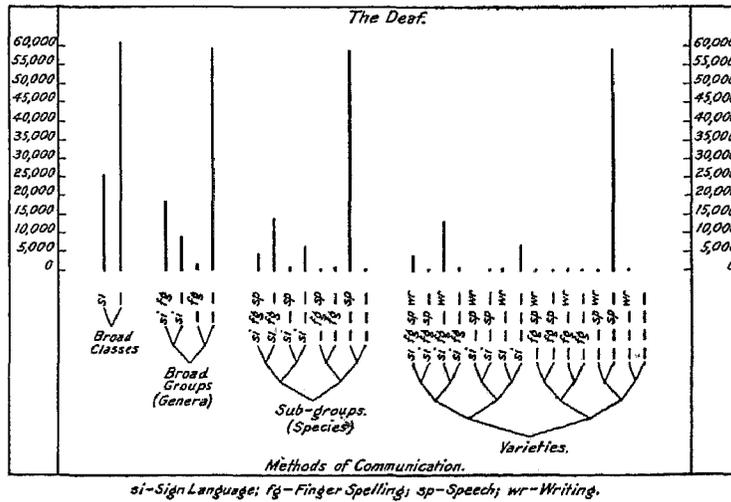
Table xxiii shows the method of communication employed, by the period of life when deafness occurred and the degree of deafness.

TABLE XXIII.—THE DEAF, BY DEGREE OF DEAFNESS, PERIOD OF LIFE WHEN DEAFNESS OCCURRED, AND METHOD OF COMMUNICATION.

METHOD OF COMMUNICATION.	Aggre- gato.	PERIOD OF LIFE WHEN DEAFNESS OCCURRED.									DEGREE OF DEAF- NESS.	
		Childhood (under 20).			Adult life (20 and over).			Unknown.			Totally deaf.	Partially deaf.
		Total.	Totally deaf.	Partially deaf.	Total.	Totally deaf.	Partially deaf.	Total.	Totally deaf.	Partially deaf.		
Total.....	80,287	50,296	33,148	17,148	35,924	3,483	32,441	3,067	795	2,272	37,426	51,861
Methods of communication:												
Not stated.....	2,652	2,416	2,184	232	63	34	20	173	147	26	2,365	287
Stated.....	80,035	47,880	30,964	16,916	35,861	3,449	32,412	2,894	648	2,246	35,061	51,574
Si.....	25,748	25,251	23,512	1,739	149	97	52	348	309	39	23,918	1,830
—.....	60,887	22,029	7,452	15,177	35,712	3,352	32,360	2,546	339	2,207	11,143	49,744
Si fg.....	18,087	17,880	16,891	989	24	21	3	183	170	13	17,082	1,005
Si —.....	7,061	7,371	6,621	750	125	76	49	165	139	26	6,836	825
— fg.....	1,483	1,437	1,347	90	24	18	6	22	10	3	1,384	99
— —.....	59,404	21,192	6,105	15,087	35,088	3,334	32,354	2,524	320	2,204	9,759	49,045
Si fg sp.....	4,254	4,216	3,455	761	10	7	3	28	20	8	3,482	772
Si fg —.....	13,838	13,664	13,436	228	14	14	—	155	150	5	13,600	233
Si — sp.....	1,070	1,000	634	466	48	21	27	22	16	6	571	499
Si — —.....	6,591	6,371	6,087	284	77	55	22	143	123	20	6,265	326
— fg sp.....	436	416	346	70	13	12	1	7	5	2	363	73
— fg —.....	1,047	1,021	1,001	20	11	6	5	15	14	1	1,021	26
— — sp.....	59,158	20,977	5,900	15,077	35,674	3,324	32,350	2,507	304	2,203	9,528	49,030
— — —.....	246	215	205	10	14	10	4	17	16	1	231	15
Si fg sp wr.....	4,049	4,010	3,317	699	7	4	3	26	19	7	3,340	709
Si fg sp —.....	205	200	138	62	3	3	—	2	1	1	142	63
Si fg — wr.....	12,826	12,674	12,470	204	12	12	—	140	135	5	12,617	209
Si fg — —.....	1,007	990	966	24	2	2	—	15	15	—	983	24
Si — sp wr.....	195	185	140	45	7	6	1	3	1	2	147	48
Si — sp —.....	875	815	394	421	41	15	20	19	15	4	424	451
Si — — wr.....	371	358	350	8	6	4	2	7	7	—	361	10
Si — — —.....	6,220	6,013	5,737	276	71	51	20	136	116	20	5,904	316
— fg sp wr.....	368	357	307	50	8	7	1	3	3	—	317	51
— fg sp —.....	68	59	39	20	5	5	—	4	2	2	46	22
— fg — wr.....	776	700	747	13	7	3	4	9	9	—	759	17
— fg — —.....	271	261	254	7	4	3	1	6	5	1	262	9
— — sp wr.....	557	500	415	85	44	27	17	13	8	5	450	107
— — sp —.....	58,601	20,477	5,485	14,992	35,630	3,297	32,333	2,494	296	2,198	9,078	49,523
— — — wr.....	246	215	205	10	14	10	4	17	16	1	231	15

The methods of communication shown in Table xxiii are illustrated by Diagram 23.

DIAGRAM 23.



Out of 89,287 deaf, the usual methods of communication are stated in 86,635 cases, and not stated in 2,652. The following percentages have been calculated upon the stated cases:

THE DEAF.

BROAD CLASSES.

Si.....2.7 per cent employ the sign-language.  
 —.....70.3 per cent do not.

BROAD GROUPS.

Si fg.....20.9 per cent employ both sign-language and finger-spelling.  
 Si —.....8.8 per cent employ sign-language but not finger-spelling.  
 — fg.....1.7 per cent employ finger-spelling but not sign-language.  
 — —.....68.6 per cent employ neither sign-language nor finger-spelling.

PRINCIPAL SUBGROUPS.

Si fg sp.....4.9 per cent employ sign-language, finger-spelling, and speech.  
 Si fg —.....16.0 per cent employ si and fg but not sp.  
 Si —.....7.6 per cent employ si but not fg or sp.  
 — — sp.....68.3 per cent employ sp but not si or fg.  
 — — —.....3.2 per cent employ other combinations of si, fg, and sp.

PRINCIPAL VARIETIES.

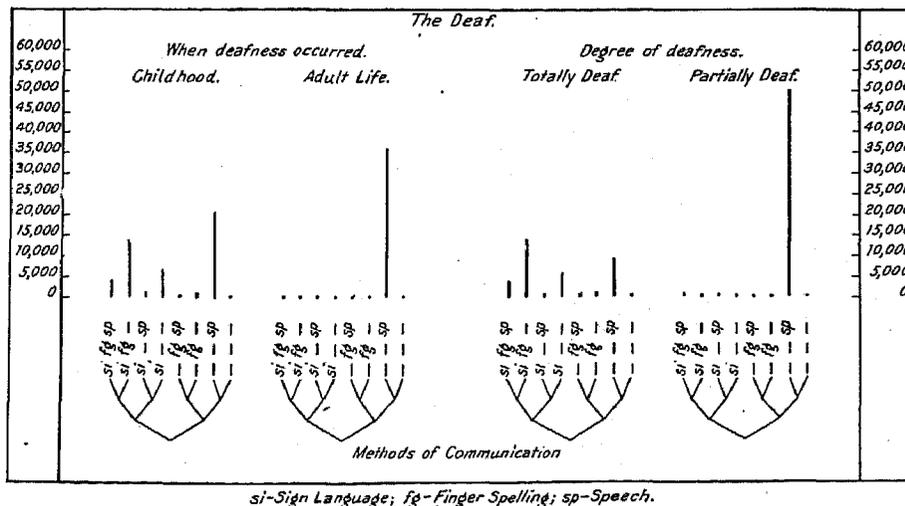
Si fg sp wr..4.7 per cent employ sign-language, finger-spelling, speech, and writing.  
 Si fg — wr..14.8 per cent employ si, fg and wr but not sp.  
 Si — — —.....7.2 per cent employ si but not fg, sp, or wr.  
 — — sp.....67.6 per cent employ sp but not si, fg, or wr.  
 — — —.....5.7 per cent employ other varieties.

The total number employing the sign-language is 25,748, the total using finger-spelling is 19,570, the total using speech is 64,918, and the total who resort to writing is 19,388. Writing, although the clearest and most definite means of communication known to the deaf, is as a rule used only as a last resort, because it is, of all means known, the slowest and most laborious. We can not assume that those persons can not write who do not specify writing among the means they employ. This omission simply means that they can make themselves sufficiently understood by the other methods specified, and do not usually resort to writing as a means of communication.

Diagram 24 contrasts the usual means of communication employed by the deaf from childhood and deaf from adult life; and by the totally deaf and partially deaf, using "subgroups" as sufficiently detailed for the purposes of comparison.

This diagram shows that the deaf from adult life and the partially deaf employ substantially only one of the methods of communication known, viz, — — sp (speech without sign-language or finger-spelling).

DIAGRAM 24.



Of the deaf from adult life, 99.5 per cent employ — — sp, and only 0.5 per cent employ other means.

Of the partially deaf, 96.2 per cent employ — — sp, and only 3.8 per cent employ other means.

The following percentages relate to the deaf from childhood (under 20) and are based upon 47,880 cases in which the usual means of communication are stated (Table XXIII).

THE DEAF FROM CHILDHOOD (UNDER 20).

BROAD CLASSES.

Si ..... 52.7 per cent employ the sign-language.  
 — ..... 47.3 per cent do not.

BROAD GROUPS.

Si fg ..... 37.3 per cent employ both sign-language and finger-spelling.  
 Si — ..... 15.4 per cent employ si but not fg.  
 — fg ..... 3.0 per cent employ fg but not si.  
 — — ..... 44.3 per cent employ neither si nor fg.

SUBGROUPS.

Si fg sp ..... 8.8 per cent employ sign-language, finger-spelling, and speech.  
 Si fg — ..... 28.5 per cent employ si and fg but not sp.  
 Si — sp ..... 2.1 per cent employ si and sp but not fg.  
 Si — — ..... 13.3 per cent employ si but not fg or sp.  
 — fg sp ..... 0.9 per cent employ fg and sp but not si.  
 — fg — ..... 2.1 per cent employ fg but not si or sp.  
 — — sp ..... 43.8 per cent employ sp but not si or fg.  
 — — — ..... 0.5 per cent employ neither fg, si, nor sp (only writing).

Diagrams 25 and 26 contrast the usual means of communication employed by the totally and partially deaf from childhood (under 20), distinguishing the age when deafness occurred by five-year groups.

From these diagrams it appears that comparatively few of the deaf from childhood who lost hearing after reaching the age of 5, whether totally or partially deaf, employ other means of communication than — — sp (speech without sign-language or finger-spelling).

DIAGRAM 25.

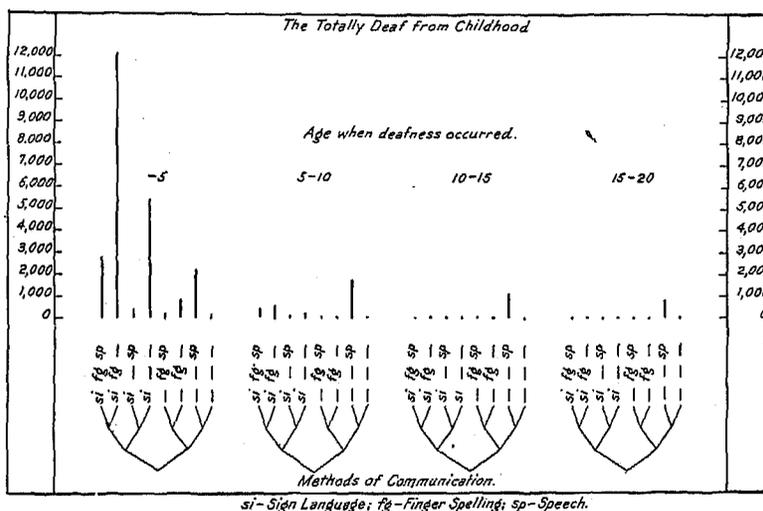
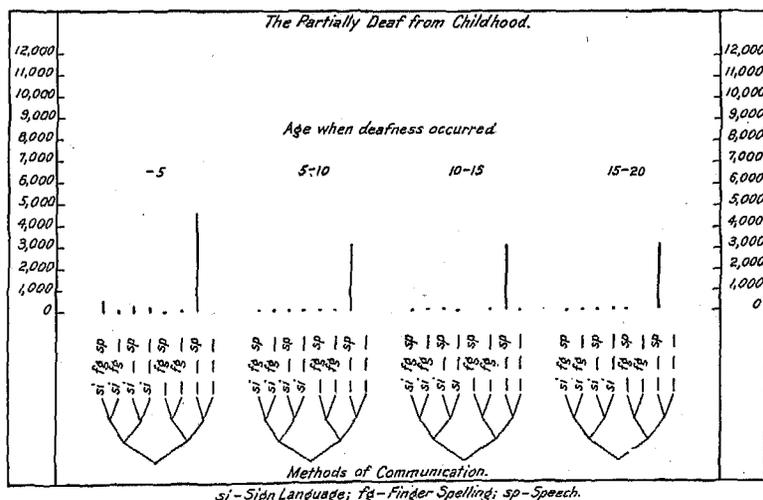


DIAGRAM 26.



Of those who became deaf before reaching the age of 5, the partially deaf, with few exceptions, also employ — — sp (Diagram 26), so that the use of the special means of communication (sign-language and finger-spelling) seems to be confined chiefly to the

totally deaf who lost hearing before reaching the age of 5 (Diagram 25). The number of persons employing sign-language or finger-spelling who do not belong to this group (the totally deaf from early childhood) is so small as to form only an insignificant fraction of the

whole, excepting in case of the totally deaf who lost hearing between 5 and 10 years (Diagram 25) and the partially deaf who became deaf before 5 (Diagram 26).

Table xxiv shows, for the deaf from childhood (under 20), the usual means of communication, by degree of deafness and age when deafness occurred.

TABLE XXIV.—THE DEAF FROM CHILDHOOD (UNDER 20), BY DEGREE OF DEAFNESS, AGE WHEN DEAFNESS OCCURRED, AND METHODS OF COMMUNICATION.

METHOD OF COMMUNICATION.	TOTALLY DEAF.						PARTIALLY DEAF.					
	Total.	Age when deafness occurred.					Total.	Age when deafness occurred.				
		Under 5.	5 and under 10.	10 and under 15.	15 and under 20.	Not stated (under 20).		Under 5.	5 and under 10.	10 and under 15.	15 and under 20.	Not stated (under 20).
Total.....	33,148	26,152	3,718	1,425	865	988	17,148	6,254	3,300	3,039	3,196	1,359
Methods of communication:												
Not stated.....	2,184	1,956	116	24	8	80	232	183	13	5	3	28
Stated.....	30,964	24,196	3,602	1,401	857	908	16,916	6,071	3,287	3,034	3,193	1,331
Si.....	23,512	20,789	1,738	217	52	716	1,739	1,434	111	21	15	158
fg.....	7,452	3,407	1,864	1,184	805	192	15,177	4,637	3,176	3,013	3,178	1,173
Si fg.....	16,891	14,978	1,250	108	25	530	989	815	70	8	3	93
Si fg.....	6,621	5,811	488	109	27	186	750	619	41	13	12	65
fg.....	1,347	1,132	133	33	14	35	90	66	12	1	2	9
sp.....	6,105	2,275	1,731	1,151	791	157	15,087	4,571	3,164	3,012	3,176	1,104
Si fg sp.....	3,455	2,805	465	49	9	127	761	622	58	7	1	73
Si fg sp.....	13,436	12,173	785	59	16	403	228	193	12	1	2	20
Si fg sp.....	534	361	104	36	9	24	466	387	22	10	4	43
Si fg sp.....	6,087	5,450	384	73	18	162	284	232	19	3	8	22
fg sp.....	346	231	68	24	10	13	70	49	11		2	8
fg sp.....	1,001	901	65	9	4	22	20	17	1	1		1
fg sp.....	5,900	2,106	1,711	1,143	787	153	15,077	4,562	3,164	3,011	3,176	1,104
fg sp.....	205	169	20	8	4	4	10	9		1		
Si fg sp wr.....	3,317	2,700	443	46	8	120	699	570	54	7	1	67
Si fg sp wr.....	138	105	22	3	1	7	62	52	4			6
Si fg sp wr.....	12,470	11,300	734	52	13	371	204	174	10	1	2	17
Si fg sp wr.....	966	873	51	7	3	32	24	19	2			3
Si fg sp wr.....	140	105	19	9	2	5	45	37				8
Si fg sp wr.....	394	256	85	27	7	19	421	350	22	10	4	35
Si fg sp wr.....	350	312	25	4		8	7	7				1
Si fg sp wr.....	5,737	5,138	359	69	18	153	276	225	19	3	8	21
fg sp wr.....	307	208	61	20	9	11	50	35	8		2	5
fg sp wr.....	39	25	7	4	1	2	20	14	3			3
fg sp wr.....	747	606	52	7	4	18	13	10	1	1		1
fg sp wr.....	254	235	13	2		4	7					
fg sp wr.....	415	301	51	35	17	11	85	64	10	4	1	6
fg sp wr.....	5,485	1,860	1,660	1,108	770	142	14,992	4,498	3,154	3,007	3,175	1,158
fg sp wr.....	205	169	20	8	4	4	10	9		1		

Diagram 27.

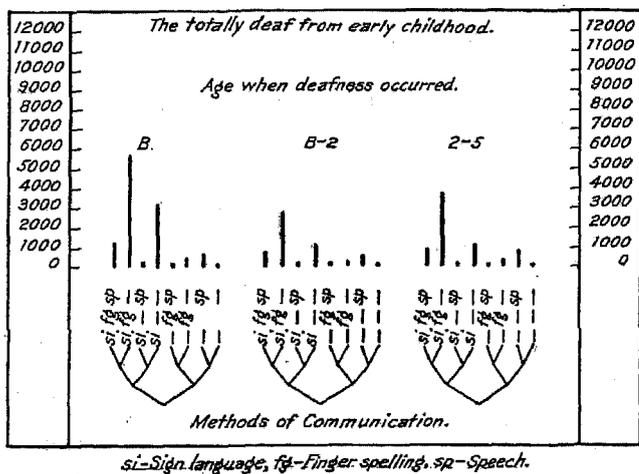
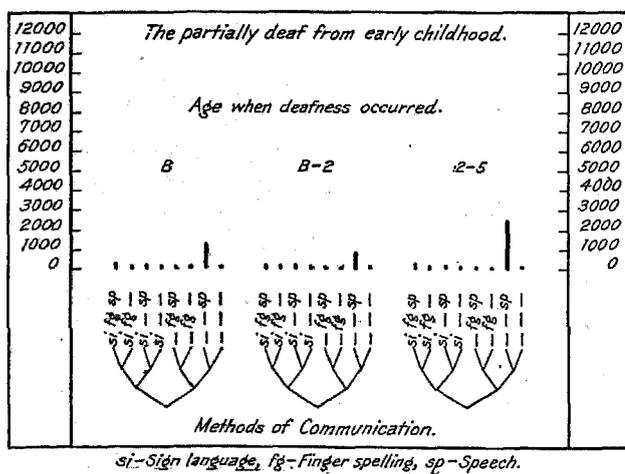


Diagram 28.



Diagrams 27 and 28 contrast the usual means of communication employed by the totally and partially deaf from early childhood (under 5), distinguishing the deaf from birth from those who became deaf in infancy

(under 2) and those who lost hearing between 2 and 5. The use of the special means (sign-language and finger-spelling) is substantially confined to the totally deaf from early childhood (Diagram 27).

The following percentages relate to the totally deaf from early childhood (under 5), and are based upon 24,196 cases in which the usual means of communication are stated according to the preceding table.

THE TOTALLY DEAF FROM EARLY CHILDHOOD (UNDER 5).

BROAD CLASSES.

SI ..... 85.9 per cent employ the sign-language.  
 — ..... 14.1 per cent do not.

BROAD GROUPS.

SI fg ..... 61.9 per cent employ both sign-language and finger-spelling.  
 SI — ..... 24.0 per cent employ si but not fg.  
 — fg ..... 4.7 per cent employ fg but not si.  
 — — ..... 9.4 per cent employ neither si nor fg.

SUBGROUPS.

SI fg sp ..... 11.6 per cent employ sign-language, finger-spelling, and speech.  
 SI fg — ..... 50.3 per cent employ si and fg but not sp.  
 SI — sp ..... 1.5 per cent employ si and sp but not fg.  
 SI — — ..... 22.5 per cent employ si but not fg or sp.  
 — fg sp ..... 1.0 per cent employ fg and sp but not si.  
 — fg — ..... 3.7 per cent employ fg but not si or sp.  
 — — sp ..... 8.7 per cent employ sp but not si or fg.  
 — — — ..... 0.7 per cent employ neither si, fg, nor sp (only writing).

Table xxv shows, for the deaf from early childhood (under 5), the usual means of communication, degree of deafness, and age when deafness occurred.

TABLE XXV.—THE DEAF FROM EARLY CHILDHOOD (UNDER 5), BY DEGREE OF DEAFNESS, AGE WHEN DEAFNESS OCCURRED, AND METHODS OF COMMUNICATION.

METHOD OF COMMUNICATION.	TOTALLY DEAF.				PARTIALLY DEAF.			
	Total.	Age when deafness occurred.			Total.	Age when deafness occurred.		
		Birth.	After birth, under 2.	2 and under 5.		Birth.	After birth, under 2.	2 and under 5.
Total.....	26,152	12,609	5,998	7,545	6,254	1,865	1,398	2,991
Methods of communication:								
Not stated.....	1,956	1,183	417	356	183	95	50	38
Stated.....	24,196	11,426	5,581	7,189	6,071	1,770	1,348	2,953
SI.....	20,789	9,993	4,839	5,957	4,434	566	430	438
—.....	3,407	1,433	742	1,232	4,637	1,204	918	2,515
SI fg.....	14,978	6,738	3,609	4,631	815	287	259	269
SI —.....	5,811	3,255	1,230	1,326	619	279	171	169
— fg.....	1,132	564	252	316	66	20	15	31
— —.....	2,275	869	400	916	4,571	1,184	903	2,484
SI fg sp.....	2,805	1,081	738	986	622	219	192	211
SI fg —.....	12,173	5,657	2,871	3,045	193	68	67	58
SI — sp.....	361	129	94	138	387	173	101	113
SI — —.....	5,450	3,126	1,130	1,188	232	106	70	56
— fg sp.....	231	87	71	73	49	14	12	23
— fg —.....	901	477	181	243	17	6	3	8
— — sp.....	2,106	784	450	872	4,562	1,182	809	2,481
— — —.....	189	85	40	44	9	2	4	3
SI fg sp wr.....	2,700	1,043	710	947	570	198	178	194
SI fg sp —.....	105	38	28	39	52	21	14	17
SI fg — wr.....	11,300	5,159	2,095	3,446	174	60	61	53
SI fg — —.....	873	498	176	199	19	8	6	5
SI — sp wr.....	105	40	29	36	37	11	16	10
SI — — sp.....	256	89	65	102	350	162	85	103
SI — — — wr.....	312	147	64	101	7	2	1	4
SI — — — —.....	5,138	2,979	1,072	1,087	225	104	69	52
— fg sp wr.....	206	78	62	66	35	12	7	16
— fg sp —.....	25	9	9	7	14	2	5	7
— fg — wr.....	666	337	141	183	10	3	3	4
— fg — —.....	235	140	40	55	7	3	—	4
— — sp wr.....	301	125	79	97	64	26	18	20
— — — sp.....	1,805	659	371	775	4,498	1,156	881	2,461
— — — — wr.....	169	85	40	44	9	2	4	3

The following percentages relate to the totally deaf from birth, and are based upon 11,426 cases in which the usual means of communication are stated (Table xxv):

THE TOTALLY DEAF FROM BIRTH.

BROAD CLASSES.

SI ..... 87.5 per cent employ the sign-language.  
 — ..... 12.5 per cent do not.

BROAD GROUPS.

SI fg ..... 59.0 per cent employ both sign-language and finger-spelling.  
 SI — ..... 28.5 per cent employ si but not fg.  
 — fg ..... 4.9 per cent employ fg but not si.  
 — — ..... 7.6 per cent employ neither si nor fg.

SUBGROUPS.

SI fg sp ..... 9.5 per cent employ sign-language, finger-spelling, and speech.  
 SI fg — ..... 49.5 per cent employ si and fg but not sp.  
 SI — sp ..... 1.1 per cent employ si and sp but not fg.  
 SI — — ..... 27.3 per cent employ si but not fg or sp.  
 — fg sp ..... 0.8 per cent employ fg and sp but not si.  
 — fg — ..... 4.2 per cent employ fg but not si or sp.  
 — — sp ..... 6.9 per cent employ sp but not si or fg.  
 — — — ..... 0.7 per cent employ neither si, fg, nor sp (only writing).

Table xxvi shows the total number of deaf persons using sign-language, finger-spelling, speech, or writing, in connection with the age when deafness occurred.

TABLE XXVI.—THE DEAF, BY AGE WHEN DEAFNESS OCCURRED, AND METHODS OF COMMUNICATION.

METHOD OF COMMUNICATION.	Total.	AGE WHEN DEAFNESS OCCURRED.			AGE WHEN DEAFNESS OCCURRED DEFINITELY STATED.											
		Definitely stated.	Indefinitely stated.	Un-known.	Birth.	After birth, under 2.	2 and under 5.	Under 5.	5 and under 10.	10 and under 15.	15 and under 20.	Under 20.	20 and under 40.	40 and under 60.	60 and under 80.	80 and over.
Total.....	89,287	81,590	4,630	3,067	14,474	7,396	10,536	32,406	7,018	4,464	4,061	47,949	16,588	9,437	6,595	1,021
Usual means of communication:																
Not stated.....	2,652	2,364	115	173	1,278	467	394	2,139	129	29	11	2,308	26	13	13	4
Stated.....	86,635	79,226	4,515	2,894	13,196	6,929	10,142	30,267	6,889	4,435	4,050	45,641	16,562	9,424	6,582	1,017
Stated:																
Sign-language used.....	25,748	24,515	885	348	10,559	5,269	6,395	22,223	1,849	238	67	24,377	90	30	17	1
Sign-language not used.....	60,887	54,711	3,630	2,546	2,637	1,690	3,747	8,044	5,040	4,197	3,983	21,264	16,472	9,394	6,565	1,016
Finger-spelling used.....	19,570	18,698	667	205	7,609	4,135	5,247	16,991	1,465	150	44	18,650	38	6	4	.....
Finger-spelling not used.....	67,065	60,528	3,848	2,689	5,587	2,794	4,895	13,276	5,424	4,285	4,006	26,991	16,524	9,418	6,578	1,017
Speech used.....	64,918	58,480	3,874	2,564	3,660	2,557	4,897	11,123	5,603	4,280	3,998	25,004	16,498	9,396	6,566	1,016
Speech not used.....	21,717	20,746	641	330	9,527	4,372	5,245	19,144	1,286	155	52	20,637	64	28	16	1
Writing used.....	19,388	18,513	657	218	7,328	4,108	5,229	16,665	1,488	195	63	18,411	74	21	6	1
Writing not used.....	67,247	60,713	3,858	2,676	5,868	2,821	4,913	13,602	5,401	4,240	3,987	27,230	16,488	9,403	6,576	1,016

Table xxvi is illustrated by Diagrams 29 and 30.

Diagram 29.

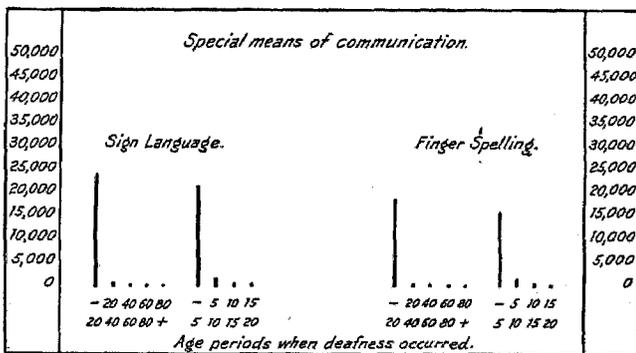
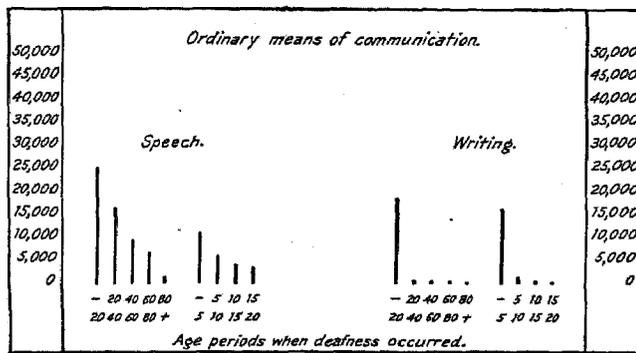


Diagram 30.



From Table xxvi and the diagrams it will be observed that the use of sign-language, finger-spelling, or writing is substantially confined to persons who lost hearing before they were 20 years of age; and that comparatively few who became deaf after 5 years of age employ them as means of communication.

The usual means of communication employed by the deaf throw light upon their social environment, for it is obvious that however much the deaf may mingle with people generally in pursuing their daily vocations in life, they are restricted in their social intercourse to persons who understand the means of

communication they employ. It is with such persons principally that they associate upon intimate terms, and it is from among them that they choose their partners in marriage.

In considering the four means of communication employed by the deaf it will be noted that speech and writing are understood by hearing people generally, and that sign-language and finger-spelling are not. Speech and writing, therefore, are principally employed by the deaf in communicating with hearing persons; sign-language and finger-spelling principally in talking with other deaf persons.

Although the majority of the deaf can speak, speech is not readily understood by them on account of their deafness. Only those who are partially deaf or who can read the lips can understand it. Writing, therefore, is the only means of communication understood generally both by the deaf and hearing, but its use is limited to educated persons. While writing is commonly employed in communicating with others at a distance, it is comparatively rarely used in talking with people close at hand. A deaf person may converse by writing with a hearing person, or a hearing person with a deaf; but the deaf do not communicate with the deaf in this way, nor the hearing with the hearing. Writing, therefore, as a direct means of communication, is limited to the communications of the deaf with the hearing and *vice versa*.

In communicating with hearing persons, speech without writing (sp —) is used by the deaf who speak well, writing without speech (— wr) by those who do not speak at all, and both speech and writing (sp wr) by those who speak imperfectly—not necessarily both at the same time, but speech in talking with persons who can understand their imperfect articulation, and writing with those who do not. Both speech and writing (sp wr) may also be reported by persons who speak well, in which case we may interpret the returns to mean that these deaf persons were poor lip-readers,

and could not understand the speech of the persons with whom they conversed, who were therefore obliged to reply by writing.

Where speech is reported as the sole means of communication (— sp —) we may interpret this to mean that the deaf persons can understand speech as well as use it, so that other means of communication are not resorted to. Such persons, therefore, are either partially deaf, or are persons who are able to read the lips; and their social intercourse is with hearing persons rather than deaf.

The sign-language is a special language peculiar to the deaf. It is not understood by people generally, and to the majority of the deaf themselves it is a foreign language. If, as is probable, the deaf who understand it are chiefly those who use it, then it is obvious that more than two-thirds of the deaf (70.3 per cent) do not understand it, for only 29.7 per cent employ it as a means of communication, and these consist largely of persons who are totally deaf from early childhood (under 5).

The sign-language, then, is employed chiefly by the deaf in conversing with other deaf persons who lost hearing completely in early childhood (under 5). It is intelligible to only a small section of hearing persons, who consist mainly of those, who, as children, were thrown closely into association with the deaf who employed it—chiefly the brothers, sisters, and children of persons totally deaf from early childhood (under 5). Few hearing adults acquire the language, and these consist mainly of professional instructors of the deaf.

Finger-spelling is employed incidentally by the educated deaf who use the sign-language in talking with one another, but chiefly as a means of expressing proper names, like the names of persons and places. Comparatively few of the deaf use it alone as a means of communication except in talking with hearing persons who understand it. The limitations to its use are the same as those noted for the sign-language, except that it is understood by a somewhat larger circle of hearing persons. Hearing adults easily learn to spell upon their fingers, whereas they find it as difficult to acquire the sign-language as any foreign tongue.

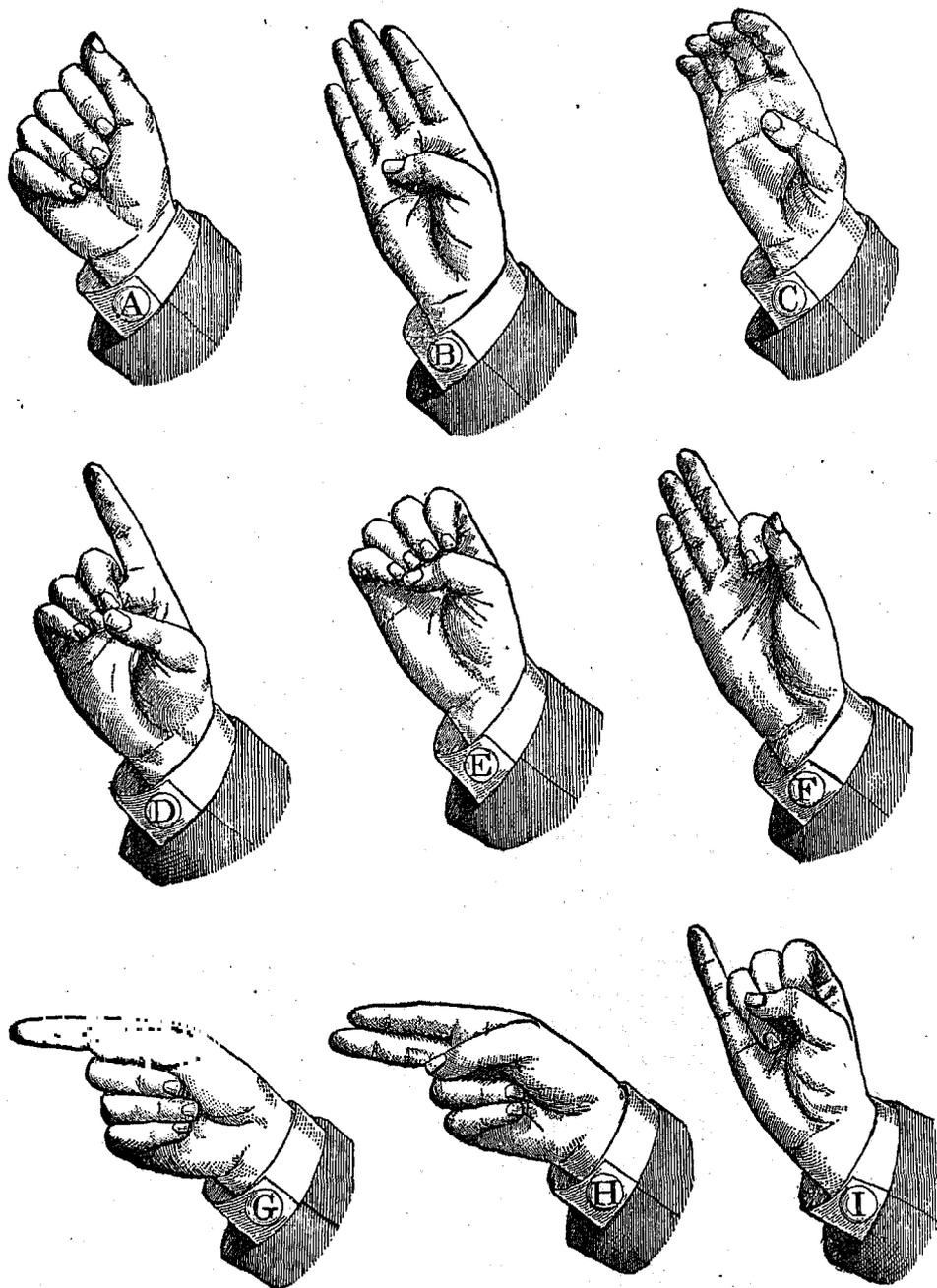
The American Manual Alphabet employed in finger-spelling by the deaf is shown in the illustrations on pages 96, 97, and 98, which have been copied from plates supplied by the Volta Bureau, which were prepared under the direction of the late Dr. Joseph C. Gordon.

In concluding this subject we may say that when the English language alone is employed in its spoken, written, or finger-spelled forms without any recourse to the sign-language (— fg sp or wr) the deaf persons associate principally, if not exclusively, with hearing persons.

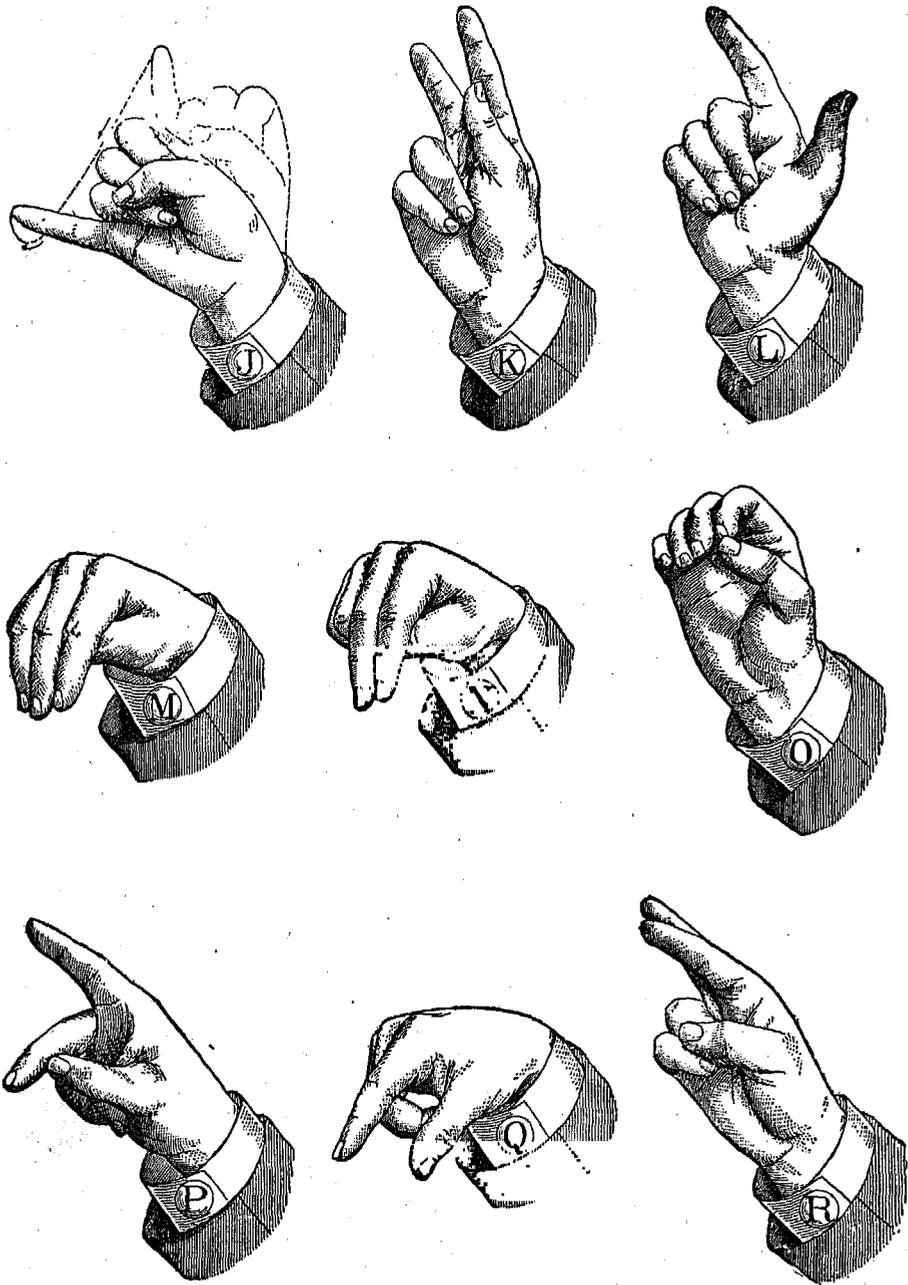
Where the sign-language (si — — —) alone is employed they associate principally, if not exclusively, with persons totally deaf from early childhood (under 5) and their hearing brothers, sisters, or children.

Where both the sign-language (si) and the English language (fg, sp, or wr) are employed, they associate with both of the classes referred to above.

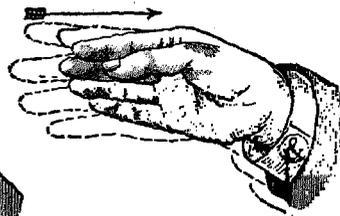
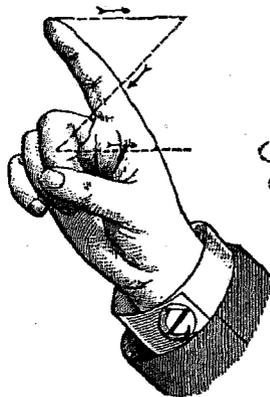
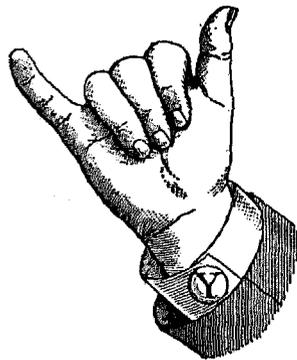
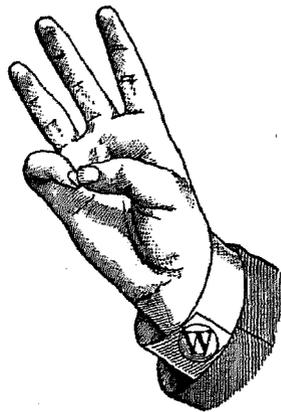
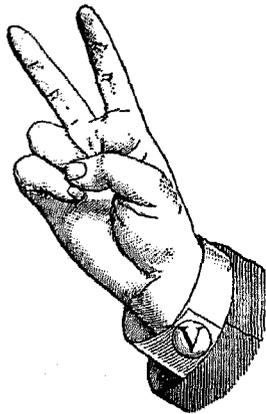
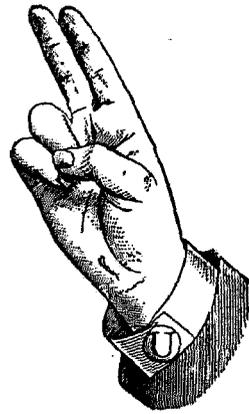
AMERICAN MANUAL ALPHABET USED IN FINGER-SPELLING.



AMERICAN MANUAL ALPHABET USED IN FINGER-SPELLING.



AMERICAN MANUAL ALPHABET USED IN FINGER-SPELLING.



*Sex.*—Out of a total of 89,287 persons returned as deaf, 46,915 were males and 42,372 were females (Table 2); the majority of the deaf are males. This fact has often been commented upon; for it is a matter of common observation that in schools for the deaf, male pupils are nearly always in the majority. The question, therefore, has often been discussed: "Why is it that there are more deaf males than females?" Various hypotheses have been adduced, such as that males are more exposed to the accidents and diseases of life than females, etc. It may be well, however, to be cautious about generalizations of this kind without sufficient evidence, for the question proposed bears a remarkable likeness to the old catch-question that has puzzled so many school boys: "Why do white sheep eat more than black sheep?" to which the answer was, "There are more of them." There are more males in the population at large than females (Table xxvii), so that there is really nothing

surprising about the fact that the majority of the deaf should be males. Of the total population, 51.1 per cent are males and 48.9 per cent, females.

In the case of the deaf 52.5 per cent are males and 47.5 per cent are females (Table xxviii). It thus appears that the proportion of males among the deaf is somewhat in excess of the proportion in the population at large, so that there may be some truth after all in the hypothesis that males are more exposed to accidents of life than females, or more susceptible to the diseases that produce deafness. It is to be noticed, however, that the predominance of males is not confined to those who lost hearing from accident or disease, but extends to the congenitally deaf. Of the deaf from birth, 53 per cent are males and only 47 per cent females (Table xxix).

Table xxvii shows the deaf by sex, race, and nativity in relation to the time when deafness occurred, degree of deafness, and ability to speak.

TABLE XXVII.—THE DEAF, BY SEX, RACE, NATIVITY, PERIOD OF LIFE WHEN DEAFNESS OCCURRED, DEGREE OF DEAFNESS, AND ABILITY TO SPEAK, COMPARED WITH TOTAL POPULATION.

SEX, RACE, AND NATIVITY.	Total population.	THE DEAF.								
		Total.	Period of life when deafness occurred.			Degree of deafness.		Ability to speak.		
			Child-hood (under 20).	Adult life (20 and over).	Un-known.	Totally deaf.	Partially deaf.	Well.	Imper-fectly.	Not at all.
Total.....	75,994,675	89,287	50,296	35,924	3,067	37,426	51,861	55,501	9,417	24,369
Sex:										
Male.....	38,816,448	46,915	26,543	18,797	1,575	20,218	26,697	28,306	5,114	13,495
Female.....	37,178,127	42,372	23,753	17,127	1,492	17,208	25,164	27,195	4,303	10,874
Race:										
White.....	66,899,196	84,361	46,807	34,655	2,899	34,500	49,771	53,440	8,902	22,010
Male.....	34,201,735	44,223	24,674	18,069	1,480	18,694	26,529	27,149	4,850	12,224
Female.....	32,697,461	40,138	22,133	16,586	1,419	15,806	23,242	26,300	4,052	9,786
Colored <sup>1</sup> .....	9,185,879	4,926	3,489	1,269	168	2,836	2,090	2,052	515	2,369
Male.....	4,614,713	2,692	1,869	728	95	1,524	1,168	1,157	284	1,271
Female.....	4,570,066	2,234	1,620	541	73	1,312	922	895	251	1,088
White:										
Native.....	56,595,379	69,865	41,155	26,612	2,098	30,054	39,811	42,721	7,057	19,487
Male.....	28,089,450	36,338	21,665	13,604	1,069	16,199	20,139	21,366	4,138	10,834
Female.....	27,908,929	33,527	19,490	13,008	1,029	3,855	19,672	21,355	3,519	8,653
Foreign born.....	10,213,817	13,786	5,108	7,963	715	4,014	9,772	10,533	1,111	2,142
Male.....	5,515,285	7,506	2,704	4,427	375	2,215	5,291	5,686	637	1,183
Female.....	4,698,532	6,280	2,404	3,536	340	1,799	4,481	4,847	474	959
Unknown nativity.....		710	544	80	86	522	188	195	134	381
Male.....		379	305	38	36	280	99	97	75	207
Female.....		331	239	42	50	242	89	98	59	174
Colored:										
Negro.....	8,833,994	4,640				2,701	1,948			
Male.....	4,386,547	2,526				1,449	1,077			
Female.....	4,447,447	2,123				1,252	871			
Indian.....	237,196	273				132	141			
Male.....	119,484	163				73	90			
Female.....	117,712	110				59	51			
Mongolian.....	114,189	4				3	1			
Male.....	108,682	3				2	1			
Female.....	5,507	1				1				

<sup>1</sup>Including Indians and Mongolians.

Table xxviii shows the number and percentage of the deaf of each sex, by period of life when deafness occurred, degree of deafness, ability to speak, race, nativity of whites, marital condition, and those hav-

ing deaf relatives. Table xxix shows the number and percentage of the deaf of each sex, by age when deafness occurred, present age, and school attendance.

TABLE XXVIII.—Number and per cent of deaf, by degree of deafness, sex, race, marital condition, and deaf relatives.

SEX, RACE, MARITAL CONDITION, ETC.	NUMBER.			PER CENT.	
	Total.	Male.	Female.	Male.	Female.
Total.....	89,287	46,915	42,372	52.5	47.5
Period of life when deafness occurred:					
Childhood (under 20).....	50,296	26,543	23,753	52.8	47.2
Adult life (20 and over).....	35,924	18,797	17,127	52.3	47.7
Unknown.....	3,067	1,575	1,492	51.4	48.6
Degree of deafness:					
Totally deaf.....	37,426	20,218	17,208	54.0	46.0
Partially deaf.....	51,861	26,697	25,164	51.5	48.5
Ability to speak:					
Well.....	55,501	28,306	27,195	51.0	49.0
Imperfectly.....	9,417	5,114	4,303	54.3	45.7
Not at all.....	24,369	13,495	10,874	55.4	44.6
Race:					
White.....	84,361	44,223	40,138	52.4	47.6
Colored.....	4,926	2,692	2,234	54.6	45.4
Negro.....	4,649	2,526	2,123	54.3	45.7
Indian.....	273	163	110	59.7	40.3
Mongolian.....	4	3	1		
Nativity of whites:					
Native.....	69,865	36,338	33,527	52.0	48.0
Foreign born.....	13,786	7,506	6,280	54.4	45.6
Unknown.....	710	379	331	53.4	46.6
Marital condition:					
Single.....	39,070	21,338	17,732	54.6	45.4
Married.....	34,206	19,746	14,460	57.7	42.3
Widowed.....	15,331	5,480	9,851	35.7	64.3
Divorced.....	353	172	181	48.7	51.3
Unknown.....	327	179	148	52.9	47.1
Deaf relatives: <sup>1</sup>					
a or b relatives.....	25,851	12,834	13,017	49.6	50.4
No a or b relatives.....	54,630	29,830	24,800	54.6	45.4
Not stated.....	8,806	4,251	4,555	48.3	51.7

<sup>1</sup>Symbols for deaf relatives—*a*, deaf brothers, sisters, or ancestors; *b*, deaf uncles, aunts, cousins, or other relatives not *a*, *c*, or *d*; *c*, deaf children; *d*, deaf husbands or wives.

TABLE XXIX.—Number and per cent of deaf, by sex, age when deafness occurred, present age, and school attendance.

AGE WHEN DEAFNESS OCCURRED, PRESENT AGE, AND SCHOOL ATTENDANCE.	NUMBER.			PER CENT.	
	Total.	Male.	Female.	Male.	Female.
Total.....	89,287	46,915	42,372	52.5	47.5
Age when deafness occurred:					
Unknown.....	3,067	1,575	1,492	51.4	48.6
Indefinitely stated.....	4,630	2,316	2,314	50.0	50.0
Definitely stated.....	81,590	43,024	38,566	52.7	47.3
Birth.....	14,474	7,670	6,804	53.0	47.0
After birth, under 2.....	7,396	4,154	3,242	56.2	43.8
2 and under 5.....	10,536	5,708	4,828	54.2	45.8
Under 5.....	32,406	17,532	14,874	54.1	45.9
5 and under 10.....	7,018	3,594	3,424	51.2	48.8
10 and under 15.....	4,464	2,139	2,325	47.9	52.1
15 and under 20.....	4,061	2,088	1,973	51.4	48.6
Under 20.....	47,949	25,353	22,596	52.9	47.1
20 and under 40.....	16,588	8,247	8,341	49.7	50.3
40 and under 60.....	9,437	5,072	4,365	53.7	46.3
60 and under 80.....	6,595	3,853	2,742	58.4	41.6
80 and over.....	1,021	499	522	48.9	51.1
Present age:					
Under 5.....	1,021	564	457	55.2	44.8
5 and under 10.....	4,551	2,521	2,030	55.4	44.6
10 and under 15.....	6,712	3,675	3,037	54.8	45.2
15 and under 20.....	6,074	3,238	2,836	53.3	46.7
Under 20.....	18,358	9,998	8,360	54.5	45.5
20 and over.....	70,602	36,741	33,861	52.0	48.0
Unknown.....	327	176	151	53.8	46.2
School attendance:					
Attended school.....	65,717	35,476	30,241	54.0	46.0
Did not attend school.....	13,557	8,987	6,570	51.5	48.5
Not stated.....	10,013	4,452	5,561	44.5	55.5
Attended school:					
Kind of school—					
Special.....	25,197	13,851	11,346	55.0	45.0
Other.....	19,664	10,441	9,223	53.1	46.9
Both.....	237	132	105	55.7	44.3
Not stated.....	20,619	11,052	9,567	53.6	46.4

Table xxx shows the number and percentage of the deaf of each sex, by causes of deafness.

TABLE XXX.—Number and per cent of deaf, by sex and causes of deafness.

CAUSE OF DEAFNESS.	NUMBER.			PER CENT.	
	Total.	Male.	Female.	Male.	Female.
Total.....	89,287	46,915	42,372	52.5	47.5
Causes of deafness:					
Affections of external ear.....	871	546	325	62.7	37.3
Affections of middle ear.....	34,801	16,241	18,560	46.7	53.3
Affections of internal ear.....	12,295	7,192	5,103	58.5	41.5
Unclassified.....	31,205	17,720	13,485	56.8	43.2
Unknown.....	10,115	5,216	4,899	51.6	48.4
Measles.....	7,424	3,497	3,927	47.1	52.9
Influenza.....	4,210	2,063	2,147	49.0	51.0
Catarrh.....	2,409	1,098	1,371	44.5	55.5
Colds.....	1,776	702	1,074	42.9	57.1
Malarial fever and quinine.....	11,702	5,565	6,137	47.6	52.4
Congenital.....	3,074	1,387	1,687	45.1	54.9
Old age.....	1,630	846	784	51.7	48.3
Military service.....	3,991	2,855	1,136	59.0	41.0
Falls and blows.....	2,913	1,189	1,724	50.1	49.9
Sickness.....	2,065	1,054	1,011	51.3	48.7
Fever.....	14,472	7,663	6,809	53.0	47.0
Hereditary.....	3,361	1,727	1,634	51.4	48.6
909.....	3,242	3,231	11	99.7	0.3
764.....	2,243	1,417	826	63.2	36.8
1,020.....	2,143	1,020	1,123	47.6	52.4
480.....	1,436	764	672	53.2	46.8
429.....	909	429	480	47.2	52.8

It appears from Table xxviii that there is no substantial difference in the proportion of the sexes among the deaf from childhood and the deaf from adult life; but the proportion of males seems to be greater among the totally deaf than the partially deaf, among the colored than the white, and among Indians than negroes. It is also greater among the foreign born white than the native, and greater among those who have no deaf relatives (*a* or *b*) than among those who have.

In relation to acquired conditions it may also be noted that the proportion of males is greater among those who do not speak at all than among those who speak imperfectly, and greater among those who speak imperfectly than among those who speak well. The proportion male is also greater among the married than among the single, widowed, or divorced, and least of all among the widowed.

From Table xxix it appears that there is an exceptionally large proportion of males (56.2 per cent) among those who lost hearing in infancy (after birth, under 2), and also among those who became deaf in adult life between the ages of 60 and 80 (58.4 per cent).

In regard to present age, the proportion of males is larger among those under 20 years of age than over. The proportion is also larger among those who have attended school than those who have not, and larger among those who attended special than other schools.

From Table xxx it appears that the proportion of males is exceptionally large among those who became deaf from affections of the external ear (62.7 per cent) and of the internal ear (58.5 per cent), but exceptionally small among those deaf from affections of the middle ear (46.7 per cent).

In relation to the principal assigned causes of deafness, the males are greatly in the preponderance among those deaf from meningitis (59 per cent) and brain fever (59.1 per cent).

Among the unclassified cases, those deaf from "military service" and "falls and blows" naturally stand out prominently as having an exceptionally large proportion of males—99.7 per cent in the former case and 63.2 per cent in the latter.

On examining the tables, it appears that males are so generally in the preponderance that in cases where females are in the majority we are at once struck by the fact as something exceptional and apparently abnormal.

From Table xxviii it appears that among the widowed and divorced, females predominate (widowed, 64.3 per cent; divorced, 51.3 per cent); but females also predominate to a still greater extent among the widowed and divorced of the whole population of the United States (widowed, 69.7 per cent; divorced, 57.5 per cent). The majority of the deaf having (*a* or *b*) deaf relatives are females (50.4 per cent) and the proportion female among those having no (*a* or *b*) deaf relatives is exceptionally small (45.4 per cent).

From Table xxix it appears that the majority are females among those who lost hearing between 10 and 15, 20 and 40, and in old age after 80—males predominating at other age periods when deafness occurred.

From Table xxx it appears that females predominate where deafness was caused by affections of the middle ear, for example, scarlet fever, disease of ear, measles, influenza, catarrh and colds; whereas in all the other cases noted males predominate, with the exception of those deaf from the indefinite cause "sickness" (52.4 per cent female) and cases noted as "hereditary" (52.8 per cent female).

In examining the ability of the deaf to speak (Table xxviii) it is perhaps noteworthy that, while females are in the minority, the proportion of females is greatest among those who speak well, least among those who speak not at all, and intermediate among those who speak imperfectly. It is a little difficult to interpret this result, for the ability to speak is an acquired and not a natural condition, and can not therefore be directly correlated with sex. The opinion has often been expressed by teachers of the deaf that females acquire speech by instruction more readily than males; but the present figures relate to the whole of the deaf—the deaf from adult life as well as the deaf from childhood—and not simply to those who have acquired speech artificially in special schools; so that if there is any truth in this explanation, we should conclude that females, generally, acquire speech more readily than males, whether naturally or by artificial means.

In comparing Tables xxix and xxx, it will be noted (1) that females predominate among those who became

deaf at three different stages of life, namely, 10 and under 15, 20 and under 40, and after 80; and (2) that females predominate among those who are deaf from affections of the middle ear. It is therefore probable that females are more susceptible to deafness from scarlet fever, disease of ear, measles, influenza, catarrh, or colds, at these three distinct periods of life, namely, adolescence, practically all of the child-bearing period, and old age.

While males predominate among those deaf from meningitis and brain fever, and females among those deaf from affections of the middle ear, we should be cautious about basing definite conclusions upon these facts alone.

This will be obvious from the following considerations: The Indiana congestion (due largely to meningitis and brain fever) and the New England congestion (due largely to affections of the middle ear) show that geographic conditions are involved. Now males predominate in Indiana and females in the New England states among the general population, and this fact of itself would lead us to expect a preponderance of males among the deaf of Indiana and a preponderance of females among the deaf of the New England states, quite independently of any different susceptibility among the sexes to the diseases specified above.

In the present census (1900) Indiana is reported as having a population of 1,285,404 males and 1,231,058 females, so that in that state 51.1 per cent are males and 48.9 per cent are females.

In the case of the New England states, New Hampshire and Massachusetts are the only states having a larger female population than male, but if we include Maine, Vermont, Connecticut, and Rhode Island, we find a total male population of 2,763,796 and a total female population of 2,828,221. In the New England states, therefore, 49.4 per cent of the whole population are male and 50.6 per cent are female.

Both in Indiana and the New England states the sexes seem to be too nearly balanced to upset the hypothesis of greater susceptibility of males to deafness caused by meningitis and brain fever, and greater susceptibility of females to deafness caused by affections of the middle ear. It is probable, therefore, that the hypothesis is correct.

*Race.*—Out of 89,287 persons returned as deaf 84,361 belong to the white race and 4,926 to the colored races (including 273 Indians and 4 Mongolians). (Table 2 and Table xxviii.)

Table xxxi shows the number and per cent of the white and colored deaf, by age when deafness occurred, degree of deafness, ability to speak, sex, present age, and school attendance.

Table xxxii shows the number and percentage of the white and colored deaf, by cause of deafness.

TABLE XXXI.—Number and per cent of deaf, by race, period of life when deafness occurred, degree of deafness, ability to speak, sex, present age, and school attendance.

PERIOD OF LIFE WHEN DEAFNESS OCCURRED, DEGREE OF DEAFNESS, ABILITY TO SPEAK, SEX, PRESENT AGE, AND SCHOOL ATTENDANCE.	NUMBER.			PER CENT.	
	Total.	White.	Colored.	White.	Colored.
Total.....	89,287	84,361	4,926	94.5	5.5
Period of life when deafness occurred:					
Childhood (under 20).....	50,296	46,807	3,489	93.1	6.9
Adult life (20 and over).....	35,924	34,655	1,269	96.5	3.5
Unknown.....	3,067	2,899	168	94.5	5.5
Degree of deafness:					
Totally deaf.....	57,426	54,590	2,836	92.4	7.6
Partially deaf.....	51,861	49,771	2,090	96.0	4.0
Ability to speak:					
Well.....	55,501	53,449	2,052	96.3	3.7
Imperfectly.....	9,417	8,902	515	94.5	5.5
Not at all.....	24,369	22,010	2,359	90.3	9.7
Sex:					
Male.....	46,915	44,223	2,692	94.3	5.7
Female.....	42,372	40,138	2,234	94.7	5.3
Age when deafness occurred:					
Unknown.....	3,067	2,899	168	94.5	5.5
Indefinitely stated.....	4,630	4,359	271	94.1	5.9
Definitely stated.....	81,590	77,103	4,487	94.5	5.5
Birth.....	14,474	12,791	1,683	88.4	11.6
After birth, under 2	7,396	7,168	228	96.9	3.1
2 and under 5.....	10,536	10,083	453	96.7	4.3
Under 5.....	32,406	30,042	2,364	92.7	7.3
5 and under 10.....	7,013	6,567	451	93.6	6.4
10 and under 15.....	4,464	4,152	312	93.0	7.0
15 and under 20.....	4,061	3,852	209	94.9	5.1
Under 20.....	47,949	44,613	3,336	93.0	7.0
20 and under 40.....	10,588	10,066	522	96.9	3.1
40 and under 60.....	9,437	9,107	330	96.5	3.5
60 and under 80.....	6,585	6,375	210	96.7	3.3
80 and over.....	1,021	942	79	92.3	7.7
Present age:					
Under 5.....	1,021	951	70	93.1	6.9
5 and under 10.....	4,551	4,182	369	91.9	8.1
10 and under 15.....	6,712	6,054	658	90.2	9.8
15 and under 20.....	6,074	5,515	559	90.8	9.2
Under 20.....	18,358	16,702	1,656	91.0	9.0
20 and over.....	70,602	67,397	3,205	95.5	4.5
Unknown.....	327	262	65	80.1	19.9
School attendance:					
Attended school.....	65,717	63,680	2,037	96.9	3.1
Did not attend school.....	13,557	11,027	2,530	81.3	18.7
Not stated.....	10,013	9,654	359	96.4	3.6
Kind of school attended—					
Special.....	25,197	24,308	889	96.5	3.5
Other.....	19,664	18,974	690	96.5	3.5
Both.....	237	236	1	99.6	0.4
Not stated.....	20,619	20,162	457	97.8	2.2

TABLE XXXII.—Number and per cent of deaf, by race and cause of deafness.

CAUSE OF DEAFNESS.	NUMBER.			PER CENT.	
	Total.	White.	Colored.	White.	Colored.
Total.....	89,287	84,361	4,926	94.5	5.5
Causes of deafness:					
Affections of external ear.....	871	807	64	92.7	7.3
Affections of middle ear.....	34,801	33,968	833	97.6	2.4
Affections of internal ear.....	12,295	11,666	629	94.9	5.1
Unclassified.....	31,205	28,467	2,738	91.2	8.8
Unknown.....	10,115	9,453	662	93.5	6.5
Factors:					
Measles.....	7,424	7,329	95	98.7	1.3
Influenza.....	4,210	3,993	217	94.8	5.2
Catarrh.....	2,469	2,367	102	97.1	2.9
Colds.....	1,776	1,740	36	98.0	2.0
Malarial fever and quinine.....	11,702	11,568	134	98.9	1.1
Meningitis.....	3,074	2,967	107	96.5	3.5
Brain fever.....	1,636	1,439	197	88.0	12.0
Typhoid fever.....	3,991	3,824	167	95.8	4.2
Congenital.....	2,013	1,965	48	97.6	2.4
Old age.....	2,055	1,961	94	95.4	4.6
Military service.....	14,472	12,789	1,683	88.4	11.6
Falls and blows.....	3,361	3,181	180	94.6	5.4
Sickness.....	3,242	3,130	112	96.5	3.5
Fever.....	2,243	2,046	197	91.2	8.8
Hereditary.....	2,143	1,907	236	89.0	11.0
Fever.....	1,436	1,318	118	91.8	8.2
Hereditary.....	909	894	15	98.3	1.7

Table XXXIII shows, by states and territories, the number and percentage of the white and the colored deaf.

TABLE XXXIII.—Number and per cent of deaf, by race, for states and territories.

STATE OR TERRITORY.	NUMBER.			PER CENT.	
	Total.	White.	Colored.	White.	Colored.
Continental United States.....	89,287	84,361	4,926	94.5	5.5
North Atlantic division.....	28,632	28,459	173	99.4	0.6
New England.....	8,854	8,815	39	99.0	0.4
Maine.....	1,257	1,256	1	99.9	0.1
New Hampshire.....	762	762	0	100.0	0.0
Vermont.....	723	723	0	100.0	0.0
Massachusetts.....	4,015	3,994	21	99.5	0.5
Rhode Island.....	583	573	10	98.3	1.7
Connecticut.....	1,514	1,507	7	99.5	0.5
Southern North Atlantic.....	19,778	19,644	134	99.3	0.7
New York.....	9,946	9,898	48	99.5	0.5
New Jersey.....	2,285	2,256	29	98.7	1.3
Pennsylvania.....	7,547	7,490	57	99.2	0.8
South Atlantic division.....	10,193	8,060	2,133	79.1	20.9
Northern South Atlantic.....	5,400	4,696	704	87.0	13.0
Virginia.....	255	237	18	92.9	7.1
North Carolina.....	1,579	1,364	215	86.4	13.6
South Carolina.....	507	436	71	86.0	14.0
Georgia.....	1,913	1,531	382	80.0	20.0
West Virginia.....	1,146	1,128	18	98.4	1.6
Southern South Atlantic.....	4,793	3,364	1,429	70.2	29.8
North Carolina.....	1,642	1,304	338	79.4	20.6
South Carolina.....	952	620	332	54.6	45.4
Georgia.....	1,817	1,268	549	69.8	30.2
Florida.....	382	272	110	71.2	28.8
North Central division.....	34,076	33,661	415	98.8	1.2
Eastern North Central.....	21,618	21,469	149	99.3	0.7
Ohio.....	6,080	6,021	59	99.0	1.0
Indiana.....	3,607	3,584	23	99.4	0.6
Illinois.....	6,053	6,014	39	99.4	0.6
Michigan.....	3,402	3,386	16	99.5	0.5
Wisconsin.....	2,476	2,464	12	99.5	0.5
Western North Central.....	12,458	12,192	266	97.9	2.1
Minnesota.....	1,738	1,733	5	99.7	0.3
Iowa.....	2,952	2,944	8	99.7	0.3
Missouri.....	3,766	3,651	115	96.9	3.1
North Dakota.....	256	240	16	93.8	6.2
South Dakota.....	430	368	62	85.6	14.4
Nebraska.....	1,220	1,208	12	99.0	1.0
Kansas.....	2,096	2,048	48	97.7	2.3
South Central division.....	12,322	10,227	2,095	83.0	17.0
Eastern South Central.....	6,968	5,716	1,252	82.0	18.0
Kentucky.....	2,619	2,387	232	91.1	8.9
Tennessee.....	2,026	1,760	266	86.9	13.1
Alabama.....	1,333	957	376	71.8	28.2
Mississippi.....	990	612	378	61.8	38.2
Western South Central.....	5,354	4,511	843	84.3	15.7
Louisiana.....	1,211	878	333	72.5	27.5
Arkansas.....	1,317	1,102	215	83.7	16.3
Indian Territory.....	228	184	44	80.7	19.3
Oklahoma.....	282	260	22	92.2	7.8
Texas.....	2,316	2,087	229	90.1	9.9
Western division.....	4,064	3,954	110	97.3	2.7
Rocky Mountain.....	1,076	1,023	53	95.1	4.9
Montana.....	126	115	11	91.3	8.7
Idaho.....	146	129	17	88.4	11.6
Wyoming.....	29	26	3	(1)	(1)
Colorado.....	472	471	1	99.8	0.2
New Mexico.....	303	282	21	93.1	6.9
Basin and Plateau.....	455	430	25	94.5	5.5
Arizona.....	51	41	10	(1)	(1)
Utah.....	343	340	3	99.1	0.9
Nevada.....	61	49	12	(1)	(1)
Pacific.....	2,533	2,501	32	98.7	1.3
Washington.....	374	368	6	98.4	1.6
Oregon.....	410	402	8	98.0	2.0
California.....	1,749	1,731	18	99.0	1.0

<sup>1</sup> Per cent not shown where base is less than 100.

From Table xxvii it appears that of the whole population of the United States, 87.9 per cent belong to the

white race and 12.1 per cent to the colored races (including Indians and Mongolians). In the case of the deaf (Table xxxi), 94.5 per cent are white and 5.5 per cent colored, so that the proportion colored is less among the deaf than among the general population.

Of the general population, 11.6 per cent belong to the negro race, 0.3 per cent to the Indian, and 0.2 per cent to the Mongolian (including Chinese and Japanese). Among the deaf (Table xxvii), 5.2 per cent are of negro extraction, 0.3 per cent are Indians, but the total number of Mongolians (only 4) is too small to afford a basis for a percentage.

The comparatively small proportion of colored persons among the deaf may indicate that colored persons are less liable to deafness than white, or that the returns of the colored are less complete than those of the white population. Both hypotheses are probably correct.

From Table xxxi it appears that the proportion colored is larger among those deaf from childhood than adult life. It is also larger among the totally than among the partially deaf. The proportion colored is substantially the same among males and females. In relation to age when deafness occurred, it will be noted that the proportion colored is twice as large among the deaf from birth (11.6 per cent) as the average for the whole of the deaf (5.5 per cent); but among those who lost hearing after birth and under 2, the proportion is abnormally small (3.1 per cent), and it may be possible that many of the colored were unable to decide correctly whether deafness occurred at birth or in infancy (after birth, under 2). The proportion colored is larger among those who lost hearing before reaching the age of 20 (7 per cent), and larger among those who lost hearing in old age after 80 (7.7 per cent) than in the intervening age periods.

In relation to present age the proportion colored is larger among those who are under 20 years of age (9 per cent) than over 20 (4.5 per cent).

In relation to acquired conditions the proportion colored is least among those who speak well, greatest among those who speak not at all, and intermediate among those who speak imperfectly. Among those who attended school only 3.1 per cent were colored, while among those who did not attend school 18.7 per cent were colored, from which it is obvious that the education of the colored deaf is neglected to a much greater degree than in the case of the white. There is no difference in the proportion of the colored among those who attended special or other schools.

From Table xxxii it appears that the proportion colored is greater among those who became deaf from affections of the external ear than among those who lost hearing from affections of the middle ear, and intermediate among those who lost hearing from affections of the internal ear. It is still greater, however, among the unclassified cases.

In considering the classified causes of deafness, the

greatest proportion colored is found among those deaf from malarial fever and quinine (12 per cent); whereas catarrh and scarlet fever, which are known to be among the principal causes of deafness in the country as a whole, show the smallest percentages of colored (catarrh, 1.1 per cent colored; scarlet fever, 1.3 per cent).

In relation to the unclassified causes of deafness, the largest percentages colored appear among the congenital cases (11.6 per cent) and among those deaf from the indefinite cause "sickness" (11 per cent). The proportion colored is also large among those deaf from indefinite "fever" (8.2 per cent) and among those deaf from falls and blows (8.8 per cent).

Table xxxiii shows the geographic distribution of the white and colored races. The largest proportion of colored appears, of course, in the Southern states, and especially in those states composing the South Atlantic division.

The statistics contained in Tables xxxi, xxxii, and xxxiii are suggestive of a racial difference in susceptibility to deafness. It appears at first sight that the colored population is almost immune, so far as deafness is concerned, to diseases of the middle ear, which are known to be predominant causes of deafness. There are, however, many qualifying circumstances that should be taken into consideration:

1. In general, the largest ratios deaf from affections of the middle ear are found in the New England states and in those parts of the country bordering upon the Great Lakes. It may be possible, therefore, that the comparative freedom of the colored people from deafness caused by these diseases (catarrh, scarlet fever, etc.) may be due to the fact that they do not reside in localities favorable to the occurrence of the diseases mentioned. It may be equally true that geographic conditions account for the comparative prevalence of malarial fever and quinine as a cause of deafness among the colored.

2. Among those who lost hearing from affections of the middle ear, the proportion colored may not be as small as it appears from the returns; for the proportion colored is comparatively large among those deaf from indefinite causes, like sickness and fever. These, if definitely specified, might prove to be diseases affecting the middle ear. It is probable that a large proportion of the colored people could not discriminate between these diseases as causes of deafness, on account of illiteracy and lack of medical attention at the time deafness occurred. They might even be unable to discriminate certainly between congenital and noncongenital deafness, for the same reasons.

3. Several thousand letters of inquiry sent out to deaf persons by the Census Office brought no reply; these doubtless were letters principally addressed to illiterates unable to respond by mail. The proportion illiterate is known to be very much greater among the colored than the white in the general population (col-

ored, 44.5 per cent; white, 6.2 per cent). Illiteracy is also more common among the colored deaf than the white, as is shown by the small percentage colored who have attended school, and the large proportion colored who did not know their present ages (19.9 per cent).

In short, we can not rely upon the hypothesis that there is a racial difference in the susceptibility to deafness. While the census returns seem to support this hypothesis, the factors of uncertainty are so large as to deprive the results of value, and it is probable that the returns themselves are defective regarding the colored races.

*Nativity of whites.*—Out of a total of 89,287 persons

returned as deaf, 84,361 were white; and of these, 69,865 were native, 13,786 were foreign born, and in 710 cases the nativity was unknown (Table 2).

Table xxvii relates to the sex, race, and nativity of the deaf, as compared with the whole population of the United States; and Tables xxxiv, xxxv, and xxxvi relate more particularly to nativity, and show the proportion native and foreign born among the white deaf, as follows:

Table xxxiv shows, for the white deaf, the number and percentage of native and foreign born, by age when deafness occurred, degree of deafness, ability to speak, sex, and present age.

TABLE XXXIV.—NUMBER AND PER CENT OF WHITE DEAF, BY NATIVITY, AGE WHEN DEAFNESS OCCURRED, DEGREE OF DEAFNESS, ABILITY TO SPEAK, SEX, AND PRESENT AGE.

AGE WHEN DEAFNESS OCCURRED, DEGREE OF DEAFNESS, ABILITY TO SPEAK, SEX, AND PRESENT AGE.	NUMBER.				PER CENT.		
	Total.	Native.	Foreign born.	Un-known.	Native.	Foreign born.	Un-known.
Total.....	84,361	69,865	13,786	710	82.8	16.4	0.8
Period of life when deafness occurred:							
Childhood (under 20).....	46,807	41,155	5,108	544	87.9	10.9	1.2
Adult life (20 and over).....	34,655	26,612	7,963	80	76.8	23.0	0.2
Unknown.....	2,899	2,098	715	86	72.4	24.6	3.0
Degree of deafness:							
Totally deaf.....	34,590	30,054	4,014	522	86.9	11.6	1.5
Partially deaf.....	49,771	39,811	9,772	188	80.0	19.6	0.4
Ability to speak:							
Well.....	53,449	42,721	10,533	195	79.9	19.7	0.4
Imperfectly.....	8,902	7,667	1,111	134	86.0	12.5	1.5
Not at all.....	22,010	19,487	2,142	381	88.6	9.7	1.7
Sex:							
Male.....	44,223	36,338	7,506	379	82.2	17.0	0.8
Female.....	40,138	33,527	6,280	331	83.5	15.7	0.8
Age when deafness occurred:							
Unknown.....	2,899	2,098	715	86	72.4	24.6	3.0
Indefinitely stated.....	4,359	3,424	862	53	78.6	20.2	1.2
Definitely stated.....	77,103	64,343	12,189	571	83.5	15.8	0.7
Birth.....	12,791	11,373	1,180	238	88.9	9.2	1.9
After birth, under 2.....	7,168	6,547	532	89	91.3	7.4	1.3
2 and under 5.....	10,083	8,853	1,114	116	87.8	11.0	1.2
Under 5.....	30,042	26,773	2,826	443	89.1	9.4	1.5
5 and under 10.....	6,567	5,559	972	36	84.7	14.8	0.5
10 and under 15.....	4,152	3,550	591	11	85.5	14.2	0.3
15 and under 20.....	3,852	3,348	492	12	86.9	12.8	0.3
Under 20.....	44,613	39,230	4,881	502	87.9	11.0	1.1
20 and under 40.....	16,066	13,162	2,868	36	81.9	17.9	0.2
40 and under 60.....	9,107	6,831	2,255	21	75.0	24.8	0.2
60 and under 80.....	6,375	4,454	1,912	9	69.9	30.0	0.1
80 and over.....	942	666	273	3	70.7	29.0	0.3
Present age:							
Under 20.....	16,702	15,507	835	360	92.8	5.0	2.2
20 and over.....	67,897	54,183	12,910	304	80.4	19.2	0.4
Unknown.....	262	175	41	46	66.8	15.6	17.6

# NATIVITY OF WHITES.

Table xxxv shows, for the white deaf, the number and percentage of native and foreign born, by causes of deafness.

TABLE XXXV.—NUMBER AND PER CENT OF WHITE DEAF, BY NATIVITY AND CAUSES OF DEAFNESS.

CAUSE OF DEAFNESS.	NUMBER.				PER CENT.		
	Total.	Native.	Foreign born.	Un-known.	Native.	Foreign born.	Un-known.
Total.....	84,361	69,865	13,786	710	82.8	16.4	0.8
Causes of deafness:							
Affections of external ear.....	807	638	165	4	79.1	20.4	0.5
Affections of middle ear.....	33,968	29,033	4,768	167	85.5	14.0	0.5
Affections of internal ear.....	11,666	10,106	1,467	93	86.6	12.6	0.8
Unclassified.....	28,467	23,104	5,055	308	81.2	17.7	1.1
Unknown.....	9,453	6,984	2,331	138	73.9	24.6	1.5
Principal assigned causes:							
Scarlet fever.....	7,329	6,389	887	53	87.2	12.1	0.7
Disease of ear.....	3,993	3,625	345	23	90.8	8.6	0.6
Measles.....	2,397	2,135	242	20	89.1	10.1	0.8
Influenza.....	1,740	1,417	314	9	81.4	18.1	0.5
Catarrh.....	11,568	10,047	1,496	25	86.9	12.9	0.2
Colds.....	2,967	1,954	1,007	6	65.9	33.9	0.2
Malarial fever and quinine.....	1,439	1,296	139	4	90.1	9.6	0.3
Meningitis.....	3,824	3,648	118	58	95.4	3.1	1.5
Brain fever.....	1,965	1,703	251	11	86.7	12.8	0.5
Typhoid fever.....	1,961	1,516	432	13	77.3	22.0	0.7
Congenital.....	12,789	11,371	1,180	238	88.9	9.2	1.9
Old age.....	3,181	2,081	1,094	6	65.4	34.4	0.2
Military service.....	3,130	2,517	600	4	80.4	19.5	0.1
Falls and blows.....	2,046	1,473	558	15	72.0	27.3	0.7
Sickness.....	1,907	1,348	543	16	70.7	28.5	0.8
Fever.....	1,318	1,087	219	12	82.5	16.6	0.9
Hereditary.....	894	701	98	5	88.5	11.0	0.5

Table xxxvi shows, for the white deaf, the number and percentage of native and foreign born, by states and territories.

TABLE XXXVI.—NUMBER AND PER CENT OF WHITE DEAF, BY NATIVITY, FOR STATES AND TERRITORIES.

STATE OR TERRITORY.	WHITE DEAF.						
	Number.				Per cent.		
	Total.	Native.	Foreign born.	Un-known.	Native.	Foreign born.	Un-known.
Continental United States.....	84,361	69,865	13,786	710	82.8	16.4	0.8
North Atlantic division.....	28,459	23,222	5,114	123	81.6	18.0	0.4
New England.....	8,815	7,201	1,493	31	82.7	16.9	0.4
Maine.....	1,256	1,140	114	2	90.8	9.1	0.1
New Hampshire.....	762	665	91	6	87.3	11.9	0.8
Vermont.....	723	613	106	4	84.8	14.7	0.5
Massachusetts.....	3,994	3,165	817	12	79.2	20.5	0.3
Rhode Island.....	573	447	126	—	78.0	22.0	—
Connecticut.....	1,507	1,261	239	7	83.7	15.8	0.5
Southern North Atlantic.....	19,644	15,931	3,021	92	81.1	18.4	0.5
New York.....	9,898	7,656	2,202	40	77.4	22.2	0.4
New Jersey.....	2,256	1,855	394	7	82.2	17.5	0.3
Pennsylvania.....	7,490	6,420	1,025	45	85.7	13.7	0.6
South Atlantic division.....	8,060	7,514	406	140	93.2	5.1	1.7
Northern South Atlantic.....	4,696	4,300	339	57	91.6	7.2	1.2
Delaware.....	237	217	19	1	91.6	8.0	0.4
Maryland.....	1,364	1,194	142	28	87.5	10.4	2.1
District of Columbia.....	436	343	92	1	78.7	21.1	0.2
Virginia.....	1,531	1,473	49	9	96.2	3.2	0.6
West Virginia.....	1,128	1,073	37	18	95.1	3.3	1.6
Southern South Atlantic.....	3,364	3,214	67	83	95.5	2.0	2.5
North Carolina.....	1,304	1,215	14	75	93.2	1.1	5.7
South Carolina.....	520	506	12	2	97.3	2.3	0.4
Georgia.....	1,268	1,245	20	3	98.2	1.6	0.2
Florida.....	272	248	21	3	91.2	7.7	1.1
North Central division.....	33,661	26,579	6,807	275	79.0	20.2	0.8
Eastern North Central.....	21,469	16,984	4,315	170	79.1	20.1	0.8
Ohio.....	6,021	5,026	955	40	83.5	15.8	0.7
Indiana.....	3,534	3,222	345	17	89.9	9.6	0.5
Illinois.....	6,014	4,637	1,335	92	76.3	22.2	1.5
Michigan.....	3,386	2,551	820	15	75.3	24.2	0.5
Wisconsin.....	2,464	1,593	860	6	64.9	34.9	0.2

TABLE XXXVI.—NUMBER AND PER CENT OF WHITE DEAF, BY NATIVITY, FOR STATES AND TERRITORIES—Continued.

STATE OR TERRITORY.	WHITE DEAF.						
	Number.				Per cent.		
	Total.	Native.	Foreign born.	Un-known.	Native.	Foreign born.	Un-known.
Western North Central.....	12,192	9,595	2,492	105	78.7	20.4	0.9
Minnesota.....	1,733	1,063	660	10	61.3	38.1	0.6
Iowa.....	2,944	2,312	614	18	78.5	20.9	0.6
Missouri.....	3,651	3,205	393	53	87.8	10.8	1.4
North Dakota.....	240	125	115	.....	52.1	47.9	.....
South Dakota.....	368	229	127	12	62.2	34.5	3.3
Nebraska.....	1,208	938	265	5	77.7	21.9	0.4
Kansas.....	2,048	1,723	318	7	84.1	15.5	0.4
South Central division.....	10,227	9,568	556	103	93.6	5.4	1.0
Eastern South Central.....	5,716	5,494	201	21	96.1	3.5	0.4
Kentucky.....	2,387	2,247	136	4	94.1	5.7	0.2
Tennessee.....	1,760	1,712	41	7	97.3	2.3	0.4
Alabama.....	957	939	15	3	98.1	1.6	0.3
Mississippi.....	612	596	9	7	97.4	1.5	1.1
Western South Central.....	4,511	4,074	355	82	90.3	7.9	1.8
Louisiana.....	878	749	110	19	85.3	12.5	2.2
Arkansas.....	1,102	1,077	19	6	97.7	1.7	0.6
Indian Territory.....	184	175	9	.....	95.1	4.9	.....
Oklahoma.....	260	190	24	46	73.1	9.2	17.7
Texas.....	2,087	1,883	193	11	90.2	9.3	0.5
Western division.....	3,954	2,982	903	69	75.4	22.8	1.8
Rocky Mountain.....	1,023	841	144	38	82.2	14.1	3.7
Montana.....	115	91	23	1	79.1	20.0	0.9
Idaho.....	129	100	29	.....	77.5	22.5	.....
Wyoming.....	26	20	6	.....	(1)	(1)	.....
Colorado.....	471	364	70	37	77.3	14.9	7.8
New Mexico.....	282	266	16	.....	94.3	5.7	.....
Basin and Plateau.....	430	254	175	1	59.1	40.7	0.2
Arizona.....	41	34	6	1	(1)	(1)	(1)
Utah.....	340	192	148	.....	56.5	43.5	.....
Nevada.....	49	28	21	.....	(1)	(1)	.....
Pacific.....	2,501	1,887	584	30	75.4	23.4	1.2
Washington.....	368	285	82	1	77.4	22.3	0.3
Oregon.....	402	323	63	16	80.3	15.7	4.0
California.....	1,731	1,279	439	13	73.9	25.4	0.7

<sup>1</sup>Per cent not shown where base is less than 100.

The statistics of Table xxvii indicate that out of the total white population of the United States, 84.7 per cent were native and 15.3 per cent foreign born.

Table xxxiv shows that of the white deaf, 82.8 per cent were native and 16.4 per cent foreign born, so that it appears that the proportion foreign born among the white deaf is slightly in excess of the proportion foreign born in the total white population.

In the case of the white deaf, the proportion foreign born is greater among those deaf from adult life than among those deaf from childhood. It is also greater among the partially than the totally deaf, and slightly greater among males than females. In regard to age when deafness occurred, the proportion foreign born is greatest among those who lost hearing between 60 and 80 years of age and after, least among those who became deaf before 20, and intermediate in the intervening age periods when deafness occurred.

In regard to present age, the proportion foreign born is greater among those over 20 years of age than under. In relation to ability to speak, the proportion foreign born is greatest among those who speak well,

least among those who speak not at all, and intermediate among those who speak imperfectly.

In regard to classified causes of deafness (Table xxxv), the proportion foreign born is greatest among those deaf from colds (33.9 per cent), and it is also great among those deaf from typhoid fever (22 per cent) and influenza (18.1 per cent), and least among those deaf from meningitis.

In relation to unclassified causes of deafness, the proportion foreign born is greatest among those deaf from old age (34.4 per cent), and large among those deaf from falls and blows, and from the indefinite cause sickness.

Table xxxvi relates to the geographic distribution of the white deaf, distinguishing the native from the foreign born. The proportion foreign born is of course greatest in those parts of the country which have the largest foreign born population.

The majority of the foreign born deaf became deaf in adult life, and it is therefore probable that in most cases the deafness occurred after they reached this country. This also accounts for the fact of the small

proportion of foreign born among the deaf from meningitis and scarlet fever, for these are diseases characteristic of childhood rather than adult life.

*The process of audition, and the mechanism whereby it is effected.*—Diagram 31 presents a sectional view of the human ear, and Diagram 32 an enlarged plan of the organ of hearing.

A source of sound may be considered as consisting essentially of an oscillating body immersed in air.

Considering the to and fro movements which take place toward or from the listener's ear, we may note that each time the movement is toward the ear the air particles in the immediate vicinity are struck a blow in the direction of the ear, much as a billiard ball might be struck by a cue. They shoot off under the impulse in the direction of the ear, but can go only a very little way before they are arrested by collision with other air particles which take up the movement. Much as an impulse may be transmitted through a

line of billiard balls by successive collisions of ball with ball, so the aerial impulse is transmitted through the free air by successive collisions of air particles with air particles. When the impulse finally reaches the listener's ear the air particles in the external ear are crowded together by the shock and are thus condensed in the passageway, or meatus, causing increased pressure upon the drum membrane of the ear, pushing it in a little way (Diagrams 31 and 32).

When the motion of the oscillating body is from the ear an opposite effect is produced, resulting in rarefaction of the air in the external ear, causing a lessening of pressure upon the drum membrane.

A source of sound thus operates to produce alternate condensations and rarefactions of the air in the external ear, causing vibratory movements of the tympanic membrane. The membrane moves inward when the air pressure is increased and outward when it is diminished.

Diagram 31.

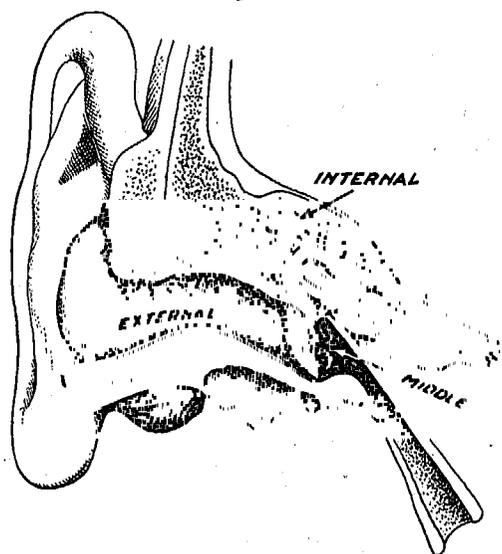


Diagram 32.



The middle ear contains a mechanism for transmitting the vibrations of the membrane to the liquid contained in the internal ear (Diagram 32). This consists of a series of small bones, or ossicles, of which the malleus, or hammerhead, is attached directly to the tympanic membrane. The stapes, or stirrup-shaped bone, at the other end of the series acts somewhat like a piston. Its flat end is attached to a membrane covering the oval opening into the labyrinth. The transmitting mechanism of the middle ear thus consists essentially of a piston operated by a stretched membrane. When the tympanic membrane moves inward, the stapes, or piston, is also pushed inward, thus exerting increased pressure on the liquid in the labyrinth. When the tympanic membrane moves outward the pressure on the liquid is relaxed.

The liquid contained in the internal ear is thus subjected to changes of statical pressure; but in the coiled-up portion of the labyrinth known as the cochlea, or snail shell, there is also a to and fro move-

ment of the fluid itself, resulting from the elasticity of the membrane covering the second opening into the labyrinth (the round window). The passageway of the cochlea is divided longitudinally into two distinct channels communicating only at the tip—shaded differently in the drawing (Diagram 32). When, therefore, the stapes, or piston, is pushed in at the oval window, an actual displacement of the fluid in the cochlea takes place, traveling up one channel and down the other and bulging out the membrane of the round window. The to and fro movement of the liquid in the cochlea causes a corresponding movement of the hairs, or rods, that line the passageways, and which are connected with the terminals of the auditory nerve.

There can be little question that the true organ of hearing is located within this coiled-up portion of the labyrinth (Diagram 32), but its exact nature and mode of operation are obscure.

The organ of Corti, which is found here, bears a curious resemblance to a musical instrument contain-

ing multitudes of rods of different lengths, which are supposed to be tuned to respond to different pitches of sound—a sort of harp in miniature within the ear. The single vibration which alone is transmitted to the internal ear—the resultant of all the sonorous vibrations that exist in the air outside of the ear—is supposed to be here analyzed into its constituent musical elements by the sympathetic vibration of those rods of Corti which correspond to them in pitch. The organ of Corti, however, may not be so essential to hearing as is commonly supposed, for it seems to be totally wanting in parrots and other birds that imitate, and therefore perceive, the sounds of human speech.

At the other end of the labyrinth from the cochlea, the curious arrangement of the three semicircular canals is worthy of note (Diagram 32)—an arrangement in which the plane of each canal is substantially at right angles to the planes of the other two, thus reminding us of the three planes used by mathematicians in coordinating directions in space.

The semicircular canals do not seem to be concerned in the process of hearing, although it is obvious that they constitute a sense organ of some kind, because they are plentifully supplied with nerve filaments connected with hairs, or rods, as in the case of the cochlea. Under the influence of sound vibrations transmitted to the liquid of the internal ear by the to and fro movement of the stapes at the oval window, the liquid in the semicircular canals is subjected to changes of statical pressure, but without the to and fro displacement of the fluid, as in the case of the cochlea. If, however, the head should be moved in any direction, displacements would be produced by the inertia of the fluid. These displacements would differ in the three canals, according to the direction and extent of the movement. It is probable that the semicircular canals constitute a special sense organ, whereby we perceive the direction and extent of bodily movements. After waltzing continuously a sensation of dizziness is usually experienced for some time after stopping, which is probably due to the continued movements of the liquid in one of the canals. Many totally deaf persons fail to experience any sensation of dizziness under such circumstances; and they experience a difficulty in walking steadily in the dark. It is probable that in such cases the injury to the ear has extended to the semicircular canals, so that the persons have lost the use of an organ intimately connected with the instinctive balancing of the body while in motion.

The true organ of hearing seems to be hidden away in the convolutions of the cochlea; but, as it is immersed in a liquid, it is not directly accessible to sound vibrations. The capacity for hearing may exist, and yet the person may be deaf on account of some defect in the transmitting apparatus. Perfection of hearing, therefore, depends upon the proper functioning of the tympanic membrane and the transmitting mechanism of the middle ear.

The tympanic membrane must be suitably stretched in order to be sensitive to delicate changes of air pressure in the external ear. It differs from an ordinary stretched membrane in not being flat. It is somewhat conical in shape with the concavity outward, thus resembling, to a certain extent, the under surface of an open umbrella. It can be stretched to a greater or less degree by movements of the malleus, to which it is attached. A very slight movement inward of the end of the malleus increases the tension; and the act of listening consists in the adjustment of certain muscles attached to the malleus, whereby the proper tension of the membrane is secured. There is thus an accommodation of the ear to feeble sounds comparable to the accommodation of the eye for near vision—an adjustment of the focus, so to speak.

A stretched membrane is most sensitive to transitory impulses when the normal pressure of the air is the same on both sides of it. The pressure of the air within the middle ear tends to push the tympanic membrane outward, and the pressure of the air in the external ear tends to push it inward. When these opposite pressures just balance one another the membrane is free to be acted upon by the transitory impulses of sound without being impeded by an unbalanced pressure from within or without. The external pressure of the atmosphere is subject to change; and without some means of introducing air into the middle ear or removing air from it when necessary, the tympanic membrane would constantly be working at a mechanical disadvantage on account of unbalanced pressures. The Eustachian tube affords the means. Through its agency, a communication is established between the middle ear and the back part of the mouth (the pharynx). During the act of swallowing saliva the end of the Eustachian tube in the pharynx is opened, thus permitting free communication between the external air and the cavity of the middle ear, resulting in equilibrium of pressure on both sides of the tympanic membrane. The Eustachian tube also serves as a drainage tube for the middle ear, preventing secretions from accumulating there.

*Causes of deafness.*—In the Twelfth Census 89,287 persons were returned as deaf, and in 10,115 cases the causes of deafness were unknown (Table 5). In the remaining 79,172 cases the supposed causes were specified.

In many cases, however, the assigned causes are vague and unsatisfactory. For example, "military service, 3,242 cases; sickness, 2,143; fever, 1,436; medicine, 205; headache, 136; hard work, 101; diarrhea and cholera infantum, 90"; etc.

To these may be added the following as examples of the curious and fanciful causes of deafness sometimes assigned in individual cases: "Caused by milk of diseased cow; chewing paper and speaking loud in my ear; bitten by a rat; holding nose and mouth shut and blowing until head would buzz; driving Govern-

ment teams on the plains; eating caustic potash; going with hay shockers; ran a piece of shingle down throat; worms; worry"; etc. No less than 1,514 cases of this character were reported. (See footnotes to Table XXXVIII.) Such causes as these—even if they are connected with the production of the deafness, which is often doubtful—are very remote causes indeed.

We may smile at the idea of driving Government teams on the plains as a cause of deafness; but we can readily trace a remote connection between the supposed cause and the effect. The driver speeding the Government teams across the plains was exposed to the weather and may have taken cold, resulting in catarrh of the middle ear, which may ultimately have caused his deafness.

It seems more satisfactory to say that deafness was caused by some specific disease—say scarlet fever, for instance—than by driving Government teams, yet really the one is no more a cause of deafness than the other. Both act indirectly by producing effects that become causes for other effects; and they differ simply in the degree of their remoteness from the ultimate effect produced—deafness. It is a matter for serious consideration that all the assigned causes of deafness, even the most plausible, are of this same indirect character, and are not in themselves true causes of deafness at all. It will readily be recognized that military service is not in itself a cause of deafness; for out of the vast number of persons who have been engaged in military service only a very small fraction are deaf. All of the other causes, however, fall into the same category; for out of the millions of people who have had scarlet fever, for example, a very small fraction indeed are deaf. Like driving Government teams on the plains, the specific diseases usually assigned may indirectly be causes of deafness, but are not so of themselves alone.

The concussion of the air due to the discharge of heavy artillery may rupture the membrane of the ear of one near at hand, and the internal ear may be so affected by the shock as to have its usefulness impaired; but in this case the true cause of the deafness is the injury to the ear, and not directly the concussion of the air, far less the cannon that produced it, or the still more remote cause—military service.

Military service may be the cause of a person being present when a cannon is fired; the firing of the cannon may be the cause of a concussion of the air; the concussion of the air may be the cause of an injury to the person's ear; and the injury to the ear may be a cause of deafness. After the manner of "The House that Jack Built," the cause of deafness may be made anything you choose, if you only carry back the chain of causation far enough. Scarlet fever and other diseases, usually accepted as legitimate causes of deafness, belong to this same class, for they only act indirectly through intermediate agencies. Scarlet fever,

for example, differs from military service simply in the fact that in the chain of causation it is nearer the ultimate effect produced.

Scarlet fever may be the proximate cause of an abscess in the middle ear; the suppurative process in the middle ear may cause serious injury and even total destruction of necessary parts of the delicate machinery of the ear; and the injury to the ear may thus cause deafness. There are many other diseases, however, that produce a similar injury to the ear and in a similar manner. For example, measles, influenza, diphtheria, pneumonia, erysipelas, smallpox, tonsillitis, bronchitis, etc. In the present report, therefore, all these diseases are grouped together and the deafness is attributed to "a suppurative affection of the middle ear."

The principle has been adopted of classifying the assigned causes by their effect upon the ear, grouping together in one class all those diseases or proximate causes that produce the same effect upon the ear. Accordingly causes of deafness are divided into three broad groups, as follows: Affections of the external ear, affections of the middle ear, affections of the internal ear.

Each group is divided into subgroups, as follows: External ear—impacted cerumen (earwax), foreign bodies in ear, miscellaneous (external ear). Middle ear—suppurative affections (inflammation and abscess), nonsuppurative (or catarrhal) affections, miscellaneous (middle ear). Internal ear—affections of labyrinth, affections of auditory nerve, affections of brain center for hearing, miscellaneous (internal ear).

Table XXXVII shows the number of the deaf, by the classes specified.

TABLE XXXVII.—*The deaf, by causes of deafness.*

CAUSE OF DEAFNESS.	Total.
All causes.....	89,287
Classified.....	47,967
Unclassified.....	31,205
Unknown.....	10,115
Classified:	
Affections of external ear.....	871
Affections of middle ear.....	34,801
Affections of internal ear.....	12,295
External ear:	
Impacted cerumen.....	357
Foreign bodies in ear.....	297
Miscellaneous (external ear).....	217
Middle ear:	
Suppurative affections.....	17,533
Nonsuppurative, or catarrhal, affections.....	17,260
Miscellaneous (middle ear).....	8
Internal ear:	
Affections of labyrinth.....	2,726
Affections of auditory nerve.....	9,361
Affections of brain center for hearing.....	129
Miscellaneous (internal ear).....	79

Out of 89,287 deaf, the causes of deafness have been classified in 47,967 cases, or a majority of the whole; 31,205 cases remain unclassified; and in 10,115 cases the causes are unknown.

*Broad groups.*—Among the classified cases, affec-

tions of the middle ear are the predominating causes. Comparatively few lost hearing from affections of the external ear. The percentage of cases in each class is as follows: External ear, 1.8 per cent; middle ear, 72.6 per cent; internal ear, 25.6 per cent—total classified, 100 per cent.

*Subgroups.*—The principal subgroups seem to be four in number; these, with the percentage of cases included in each, are shown as follows: Middle ear—

suppurative affections, 36.5 per cent; nonsuppurative (or catarrhal), 36 per cent. Internal ear—affections of labyrinth, 5.7 per cent; affections of nerve, 19.5 per cent. Other subgroups, 2.3 per cent. Aggregate classified, 100 per cent.

Table xxxviii shows the classification of causes of deafness adopted, with the subdivision into broad groups and subgroups, and the number of cases compiled under each assigned cause.

TABLE XXXVIII.—NUMBER OF CASES OF DEAFNESS, BY CAUSES.

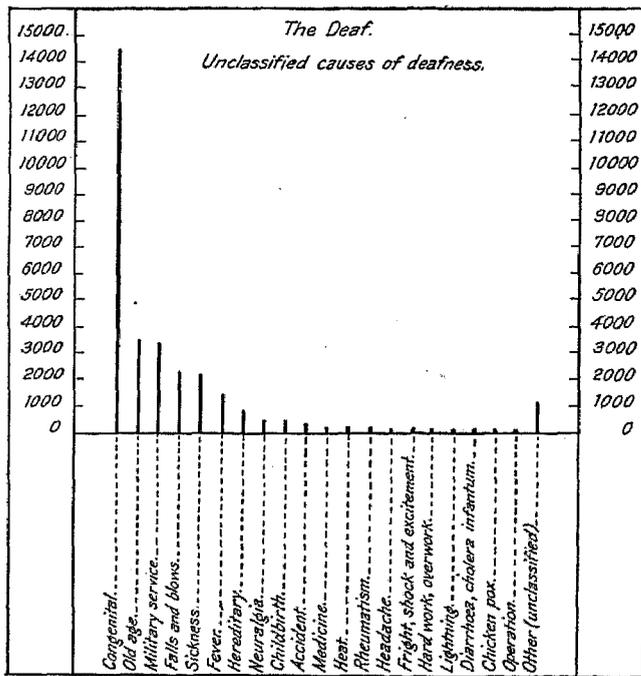
[The detailed causes of deafness reported and classified as "other" causes belonging to the subgroups specified in this table are given in the footnotes hereto.]

CAUSE OF DEAFNESS.			Number of cases.
Broad groups.	Subgroups.	Assigned causes.	
Classified	External ear.	Impacted cerumen.....	290
		Foreign bodies in ear.....	67
Miscellaneous.....		Water in ear, swimming, diving, bathing.....	297
		Foreign bodies in ear.....	82
		Cancer and tumor.....	57
		Burns and scalds.....	51
		Eczema.....	27
		Other (external ear) <sup>1</sup> .....	7,424
		Scarlet fever.....	4,210
		Disease of ear.....	2,469
Middle ear.	Suppurative.....	Mumps.....	1,776
		Diphtheria.....	503
		Pneumonia.....	308
		Erysipelas.....	228
		Smallpox.....	147
		Tonsillitis.....	139
		Teething.....	117
		Bronchitis.....	68
		Consumption.....	8
		Other (suppurative) <sup>2</sup> .....	46
Middle ear.	Nonsuppurative.....	Catarrh.....	11,702
		Cold.....	3,074
		Whooping cough.....	675
		Sore throat.....	553
		Exposure and cold.....	446
		Disease of throat.....	327
		Thickening and hardening of eardrum.....	157
		Croup.....	57
		Other (nonsuppurative) <sup>3</sup> .....	269
		Miscellaneous (middle ear) <sup>4</sup> .....	8
Internal ear.	Labyrinth.....	Malarial fever and quinine.....	1,636
		Noise and concussion.....	820
		Mumps.....	243
		Syphilis.....	27
		Meningitis.....	3,991
		Brain fever.....	2,013
		Typhoid fever.....	2,055
		Paralysis.....	571
		Convulsions.....	402
		Other.....	182
Internal ear.	Nerve.....	Hydrocephalus.....	93
		Epilepsy.....	74
		Miscellaneous (internal ear) <sup>5</sup> .....	68
		Congenital.....	41
		Old age.....	79
		Military service.....	14,472
		Falls and blows.....	3,361
		Sickness.....	3,242
		Fever.....	2,243
		Hereditary.....	2,143
Neuralgia.....	1,436		
Childbirth.....	909		
Accident.....	418		
Unclassified.....	Miscellaneous.....	Medicine.....	393
		Heat.....	335
		Rheumatism.....	205
		Headache.....	186
		Fright, shock, excitement.....	167
		Hard work, overwork.....	136
		Lightning.....	119
		Diarrhea and cholera infantum.....	101
		Chickenpox.....	93
		Operation.....	90
Unknown.....	Miscellaneous.....	Other (unclassified) <sup>6</sup> .....	39
		Unknown.....	27
		Aggregate.....	1,085
			10,115
			89,287

<sup>1</sup> Other (external ear).—Includes bathing and vaccination; cold and dust getting in ear; corrugated growth on ear passages; ears filled up; ears pulled; exostosis; filling up of ear; formation on inside of ear; growth about ears; hardening of wax and snuff; old age, and ears grown together; salt rheum; scald; skin disease; substance growing on drum; too frequent syringing.  
<sup>2</sup> Other (suppurative).—Includes boil behind ear; broken eardrums; corrosion mastoid bone; defective eardrums; disease of bone; disease of mastoid bone; drum of ear gone; eardrum of right ear gone, left one closed; ear trumpets are gone; perforated eardrum; perforated eardrums, inherited; pleurisy; sore eyes (doctor kept blister back of ears for three weeks); ulceration of membrane.  
<sup>3</sup> Other (nonsuppurative affections of middle ear).—Includes adenoid growth; adenoid; of posterior nerve; air in ear; air on the head; air tubes closed; asthma; asthma and coughing; asthma and nervousness; asthma and old age; bent eardrum; bronchial affection; bronchial and catarrhal trouble; bronchial trouble; buzzing noises in head; chronic catarrh; chronic rheumatic pharyngitis; chronic laryngitis; chronic nonsuppurative inflammation; closing of tube; collapse of Eustachian



Diagram 34.



From Table xxxviii and Diagram 33 it appears that among the classified cases the principal assigned causes are:

Scarlet fever	7,424
Disease of ear	4,210
Measles	2,469
Influenza	1,776
Catarrh	11,702
Colds	3,074
Malarial fever and quinine	1,636
Meningitis	3,991
Brain fever	2,013
Typhoid fever	2,055
Minor causes	40,350
Aggregate classified	7,617
	47,967

Malarial fever is given as a cause of deafness in some cases, and quinine in others. In large doses quinine is known to affect the hearing; but it is doubtful whether malarial fever, without quinine, produces deafness. As it is probable that all of the malarial fever cases were dosed with quinine, and that most of the quinine cases had malarial fever or were threatened with it, the best disposition of these causes seems to be to group them together and attribute the deafness to an affection of the internal ear, for quinine is known to have a specific effect upon the labyrinth.

Meningitis includes all persons returned as deaf from cerebro-spinal meningitis, meningitis (simply), or spotted fever. It is probable that brain fever is the same thing under another name; but the number of cases returned under this head seems to be sufficiently large to justify the retention of brain fever as a specific cause.

Catarrh and colds probably constitute one and the same disease; but the number of cases of deafness

due to colds seems to be large enough to demand separate recognition.

Among the assigned causes of deafness in the classified cases, the following are specially predominant: Catarrh and colds, 14,776; scarlet fever, 7,424; meningitis and brain fever, 6,004. These three causes alone include the majority of the classified cases (58.8 per cent).

From Diagram 34 it appears that among the unclassified cases the principal assigned causes are:

Congenital	14,472
Old age	3,361
Military service	3,242
Falls and blows	2,243
Sickness	2,143
Fever	1,436
Hereditary	909
Minor causes	27,806
Aggregate unclassified	3,399
	31,205

First in importance and overshadowing all of the others are the congenital cases—14,472 in number. These, with two others, tabulated under the head of "other causes unclassified," constitute the "deaf from birth"—14,474 cases.

It is unfortunate, considering the large numbers involved, that the assigned causes of deafness referred to in Diagram 34 are too vague to enable us to decide definitely the location or nature of the defect in the hearing apparatus.

Congenital deafness probably involves the internal ear, for the deaf from birth as a class are totally deaf. Falls and blows also are apt to produce injury to the internal ear. Those deaf from old age are, as a class, only partially deaf, so that in their case the internal ear is not incapacitated. It is probable that the defect relates chiefly to the external ear, resulting from impacted cerumen or thickening of the drum membrane. Military service may mean almost anything. Deafness due to the discharge of artillery would affect the internal ear; so would typhoid fever and malarial fever accompanied by quinine. Other diseases incident to military service, like catarrh and colds arising from exposure to the weather, might involve the middle ear. Sickness, fever, and hereditary causes would probably not involve the external ear, but might refer either to the middle ear or the internal ear.

If all the causes of deafness could be classified by their effect on the ear, it is probable that the proportions deaf from affections of the external ear and of the internal ear would be considerably increased, leading to a corresponding diminution in the proportion deaf from affections of the middle ear.

In Tables xxxix and xl the classified causes of deafness, and the principal assigned causes, are presented in connection with their geographic distribution.

Table xxxix shows, by geographic divisions and states and territories, the deaf from the classified causes, grouped according to the effect of the causes upon the ear.

CAUSES OF DEAFNESS.

TABLE XXXIX.—THE DEAF FROM CLASSIFIED CAUSES, BY EFFECT OF CAUSES UPON THE EAR, FOR STATES AND TERRITORIES.

STATE OR TERRITORY.	ALL CLASSIFIED CAUSES.				EXTERNAL EAR.			MIDDLE EAR.			INTERNAL EAR.			
	Total.	External ear.	Middle ear.	Internal ear.	Impacted cerumen.	Foreign bodies in ear.	Miscellaneous.	Suppurative.	Nonsuppurative.	Miscellaneous.	Labyrinth.	Nerve.	Brain.	Miscellaneous.
Continental United States.....	47,907	871	34,801	12,295	357	297	217	17,533	17,260	8	2,726	9,361	129	79
North Atlantic division.....	15,821	280	12,473	3,068	150	74	50	6,593	5,875	5	623	2,356	52	37
New England.....	4,979	80	4,182	717	43	16	21	2,127	2,054	1	176	520	17	4
Maine.....	693	11	613	69	3	1	7	316	297	1	21	47	1	1
New Hampshire.....	451	6	389	50	2	1	4	201	188	1	15	40	1	1
".....	434	10	387	37	5	4	1	182	205	1	16	18	2	1
".....	2,225	39	1,830	356	22	10	7	931	898	1	75	273	7	1
".....	329	4	278	47	3	1	1	151	127	1	13	31	3	1
Connecticut.....	847	10	685	152	8	1	1	346	339	1	36	111	4	1
Southern North Atlantic.....	10,842	200	8,291	2,351	107	58	35	4,466	3,821	4	447	1,836	35	33
New York.....	5,511	94	4,187	1,230	49	31	14	2,161	2,023	3	235	951	23	21
New Jersey.....	1,278	36	1,023	219	21	7	8	562	461	1	62	154	2	1
Pennsylvania.....	4,053	70	3,081	902	37	20	13	1,743	1,337	1	150	731	10	11
South Atlantic division.....	4,534	118	3,245	1,171	42	44	32	1,738	1,506	1	383	778	8	2
Northern South Atlantic.....	2,603	62	1,923	618	27	23	12	1,059	864	1	171	443	3	1
Delaware.....	127	4	104	19	2	1	1	49	55	1	8	11	1	1
".....	792	22	577	193	9	10	3	320	257	1	40	150	2	1
".....	265	1	178	86	1	1	1	84	94	1	9	77	1	1
Virginia.....	832	24	604	204	13	7	4	332	272	1	82	121	1	1
West Virginia.....	587	11	460	116	2	5	4	274	186	1	32	84	1	1
Southern South Atlantic.....	1,931	56	1,322	553	15	21	20	679	642	1	212	335	5	1
North Carolina.....	588	12	421	155	3	5	4	238	183	1	53	98	4	1
South Carolina.....	333	21	205	107	6	9	6	99	106	1	48	58	1	1
Georgia.....	820	20	557	243	6	7	7	271	286	1	90	152	4	1
Florida.....	190	3	139	48	1	1	1	71	67	1	21	27	1	1
North Central division.....	19,553	293	13,519	5,741	105	109	79	6,474	7,043	2	906	4,760	47	28
Eastern North Central.....	12,511	180	8,688	3,663	50	57	53	4,139	4,547	2	555	3,059	27	22
Ohio.....	3,470	45	2,539	889	21	10	14	1,266	1,270	1	157	712	6	14
Indiana.....	2,205	28	1,371	806	9	7	12	623	743	1	118	680	5	2
Illinois.....	3,490	41	2,375	1,080	5	22	14	1,080	1,293	2	165	504	9	2
".....	2,069	23	1,495	551	9	6	8	712	783	1	97	448	4	2
".....	1,271	23	911	337	6	12	5	453	458	1	18	315	2	2
Western North Central.....	7,042	133	4,831	2,078	55	52	26	2,335	2,496	1	351	1,701	20	6
Minnesota.....	801	12	617	262	5	5	2	297	320	1	21	236	4	1
Iowa.....	1,795	36	1,275	484	14	18	4	574	701	1	78	402	2	2
".....	2,128	43	1,354	731	17	15	11	680	674	1	139	585	4	3
".....	128	6	88	34	0	1	1	46	42	1	3	30	1	1
South Dakota.....	232	5	168	59	1	1	3	85	83	1	6	50	3	1
Nebraska.....	694	15	514	165	8	6	1	271	243	1	24	138	3	1
Kansas.....	1,174	16	815	343	4	7	5	382	433	1	80	260	3	1
South Central division.....	5,664	120	3,861	1,674	40	51	38	2,002	1,859	1	648	1,009	13	4
Eastern South Central.....	3,110	61	2,155	894	15	28	18	1,141	1,014	1	327	558	7	2
Kentucky.....	1,242	25	835	382	11	7	7	447	388	1	93	285	3	1
Tennessee.....	895	15	665	215	2	9	4	352	313	1	53	128	3	1
Alabama.....	578	15	493	160	1	8	6	223	180	1	80	80	1	1
Mississippi.....	395	6	262	137	1	4	1	119	133	1	71	65	1	1
Western South Central.....	2,554	68	1,706	780	25	23	20	861	845	1	321	451	6	2
Louisiana.....	469	22	305	142	11	7	4	141	164	1	74	67	1	1
Arkansas.....	643	9	409	225	1	7	4	213	196	1	84	140	1	1
Indian Territory.....	135	3	86	46	1	1	2	44	42	1	15	26	1	1
Oklahoma.....	171	2	113	51	1	1	1	63	55	1	11	37	3	1
Texas.....	1,136	32	788	316	13	8	11	400	388	1	134	181	1	1
Western division.....	2,395	51	1,703	641	20	19	12	726	977	1	106	458	9	8
Rooky Mountain.....	589	25	423	141	11	11	3	178	245	1	30	104	2	5
Montana.....	80	2	55	23	1	2	1	29	26	1	5	13	1	5
Idaho.....	93	3	68	22	1	2	1	29	39	1	7	15	1	1
Wyoming.....	18	1	12	6	1	1	1	3	9	1	1	5	1	1
Colorado.....	307	10	228	69	5	2	3	88	140	1	10	59	1	1
New Mexico.....	91	10	60	21	5	5	1	29	31	1	7	12	2	1
Basin and Plateau.....	258	4	179	75	2	1	1	98	81	1	15	59	1	1
Arizona.....	28	2	17	9	1	1	1	11	6	1	1	7	1	1
Utah.....	194	1	136	57	1	1	1	77	59	1	10	47	1	1
Nevada.....	36	1	26	9	1	1	1	10	16	1	4	5	1	1
Pacific.....	1,548	22	1,101	425	7	7	8	450	651	1	121	295	6	3
Washington.....	252	5	160	87	1	1	3	64	96	1	10	73	4	1
Oregon.....	259	2	180	77	1	1	1	96	84	1	18	58	1	1
California.....	1,037	15	761	261	6	5	4	290	471	1	93	164	2	2

Table XL shows, by states and territories and geographic divisions, the deaf from the principal assigned causes, classified and unclassified.

TABLE XL.—THE DEAF, BY PRINCIPAL ASSIGNED CAUSES, FOR STATES AND TERRITORIES.

STATE OR TERRITORY.	CLASSIFIED CAUSES.										UNCLASSIFIED CAUSES.						
	Scarlet fever.	Disease of ear.	Measles.	Influenza.	Catarrh.	Colds.	Malarial fever and quinine.	Menigitis.	Brain fever.	Typhoid fever.	Con-genital.	Old age.	Military service.	Falls and blows.	Sick-ness.	Fever.	Hered-itary.
Continental United States.....	7,424	4,210	2,469	1,776	11,702	3,074	1,636	3,991	2,013	2,055	14,472	3,361	3,242	2,243	2,143	1,436	909
North Atlantic division.....	3,483	1,095	761	637	4,020	1,132	221	882	549	516	3,466	1,392	919	822	533	315	387
New England.....	1,077	409	241	202	1,440	355	57	168	104	130	950	527	254	255	126	116	146
Maine.....	137	84	44	29	213	37	6	9	15	10	186	51	50	36	14	20	19
New Hampshire.....	100	57	12	19	137	28	7	6	8	13	57	51	22	12	14	9	12
Vermont.....	88	31	18	24	153	33	3	3	3	9	29	52	41	20	8	12	15
.....	464	175	99	93	597	180	15	103	49	64	432	256	109	127	55	46	70
.....	85	25	22	7	94	19	4	9	8	5	56	28	16	16	9	8	10
.....	203	37	46	30	246	58	25	38	24	29	190	89	16	44	26	21	20
Southern North Atlantic ..	2,406	686	520	435	2,580	777	164	714	445	386	2,516	865	665	567	407	199	241
New York.....	1,179	328	233	194	1,402	390	79	386	241	170	1,178	482	285	316	195	84	127
New Jersey.....	289	108	62	54	313	94	33	45	39	43	228	114	62	59	38	12	38
Pennsylvania.....	938	250	225	187	865	293	52	283	165	173	1,110	290	318	192	174	103	76
South Atlantic division.....	599	561	240	153	863	342	256	313	99	241	2,721	327	313	229	243	196	105
Northern South Atlantic ..	444	260	145	93	497	206	87	160	66	154	1,152	205	199	130	127	77	65
Delaware.....	20	5	10	6	35	14	4	1	3	5	36	7	9	7	7	1	5
Maryland.....	148	62	40	36	157	65	19	32	20	76	291	60	45	44	31	11	15
District of Columbia.....	49	11	8	8	58	27	6	40	11	17	51	58	28	17	13	7	2
Virginia.....	103	116	47	29	147	63	44	51	11	36	527	63	73	39	55	26	29
West Virginia.....	124	66	40	14	100	37	14	36	21	20	247	17	44	23	21	32	14
Southern South Atlantic ..	155	301	104	60	366	136	169	153	33	87	1,569	122	114	99	116	119	40
North Carolina.....	57	110	31	22	93	41	41	39	12	27	646	31	41	28	30	47	13
South Carolina.....	13	39	22	9	56	25	42	29	6	12	333	34	12	24	32	25	11
Georgia.....	66	115	44	25	183	50	68	74	14	39	502	49	49	40	46	38	16
Florida.....	19	37	7	4	34	20	18	11	1	9	88	8	12	7	8	9	.....
North Central division.....	2,604	1,452	1,067	744	5,021	1,094	566	2,133	1,086	976	4,603	1,141	1,501	822	956	492	307
Eastern North Central ..	1,735	864	692	468	3,234	724	324	1,276	761	645	2,823	784	918	522	583	275	212
Ohio.....	529	248	207	143	900	183	86	243	197	178	790	236	314	142	112	76	68
Indiana.....	232	134	123	77	526	95	70	313	191	115	447	130	162	67	89	57	35
Illinois.....	415	261	181	125	918	227	108	400	220	168	706	229	215	172	197	81	57
Michigan.....	332	147	110	77	591	109	53	192	86	104	413	95	144	90	77	37	36
Wisconsin.....	227	74	71	46	299	110	7	128	67	78	467	94	83	51	111	24	16
Western North Central ..	869	588	375	276	1,787	370	242	857	325	331	1,780	357	583	300	373	217	95
Minnesota.....	140	54	32	29	213	72	9	85	59	69	325	40	51	43	85	15	13
Iowa.....	240	127	91	56	529	94	51	201	80	73	336	99	106	66	64	41	21
Missouri.....	197	232	109	57	477	85	105	353	92	92	578	111	185	81	95	84	32
North Dakota.....	18	10	9	4	28	10	.....	9	11	4	48	3	8	8	15	4	.....
South Dakota.....	38	22	8	8	53	17	2	18	6	16	52	8	11	19	27	7	5
Nebraska.....	110	51	51	31	165	45	10	82	31	28	161	45	65	30	36	21	10
Kansas.....	126	92	75	51	322	47	65	129	46	49	280	51	157	53	51	45	14
South Central division.....	431	931	303	171	1,155	288	504	460	192	217	3,164	339	394	243	326	357	85
Eastern South Central ..	274	500	177	100	585	169	252	241	111	134	1,832	216	234	125	155	201	55
Kentucky.....	140	164	73	35	216	58	73	105	64	78	630	91	90	46	48	91	20
Tennessee.....	88	146	50	35	180	45	54	64	24	25	554	42	78	22	42	67	20
Alabama.....	30	127	32	21	107	34	67	24	14	22	370	53	35	28	28	24	8
Mississippi.....	16	63	22	9	82	22	58	38	9	9	278	30	31	29	37	19	7
Western South Central ..	157	431	126	71	570	129	252	219	81	83	1,332	123	160	118	171	156	30
Louisiana.....	44	65	11	7	90	50	52	15	14	18	363	44	40	27	53	29	8
Arkansas.....	30	119	29	16	128	27	68	72	33	17	328	26	42	29	33	34	5
Indian Territory.....	7	25	6	3	28	4	15	14	8	2	43	1	3	3	5	10	1
Oklahoma.....	17	16	17	6	37	9	7	23	7	5	51	3	14	4	5	8	2
Texas.....	59	206	63	39	287	39	110	95	19	41	547	49	61	55	69	75	14
Western division.....	307	171	80	71	643	218	89	203	87	105	518	162	115	127	85	76	25
Rocky Mountain.....	72	40	23	19	161	47	16	55	12	23	149	49	37	40	17	27	3
Montana.....	14	4	3	6	17	5	4	7	2	1	16	1	4	3	3	6	.....
Idaho.....	13	7	3	2	25	10	3	8	1	6	17	2	5	5	3	2	.....
Wyoming.....	1	.....	.....	1	6	1	.....	1	3	1	2	.....	3	.....	.....	1	.....
Colorado.....	37	13	16	10	97	26	6	34	6	12	52	11	17	15	7	8	.....
New Mexico.....	7	16	1	.....	16	5	3	5	.....	3	62	35	8	17	4	11	2
Basin and Plateau.....	43	22	10	8	48	19	7	32	7	19	64	16	13	13	16	13	2
Arizona.....	4	7	.....	.....	4	.....	1	3	3	1	5	2	5	2	2	1	.....
Utah.....	35	12	9	7	35	15	4	27	3	16	54	10	6	11	10	12	.....
Nevada.....	4	3	1	1	9	4	2	2	1	2	5	4	2	4	4	.....	2
Pacific.....	192	109	56	44	434	152	66	116	68	63	305	97	65	74	52	36	20
Washington.....	26	17	8	5	70	14	5	35	20	14	48	9	8	4	7	4	5
Oregon.....	42	18	20	8	55	18	8	24	13	13	52	7	16	18	13	7	1
California.....	124	74	28	31	309	120	53	57	35	36	205	81	41	52	32	25	14

CAUSES OF DEAFNESS.

Table xli gives the ratio per million of total population for certain classes of deaf shown in Tables xxxix and xl.

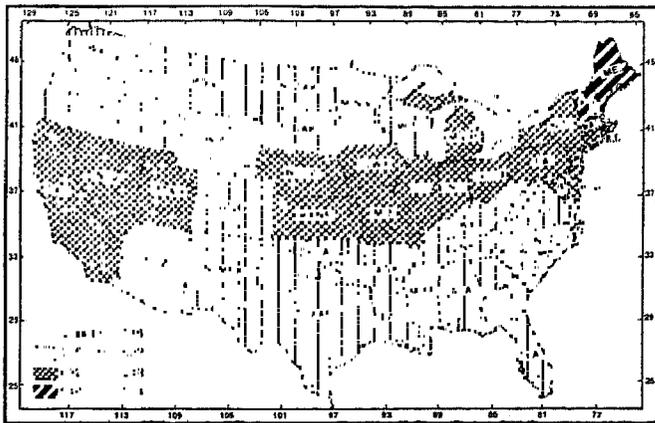
TABLE XLI.—NUMBER OF DEAF FROM SPECIFIED CAUSES PER MILLION OF TOTAL POPULATION, BY STATES AND TERRITORIES.

STATE OR TERRITORY.	NUMBER OF DEAF FROM SPECIFIED CAUSE PER 1,000,000 POPULATION.										
	All classified causes.	Middle ear.	Middle ear: Suppurative.	Scarlet fever.	Middle ear: Non-suppurative.	Catarrh and colds.	Internal ear.	Labyrinth.	Nerve.	Menigitis and brain fever.	Congenital.
Continental United States .....	931	458	231	98	227	194	162	36	123	79	190
North Atlantic division .....	752	593	313	165	279	245	146	30	112	68	165
New England .....	890	748	380	193	367	321	128	31	93	49	170
Maine .....	998	883	455	197	428	360	99	30	68	34	267
New Hampshire .....	1,090	945	488	245	457	400	136	36	97	35	140
Vermont .....	1,263	1,126	530	256	597	540	108	47	52	9	86
Massachusetts .....	793	652	332	165	320	277	127	27	97	54	154
Rhode Island .....	768	649	352	197	296	262	110	30	72	39	130
Connecticut .....	932	754	381	223	373	334	167	40	122	68	209
Southern North Atlantic .....	702	536	289	156	247	217	152	29	119	75	163
New York .....	758	576	297	162	278	246	169	32	131	86	162
New Jersey .....	678	543	298	154	245	216	116	33	82	45	121
Pennsylvania .....	643	489	277	149	212	184	143	24	116	71	176
South Atlantic division .....	434	311	166	57	144	115	112	37	74	39	261
Northern South Atlantic .....	583	431	237	99	194	157	138	38	99	51	258
Delaware .....	687	593	295	111	298	265	103	43	60	22	196
Maryland .....	667	486	269	124	216	187	102	34	126	43	244
District of Columbia .....	951	689	301	174	337	304	309	32	276	184	184
Virginia .....	449	326	179	55	147	113	110	44	65	33	284
West Virginia .....	612	480	286	129	194	143	121	33	83	59	257
Southern South Atlantic .....	323	221	114	26	107	84	92	35	56	31	262
North Carolina .....	310	222	126	30	97	71	82	28	52	27	341
South Carolina .....	248	153	74	10	79	61	80	36	43	26	248
Georgia .....	370	251	122	30	120	105	110	41	69	40	227
Florida .....	359	263	134	36	127	102	91	40	51	22	166
North Central division .....	743	513	246	99	267	232	218	34	181	122	175
Eastern North Central .....	783	543	250	109	284	248	229	35	191	127	177
Ohio .....	835	610	305	127	305	261	214	38	171	106	190
Indiana .....	876	545	250	92	295	243	320	47	270	200	178
Illinois .....	725	493	224	86	268	237	224	34	187	128	146
Michigan .....	855	618	294	137	323	289	228	40	185	115	170
Wisconsin .....	614	440	219	110	221	198	103	9	152	94	226
Western North Central .....	681	467	226	84	241	208	201	34	164	114	172
Minnesota .....	599	352	170	80	183	163	150	12	135	82	186
Iowa .....	804	571	267	108	314	275	217	35	180	125	154
Missouri .....	685	436	219	64	217	363	235	45	188	143	186
North Dakota .....	401	276	144	56	132	119	107	9	94	63	150
South Dakota .....	578	418	212	92	207	170	147	15	125	57	127
Nebraska .....	651	482	254	103	228	197	155	23	129	87	151
Kansas .....	798	554	260	85	294	251	233	54	177	119	191
South Central division .....	402	274	142	31	132	102	119	46	72	46	225
Eastern South Central .....	412	286	151	36	134	99	118	43	74	47	243
Kentucky .....	578	389	208	65	181	127	178	43	133	79	294
Tennessee .....	443	329	174	43	155	111	106	41	63	43	274
Alabama .....	316	220	122	17	98	77	87	44	44	26	202
Mississippi .....	255	162	77	11	86	67	88	46	42	30	179
Western South Central .....	391	261	132	24	129	107	119	49	69	46	204
Louisiana .....	339	221	102	32	119	101	103	54	48	21	163
Arkansas .....	490	312	162	23	149	118	172	64	107	80	250
Indian Territory .....	344	219	112	18	107	83	117	46	66	55	110
Oklahoma .....	429	296	158	43	138	115	128	28	93	75	128
Texas .....	373	258	131	20	127	107	104	44	59	38	180
Western division .....	585	416	177	75	239	210	157	41	112	71	127
Rocky Mountain .....	478	343	144	58	199	169	114	24	84	54	121
Montana .....	329	226	119	58	107	90	95	21	53	38	64
Idaho .....	576	420	179	80	241	217	136	43	93	56	166
Wyoming .....	195	130	32	10	37	80	65	11	54	40	20
Colorado .....	599	422	163	69	259	227	128	19	109	74	96
New Mexico .....	466	307	148	35	159	105	108	36	61	25	315
Basin and Plateau .....	584	405	222	97	183	152	170	34	133	88	145
Arizona .....	228	138	80	32	49	30	73	8	57	48	41
Utah .....	701	491	278	127	213	180	206	36	170	107	194
Nevada .....	850	614	236	95	378	300	213	94	118	70	120
Pacific .....	641	456	186	79	269	242	170	50	122	76	126
Washington .....	486	309	124	50	185	162	168	19	141	106	92
Oregon .....	626	435	232	102	203	177	186	44	140	90	127
California .....	698	512	195	83	317	289	176	63	110	62	137

Table XLI is illustrated by the series of shaded maps constituting Maps 4 to 9, inclusive, showing the ratio per million of population in each state and territory reported as deaf from the specified causes.

In 47,967 cases the assigned causes of deafness have been classified by their effect upon the ear, and Map 4 shows approximately the proportion of the population in each state or territory who lost hearing from the classified causes.

MAP 4.—Number of deaf from classified causes per million of population, by states and territories.



Four grades of shading are employed: The second indicates a proportion double that shown by the first; the third, three times that proportion; and the fourth, four times—at least approximately. The largest proportion deaf from the classified causes, indicated by the fourth or heaviest shading, is found in the territory covered by Maine, New Hampshire, and Vermont. The territory covered by the third grade of shading abuts upon this and extends westward as a narrow tongue as far as Nebraska and Kansas—including these states. The next, or second, shading extends pretty uniformly over the rest of the country (excluding the Western division), except in the states of North Carolina, South Carolina, and Mississippi. The states composing the Western division, with the exception of California, have very small populations, so that the ratios deaf have not the same significance as in the case of the older and more thickly settled states, since the addition or subtraction of a mere handful of deaf would make an appreciable change in the ratios.

*Broad groups.*—It appears that the states having the largest ratios deaf from affections of the middle ear compose a territory covering the New England states

and the states bordering on the Great Lakes (New York, Ohio, and Michigan), with an outlying territory in Iowa. The largest ratios of all are found in Maine, New Hampshire, and Vermont, and the smallest in the Southern states.

The largest ratios deaf from affections of the internal ear are found in a territory covering the North Central division of the United States (except Minnesota, North Dakota, South Dakota, and Nebraska), with outlying extensions in New York, Maryland, Kentucky, and Arkansas. The largest ratio of all is found in Indiana, and the smallest, if Arizona be disregarded, in South Carolina.

*Subgroups.*—Maps 5 and 6 show, in contrast, the geographic distribution of the deaf who lost hearing from suppurative and nonsuppurative (or catarrhal) affections of the middle ear; and Maps 7 and 8 relate to deafness caused by affections of the labyrinth and auditory nerve.

*Principal assigned causes.*—Map 9 shows the geographic distribution of the congenital (unclassified) deaf.

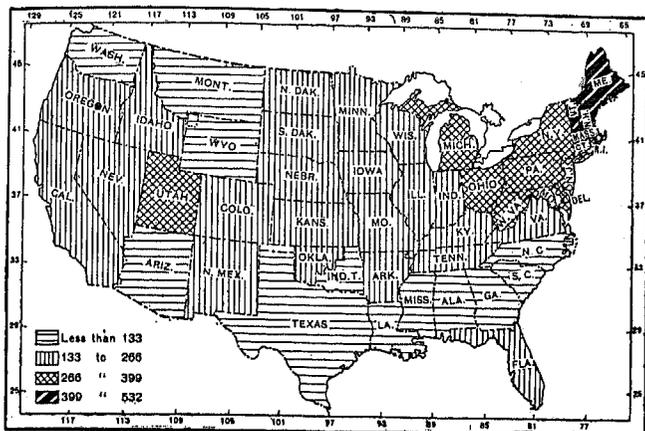
The larger ratios, congenitally deaf, prevail over the greater portion of the country (excluding the Western division); and the largest ratios are found in a group of states comprising Kentucky, Tennessee, Virginia, and North Carolina, with a detached area in Maine. The largest ratio of all is found in North Carolina.

Map 10 shows the average percentage of sunshine in the states and territories during a period of 31 years (1870 to 1901), from records compiled by the United States Weather Bureau under the direction of Prof. Willis L. Moore.

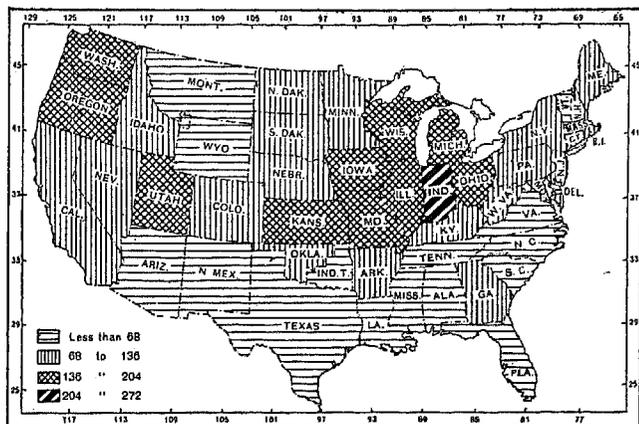
It is noteworthy that the area of country having the least percentage of sunshine corresponds very closely to the area showing the largest ratios deaf from affections of the middle ear. We would naturally expect that a cold, damp climate would favor the production of catarrhal affections of the middle ear (Map 6), but the sunshine map corresponds more closely with the map showing the geographic distribution of affections of the suppurative variety (Map 5) caused principally by scarlet fever.

Maps 11 and 12 relate to the geographic distribution of the totally deaf from early childhood (under 5), all of whom naturally are deaf and dumb, distinguishing the congenital cases (Map 11) from the noncongenital (Map 12).

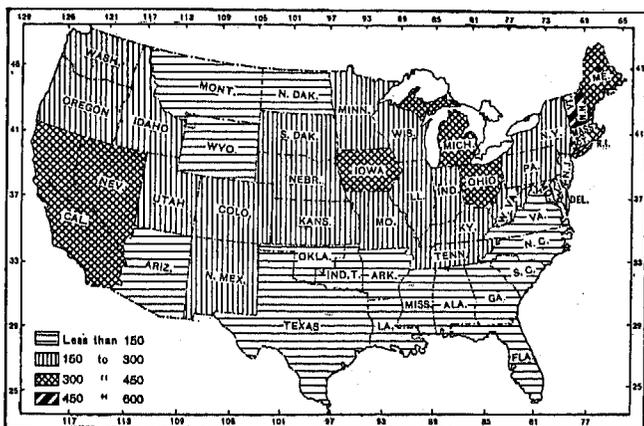
MAP 5.—Number of deaf from suppurative affections of middle ear per million of population, by states and territories.



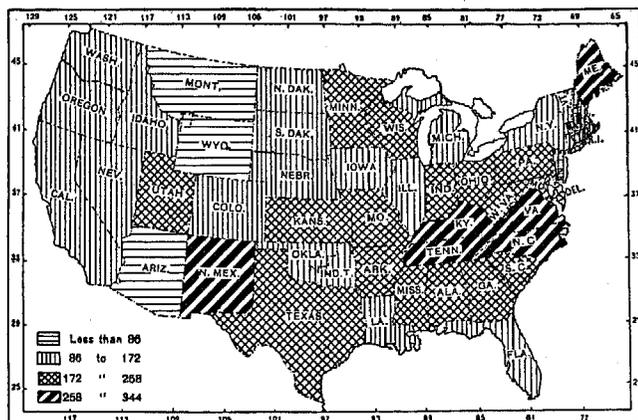
MAP 8.—Number of deaf from affections of the auditory nerve per million of population, by states and territories.



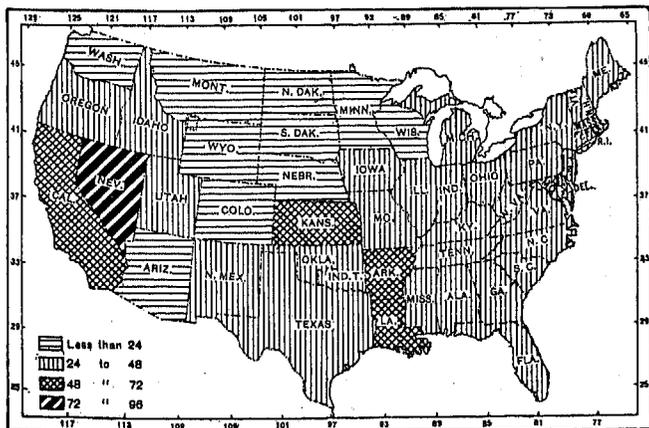
MAP 6.—Number of deaf from catarrhal affections of middle ear per million of population, by states and territories.



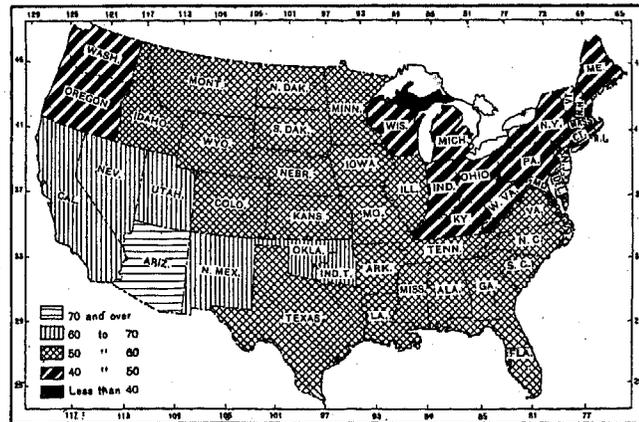
MAP 9.—Number of congenital deaf per million of population, by states and territories.



MAP 7.—Number of deaf from affections of the labyrinth per million of population, by states and territories.



MAP 10.—Per cent of sunshine in each state and territory, 1870 to 1891, inclusive.





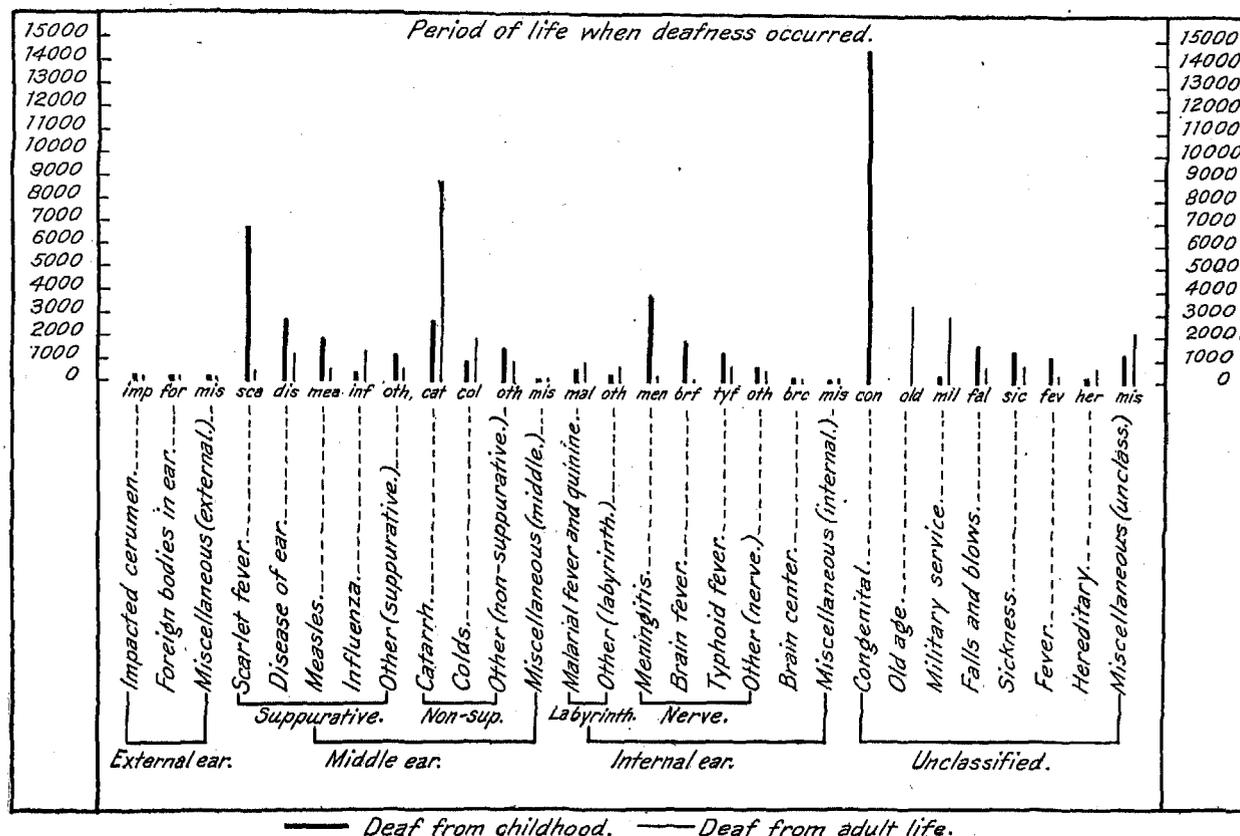
It will be seen from Table XLII that the number deaf from childhood exceeds the number deaf from adult life in each of the three broad groups—external ear, middle ear, and internal ear. This predominance is especially marked where deafness resulted from affections of the internal ear.

The deaf from childhood predominate among those

deaf from suppurative affections of the middle ear and affections of the auditory nerve, and the deaf from adult life predominate in the case of nonsuppurative affections of the middle ear and affections of the labyrinth.

In Diagram 35 the principal assigned causes are considered in connection with the period of life when deafness occurred.

DIAGRAM 35.



From Diagram 35 it is clearly seen that the predominant causes of deafness are different in the case of deaf from childhood and the deaf from adult life. Scarlet fever, meningitis, and brain fever, which are among the leading causes of deafness occurring in childhood, are comparatively insignificant as causes of deafness occurring in adult life. On the other hand, catarrh, colds, and influenza, which are the leading causes of deafness occurring in adult life, are of lesser importance as causes of deafness in childhood. Catarrh is reported as the cause (of deafness) in over 35 per cent (35.1) of the assigned causes of deafness occurring in adult life. Among the unclassified causes it is somewhat noteworthy that most of the "hereditary" cases lost hearing in adult life, and that none of them were born deaf.

The difference between the deaf from childhood and

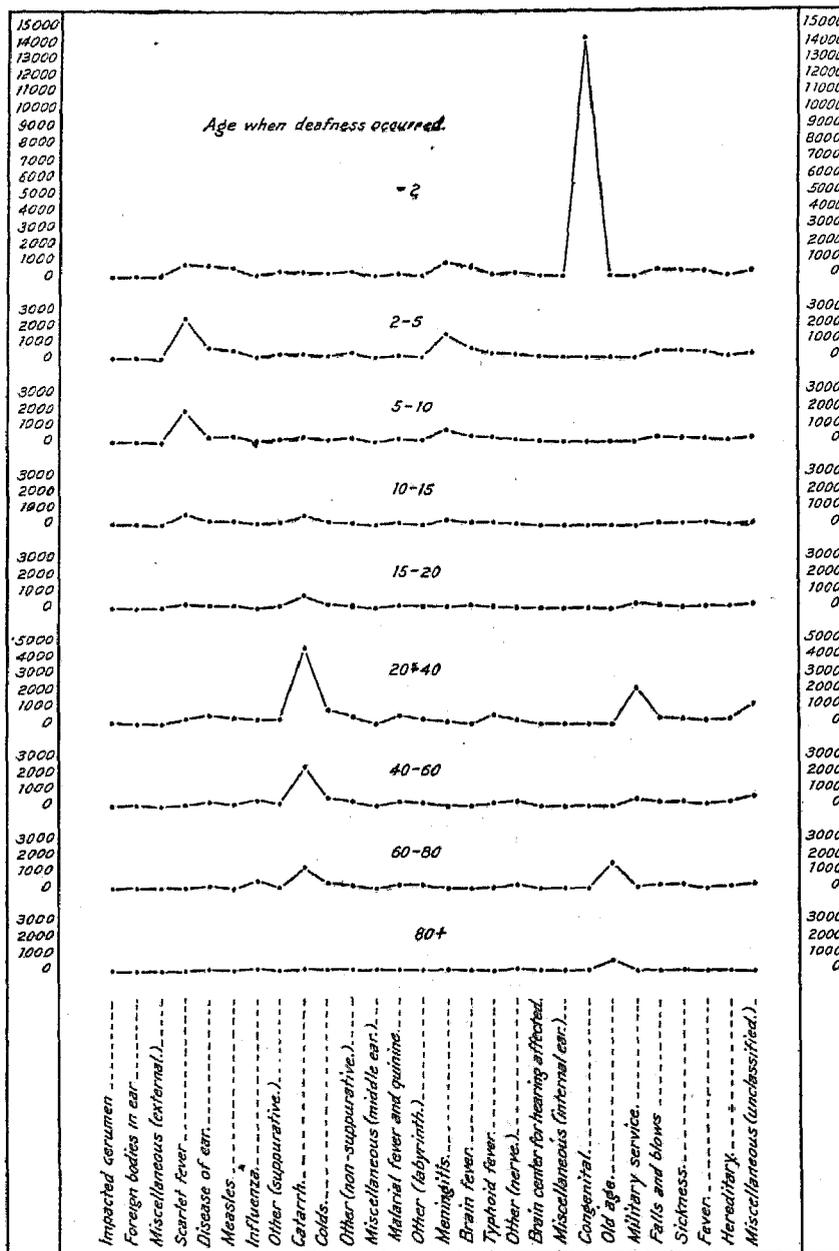
the deaf from adult life may be illustrated by giving in each case the principal assigned causes among the classified cases, in the order of their importance, as follows:

Deaf from childhood:	
Scarlet fever	6,857
Meningitis and brain fever	5,801
Catarrh and colds	3,702
Disease of ear	2,834
Measles	1,925
Typhoid fever	1,211
Malarial fever and quinine	665
Influenza	388
Deaf from adult life:	
Catarrh and colds	10,035
Influenza	1,344
Disease of ear	1,278
Malarial fever and quinine	944
Typhoid fever	823
Measles	511
Scarlet fever	454
Meningitis and brain fever	175

THE DEAF.

In Diagram 36 the principal assigned causes are considered in connection with the age when deafness occurred.

DIAGRAM 36.



*Under 2.*—The congenitally deaf form the mass of those who lost hearing before the age of 2, and among the noncongenital cases scarlet fever, disease of ear, measles, meningitis, and brain fever seem to predominate slightly over the other causes assigned.

*2 and under 5.*—Scarlet fever and meningitis stand out prominently as causes of deafness occurring at this period. Disease of the ear and brain fever are next in importance. It is interesting to note that over 65 per cent of the cases due to brain fever occur before the age of 5.

5 and under 10.—Where deafness occurred between 5 and 10 years of age, scarlet fever is markedly the leading cause, and meningitis only slightly predominates over the other causes.

10 and under 15.—No single cause seems to be predominant in a marked degree. Scarlet fever and catarrh are slightly conspicuous. Meningitis is less conspicuous than in the preceding groups.

15 and under 20.—Catarrh now takes the lead, but only slightly, and scarlet fever and meningitis no longer appear as conspicuous causes.

20 and under 40.—Deafness occurring in adult life between the ages of 20 and 40 seems to be due chiefly to catarrh. A considerable number, however, report deafness as caused by military service. Malarial fever and quinine, and typhoid fever, which are also slightly conspicuous, are more prominent at this period than at any other.

40 and under 60.—The only conspicuous cause is catarrh, but it is less conspicuous than in the preceding age period.

60 and under 80.—Deafness occurring between the ages of 60 and 80 is chiefly recorded as due to old age, although catarrh still shows conspicuously, but in a much less marked degree than in the two preceding age periods.

80 and over.—The only conspicuous cause assigned for deafness occurring at this period is old age. Two-thirds of the cases occurring after 80 years of age are due to this cause.

In relation to the four principal assigned causes of deafness it may be noted that congenital deafness occurs exclusively at birth, and deafness due to catarrh almost exclusively in adult life. Meningitis produces deafness chiefly before the age of 5 and scarlet fever before the age of 10.

Table XLIII shows the percentage deaf from childhood and from adult life for each of the principal assigned causes.

From Table XLIII it is seen that in affections of the middle ear the proportion deaf from adult life more nearly approaches the proportion deaf from childhood than in either of the other two broad groups, although the proportions in the several causes under affections of the middle ear vary greatly. The proportion deaf

from childhood is largest in affections of the internal ear, being over 70 per cent of the total number of such cases. In only one of the leading causes under this group does the proportion deaf from adult life exceed that of the deaf from childhood, namely, in malarial fever and quinine.

TABLE XLIII.—Per cent distribution of the deaf, by degree of deafness, period of life when deafness occurred, and principal causes.

CAUSE.	PER CENT DISTRIBUTION OF THE DEAF BY—				
	Degree of deafness.		Period of life when deafness occurred.		
	Totally deaf.	Partially deaf.	Deaf from childhood.	Deaf from adult life.	Unknown.
All causes.....	41.9	58.1	56.3	40.2	3.5
Affections of external ear.....	23.8	76.2	55.6	41.8	2.6
Affections of middle ear.....	29.4	70.6	52.3	45.4	2.3
Scarlet fever.....	55.8	44.2	92.3	6.1	1.6
Disease of ear.....	32.4	67.6	67.3	30.4	2.3
Measles.....	38.6	61.4	78.0	20.7	1.3
Influenza.....	15.4	84.6	21.8	75.7	2.5
Catarrh.....	11.6	88.4	23.2	73.9	2.9
Colds.....	18.9	81.1	32.0	64.7	3.3
Affections of internal ear.....	62.9	37.1	71.8	26.7	1.5
Malarial fever and quinine.....	26.8	73.2	40.6	57.7	1.7
	90.4	9.6	96.9	2.7	0.4
	86.6	13.4	96.0	3.4	0.6
	44.2	55.8	58.9	40.1	1.0
Unclassified.....	54.3	45.7	64.2	34.7	1.1
Congenital.....	87.1	12.9	100.0	.....	.....
Old age.....	3.4	96.6	.....	100.0	.....
Military service.....	11.6	88.4	9.0	88.3	2.7
Falls and blows.....	46.8	53.2	68.1	29.9	2.0
Sickness.....	46.8	53.2	62.5	33.4	4.1
Fever.....	52.8	47.2	73.1	25.3	1.6
Hereditary.....	13.4	86.6	23.0	74.4	2.6

More than 90 per cent of the deafness from scarlet fever, meningitis, and brain fever, more than 75 per cent of the deafness due to measles, and over 65 per cent of the deafness due to disease of the ear occurred in childhood; on the other hand, more than 60 per cent of the deafness from influenza, catarrh, and colds occurred in adult life.

Among the unclassified cases about 75 per cent of the "hereditary" cases lost hearing in adult life. It is noteworthy that over 70 per cent of the deafness due to fever, over 65 per cent of the cases due to falls and blows, and over 60 per cent of the cases due to sickness occurred in childhood. It is interesting also to note that 9 per cent of the deafness due to military service occurred in childhood (under 20 years).

In Table XLIV the deaf are considered by causes of deafness in relation to degree of deafness, deaf relatives, and consanguinity of parents.

TABLE XLIV.—THE DEAF, BY DEGREE OF DEAFNESS, DEAF RELATIVES, CONSANGUINITY OF PARENTS, AND CAUSES OF DEAFNESS.

CAUSE OF DEAFNESS.	Total.	DEGREE OF DEAFNESS.		DEAF RELATIVES. <sup>1</sup>			CONSANGUINITY OF PARENTS.		
		Totally deaf.	Partially deaf.	a, b, or c relatives.	No a, b, or c relatives.	Not stated.	Parents cousins.	Parents notcousins.	Not stated.
All causes.....	89,287	37,426	51,861	26,221	54,260	8,806	4,065	75,530	9,692
Classified.....	47,947	18,164	29,803	13,389	31,212	3,366	1,610	42,705	3,652
Unclassified.....	31,205	16,950	14,255	9,998	18,031	3,176	2,183	25,281	3,741
Unknown.....	10,115	2,312	7,803	2,834	5,017	2,264	272	7,544	2,299
Classified:									
External ear.....	871	207	664	237	559	75	29	760	82
Impacted cerumen.....	357	71	286	105	226	26	3	324	30
Foreign bodies in ear.....	297	50	247	79	191	27	0	256	32
Miscellaneous (external ear).....	217	86	131	53	142	22	17	180	20
Middle ear.....	34,801	10,227	24,574	10,950	21,285	2,506	1,238	30,824	2,739
Measles.....	17,533	7,390	10,143	4,551	11,809	1,173	738	15,510	1,285
Influenza.....	7,424	4,145	3,279	1,608	5,394	422	285	6,647	492
Catarrh.....	4,210	1,365	2,845	1,316	2,601	293	222	3,683	305
Other (suppurative).....	2,469	953	1,516	682	1,642	145	101	2,194	174
Nonsuppurative.....	1,776	273	1,503	468	1,099	209	45	1,524	207
Catarrh.....	1,654	654	1,000	477	1,073	104	85	1,402	107
Colds.....	17,260	2,836	14,424	6,397	9,474	1,389	500	15,309	1,461
Other (nonsuppurative).....	11,702	1,354	10,348	4,701	6,050	951	304	10,460	948
Miscellaneous (middle ear).....	3,074	580	2,494	560	1,926	288	81	2,606	327
Other (nonsuppurative).....	2,484	902	1,582	836	1,498	150	115	2,193	176
Miscellaneous (middle ear).....	8	1	7	2	2	4	.....	5	3
Internal ear.....	12,295	7,730	4,565	2,202	9,368	725	343	11,121	831
Meningitis.....	2,726	661	2,065	721	1,783	222	88	2,305	273
Brain fever.....	1,636	439	1,197	456	1,061	119	67	1,427	142
Typhoid fever.....	1,090	222	868	265	722	103	21	938	131
Other (nerve).....	9,361	6,931	2,430	1,457	7,432	472	251	8,582	528
Brain center for hearing.....	3,991	3,609	382	446	3,400	145	83	3,741	167
Other (nerve).....	2,013	1,744	269	260	1,670	83	59	1,859	95
Brain center for hearing.....	2,055	908	1,147	515	1,410	190	60	1,839	156
Other (nerve).....	1,302	670	632	236	952	114	49	1,143	110
Brain center for hearing.....	129	96	33	13	103	13	4	112	13
Miscellaneous (internal ear).....	79	42	37	11	50	18	.....	62	17
Unclassified:									
Congenital.....	14,472	12,607	1,865	6,155	7,273	1,044	1,710	11,322	1,440
Old age.....	3,361	115	3,246	899	1,934	1,028	38	2,369	954
Military service.....	3,242	375	2,867	536	2,440	266	40	2,897	305
Falls and blows.....	2,243	1,050	1,193	449	1,626	168	95	1,933	215
Sickness.....	2,143	1,002	1,141	418	1,511	214	80	1,786	277
Fever.....	1,436	758	678	292	1,051	93	62	1,257	117
Hereditary.....	909	122	787	850	19	40	57	799	53
Miscellaneous (unclassified).....	3,399	921	2,478	899	2,177	323	101	2,918	380

<sup>1</sup> Symbols for deaf relatives—*a*, deaf brothers, sisters, or ancestors; *b*, deaf uncles, aunts, cousins, or other relatives not *a*, *c*, or *d*; *c*, deaf children (sons or daughters); *d*, deaf husbands or wives.

The results contained in Table XLIV relating to total and partial deafness are shown graphically in Diagram 37 (page 123).

*Broad groups.*—It appears that affections of the middle ear result chiefly in partial deafness, and affections of the internal ear chiefly in total deafness.

*Subgroups.*—Suppurative affections of the middle ear appear to be much more productive of total deafness than nonsuppurative, or catarrhal, affections. Affections of the labyrinth result chiefly in partial deafness and affections of the auditory nerve in total deafness.

*Principal assigned causes.*—From Diagram 37 it appears that of the diseases affecting the middle ear, scarlet fever seems to be the only one producing total deafness in a majority of the cases. Catarrh produces

chiefly partial deafness. Of the diseases affecting the internal ear, meningitis and brain fever produce chiefly total deafness.

In regard to the unclassified causes, the deafness is chiefly total among the congenital cases and partial among those deaf from old age, military service, or hereditary causes.

More than 80 per cent of those deaf from influenza, catarrh, or colds were only partially deaf, and more than 80 per cent were totally deaf among those deaf from meningitis, brain fever, and among the congenital cases. More than 85 per cent were only partially deaf among those deaf from old age, military service, or hereditary causes.

In Table XLV the deaf are shown by causes of deafness, in relation to sex, race, and nativity of the whites.

CAUSES OF DEAFNESS.

DIAGRAM 37.

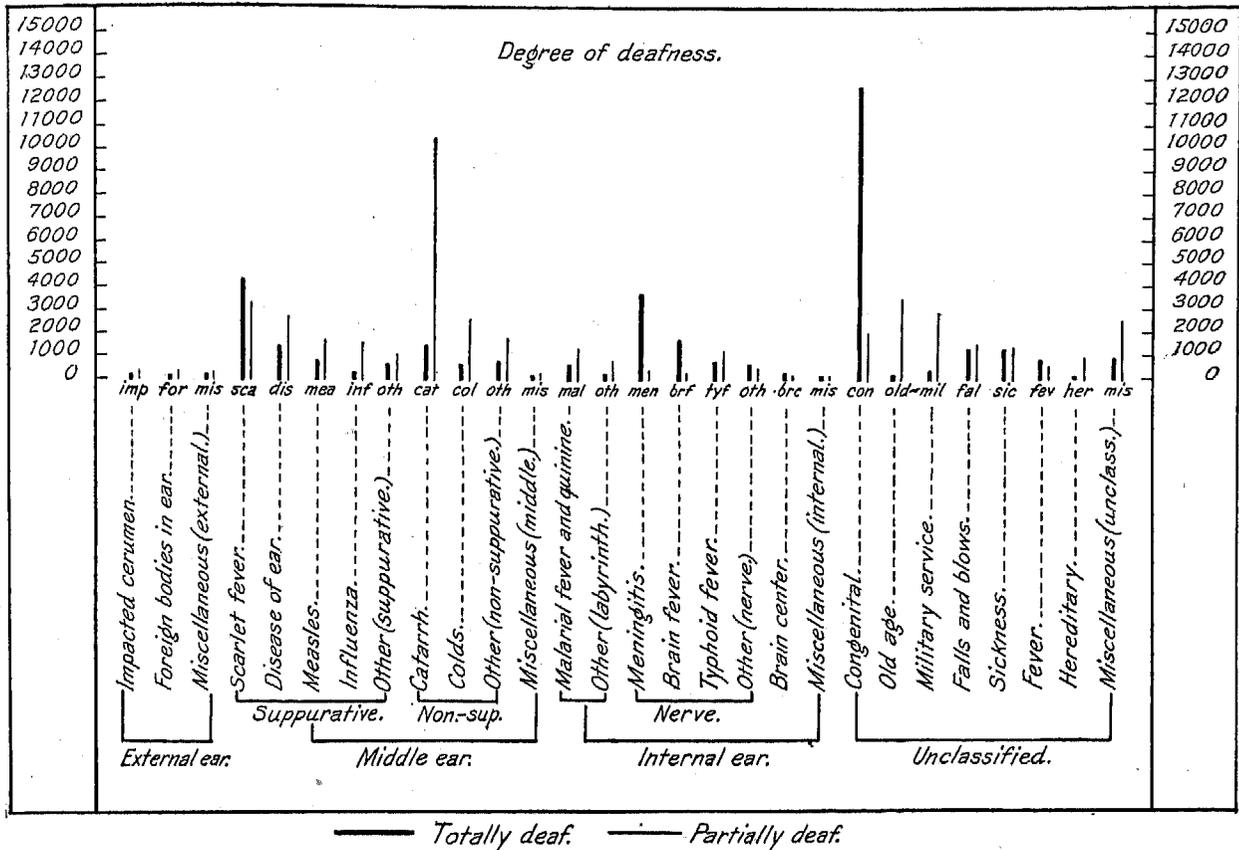


TABLE XLV.—THE DEAF, BY SEX, RACE, NATIVITY OF WHITES, AND CAUSES OF DEAFNESS.

CAUSE OF DEAFNESS.	Total.	SEX.		RACE.		NATIVITY OF WHITES.			COLORED.		
		Male.	Female.	White.	Colored.	Native.	Foreign.	Unknown.	Negro.	Indian.	Mongolian.
All causes	89,287	46,915	42,372	84,361	4,926	69,865	13,786	710	4,649	273	4
	47,967	23,979	23,988	46,441	1,526	39,777	6,400	264	1,439	87	2
	31,205	17,720	13,485	28,467	2,738	23,104	5,055	308	2,586	150	2
	10,116	5,216	4,800	9,453	662	6,984	2,331	138	624	36	2
Classified:											
External ear	871	546	325	807	64	638	165	4	58	6	
Impacted cerumen	357	276	81	340	17	253	85	2	13	4	
Foreign bodies in ear	267	157	140	269	28	214	53	2	27	1	
Miscellaneous (external ear)	217	113	104	198	19	171	27		18	1	
Middle ear	34,801	16,241	18,560	33,968	833	29,033	4,768	167	770	63	
Suppurative	17,533	8,133	9,400	17,060	473	14,950	1,994	116	442	31	
Scarlet fever	7,424	3,497	3,927	7,329	95	6,389	887	53	89	6	
Disease of ear	4,210	2,063	2,147	3,993	217	3,625	345	23	202	15	
Measles	2,409	1,098	1,371	2,397	72	2,135	242	20	67	5	
Influenza	1,776	762	1,014	1,740	36	1,417	314	9	34	2	
Other (suppurative)	1,054	713	941	1,601	53	1,384	206	11	50	3	
Nonsuppurative	17,260	8,106	9,154	16,900	360	14,078	2,771	51	328	32	
Catarrh	11,702	5,565	6,137	11,568	134	10,047	1,496	25	118	10	
Colds	3,074	1,387	1,687	2,967	107	1,954	1,007	6	98	9	
Other (nonsuppurative)	2,484	1,154	1,330	2,365	119	2,077	268	20	112	7	
Miscellaneous (middle ear)	8	2	6	8		5	3				
Internal ear	12,295	7,192	5,103	11,666	629	10,106	1,467	93	611	18	
Labyrinth	2,726	1,698	1,028	2,474	252	2,065	402	7	250	2	
Malarial fever and quinine	1,636	846	790	1,439	197	1,296	139	4	196	1	
Other (labyrinth)	1,090	852	238	1,035	55	769	263	3	54	1	
Nerve	9,361	5,371	3,990	8,991	370	7,875	1,030	86	358	12	
Meningitis	3,991	2,355	1,636	3,824	167	3,648	118	58	165	2	
Brain fever	2,013	1,189	824	1,965	48	1,703	251	11	47	1	
Typhoid fever	2,055	1,054	1,001	1,961	94	1,516	432	13	91	3	
Other (nerve)	1,302	773	529	1,241	61	1,008	229	4	55	6	
Brain center for hearing	129	75	54	124	5	104	20		2	3	
Miscellaneous (internal ear)	79	48	31	77	2	62	15		1	1	
Unclassified:											
Congenital	14,472	7,068	6,804	12,789	1,683	11,371	1,180	238	1,616	66	1
Old age	3,361	1,727	1,634	3,181	180	2,081	1,094	6	167	13	
Military service	3,242	3,231	11	3,130	112	2,517	609	4	109	3	
Falls and blows	2,243	1,417	826	2,046	197	1,473	558	15	183	14	
Sickness	2,143	1,020	1,123	1,907	236	1,348	543	16	200	35	1
Fever	1,436	764	672	1,318	118	1,087	219	12	111	7	
Hereditary	909	429	480	894	15	791	98	5	15		
Miscellaneous (unclassified)	3,390	1,464	1,935	3,202	197	2,436	754	12	185	12	

Table XLVI shows the approximate percentage of the deaf of each class included in Tables XLII, XLIV, and XLV who lost hearing from the specified causes.

TABLE XLVI.—PER CENT DEAF FROM EACH SPECIFIED CAUSE, BY PERIOD OF LIFE WHEN DEAFNESS OCCURRED, DEGREE OF DEAFNESS, SEX, RACE, DEAF RELATIVES, AND CONSANGUINITY OF PARENTS.

CAUSE OF DEAFNESS.	Total.	PERIOD OF LIFE WHEN DEAFNESS OCCURRED.		DEGREE OF DEAFNESS.		SEX.		RACE.						DEAF RELATIVES.		CONSANGUINITY OF PARENTS.	
		Childhood (under 20).	Adult life (20 and over).	Totally deaf.	Partially deaf.	Male.	Female.	Total.		White.		Colored.		a, b, c relatives.	No a, b, c relatives.	Parents cons-ins.	Parents not cons-ins.
								White.	Colored.	Native.	Foreign born.	Negro.	Indian.				
All causes	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Classified	53	54	54	48	57	51	56	55	30	56	46	30	32	51	57	39	56
Unclassified	34	39	39	45	27	37	31	33	55	33	36	55	55	38	33	53	33
Unknown	11	5	15	6	15	11	11	11	13	9	16	13	13	10	9	6	9
Classified:																	
External ear	0	0	1	0	1	1	0	0	1	0	1	1	2	0	1	0	1
Impacted cerumen	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Foreign bodies in ear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous (external ear)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Middle ear	38	36	43	27	47	34	43	40	16	41	34	16	23	41	39	30	40
Suppurative	19	25	11	19	19	17	22	20	9	21	14	9	11	17	21	18	20
Scarlet fever	8	13	1	11	6	7	9	8	1	9	6	1	2	6	9	7	8
Disease of ear	4	5	3	3	5	4	5	4	4	5	2	4	5	5	4	5	4
Measles	2	3	1	2	2	2	3	2	1	3	1	1	2	2	3	2	2
Influenza	1	0	3	0	2	1	2	2	0	2	2	0	1	1	1	1	2
Other (suppurative)	1	2	1	1	1	1	2	1	1	1	1	1	1	1	1	2	1
Nonsuppurative	19	10	32	7	27	17	21	20	7	20	20	7	12	24	17	12	20
Catarrh	13	5	24	3	19	11	14	13	2	14	10	2	6	17	11	7	13
Colds	3	1	5	1	4	2	3	3	2	2	7	2	3	3	3	2	3
Other (nonsuppurative)	2	2	2	2	3	2	3	2	2	2	1	2	2	3	2	2	2
Miscellaneous (middle ear)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Internal ear	13	17	9	20	8	15	12	13	12	14	10	13	6	8	17	8	14
Nerve	10	15	4	18	4	11	9	10	7	11	7	7	4	5	13	6	11
Meningitis	4	7	0	9	0	5	3	4	3	5	0	3	1	1	6	2	4
Brain fever	2	3	0	4	0	2	1	2	0	2	1	1	0	0	3	1	2
Typhoid fever	2	2	2	2	2	2	2	2	1	2	3	1	1	1	2	1	2
Other (nerve)	1	1	1	1	1	1	1	1	1	1	1	1	2	0	1	1	1
Brain center for hearing	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0
Miscellaneous (internal ear)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unclassified:																	
Congenital	16	28	9	33	3	16	16	15	34	16	8	34	24	23	13	42	14
Old age	3	0	0	6	3	3	3	3	2	7	3	5	1	1	3	0	3
Military service	3	0	7	1	5	6	0	3	3	4	2	1	2	2	4	1	3
Falls and blows	2	3	1	2	2	3	1	2	4	2	4	3	5	1	2	2	2
Sickness	2	2	1	2	2	2	2	2	4	1	3	4	13	1	2	1	2
Fever	1	2	1	2	1	1	1	1	2	1	1	2	2	1	1	1	1
Hereditary	1	0	1	0	1	0	1	1	0	1	0	0	0	3	0	1	1
Miscellaneous (unclassified)	3	2	6	2	4	3	4	3	4	3	5	4	4	3	4	2	3

1 In this table the cipher "0" indicates less than 1 per cent; the figure "1" indicates 1 and less than 2 per cent; the figure "2," 2 and less than 3 per cent, etc.

*Period of life when deafness occurred.*—Table XLVI shows that the percentage deaf from suppurative affections of the middle ear is more than twice as great among the deaf from childhood as among the deaf from adult life, and the proportion deaf from affections of the auditory nerve more than three times as great.

On the other hand, the proportion deaf from nonsuppurative or catarrhal affections of the middle ear is more than three times as great among the deaf from adult life as among those deaf from childhood.

*Degree of deafness.*—The percentage congenitally deaf is eleven times as great among the totally as among the partially deaf, and the proportion deaf from affections of the auditory nerve more than four times as great. On the other hand, the percentage deaf from nonsuppurative or catarrhal affections of the middle ear is nearly four times as great among the partially as among the totally deaf.

*Sex.*—The percentage deaf from affections of the internal ear is greater among males than females, and the proportion deaf from affections of the middle ear greater among females than males. The proportion born deaf and deaf from old age is about the same in either case. Military service and falls and blows are of course responsible for a greater proportion of cases among the males than the females.

*Race.*—The percentage deaf from affections of the middle ear is more than twice as great among the whites as among the colored. In the case of scarlet fever, eight times as great. On the other hand, the proportion deaf from malarial fever and quinine is four times as great among the colored as among the whites; and the proportion born deaf more than twice as great.

*Nativity of whites.*—The percentage deaf from the specified causes are larger among the native whites than the foreign born excepting in the case of colds,

typhoid fever, old age, military service, falls and blows, and sickness. An extremely small percentage of the foreign born lost hearing from meningitis.

*Colored races.*—The proportion born deaf and deaf from affections of the internal ear is greater among the negroes than among the Indians; and the proportion deaf from affections of the middle ear, old age, falls and blows, and indefinite "sickness" greater among the Indians than the negroes. More than 4 per cent of the negroes lost hearing from malarial fever and quinine, and less than 1 per cent of the Indians.

*Deaf relatives.*—The percentage born deaf and deaf from disease of ear, catarrh, and from "hereditary" causes is greater among those who have deaf relatives than among those who have not; and the percentage deaf from meningitis, brain fever, typhoid fever, old age, military service, falls and blows, and sickness is less.

*Consanguinity of parents.*—The most striking feature seems to be the large proportion congenitally deaf among those whose parents were cousins. The percentage congenitally deaf is nearly three times as great among those whose parents were cousins as

among those whose parents were not; the percentage deaf from disease of ear is also larger, but only slightly. The percentage deaf from scarlet fever is less, but not to any great extent; and the percentage deaf from catarrh, though considerably less, is sufficiently great to give catarrh prominence among the assigned causes of deafness, both where the parents were cousins and where they were not.

Meningitis, old age, and military service are not at all prominent where the parents were cousins, but moderately so where they were not.

Out of a total of 89,287 deaf, 4,065, 4.5 per cent of the total or 5.1 per cent of those answering, reported that their parents were cousins; 75,530, 84.6 per cent of the total or 94.9 per cent of those answering, reported that their parents were not cousins; and in 9,692 cases, or 10.9 per cent of the whole, the question was not answered. Therefore at least 4.5 per cent of the deaf are the offspring of cousin-marriages.

Table XLVII shows the age and period of life when deafness occurred, the degree of deafness, and the deaf having deaf relatives, by consanguinity of parents, with the percentages resulting.

TABLE XLVII.—NUMBER AND PER CENT OF DEAF, BY AGE WHEN DEAFNESS OCCURRED, DEGREE OF DEAFNESS, DEAF RELATIVES, AND CONSANGUINITY OF PARENTS.

AGE OR PERIOD OF LIFE WHEN DEAFNESS OCCURRED, DEGREE OF DEAFNESS, AND DEAF RELATIVES.	Total.	CONSANGUINITY OF PARENTS.			PER CENT OF TOTAL.			PER CENT OF EACH CLASS.	
		Parents cousins.	Parents not cousins.	Not stated.	Parents cousins.	Parents not cousins.	Not stated.	Parents cousins.	Parents not cousins.
Total.....	89,287	4,065	75,530	9,692	4.5	84.6	10.9	100.0	100.0
Period of life when deafness occurred:									
Childhood (under 20).....	50,296	3,276	43,187	3,833	6.5	85.9	7.6	80.6	57.2
Adult life (20 and over).....	35,924	725	30,731	4,468	2.0	85.6	12.4	17.8	40.7
Unknown.....	3,067	64	1,612	1,391	2.1	52.6	45.3	1.6	2.1
Degree of deafness:									
Totally deaf.....	37,426	2,525	31,500	3,341	6.8	84.3	8.9	62.1	41.8
Partially deaf.....	51,861	1,540	43,970	6,351	3.0	84.8	12.2	37.9	58.2
Deaf relatives: <sup>1</sup>									
<i>a</i> or <i>b</i> relatives.....	25,851	2,171	22,552	1,128	8.4	87.2	4.4	53.4	29.9
No <i>a</i> or <i>b</i> relatives.....	54,630	1,740	51,087	1,808	3.2	93.5	3.3	42.8	67.6
Not stated.....	8,806	154	1,891	6,761	1.7	21.5	76.8	3.8	2.5
Age when deafness occurred:									
Unknown.....	3,067	64	1,612	1,391	2.1	52.6	45.3	1.6	2.1
Indefinitely stated.....	4,630	115	3,333	1,182	2.5	72.0	25.5	2.8	4.4
Definitely stated.....	81,590	3,886	70,685	7,119	4.8	86.5	8.7	95.6	93.5
Birth.....	14,474	1,710	11,324	1,440	11.8	78.2	10.0	42.1	15.0
After birth, under 2.....	7,396	429	6,598	369	5.8	89.2	5.0	10.5	8.7
2 and under 5.....	10,536	509	9,423	604	4.8	89.5	5.7	12.5	12.5
Under 5.....	32,406	2,648	27,345	2,413	8.2	84.4	7.4	65.1	36.2
5 and under 10.....	7,018	248	6,306	464	3.5	89.9	6.6	6.1	8.3
10 and under 15.....	4,464	161	3,995	308	3.6	89.5	6.9	4.0	5.3
15 and under 20.....	4,061	130	3,672	259	3.2	90.4	6.4	3.2	4.9
Under 20.....	47,949	3,187	41,318	3,444	6.6	86.2	7.2	78.4	54.7
20 and under 40.....	16,588	382	14,856	1,350	2.3	89.6	8.1	9.4	19.7
40 and under 60.....	9,437	200	8,176	1,061	2.1	86.6	11.3	4.9	10.8
60 and under 80.....	6,595	105	5,427	1,063	1.6	82.3	16.1	2.6	7.2
80 and over.....	1,021	12	808	201	1.2	79.1	19.7	0.3	1.1

<sup>1</sup> Symbols employed—*a*, deaf brothers, sisters, or ancestors; *b*, deaf uncles, aunts, cousins, or other relatives not *a*, *c*, or *d*; *c*, deaf children (sons or daughters); *d*, deaf husbands or wives.

In the case of the deaf from birth the proportion whose parents were cousins is more than twice as great as when all the deaf are considered, 11.8 per cent of the deaf from birth being the children of cousins and 4.5 per cent of the whole of the deaf.

These would be the true percentages on the usual assumption that the ratios in "not stated" cases are substantially the same as in the cases stated, but in the present instance there is some reason for supposing that they may be different.

Some people are sensitive to questions concerning consanguinity in marriage, especially where defective offspring have appeared, and in such cases nonreply would be an easy means of evading the question. It may be possible, therefore, that the proportion having parents cousins may be larger among the "not stated" than the stated cases. However this may be, and whatever interpretation be put upon cases of nonreply, it is obvious that the true percentages, both in the case of parents cousins and parents not cousins, are greater than those noted in the tables, for the reason already given, viz, that these percentages are based upon totals that include the "not stated" cases.

It also appears that the percentage having parents cousins is greater among the deaf from childhood than the deaf from adult life; greater among the totally deaf than the partially deaf; and greater among those having *a* or *b* deaf relatives than among those who have not (*a* relatives are brothers, sisters, or ancestors; *b* relatives are uncles, aunts, cousins, or other relatives

not *a*, *c*, or *d*; *c* relatives are sons or daughters; and *d* relatives are husbands or wives).

The percentage "not stated" is larger among the deaf from adult life than the deaf from childhood; and, in the case of the deaf from adult life, seems to be proportionally larger the more advanced the age when deafness occurred. This increase is accompanied by a corresponding decrease in the percentage having parents not cousins. The reason for this is not obvious.

Of those whose parents were cousins, 42.1 per cent were deaf from birth, and only 15 per cent of those whose parents were not cousins. It thus appears that the percentage deaf from birth is nearly three times as great (2.8) among the deaf whose parents were cousins as among those whose parents were not.

Of the deaf whose parents were cousins, 53.4 per cent, and of those whose parents were not, 29.9 per cent, have other members of their families deaf (*a* or *b* relatives). It thus appears that the percentage having *a* or *b* deaf relatives is nearly twice as great (1.8) among those whose parents are cousins as among those whose parents are not.

The converse fact also appears, viz, that the percentage having parents cousins is more than twice as great (2.6) among those who have *a* or *b* deaf relatives as among those who have not (relatives, 8.4 per cent; no relatives, 3.2).

Table XLVIII shows the number of deaf from the principal assigned causes, by consanguinity of parents, with the percentages resulting.

TABLE XLVIII.—NUMBER AND PER CENT DEAF FROM PRINCIPAL CAUSES, BY CONSANGUINITY OF PARENTS.

CAUSE OF DEAFNESS.	Total.	CONSANGUINITY OF PARENTS.			PER CENT.		
		Parents cousins.	Parents not cousins.	Not stated.	Parents cousins.	Parents not cousins.	Not stated.
Total.....	89,287	4,065	75,530	9,692	4.5	84.6	10.9
Causes of deafness:							
Affections of external ear.....	871	29	760	82	3.3	87.3	9.4
Affections of middle ear.....	34,801	1,238	30,824	2,739	3.5	88.6	7.9
Affections of internal ear.....	12,295	343	11,121	831	2.8	90.4	6.8
Unclassified.....	31,205	2,183	28,281	3,741	7.0	81.0	12.0
Unknown.....	10,115	272	7,544	2,299	2.7	74.6	22.7
Principal assigned causes:							
Scarlet fever.....	7,424	285	6,647	492	3.9	89.5	6.6
Disease of ear.....	4,210	222	3,683	305	5.3	87.5	7.2
Measles.....	2,469	101	2,194	174	4.1	88.9	7.0
Influenza.....	1,776	45	1,524	207	2.5	85.8	11.7
Catarrh.....	11,702	304	10,480	948	2.6	89.3	8.1
Colds.....	3,074	81	2,666	327	2.6	86.7	10.7
Malarial fever and quinine.....	1,636	67	1,427	142	4.1	87.2	8.7
Meningitis.....	3,991	83	3,741	167	2.1	93.7	4.2
Brain fever.....	2,013	59	1,859	95	2.9	92.4	4.7
Typhoid fever.....	2,055	60	1,839	156	2.9	89.5	7.6
Congenital.....	14,472	1,710	11,322	1,440	11.8	78.2	10.0
Old age.....	3,361	38	2,369	954	1.1	70.5	28.4
Military service.....	3,242	40	2,897	305	1.2	89.4	9.4
Falls and blows.....	2,243	95	1,933	215	4.2	86.2	9.6
Sickness.....	2,143	80	1,786	277	3.7	83.4	12.9
Fever.....	1,436	62	1,257	117	4.3	87.5	8.2
Hereditary.....	909	57	799	53	6.3	87.9	5.8

Table XLVIII shows that of the deaf whose parents were cousins, the assigned causes to which the largest percentages are attributed are the congenital and hereditary causes and disease of ear.

*Deaf relatives.*—Out of a total of 89,287 deaf, 29,716, or 33.3 per cent, had deaf relatives; 50,765, or 56.8

per cent, had not; and in 8,806, or 9.9 per cent, the question relating to deaf relatives remained unanswered (Table 3). It thus appears that one-third of the deaf population of the United States have other members of their families deaf.

Where only one member of a family is deaf, there

is nothing to indicate any inherited predisposition toward deafness in the individual considered; sporadic deafness may be purely adventitious and accidental. But where two or more members of the same family are deaf, it is a little less likely that the deafness is accidental. It is more probable that in many, if not in most, cases heredity has played a part in the production of the deafness; in which case we should look up to the common ancestor of the deaf persons for the initiating cause.

Where a tendency toward ear trouble exists in a family, it may lie dormant and unsuspected until some serious illness attacks a member of the family, when the weak spot is revealed and deafness is produced. We are not all built like that wonderful one-horse shay that was so perfectly made in all its parts that when at last it broke down it crumbled into dust. When an accident occurs, it is the weak part that gives way, and it would be incorrect to attribute the damage to the accident alone and ignore the weakness of the part; both undoubtedly are contributing causes.

In the case, then, of a deaf person who has deaf relatives the assigned cause of deafness may not be the only cause involved, or indeed the true cause at all. It may be the cause simply in the same sense that the pulling of a trigger is the cause of the expulsion of a bullet from a rifle, or a spark the cause of the explosion of a gunpowder magazine; hereditary influences may be involved.

In considering the subject of deaf relatives it seems advisable to distinguish blood relatives from persons who are relatives simply by marriage; and relatives in the direct line, from collateral or distant relatives.

In the present report four kinds of deaf relatives are distinguished, which for convenience of reference are designated by the letters *a*, *b*, *c*, and *d*: *a*, brothers, sisters, or ancestors (direct line); *b*, uncles, aunts, cousins, and other relatives not *a*, *c*, or *d* (collateral); *c*, sons or daughters (descendants); *d*, husbands or wives (relatives by marriage).

The attempt to distinguish blood relatives from persons who are relatives by marriage only has not been entirely successful, for many of the uncles and aunts contained in the *b* class may be relatives by marriage alone.

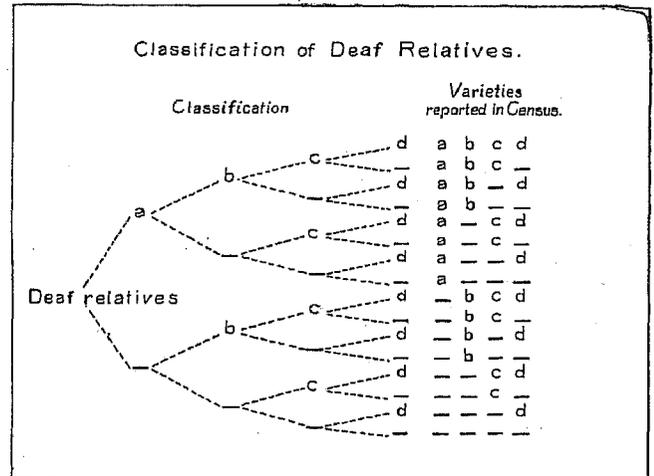
Some of the deaf have *a* relatives, others have *b* relatives, etc., and still others have both *a* and *b* relatives, as well, perhaps, as relatives belonging to the *c* and *d* classes. It therefore becomes necessary to effect a classification of deaf relatives so as to distinguish in the tables the various combinations; for it is obvious that if (without some special arrangement or understanding in this matter) we should add together the

totals having *a*, *b*, *c*, or *d* relatives, the summation would exceed the aggregate. For example, the total number reported as having deaf relatives is 29,716 (Table 3). Of these, 21,660 had *a* relatives deaf, 8,308 had *b* relatives deaf, 677 had *c* relatives deaf, and 5,051 had *d* relatives deaf. The summation is 35,696, which exceeds the aggregate by 5,980. This, of course, results from the fact that some of those having *a* relatives had also *b* or *c* or *d* relatives, etc. In former censuses, in which deaf relatives were divided into smaller groups and more of them, the discrepancy between the summation and the aggregate was so great as to render it exceedingly difficult to draw broad conclusions from the statistics.

In the present report only four kinds of relatives are considered, giving the advantage of larger numbers with which to deal; and a plan of classification has been adopted which enables us to safely add the varieties together without duplication, thus facilitating researches relating to deaf relatives.

*Classes.*—In classifying deaf relatives we may begin by dividing the deaf into two classes—those who have *a* relatives and those who have not (Diagram 38).

Diagram 38.



*Broad groups.*—Each of these classes may then be divided into two broad groups (comparable to genera)—those who have *b* relatives and those who have not.

*Subgroups.*—Each of these groups may then be divided into two subgroups (comparable to species)—those who have *c* relatives and those who have not.

*Varieties.*—Each of these subgroups may be still further subdivided into two varieties—those who have *d* relatives and those who have not.

It will be noticed that the census returns include all possible combinations of *a*, *b*, *c*, and *d*. Diagram 38 exhibits the whole scheme of classification after the manner of a genealogical chart, with the combinations

of a, b, c, and d relatives reported in the census arranged in accordance with the classification.

Tables XLIX and L relate to the deaf who have deaf relatives, arranging them into classes, broad groups, subgroups, and varieties in accordance with the classification.

Table XLIX shows the number of the deaf having deaf relatives of the specified classes, by period of life when deafness occurred, degree of deafness, sex, consanguinity of parents, and sex of the married deaf, and is illustrated by Diagram 39.

Table L shows the number of the deaf having deaf relatives of the specified classes, by age or period of life when deafness occurred.

Diagram 39.

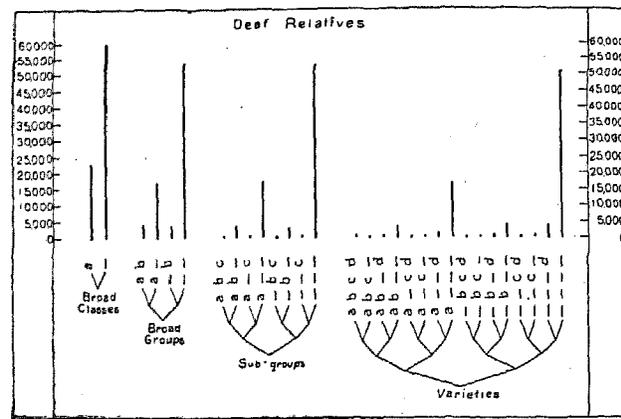


TABLE XLIX.—THE DEAF BY DEAF RELATIVES (a, b, c, OR d),<sup>1</sup> PERIOD OF LIFE WHEN DEAFNESS OCCURRED, DEGREE OF DEAFNESS, SEX, CONSANGUINITY OF PARENTS, AND SEX OF MARRIED DEAF.

CLASS OF DEAF RELATIVES.	Total.	PERIOD OF LIFE WHEN DEAFNESS OCCURRED.			DEGREE OF DEAFNESS.		SEX.		CONSANGUINITY OF PARENTS.			THE MARRIED DEAF.		
		Child-hood (under 20).	Adult life (20 and over).	Un-known.	Totally deaf.	Partially deaf.	Male.	Female.	Parents cousins.	Parents not cousins.	Not stated.	Total.	Male.	Female.
Total.....	89,287	50,296	35,924	3,067	37,426	51,861	46,915	42,372	4,005	75,530	9,692	34,206	19,746	14,460
Deaf relatives:														
Not stated.....	8,806	3,049	4,356	1,401	2,646	6,160	4,251	4,555	154	1,891	6,761	2,872	1,655	1,217
Stated.....	80,481	47,247	31,568	1,666	34,780	45,701	42,664	37,817	3,911	73,639	2,931	31,334	18,091	13,243
Stated:														
a relatives.....	21,660	11,783	9,520	357	8,170	13,490	10,669	10,991	1,850	18,838	972	9,308	5,027	4,281
No a relatives.....	58,821	35,464	22,045	1,309	26,610	32,211	31,995	26,826	2,061	54,801	1,959	22,026	13,064	8,962
a or b relatives.....	25,851	14,481	10,946	424	10,063	15,818	12,834	13,017	2,171	22,552	1,128	10,888	5,876	5,012
a b.....	4,117	2,352	1,704	61	1,499	2,618	1,947	2,170	412	3,587	118	1,764	919	845
a.....	17,543	9,431	7,816	296	6,671	10,872	8,722	8,821	1,438	15,251	854	7,544	4,108	3,436
b.....	4,191	2,698	1,426	67	1,863	2,328	2,165	2,026	321	3,714	150	1,580	849	731
No a or b relatives.....	54,630	32,766	20,622	1,242	24,747	29,883	29,830	24,800	1,740	51,087	1,803	20,446	12,215	8,231
a, b, or c relatives.....	26,221	14,614	11,167	440	10,152	16,069	13,011	13,210	2,181	22,879	1,161	11,116	6,009	5,107
a b c.....	71	42	29	-----	33	38	36	35	5	65	1	52	31	21
a b.....	4,046	2,310	1,675	61	1,466	2,580	1,911	2,135	407	3,522	117	1,712	888	824
a.....	198	92	103	3	80	118	92	106	16	171	11	137	76	61
b.....	17,345	9,339	7,713	293	6,591	10,754	8,630	8,715	1,422	15,080	843	7,407	4,032	3,375
c.....	38	15	23	-----	14	24	14	24	-----	36	2	20	10	10
b c.....	4,153	2,683	1,403	67	1,849	2,304	2,151	2,002	321	3,678	154	1,560	839	721
b.....	370	133	221	16	119	251	177	193	10	327	33	228	133	95
c.....	54,260	32,633	20,401	1,226	24,628	29,632	29,653	24,607	1,730	50,760	1,770	20,218	12,082	8,136
a, b, c, or d relatives.....	29,716	17,681	11,523	512	13,039	16,677	14,771	14,945	2,285	26,088	1,343	14,558	7,750	6,808
a b c d.....	23	20	3	-----	20	3	16	7	3	19	1	23	16	7
a b c.....	48	22	26	-----	13	35	20	28	2	46	-----	29	15	14
a b.....	221	201	16	4	185	36	111	110	24	187	10	219	110	109
a b.....	3,825	2,109	1,659	57	1,281	2,544	1,800	2,025	383	3,335	107	1,493	778	715
a.....	54	51	2	1	48	6	26	28	8	43	3	53	25	28
b.....	144	41	101	2	32	112	66	78	8	128	8	84	51	33
c.....	930	829	88	13	766	164	453	477	111	775	44	914	450	464
a.....	16,415	8,510	7,625	280	5,825	10,590	8,177	8,238	1,311	14,305	799	6,493	3,582	2,911
b c d.....	8	8	-----	-----	7	1	2	6	-----	7	1	6	2	4
b c.....	30	7	23	-----	7	23	12	18	-----	20	1	14	8	6
b.....	241	223	14	4	212	29	127	114	13	219	9	231	121	110
b.....	3,912	2,460	1,389	63	1,637	2,275	2,024	1,888	308	3,459	145	1,329	718	611
c d.....	79	72	7	-----	66	13	37	42	2	72	5	77	36	41
c.....	291	61	214	16	53	238	140	151	8	255	28	151	87	54
d.....	3,495	3,067	356	72	2,887	608	1,760	1,735	104	3,209	182	3,442	1,741	1,701
No a, b, c, or d relatives.....	50,765	29,566	20,045	1,154	21,741	29,024	27,593	22,572	1,626	47,551	1,588	16,776	10,341	6,435

<sup>1</sup> Symbols employed—*a*, deaf brothers, sisters, or ancestors; *b*, deaf uncles, aunts, cousins, or other relatives not *a*, *c*, or *d*; *c*, deaf children (sons or daughters); *d*, deaf husbands or wives.

# DEAF RELATIVES.

TABLE L.—THE DEAF BY DEAF RELATIVES (*a, b, c, or d*),<sup>1</sup> AND AGE WHEN DEAFNESS OCCURRED.

CLASS OF DEAF RELATIVES.	Total.	AGE WHEN DEAFNESS OCCURRED.			AGE WHEN DEAFNESS OCCURRED.											
		Definitely stated.	Indefinitely stated.	Unknown.	Birth.	After birth, under 2.	2 and under 5.	Under 5.	5 and under 10.	10 and under 15.	15 and under 20.	Under 20.	20 and under 40.	40 and under 60.	60 and under 80.	80 and over.
Total.....	89,287	81,590	4,630	3,067	14,474	7,396	10,536	32,406	7,018	4,464	4,061	47,949	16,588	9,437	6,595	1,021
Deaf relatives:																
Not stated.....	8,806	6,199	1,206	1,401	1,044	298	485	1,827	367	262	218	2,674	1,201	966	1,141	217
Stated.....	80,481	75,391	3,424	1,666	13,430	7,098	10,051	30,579	6,651	4,202	3,843	45,275	15,387	8,471	5,454	804
Stated:																
<i>a</i> relatives.....	21,660	20,451	852	357	5,295	961	1,341	7,597	1,123	1,227	1,315	11,262	5,256	2,633	1,198	102
No <i>a</i> relatives.....	58,821	54,940	2,572	1,309	8,135	6,137	8,710	22,982	5,528	2,975	2,528	34,013	10,131	5,838	4,256	702
<i>a</i> or <i>b</i> relatives.....	25,851	24,411	1,016	424	6,116	1,378	1,873	9,367	1,451	1,457	1,569	13,844	6,111	3,003	1,340	113
<i>a</i> <i>b</i> .....	4,117	3,904	152	61	1,021	160	243	1,424	212	305	320	2,261	1,086	438	111	8
<i>a</i> —.....	17,543	16,547	700	296	4,274	801	1,098	6,173	911	922	995	9,001	4,170	2,195	1,087	94
— <i>b</i> .....	4,191	3,960	164	67	821	417	532	1,770	328	230	254	2,582	855	370	142	11
No <i>a</i> or <i>b</i> relatives.....	54,030	50,980	2,408	1,242	7,314	5,720	8,178	21,212	5,200	2,745	2,274	31,431	9,276	5,468	4,114	691
<i>a, b, or c</i> relatives.....	20,221	24,749	1,032	440	6,155	1,397	1,902	9,454	1,467	1,469	1,584	13,974	6,210	3,060	1,388	117
<i>a</i> <i>b</i> <i>c</i> .....	71	70	1	1	16	3	3	22	5	3	11	41	20	9	1	1
<i>a</i> <i>b</i> <i>c</i> .....	4,046	3,834	151	61	1,005	157	240	1,402	207	302	309	2,220	1,066	429	111	8
<i>a</i> — <i>c</i> .....	198	190	5	3	52	5	7	64	9	9	10	92	61	26	11	1
<i>a</i> — <i>b</i> .....	17,345	16,357	695	293	4,222	796	1,091	6,109	902	913	985	8,909	4,109	2,169	1,076	94
— <i>b</i> <i>c</i> .....	38	36	2	1	4	1	3	8	2	3	1	14	8	4	1	1
— <i>b</i> <i>c</i> .....	4,153	3,924	162	67	817	416	529	1,762	326	227	253	2,568	845	362	138	11
— <i>c</i> .....	370	338	16	16	30	19	29	87	16	12	15	130	99	57	48	4
No <i>a, b, or c</i> relatives.....	54,260	50,642	2,392	1,226	7,275	5,701	8,149	21,125	5,184	2,733	2,259	31,301	9,177	5,411	4,066	687
<i>a, b, c, or d</i> relatives.....	29,716	28,087	1,117	512	6,621	1,948	3,143	11,712	2,051	1,606	1,626	16,995	6,311	3,161	1,494	126
<i>a</i> <i>b</i> <i>c</i> <i>d</i> .....	23	22	1	1	12	3	3	18	1	1	1	19	3	1	1	1
<i>a</i> <i>b</i> <i>c</i> .....	48	48	1	1	4	1	1	4	1	1	1	22	17	9	1	1
<i>a</i> <i>b</i> — <i>d</i> .....	221	217	4	4	122	27	28	177	17	5	2	201	11	4	1	1
<i>a</i> <i>b</i> —.....	3,825	3,617	151	57	883	130	212	1,225	190	297	307	2,019	1,055	425	110	8
<i>a</i> — <i>c</i> .....	54	53	1	1	37	4	4	45	4	1	1	51	2	1	1	1
<i>a</i> — <i>c</i> .....	144	137	5	2	15	1	3	19	5	8	9	41	59	26	11	1
<i>a</i> — <i>b</i> <i>c</i> .....	930	889	28	13	468	87	157	712	73	15	6	806	36	28	18	1
<i>a</i> — <i>b</i> <i>c</i> .....	16,415	15,468	697	280	3,754	709	934	5,397	829	898	979	8,103	4,973	2,141	1,058	93
— <i>b</i> <i>c</i> <i>d</i> .....	8	8	1	1	3	1	3	7	1	1	1	8	1	1	1	1
— <i>b</i> <i>c</i> .....	30	28	2	1	1	1	1	1	1	1	1	6	10	8	4	1
— <i>b</i> <i>c</i> .....	241	233	4	4	50	48	75	173	36	10	1	220	6	3	4	1
— <i>b</i> .....	3,012	3,091	158	63	767	368	454	1,589	290	217	252	2,348	839	359	134	11
— <i>c</i> .....	79	77	2	2	25	16	21	62	5	2	1	70	5	1	1	1
— <i>c</i> .....	291	261	14	16	14	3	8	25	11	10	14	60	94	56	47	4
— <i>c</i> .....	3,495	3,338	85	72	466	551	1,241	2,258	584	137	42	3,021	101	101	107	9
No <i>a, b, c, or d</i> relatives.....	50,765	47,304	2,307	1,154	6,809	5,150	6,908	18,867	4,600	2,596	2,217	28,280	9,078	5,310	3,960	678

<sup>1</sup> Symbols employed—*a*, deaf brothers, sisters, or ancestors; *b*, deaf uncles, aunts, cousins, or other relatives not *a, c, or d*; *c*, deaf children (sons or daughters); *d*, deaf husbands or wives.

*Broad classes.*—The primary division is into two broad classes, “*a* relatives” and “no *a* relatives.”

The first class (*a*) consists of deaf persons who have deaf brothers, sisters, or ancestors.

The second class (—) consists of those who have no deaf brothers, sisters, or ancestors.

*a*.....*a* relatives.  
—.....No *a* relatives.

*Broad groups.*—Two divisions, “*a* or *b* relatives” and “no *a* or *b* relatives.”

The first division consists of deaf persons who have (*a*) deaf brothers, sisters, or ancestors; or (*b*) deaf uncles, aunts, cousins, or other more distant relatives (not *a, c, or d*).

The second division consists of (— —) those who have neither *a* nor *b* relatives.

*a* or *b* relatives:  
*a* *b*.....both *a* and *b*.  
*a* —.....*a* but not *b*.  
— *b*.....*b* but not *a*.

No *a* or *b* relatives:  
— —.....neither *a* nor *b*.

*Subgroups.*—Two divisions, “*a, b, or c* relatives” and “no *a, b, or c* relatives.”

The first division consists of deaf persons who have (*a*) deaf brothers, sisters, or ancestors; (*b*) deaf uncles, aunts, cousins, or other more distant relatives (not *a, c, or d*); or (*c*) deaf children (sons or daughters).

The second division consists of (— — —) those who have neither *a, b, nor c* deaf relatives.

*a, b, or c* relatives:  
*a* *b* *c*.....*a, b, and c*.  
*a* *b* —.....*a* and *b* but not *c*.  
*a* — *c*.....*a* and *c* but not *b*.  
*a* —.....*a* but not *b* or *c*.  
— *b* *c*.....*b* and *c* but not *a*.  
— *b*.....*b* but not *a* or *c*.  
— — *c*.....*c* but not *a* or *b*.

No *a, b, or c* relatives:  
— — —.....neither *a, b, nor c*.

*Varieties.*—Two divisions, “*a, b, c, or d* relatives” and “no *a, b, c, or d* relatives.”

The first division consists of deaf persons who have (*a*) deaf brothers, sisters, or ancestors; (*b*) deaf uncles, aunts, cousins, or other more distant relatives (not *a, c, or d*); (*c*) deaf children (sons or daughters); or (*d*) deaf husbands or wives.

The second division consists of (— — —) those who have neither *a*, *b*, *c*, nor *d* deaf relatives.

*a*, *b*, *c*, or *d* relatives:

- a b c d*....*a*, *b*, *c*, and *d*.
- a b c* —....*a*, *b*, *c*, but not *d*.
- a b* — *d*....*a*, *b*, *d*, but not *c*.
- a b* — —....*a*, *b*, but not *c*, *d*.
- a* — *c d*....*a*, *c*, *d*, but not *b*.
- a* — *c* —....*a*, *c*, but not *b*, *d*.
- a* — — *d*....*a*, *d*, but not *b*, *c*.
- a* — — —....*a* but not *b*, *c*, *d*.
- *b c d*....*b*, *c*, *d*, but not *a*.
- *b c* —....*b*, *c*, but not *a*, *d*.
- *b* — *d*....*b*, *d*, but not *a*, *c*.
- *b* — —....*b* but not *a*, *c*, *d*.
- — *c d*....*c*, *d*, but not *a*, *b*.
- — *c* —....*c* but not *a*, *b*, *d*.
- — — *d*....*d* but not *a*, *b*, *c*.

No *a*, *b*, *c*, or *d* relatives:

- — — —....neither *a*, *b*, *c*, nor *d*.

The 16 varieties shown can be added together in any way that may be desired without duplication of the persons referred to.

As an illustration of the method of handling deaf relatives symbolically, take a case from Table XLIX.

Suppose we desire to ascertain the number of deaf persons reported to have deaf children; we simply add together all the varieties containing the letter *c* (the symbol for deaf sons or daughters). The summation of the varieties containing the letter *d* will give us the

number having deaf husbands or wives. The varieties containing the combination *c d* will give us those who have both *c* and *d* relatives; and — *d* will give us *d* relatives without *c*.

ILLUSTRATION.

<i>a b c d</i>				<i>a b c d</i>
<i>a b c</i> —				<i>a b</i> — <i>d</i>
<i>a</i> — <i>c d</i>				<i>a</i> — <i>c d</i>
<i>a</i> — <i>c</i> —				<i>a</i> — — <i>d</i>
— <i>b c d</i>	<i>a b c d</i>	<i>a b</i> — <i>d</i>		— <i>b c d</i>
— <i>b c</i> —	<i>a</i> — <i>c d</i>	<i>a</i> — — <i>d</i>		— <i>b</i> — <i>d</i>
— — <i>c d</i>	— <i>b c d</i>	— <i>b</i> — <i>d</i>		— — <i>c d</i>
— — <i>c</i> —	— — <i>c d</i>	— — — <i>d</i>		— — — <i>d</i>
	<i>c</i>	<i>c d</i>	— <i>d</i>	<i>d</i>

INTERPRETATION.

- c*...The total number having deaf children (sons or daughters).
- c d*...Number having deaf children and deaf husbands or wives.
- *d*...Number having deaf husbands or wives but not deaf children.
- d*...The total number having deaf husbands or wives.

The importance will be noted of (—), a positive sign for a negative fact; *d* means a different thing from — *d*.

*a* or *b* relatives.—From Table XLIX it appears that out of a total of 89,287 deaf persons 80,481 answered the questions relating to deaf relatives and 8,806 did not. The percentages given in Table LI are based upon the "stated cases."

TABLE LI.—THE PER CENT OF THE DEAF HAVING DEAF RELATIVES (*a* OR *b*), SHOWN FOR THE DEAF CLASSIFIED BY PERIOD OF LIFE WHEN DEAFNESS OCCURRED, DEGREE OF DEAFNESS, SEX, CONSANGUINITY OF PARENTS, AND SEX OF MARRIED DEAF.

CLASS OF DEAF RELATIVES.	Total.	PERIOD OF LIFE WHEN DEAFNESS OCCURRED.		DEGREE OF DEAFNESS.		SEX.		CONSANGUINITY OF PARENTS.		THE MARRIED DEAF.		
		Childhood (under 20).	Adult life (20 and over).	Totally deaf.	Partially deaf.	Male.	Female.	Parents cousins.	Parents not cousins.	Total.	Male.	Female.
Deaf relatives:												
Stated.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<i>a</i> .....	26.9	25.0	30.2	23.5	29.5	25.0	29.0	47.3	25.5	29.7	27.8	32.3
—.....	73.1	75.0	69.8	76.5	70.5	75.0	71.0	52.7	74.5	70.3	72.2	67.7
( <i>a</i> or <i>b</i> ).....	32.1	30.7	34.7	28.8	34.6	30.1	34.4	55.5	30.6	34.7	32.5	37.8
<i>a b</i> .....	5.1	5.0	5.4	4.3	5.7	4.6	5.7	10.5	4.8	5.6	5.1	6.4
<i>a</i> —.....	21.8	20.0	24.8	19.2	23.8	20.4	23.3	36.8	20.7	24.1	22.7	25.9
— <i>b</i> .....	5.2	5.7	4.5	5.3	5.1	5.1	5.4	8.2	5.1	5.0	4.7	5.5
— —.....	67.9	69.3	65.3	71.2	65.4	69.9	65.6	44.5	69.4	65.3	67.5	62.2

Nearly one-third of the deaf, 32.1 per cent, are reported as having deaf relatives (*a* or *b*). That is, they had deaf brothers, sisters, ancestors, or deaf uncles, aunts, cousins, or more distant relatives.

Table LI shows that the proportion having deaf relatives (*a* or *b*) is greater among the deaf from adult life than among the deaf from childhood, and greater among the partially deaf than the totally deaf. It is also greater among females than males. It is greatest of all among deaf persons whose parents were cousins (parents cousins, 55.5 per cent; not cousins, 30.6 per cent).

In the case of the deaf from birth (Table L) 45.5 per cent had deaf relatives (*a* or *b*); so that it seems strange that the proportion having deaf relatives should be smaller among the deaf from childhood (which includes the deaf from birth) than among those who became deaf in adult life. This means, of course, that the percentage having deaf relatives must be still smaller among the noncongenitally deaf from childhood. If we limit our inquiry to the deaf from early childhood (under 5), all of whom belong naturally to the class deaf and dumb, we find that even in their case the proportion having deaf relatives

is smaller than in the case of the deaf from adult life. From Table L it appears that 9,367 persons who became deaf before reaching the age of 5 had *a* or *b* deaf relatives; and these constitute 30.6 per cent of the stated cases, whereas 34.7 per cent of the deaf from adult life had deaf relatives (*a* or *b*) (Table LI).

Of the 9,367 cases referred to above 6,116 were deaf from birth and 3,251 became deaf after birth and before reaching the age of 5 (Table L). Thus 45.5 per cent of the deaf from birth, 18.9 per cent of the noncongenitally deaf from early childhood (under 5), and 34.7 per cent of the deaf from adult life had *a* or *b* deaf relatives.

These figures are very striking, and seem to indicate that heredity has played a part in the production of congenital deafness, and also of deafness occurring in adult life (caused principally by catarrh); whereas deafness occurring in early childhood after birth and under the age of 5 (due principally to scarlet fever, meningitis, and brain fever) is probably adventitious in a large proportion of cases—the sporadic cases constituting 81.1 per cent of the whole.

The partial deafness of adult life caused by catarrh usually comes on gradually and sometimes affects different members of the same family at or about the

same age. It is probable, therefore, that a tendency toward catarrh is hereditary in these families, producing deafness occasionally in different members by extension to the middle ear; or the inherited tendency may be toward a local catarrh of the middle ear.

The noncongenital deafness of early childhood, caused mainly by scarlet fever, meningitis, and brain fever, is more accidental in character, and is probably due chiefly to extraneous causes of an epidemical nature producing total deafness in a large proportion of cases.

The causes of congenital deafness are very obscure, but it is obvious that in many cases hereditary influences are involved. This is shown by the large proportion having deaf relatives. It is also shown by the large proportion of the deaf from birth whose parents were cousins, and by the large proportion of the deaf whose parents were cousins who were born deaf (Table XLVII).

The most prominent figures of Table L are reduced to percentages in Table LII. In this table the deaf are arranged by age groups when deafness occurred, and the percentage in each age group who have *a* or *b* relatives is shown.

TABLE LII.—THE PER CENT OF THE DEAF HAVING DEAF RELATIVES (*a* OR *b*), SHOWN FOR THE DEAF CLASSIFIED BY AGE WHEN DEAFNESS OCCURRED.

CLASS OF DEAF RELATIVES.	AGE WHEN DEAFNESS OCCURRED DEFINITELY STATED.								
	Birth.	After birth, under 5.	5 and under 10.	10 and under 15.	15 and under 20.	20 and under 40.	40 and under 60.	60 and under 80.	80 and over.
Deaf relatives: Stated.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<i>a</i> .....	39.4	13.4	16.0	20.2	34.2	34.2	31.1	22.0	12.7
<i>b</i> .....	60.6	86.6	83.1	70.8	65.8	65.8	68.9	78.0	87.3
<i>a</i> or <i>b</i> .....	45.5	18.9	21.8	34.7	40.8	39.8	35.5	24.6	14.0
<i>a</i> and <i>b</i> .....	7.6	2.3	3.2	7.3	8.3	7.0	5.2	2.0	1.0
$\frac{a}{b}$ .....	31.8	11.1	13.7	21.9	25.9	27.2	25.9	20.0	11.7
$\frac{b}{a}$ .....	6.1	5.5	4.9	5.5	6.6	5.6	4.4	2.6	1.3
—.....	54.5	81.1	78.2	65.3	59.2	60.2	64.5	75.4	86.0

In the noncongenital cases it will be observed that the proportion having *a* or *b* relatives deaf is small among the deaf from early childhood (under 5), and then becomes progressively greater where deafness occurred in middle childhood (5 to 10) and late childhood (10 to 15), reaching a maximum in youth or adolescence (15 to 20). This maximum is substantially retained during early manhood (20 to 40), and then the percentage progressively diminishes in middle life (40 to 60), declining years (60 to 80), and old age (80 and over).

Where deafness occurred during these periods of life the percentages having deaf relatives (*a* or *b*) are respectively as follows: 18.9, 21.8, 34.7, 40.8, 39.8, 35.5, 24.6, and 14 (Table LII).

The noncongenitally deaf who lost hearing between the ages of 15 and 40 show the largest percentage having deaf relatives (*a* or *b*)—about 40 per cent.

The evidence seems to point to heredity as a contributing cause of deafness in two classes of deaf persons, the deaf from birth (most of whom are totally deaf), and the deaf from catarrh (most of whom are partially deaf).

Persons who lost hearing from affections of the middle ear, however (including catarrh), are found mostly in those parts of the country which have the least sunshine (Map 10), namely, the New England states and the states bordering on the Great Lakes, so that it is probable that climatic conditions have a good deal to do with the production of catarrhal deafness. As the members of the same family would often be exposed to identical climatic conditions, we might reasonably anticipate that catarrhal deafness would sometimes appear in more than one member of the same family, quite independently of any hereditary tendency toward the disease (Map 6).

The geographic congestion of the deaf from scarlet fever, however, is even more marked (Map 5), and it is not at all unusual for several members of the same family to be ill from scarlet fever at the same time. The deaf from meningitis, too, an epidemic disease of great virulence, show a very marked geographic congestion within a limited area of country, having its center in Indiana (Map 8); and yet the percentage having *a* or *b* relatives deaf is small among the noncongenitally deaf from early childhood (under 5), most of whom lost hearing from scarlet fever and meningitis, while it is large among the deaf from adult life, most of whom became deaf from catarrh. The hereditary character of catarrhal deafness can hardly be doubted.

*c relatives.*—Six hundred and seventy-seven deaf persons are returned who have deaf children; 319 of these were males and 358 females (Table LIII). The number of deaf children born to these persons is not stated in the tabulated returns, but we may form some idea of the number by ascertaining how many families were formed by these 677 persons and crediting each family with one deaf child.

Of the 677 persons reported to have deaf children, 437 (250 males and 187 females) appeared among the returns of the married deaf (Table LVII); and the remaining 240 cases (69 males and 171 females) were returned among the single, widowed, or divorced. These 240 cases, therefore, constituted 240 families, 69 of which had deaf male heads only, and 171 deaf female heads.

Of the 437 cases which appeared among the married deaf, 159 were deaf persons with deaf husbands or wives (79 deaf males with deaf wives and 80 deaf females with deaf husbands) (Table LVII), and in 278 cases the husbands or wives were not deaf—that is, they were hearing persons. These consisted of 171 deaf males with hearing wives and 107 deaf females with hearing husbands.

If we assume that the deaf males with deaf wives constituted the same families as the deaf females with deaf husbands, then we find a total of 80 families containing deaf children in which both the husbands and wives were deaf.

The 278 cases in which the husbands or wives were not deaf constituted 278 families. Thus the 677 persons reported as having deaf children (Table LIII) constituted 598 families; and if each family had only one deaf child, then there were 598 deaf children having one or both parents deaf. This is a minimum estimate, for some of the families considered undoubtedly contained two or more deaf children. Cases are well known in which two, three, four, five, six, and even seven deaf children have appeared in families in which both the parents were deaf mutes.

The deaf whose parents were deaf were reported in the original verified census schedules, but unfortunately the returns have not been tabulated separately, being simply included in the returns of those having *a* relatives (deaf brothers, sisters, or ancestors). We are therefore obliged to resort to an estimate; and all we can conclude from the tabulated statements is that more than 598 deaf persons having one or both parents deaf are referred to in the present census. How many more it is now impossible to ascertain without resort to the original schedules.

Out of a total population of 75,994,575 persons, 89,287, or 1,175 per million, were returned as deaf. If, then, the children of deaf persons were no more liable to deafness than the people generally of the United States, we should expect to find 105 deaf persons returned whose parents were deaf, for this number would constitute 1,175 per million of the deaf population. But the above facts show that more than 598 deaf children of deaf parents exist in the United States, from which it is obvious that the tendency to deafness among the children of deaf persons is more than five and one-half times as great as in the case of the general population of the United States. How much more can not now be ascertained excepting by a special investigation of the original schedules.

Table LIII shows the deaf who have deaf children (*c*), by deaf relatives (*a* or *b*), by period of life when deafness occurred, degree of deafness, sex, and consanguinity of parents, giving the number and percentage in each class.

TABLE LIII.—THE DEAF HAVING DEAF CHILDREN (*c*), CLASSIFIED BY PERIOD OF LIFE WHEN DEAFNESS OCCURRED, DEGREE OF DEAFNESS, SEX, CONSANGUINITY OF PARENTS, AND DEAF RELATIVES (*a* OR *b*).

CLASS OF DEAF RELATIVES.	Total.	PERIOD OF LIFE WHEN DEAFNESS OCCURRED.			DEGREE OF DEAFNESS.		SEX.		CONSANGUINITY OF PARENTS.		
		Childhood (under 20).	Adult life (20 and over).	Un-known.	Totally deaf.	Partially deaf.	Male.	Female.	Parents cousins.	Not cousins.	Not stated.
Number:											
<i>c</i> .....	677	282	376	19	246	431	319	358	31	599	47
( <i>a</i> or <i>b</i> ) <i>c</i> .....	307	140	155	3	127	180	142	165	21	272	14
<i>a</i> <i>b</i> <i>c</i> .....	71	42	29	.....	33	38	36	35	5	65	1
<i>a</i> — <i>c</i> .....	198	92	103	3	80	118	92	106	16	171	11
— <i>b</i> <i>c</i> .....	38	15	23	.....	14	24	14	24	.....	36	2
— — <i>c</i> .....	370	133	221	16	119	251	177	193	10	327	33
Per cent:											
<i>c</i> .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
( <i>a</i> or <i>b</i> ) <i>c</i> .....	45.3	52.8	41.2	(1)	51.6	41.8	44.5	46.1	(1)	45.4	(1)
<i>a</i> <i>b</i> <i>c</i> .....	10.5	14.9	7.7	.....	13.4	8.8	11.3	9.8	.....	10.9	.....
<i>a</i> — <i>c</i> .....	29.2	32.7	27.4	.....	32.5	27.4	28.8	29.6	.....	28.5	.....
— <i>b</i> <i>c</i> .....	5.6	5.2	6.1	.....	5.7	5.6	4.4	6.7	.....	6.0	.....
— — <i>c</i> .....	54.7	47.2	58.8	.....	48.4	58.2	55.5	53.9	.....	54.6	.....
Per cent:											
<i>c</i> .....	100.0	41.7	55.5	2.8	36.3	63.7	47.1	52.9	4.6	88.5	6.9
( <i>a</i> or <i>b</i> ) <i>c</i> .....	100.0	48.5	50.5	1.0	41.4	58.6	46.3	53.7	6.8	88.6	4.6
<i>a</i> <i>b</i> <i>c</i> .....	100.0	(1)	.....	.....	.....	.....	.....	.....	.....	.....	.....
<i>a</i> — <i>c</i> .....	100.0	46.5	52.0	1.5	40.4	59.6	46.5	53.5	8.1	86.3	5.6
— <i>b</i> <i>c</i> .....	100.0	(1)	.....	.....	.....	.....	.....	.....	.....	.....	.....
— — <i>c</i> .....	100.0	36.0	59.7	4.3	32.1	67.9	47.8	52.2	2.8	88.3	8.9

<sup>1</sup> Percentage not given where base is less than 100.

Table LIII reveals the fact that the majority of the deaf who have deaf children are persons who became deaf in adult life. This result is somewhat surprising and could not have been anticipated. It only confirms the conclusion reached upon other grounds that heredity sometimes plays a part in the production of catarrh of the middle ear—the chief cause of deafness occurring in adult life.

The total number returned as having deaf children is 677, of whom 63.7 per cent were partially deaf and 55.5 per cent deaf from adult life; 52.9 per cent were females; 45.3 per cent had *a* or *b* deaf relatives; and 4.6 per cent were the offspring of cousin-marriages.

In the case of the deaf who had deaf children, the proportion having deaf relatives (*a* or *b*) is greater among those deaf from childhood than adult life; and greater among the totally deaf than the partially deaf (Table LIII). The opposite is the case among the whole of the deaf (Table LI).

In both cases, however, the percentage is greater among females than males; and greater among those whose parents were cousins than among those whose parents were not.

Nearly one-third of the whole deaf population, 32.1 per cent, had *a* or *b* deaf relatives (Table LI); and nearly one-half, 45.3 per cent, of the deaf who had deaf children had *a* or *b* relatives deaf (Table LIII).

*d* relatives.—Out of a total of 89,287 deaf, 5,051 had deaf husbands or wives (*d*), 75,430 had not, and in 8,806 cases the question relating to deaf relatives remained unanswered (Table XLIX).

We can not assume that the 75,430 persons referred to above had hearing husbands or wives, for the figures include the whole of the deaf—the single as well as the married, widowed, and divorced. Even in the case of the 5,051 deaf persons who had deaf husbands or wives (*d*), we can not assume that the deaf husbands or wives reported were all living at the time the census was taken; for only 4,965 appear in the returns of the married (Table XLIX), so that the remaining 86 were either widowed or divorced.

Table LIV shows the deaf who had deaf husbands or wives (*d*), by deaf relatives (*a*, *b*, or *c*); by period of life when deafness occurred, degree of deafness, sex, and consanguinity of parents.

TABLE LIV.—THE DEAF HAVING DEAF HUSBANDS OR WIVES (*d*), CLASSIFIED BY PERIOD OF LIFE WHEN DEAFNESS OCCURRED, DEGREE OF DEAFNESS, SEX, CONSANGUINITY OF PARENTS, AND DEAF RELATIVES (*a*, *b*, OR *c*).

CLASS OF DEAF RELATIVES.	Total.	PERIOD OF LIFE WHEN DEAFNESS OCCURRED.			DEGREE OF DEAFNESS.		SEX.		CONSANGUINITY OF PARENTS.		
		Childhood (under 20).	Adult life (20 and over).	Unknown.	Totally deaf.	Partially deaf.	Male.	Female.	Parents cousins.	Not cousins.	Not stated.
<i>d</i> .....	5,051	4,471	486	94	4,191	860	2,532	2,519	265	4,531	255
( <i>a</i> or <i>b</i> ) <i>d</i> .....	1,477	1,332	123	22	1,238	239	735	742	159	1,250	68
<i>a b d</i> .....	244	221	19	4	205	39	127	117	27	206	11
<i>a - d</i> .....	984	880	90	14	814	170	479	505	119	818	47
- <i>b d</i> .....	249	231	14	4	219	30	129	120	13	226	10
- - <i>d</i> .....	3,574	3,139	363	72	2,953	621	1,797	1,777	106	3,281	187
<i>c d</i> .....	164	151	12	1	141	23	81	83	13	141	10
( <i>a</i> or <i>b</i> ) <i>c d</i> .....	85	79	5	1	75	10	44	41	11	69	5
<i>a b c d</i> .....	23	20	3		20	3	16	7	3	19	1
<i>a - c d</i> .....	54	51	2	1	48	6	26	28	8	43	3
- <i>b c d</i> .....	8	8			7	1	2	6		7	1
- - <i>c d</i> .....	79	72	7		66	13	37	42	2	72	5
- <i>d</i> .....	4,887	4,320	474	93	4,050	837	2,451	2,436	252	4,390	245
( <i>a</i> or <i>b</i> ) - <i>d</i> .....	1,392	1,253	118	21	1,163	229	691	701	148	1,181	68
<i>a b - d</i> .....	221	201	16	4	185	36	111	110	24	187	10
<i>a - - d</i> .....	930	829	88	13	766	164	453	477	111	775	44
- <i>b - d</i> .....	241	223	14	4	212	29	127	114	13	219	9
- - - <i>d</i> .....	3,495	3,067	356	72	2,887	608	1,760	1,735	104	3,209	182

From Table LIV it appears that of the 5,051 deaf persons who had deaf husbands or wives, 88.5 per cent were deaf from childhood, 9.6 per cent were deaf from adult life, and in 1.9 per cent of the cases the period of life when deafness occurred was unknown; 83 per cent were totally deaf and 17 per cent partially deaf; 50.1 per cent were males and 49.9 per cent were females; 5.2 per cent were the offspring of cousin-marriages, 89.7 per cent were not the offspring of cousins, and in 5.1 per cent of the cases the question relating to consanguinity of parents remained unanswered; 29.2 per cent had deaf relatives (*a* or *b*) and 70.8 per cent had no (*a* or *b*) deaf relatives; 3.3 per cent had deaf children (*c d*) and 96.7 per cent had no deaf children (*- d*)—that is, they had either hearing children or no children at all.

Table LIV shows that in the case of the 5,051 persons reported to have deaf husbands or wives, the vast majority were deaf from childhood (88.5 per cent),

and the vast majority were totally deaf (83 per cent). This, taken in connection with the fact of the nearly equal division of the sexes, leads to the inference that in most of the cases of intermarriage of deaf persons with one another both of the parties to the marriage were deaf from childhood, and both totally deaf. Most of these persons lost hearing before reaching the age of 5 (Table LVII), and belonged, naturally, to the class deaf and dumb; so that these unions consist largely of intermarriages of deaf mutes with one another.

*The married deaf.*—The figures with which we have hitherto been dealing relate to the whole of the deaf, including the single, married, widowed, and divorced. Tables LV, LVI, LVII, and LVIII relate to the married deaf alone and to conditions of marriage that affect the production of deaf offspring. Tables LVI and LVII summarize the detail figures given in Table LV.

DEAF RELATIVES.

TABLE LV.—THE MARRIED DEAF, BY DEGREE OF DEAFNESS, PERIOD OF LIFE WHEN DEAFNESS OCCURRED, SEX, AND DEAF RELATIVES (a, b, OR d), WITH THE NUMBER IN EACH CLASS HAVING DEAF CHILDREN AND THE NUMBER HAVING NO DEAF CHILDREN.

SEX AND CLASS OF DEAF RELATIVES.	TOTALLY DEAF.							PARTIALLY DEAF.						
	Total.	Period of life when deafness occurred.			Deaf from early childhood (under 5).			Total.	Period of life when deafness occurred.			Deaf from early childhood (under 5).		
		Childhood (under 20).	Adult life (20 and over).	Un-known.	Total.	Congenital.	Noncongenital.		Childhood (under 20).	Adult life (20 and over).	Un-known.	Total.	Congenital.	Noncongenital.
Married males.....	4,566	3,304	1,145	107	2,176	834	1,342	15,190	3,364	11,188	638	714	169	545
Deaf relatives:														
Not stated.....	169	53	81	35	29	21	8	1,486	183	1,067	236	37	13	24
Stated.....	4,387	3,251	1,064	72	2,147	813	1,334	13,704	3,181	10,121	402	677	156	521
a b d.....	108	106	1	1	99	74	25	18	8	10		4	2	2
a b c d.....	13	13			12	10	2	3		3				
a b - d.....	95	93	1	1	87	64	23	15	8	7		4	2	2
a - d.....	389	386	1	2	337	239	98	86	41	43	2	25	12	13
a - c d.....	21	21			20	17	3	4	3		1			
a - - d.....	368	365	1	2	317	222	95	82	38	43	1	25	12	13
- b d.....	109	107		2	85	23	62	14	5	9		3		3
- b c d.....	2	2			2		2							
- b - d.....	107	105		2	83	23	60	14	5	9		3		3
- - d.....	1,471	1,435	15	21	1,062	220	842	306	117	173	16	74	15	59
- - c d.....	32	32			28	12	16	4	3					
- - - d.....	1,439	1,403	15	21	1,034	208	826	302	114	172	16	74	15	59
a b -.....	115	64	49	2	32	27	5	678	220	447	11	38	11	27
a b c -.....	3	3			1	1		12	7	5				
a b - -.....	112	61	49	2	31	26	5	666	213	442	11	38	11	27
a - -.....	494	242	245	7	139	97	42	3,139	773	2,296	70	117	42	75
a - c -.....	11	6	5		3	3		40	10	30		4	1	3
a - - -.....	483	236	240	7	136	94	42	3,099	763	2,266	70	113	41	72
- b -.....	104	61	41	2	31	13	18	622	187	425	10	31	8	23
- b c -.....	2		2					6	2	4				
- b - -.....	102	61	39	2	31	13	18	616	185	421	10	31	8	23
- - -.....	1,597	850	712	35	362	120	242	8,841	1,830	6,718	293	385	66	319
- - c -.....	14	5	9		5	5		83	14	63	6	4		4
- - - -.....	1,583	845	703	35	357	115	242	8,758	1,816	6,655	287	381	66	315
Married females.....	3,775	3,058	624	93	2,110	772	1,338	10,685	3,198	7,073	414	603	108	495
Deaf relatives:														
Not stated.....	140	68	50	22	37	24	13	1,077	229	667	181	41	10	31
Stated.....	3,635	2,990	574	71	2,073	748	1,325	9,608	2,969	6,406	233	562	98	464
a b d.....	95	93		2	82	52	30	21	12	8	1	9	5	4
a b c d.....	7	7			6	2	4							
a b - d.....	88	86		2	76	50	26	21	12	8	1	9	5	4
a - d.....	400	400	1	8	360	234	126	83	38	43	2	21	12	9
a - c d.....	26	26			25	20	5	2	1	1				
a - - d.....	383	374	1	8	335	214	121	81	37	42	2	21	12	9
- b d.....	99	98		1	80	26	54	15	10	4	1	4	1	3
- b c d.....	3	3			3	1	2	1	1					
- b - d.....	96	95		1	77	25	52	14	9	4	1	4	1	3
- - d.....	1,436	1,407	5	24	1,077	242	835	306	131	164	11	72	7	65
- - c d.....	33	33			31	13	18	8	3	5		2		2
- - - d.....	1,403	1,374	5	24	1,046	229	817	298	128	159	11	70	7	63
a b -.....	80	42	35	3	21	12	9	649	207	435	7	25	8	17
a b c -.....	3	2	1					11	4	7				
a b - -.....	77	40	34	3	21	12	9	638	203	428	7	25	8	17
a - -.....	363	198	153	12	116	84	32	2,581	708	1,835	38	86	26	60
a - c -.....	7	3	3		2	2		26	9	16	1	1	1	
a - - -.....	356	195	150	11	114	82	32	2,555	699	1,819	37	85	25	60
- b -.....	85	52	32	1	28	12	16	582	187	338	7	29	6	23
- b c -.....	1		1					5	2	3				
- b - -.....	84	52	31	1	28	12	16	527	185	335	7	29	6	23
- - -.....	1,068	700	348	20	309	86	223	5,421	1,676	3,579	166	316	33	283
- - c -.....	12	10	2		6	5	3	42	13	27	2	4		4
- - - -.....	1,056	690	346	20	303	83	220	5,379	1,663	3,552	164	312	33	279

THE DEAF.

TABLE LVI.—THE MARRIED DEAF, BY DEGREE OF DEAFNESS, PERIOD OF LIFE WHEN DEAFNESS OCCURRED, AND DEAF RELATIVES (a, b, OR d), WITH THE NUMBER IN EACH CLASS HAVING DEAF CHILDREN AND THE NUMBER HAVING NO DEAF CHILDREN.

CLASS OF DEAF RELATIVES.	TOTALLY DEAF.							PARTIALLY DEAF.						
	Total.	Period of life when deafness occurred.			Deaf from early childhood (under 5).			Total.	Period of life when deafness occurred.			Deaf from early childhood (under 5).		
		Childhood (under 20).	Adult life (20 and over).	Un-known.	Total.	Congenital.	Noncongenital.		Childhood (under 20).	Adult life (20 and over).	Un-known.	Total.	Congenital.	Noncongenital.
The married deaf.....	8,331	6,392	1,769	200	4,286	1,606	2,680	25,875	6,562	18,261	1,052	1,317	277	1,040
Deaf relatives:														
Not stated.....	309	121	131	57	66	45	21	2,563	412	1,734	417	78	23	55
Stated.....	8,022	6,241	1,638	143	4,220	1,561	2,659	23,312	6,150	16,527	635	1,239	254	985
d.....	4,116	4,032	23	61	3,182	1,110	2,072	840	362	454	33	212	54	158
—.....	3,906	2,209	1,615	82	1,038	451	587	22,463	5,788	16,073	602	1,027	200	827
a d.....	1,001	985	3	13	878	599	279	208	99	104	5	59	31	28
—d.....	3,115	3,047	20	48	2,304	511	1,793	641	263	350	28	153	23	130
a —.....	1,052	546	482	24	308	230	88	7,047	1,908	5,013	126	266	87	179
—.....	2,854	1,643	1,133	58	730	231	499	15,416	3,880	11,060	476	761	113	648
a b d.....	203	199	1	3	181	126	55	39	20	18	1	13	7	6
a —d.....	798	786	2	10	697	473	224	169	79	86	4	46	24	22
—b d.....	208	205	3	3	165	49	116	29	15	13	1	7	1	6
—.....	2,907	2,842	20	45	2,139	462	1,677	612	248	337	27	146	22	124
a b —.....	195	106	84	5	53	39	14	1,327	427	882	18	63	19	44
a —.....	857	440	398	19	255	181	74	5,720	1,481	4,131	108	203	68	135
a b —.....	189	113	73	3	59	25	34	1,154	374	763	17	60	14	46
—.....	2,665	1,550	1,060	55	671	206	465	14,262	3,506	10,297	469	701	99	602
Stated:							1							
c.....	190	166	23	1	144	89	55	247	72	165	10	15	2	13
—.....	7,832	6,075	1,615	142	4,076	1,472	2,604	23,065	6,078	16,362	625	1,224	252	972
d:														
c.....	137	137	—	—	127	75	52	22	11	10	1	2	—	2
—.....	3,979	3,895	23	61	3,055	1,035	2,020	827	351	444	32	210	54	156
—:														
c.....	53	29	23	1	17	14	3	225	61	155	9	13	2	11
—.....	3,853	2,180	1,582	81	1,021	437	584	22,238	5,727	15,918	503	1,014	198	816
a d:														
c.....	67	67	—	—	63	49	14	9	4	4	1	—	—	—
—d.....	934	918	3	13	815	550	265	199	95	100	4	59	31	28
—:														
c.....	70	70	—	—	64	26	38	13	7	6	—	2	—	2
a —.....	3,045	2,977	20	48	2,240	485	1,755	628	256	344	28	151	23	128
—:														
c.....	24	14	9	1	6	6	—	89	30	58	1	5	2	3
—.....	1,028	532	473	23	302	214	88	6,958	1,878	4,955	125	261	85	176
—:														
c.....	29	15	14	—	11	8	3	136	31	97	8	8	—	8
—.....	2,825	1,648	1,119	58	719	223	496	15,280	3,849	10,963	468	753	113	640
a b d:														
c.....	20	20	—	—	18	12	6	3	—	3	—	—	—	—
a —d.....	183	179	1	3	163	114	49	36	20	15	1	13	7	6
—:														
c.....	47	47	—	—	45	37	8	6	4	1	1	—	—	—
—b d.....	751	739	2	10	652	436	216	163	75	85	3	46	24	22
—:														
c.....	5	5	—	—	5	1	4	1	1	—	—	—	—	—
—d.....	203	200	—	3	160	48	112	28	14	13	1	7	1	6
—:														
c.....	65	65	—	—	59	25	34	12	6	6	—	2	—	2
a b —.....	2,842	2,777	20	45	2,080	437	1,643	600	242	331	27	144	22	122
—:														
c.....	6	5	1	—	1	1	—	23	11	12	—	—	—	—
a —.....	189	101	83	5	52	38	—	1,304	416	870	18	63	19	44
—:														
c.....	18	9	8	1	5	5	—	66	19	46	1	5	2	3
—b —.....	839	431	390	18	250	176	74	5,654	1,462	4,085	107	198	66	132
—:														
c.....	3	—	3	—	—	—	—	11	4	7	—	—	—	—
—.....	186	113	70	3	59	25	34	1,143	370	756	17	60	14	46
—:														
c.....	26	15	11	—	11	8	3	125	27	90	8	8	—	8
—.....	2,639	1,535	1,049	55	680	198	462	14,137	3,479	10,207	451	693	99	594

# DEAF RELATIVES.

TABLE LVII.—THE MARRIED DEAF, BY SEX, DEGREE OF DEAFNESS, PERIOD OF LIFE WHEN DEAFNESS OCCURRED, AND DEAF RELATIVES (a, b, OR d), WITH THE NUMBER IN EACH CLASS HAVING DEAF CHILDREN AND THE NUMBER HAVING NO DEAF CHILDREN.

CLASS OF DEAF RELATIVES.	Total.	SEX.		DEGREE OF DEAFNESS.		PERIOD OF LIFE WHEN DEAFNESS OCCURRED.					
		Male.	Female.	Totally deaf.	Partially deaf.	Childhood (under 20).	Adult life (20 and over).	Unknown.	Early childhood (under 5).		
									Total.	Congenital.	Noncongenital.
The married deaf.....	34,206	19,746	14,460	8,331	25,875	12,924	20,030	1,252	5,603	1,883	3,720
Deaf relatives:											
Not stated.....	2,872	1,655	1,217	309	2,563	533	1,865	474	144	68	76
Stated.....	31,334	18,091	13,243	8,022	23,312	12,391	18,165	778	5,459	1,815	3,644
d.....	4,965	2,501	2,464	4,116	849	4,394	477	94	3,394	1,164	2,230
-----	26,369	15,590	10,779	3,906	22,463	7,997	17,688	684	2,065	651	1,414
a d.....	1,209	601	608	1,001	208	1,084	107	18	937	630	307
-----	3,756	1,900	1,856	3,115	641	3,310	370	76	2,457	534	1,923
a-----	8,090	4,426	3,673	1,052	7,047	2,454	5,495	150	574	307	267
-----	18,270	11,164	7,106	2,854	15,416	5,543	12,193	534	1,491	344	1,147
a b d.....	242	126	116	203	39	219	19	4	194	133	61
-----	967	475	492	798	169	865	88	14	743	497	246
- b d.....	237	123	114	208	29	220	13	4	172	50	122
-----	3,519	1,777	1,742	2,907	612	3,090	357	72	2,285	484	1,801
a b-----	1,522	793	729	195	1,327	533	966	23	116	58	58
-----	6,577	3,633	2,944	857	5,720	1,921	4,529	127	458	249	209
a-----	1,343	726	617	189	1,154	487	836	20	119	39	80
-----	10,927	10,438	6,489	2,665	14,262	5,056	11,357	514	1,372	305	1,067
Stated:											
c.....	437	250	187	190	247	238	188	11	159	91	68
-----	30,897	17,841	13,056	7,832	23,065	12,153	17,977	767	5,300	1,724	3,576
d:											
c.....	159	79	80	137	22	148	10	1	129	75	54
-----	4,806	2,422	2,384	3,979	827	4,246	467	93	3,265	1,089	2,176
-----	278	171	107	53	225	90	178	10	30	10	14
c.....	26,091	15,419	10,672	3,853	22,238	7,907	17,510	674	2,035	635	1,400
a d:											
c.....	76	41	35	67	9	71	4	1	63	49	14
-----	1,133	560	573	934	199	1,013	103	17	874	581	293
- d:											
c.....	83	38	45	70	13	77	6	-----	60	26	40
-----	3,673	1,862	1,811	3,045	628	3,233	364	76	2,391	568	1,823
a-----	113	66	47	24	80	44	67	2	11	8	3
-----	7,986	4,360	3,626	1,028	6,958	2,410	5,428	148	563	299	264
-----	105	105	60	29	136	46	111	8	19	8	11
c.....	18,105	11,059	7,046	2,825	15,280	5,497	12,082	520	1,472	336	1,136
a b d:											
c.....	23	16	7	20	3	20	3	-----	18	12	6
-----	219	110	109	183	36	199	16	4	176	121	55
a-----	53	25	28	47	6	51	1	1	45	37	8
c.....	914	450	464	751	163	814	87	13	698	460	238
- b d:											
c.....	6	2	4	5	1	6	-----	-----	5	1	-----
-----	231	121	110	203	28	214	13	4	167	49	118
- d:											
c.....	77	36	41	65	12	71	6	-----	61	25	36
-----	3,442	1,741	1,701	2,842	600	3,019	351	72	2,224	459	1,765
a b-----	29	15	14	6	23	16	13	-----	1	1	-----
c.....	1,493	778	715	189	1,304	517	953	23	115	57	58
a-----	84	51	33	18	66	28	54	2	10	7	3
-----	6,463	3,582	2,911	839	5,654	1,893	4,475	125	448	242	206
- b-----	14	8	6	3	11	4	10	-----	-----	-----	-----
c.....	1,329	718	611	186	1,143	483	826	20	119	39	80
-----	151	97	54	26	125	42	101	8	19	8	11
c.....	16,776	10,341	6,435	2,639	14,137	5,014	11,250	506	1,353	297	1,056

TABLE LVIII.—THE PER CENT OF THE MARRIED DEAF HAVING DEAF CHILDREN AND THE PER CENT HAVING NO DEAF CHILDREN, BY SEX, DEGREE OF DEAFNESS, AND PERIOD OF LIFE WHEN DEAFNESS OCCURRED, AND DEAF RELATIVES (*a, b, OR d*).

CLASS OF DEAF RELATIVES.	Total.	SEX.		DEGREE OF DEAFNESS.		PERIOD OF LIFE WHEN DEAFNESS OCCURRED.													
		Male.	Female.	Totally deaf.	Partially deaf.	Child-hood (under 20).	Adult life (20 and over).	Un-known.	Early childhood (under 5).										
									Total.	Congenital.	Noncongenital.								
The married deaf:																			
Deaf relatives—																			
Stated	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
c.	1.4	1.4	1.4	2.4	1.1	1.9	1.0	1.4	2.9	5.0	1.9	98.6	98.6	98.6	97.6	98.9	98.1	99.0	98.6
—	98.6	98.6	98.6	97.6	98.9	98.1	99.0	98.6	97.1	95.0	98.1								
<i>d</i>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	(1)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
c.	3.2	3.2	3.2	3.3	2.6	3.4	2.1	(1)	3.8	6.4	2.4	96.8	96.8	96.8	96.7	97.4	96.6	97.9	(1)
—	96.8	96.8	96.8	96.7	97.4	96.6	97.9	(1)	96.2	93.6	97.6								
<i>a</i>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0 <sup>1</sup>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
c.	1.1	1.1	1.0	1.4	1.0	1.1	1.0	1.5	1.5	2.5	1.0	98.9	98.9	99.0	98.5	98.5	98.5	99.0	98.5
—	98.9	98.9	99.0	98.6	99.0	98.9	99.0	98.5	98.5	97.5	99.0								
<i>a d</i>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	(1)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
c.	6.3	6.8	5.8	6.7	4.3	6.5	3.7	(1)	6.7	7.8	4.6	93.7	93.2	94.2	93.3	95.7	93.5	96.3	(1)
—	93.7	93.2	94.2	93.3	95.7	93.5	96.3	(1)	93.3	92.2	95.4								
<i>- d</i>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	(1)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
c.	2.2	2.0	2.4	2.2	2.0	2.3	1.6	(1)	2.7	4.9	2.1	97.8	98.0	97.6	97.8	98.0	97.7	98.4	(1)
—	97.8	98.0	97.6	97.8	98.0	97.7	98.4	(1)	97.3	95.1	97.9								
<i>a -</i>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
c.	1.4	1.5	1.3	2.3	1.3	1.8	1.2	1.3	1.9	2.6	1.1	98.6	98.5	98.7	97.7	98.7	98.2	98.8	98.7
—	98.6	98.5	98.7	97.7	98.7	98.2	98.8	98.7	98.1	97.4	98.9								
<i>- -</i>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
c.	0.9	0.9	0.8	1.0	0.9	0.8	0.9	1.5	1.3	2.3	1.0	99.1	99.1	99.2	99.0	99.1	99.2	99.1	99.2
—	99.1	99.1	99.2	99.0	99.1	99.2	99.1	98.5	98.7	97.7	99.0								
<i>a b d</i>	100.0	100.0	100.0	100.0	(1)	100.0	(1)	(1)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
c.	9.5	12.7	6.0	9.9	(1)	9.1	(1)	(1)	9.3	9.0	(1)	90.5	87.3	94.0	90.1	(1)	90.9	(1)	(1)
—	90.5	87.3	94.0	90.1	(1)	90.9	(1)	(1)	90.7	91.0	(1)								
<i>a - d</i>	100.0	100.0	100.0	100.0	100.0	100.0	(1)	(1)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
c.	5.5	5.3	5.7	5.9	3.6	5.9	(1)	(1)	6.1	7.4	3.3	94.5	94.7	94.3	94.1	96.4	94.1	(1)	(1)
—	94.5	94.7	94.3	94.1	96.4	94.1	(1)	(1)	93.9	92.6	96.7								
<i>- b d</i>	100.0	100.0	100.0	100.0	(1)	100.0	(1)	(1)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
c.	2.5	1.6	3.5	2.4	(1)	2.7	(1)	(1)	2.9	(1)	3.3	97.5	98.4	96.5	97.6	(1)	97.3	(1)	(1)
—	97.5	98.4	96.5	97.6	(1)	97.3	(1)	(1)	97.1	(1)	96.7								
<i>- - d</i>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
c.	2.2	2.0	2.4	2.2	2.0	2.3	1.7	(1)	2.7	5.2	2.0	97.8	98.0	97.6	97.8	98.0	97.7	98.3	(1)
—	97.8	98.0	97.6	97.8	98.0	97.7	98.3	(1)	97.3	94.8	98.0								
<i>a b -</i>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
c.	1.9	1.9	1.9	3.1	1.7	3.0	1.3	(1)	0.9	(1)	(1)	98.1	98.1	98.1	96.9	98.3	97.0	98.7	(1)
—	98.1	98.1	98.1	96.9	98.3	97.0	98.7	(1)	99.1	(1)	(1)								
<i>a - -</i>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
c.	1.3	1.4	1.1	2.1	1.2	1.5	1.2	1.6	2.2	2.8	1.4	98.7	98.6	98.9	97.9	98.8	98.5	98.8	98.4
—	98.7	98.6	98.9	97.9	98.8	98.5	98.8	98.4	97.8	97.2	98.6								
<i>- b -</i>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
c.	1.0	1.1	1.0	1.6	1.0	0.8	1.2	(1)	1.0	(1)	(1)	99.0	98.9	99.0	98.4	99.0	99.2	98.8	(1)
—	99.0	98.9	99.0	98.4	99.0	99.2	98.8	(1)	100.0	(1)	(1)								
<i>- - -</i>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
c.	0.9	0.9	0.8	1.0	0.9	0.8	0.9	1.6	1.4	2.6	1.0	99.1	99.1	99.2	99.0	99.2	99.1	99.1	98.4
—	99.1	99.1	99.2	99.0	99.1	99.2	99.1	98.4	98.6	97.4	99.0								

<sup>1</sup> Percentage not given where aggregate is less than 100.

From Table LVII it appears that 34,206 married deaf persons were reported in the census of 1900. Of these, 57.7 per cent were males and 42.3 per cent were females; 37.8 per cent were deaf from childhood (under 20), 58.5 per cent became deaf in adult life, and in 3.7 per cent of the cases the period of life when deafness occurred was unknown.

Of the 12,924 cases deaf from childhood, 51.5 per cent were males and 48.5 per cent were females. Of the 20,030 cases deaf from adult life, 61.6 per cent were males and only 38.4 per cent were females

(Tables LV and LVI). It thus appears that the majority of the deaf who marry are males; and the disproportion of the sexes in this respect is most manifest in the case of the deaf from adult life, of whom 61.6 per cent were males.

Out of a total of 34,206 married deaf persons, 31,334 answered the question relating to deaf relatives and 2,872 did not (Table LVII). The following percentages relate to the stated cases:

*a or b relatives.*—10,888, or 34.7 per cent, of the married deaf had deaf brothers, sisters, ancestors,

uncles, aunts, cousins, or more distant relatives, and 20,446, or 65.3 per cent, had no *a* or *b* deaf relatives (Table LVII).

*c relatives*.—437, or 1.4 per cent, of the married deaf had deaf children, and 30,897, or 98.6 per cent, had no deaf children—that is, they either had hearing children or no children at all (Table LVII).

*d relatives*.—4,965, or 15.8 per cent, of the married deaf had deaf husbands or wives, and in 26,369 cases, or 84.2 per cent, the husbands or wives were not deaf—that is, they were hearing persons (Table LVII).

Of the 4,965 married deaf who had deaf husbands or wives, 4,394, or 88.5 per cent, were deaf from childhood (under 20); 477, or 9.6 per cent, became deaf in adult life; and in 94 cases, or 1.9 per cent, the period of life when deafness occurred was unknown (Table LVII).

Of the 26,369 married deaf whose husbands or wives were not deaf, 7,997, or 30.3 per cent, were deaf from childhood; 17,688, or 67.1 per cent, were deaf from adult life; and in 684 cases, or 2.6 per cent, the period of life when deafness occurred was unknown (Table LVII).

Thus the vast majority of the married deaf who had deaf husbands or wives (88.5 per cent) were deaf from childhood, and about two-thirds of the married deaf whose husbands and wives were not deaf (67.1 per cent) were persons who lost hearing in adult life. It will also be noticed that the majority of the married deaf who had deaf husbands or wives (68.3 per cent) were deaf from early childhood (under 5) (Table LVII), and belong naturally to the class deaf and dumb. They represent intermarriages of deaf-mutes with one another.

In studying the marriages of the deaf, and the influence of these marriages upon the offspring, the plan has been adopted of calculating the percentage having deaf children upon the basis of a total which includes the males and females considered, instead of noting separately the percentage of males and the percentage of females having deaf children. The percentage derived from the summation of the two classes is more reliable than that derived from either class alone, because based upon larger numbers. And the percentages express not merely the proportion of deaf persons who have deaf children, but the proportion of families containing deaf children. This is an important point and worthy of special consideration.

In regard to the absolute numbers involved it will of course be noticed that the figures expressing the number of deaf persons who have deaf children do not represent the number of deaf children born to them, even if we assume that each person had only one deaf child—which would be an underestimate. Some of the males and females included were undoubtedly the parents of the same children—two parents to one child. Nor do these figures represent the number

of families having deaf children, which is necessarily less than the number of married persons composing them; and yet the percentage of persons having deaf children expresses the percentage of families having deaf children, even though the absolute number of families may be unknown. This will be obvious from the following considerations:

Let there be one hundred families, and let one of them contain deaf children; then the proportion of families having deaf children is 1 per cent.

*Case 1*.—Now assume that in each of these families only one of the married partners was deaf; then 100 married deaf persons in all would be recorded, of whom 1 had deaf children. In this case the proportion having deaf children would be 1 per cent, thus corresponding with the percentage of families.

*Case 2*.—Next assume that in each of the families considered both of the married partners were deaf; then 200 married deaf persons in all would be recorded, of whom 2 had deaf children. But the proportion having deaf children would remain at 1 per cent, thus still corresponding with the percentage of families.

*Case 3*.—These are extreme cases, and there is only one other supposable case between them, namely, that in some of the families the married partners were both deaf, and that in others only one of the married partners was deaf. In this case also it is obvious that the percentage of deaf persons having deaf children would correspond to the percentage of families.

In the case of the married deaf we do not know exactly the total number of families involved or the exact number of families containing deaf children; but still we can estimate these numbers with a sufficient approximation to the truth to enable us to test the accuracy of the conclusions noted above.

*Case 1*.—The 26,369 married deaf persons whose husbands or wives were not deaf constituted, of course, 26,369 families, and the 278 persons among them who had deaf children also evidently constituted 278 families; so that here the percentage of persons having deaf children is obviously the same as the percentage of families containing deaf children.

*Case 2*.—In the case of the 4,965 married deaf persons who had deaf husbands or wives, 2,501 were males and 2,464 were females; so they constituted at least 2,501 families. There may have been more, but certainly not less. In the case of the 159 persons among them who had deaf children 79 were males and 80 were females; so that these persons constituted not less than 80 families.

$$\frac{4965}{159} = \text{the ratio of persons.}$$

$$\frac{2501}{80} = \text{the (approximate) ratio of families.}$$

These ratios are substantially the same, for—

$$4965 : 159 :: 2501 : 80.09.$$

*Case 3.*—In the case of the 31,334 married deaf persons constituting the stated cases in Table LVII, 18,091 were males and 13,243 were females. These persons therefore constituted at least 18,091 families. In the case of the 437 persons among them who had deaf children 250 were males and 187 were females; so that they constituted at least 250 families. There may have been more, but certainly not less.

$$\frac{31334}{437} = \text{the ratio of persons.}$$

$$\frac{18091}{250} = \text{the (approximate) ratio of families.}$$

These two ratios are very nearly the same, for—

$$31334 : 437 :: 18091 : 252.3.$$

*Conditions affecting the production of deaf offspring.*—Table LVII shows that out of 31,334 married deaf persons 437, or 1.4 per cent, had deaf children. This means that on the average 1.4 per cent of the marriages contracted by deaf persons are productive of deaf offspring. Out of every 100 families formed by these marriages 1.4 contain deaf children.

*Sex.*—Out of 18,091 married deaf males 250, or 1.4 per cent, had deaf children. Out of 13,243 married deaf females 187, or 1.4 per cent, had deaf children (Table LVII).

From this it appears that the sex of the deaf partner in marriage does not appreciably affect the proportion having deaf children, although it should be noticed that in the case of those having *a b d* deaf relatives the percentage having deaf children is more than twice as great among the males as among the females (males, 12.7; females, 6) (Table LVIII). The totals, however, on which these latter percentages are based are comparatively small, very little exceeding 100; whereas the percentages for the whole of the married males and females are based upon many thousands of cases, and show no difference in this respect between the males and females. The sex of the deaf parent alone, without other complicating conditions (like *a b d* deaf relatives) does not seem to be a factor affecting the proportion having deaf children.

Males.....	1.4
Females.....	1.4

*Degree of deafness.*—Out of 8,022 married deaf persons who were totally deaf 190, or 2.4 per cent, had deaf offspring; and out of 23,312 married deaf persons who were partially deaf 247, or 1.1 per cent, had deaf children (Table LVII).

It thus appears that the proportion having deaf offspring is more than twice as great among the totally deaf as among the partially deaf married persons. Table LVII shows that the majority of the deaf who have deaf offspring are partially deaf; but this evidently results not from any greater liability on their part to produce deaf offspring, but from the fact that the partially deaf are more numerous than the totally

deaf in the whole deaf population. Among the married deaf 25,875 were partially deaf and only 8,331 totally deaf (Table LVII).

Totally deaf.....	2.4
Partially deaf.....	1.1

*Period of life when deafness occurred.*—Out of 12,391 married deaf who were deaf from childhood (under 20) 238, or 1.9 per cent, had deaf children. Out of 18,165 married deaf who became deaf in adult life 188, or 1 per cent, had deaf children (Table LVII).

Out of 5,459 married deaf persons who lost hearing before the age of 5, 159, or 2.9 per cent, had deaf children. Of these, 1,815 were congenitally deaf and 3,644 became deaf after birth and before reaching the age of 5. Of the congenitally deaf cases, 91, or 5 per cent, had deaf children. Of the noncongenitally deaf cases, 68, or 1.9 per cent, had deaf children (Table LVII).

It thus appears that the tendency to transmit the defect is greater among the deaf from childhood than the deaf from adult life. It is still greater among the deaf from early childhood (under 5), all of whom belong naturally to the class deaf and dumb, and greatest of all among the deaf from birth (the congenital cases).

Childhood (under 20).....	1.9
Adult life (20 and over).....	1.0
Early childhood (under 5).....	2.9
Congenital.....	5.0
Noncongenital (under 5).....	1.9

*a, b, or d relatives.*—Out of 14,407 married deaf persons who had deaf relatives (*a, b, or d*), 286, or 2 per cent, had deaf children. Out of 16,927 who had no deaf relatives (*a, b, or d*), 151, or 0.9 per cent, had deaf children (Table LVII).

It thus appears that the proportion having deaf children is more than twice as great among the married deaf who have deaf relatives (*a, b, or d*) as among those who have no *a, b, or d* deaf relatives.

Deaf relatives ( <i>a, b, or d</i> ).....	2.0
No deaf relatives ( <i>a, b, or d</i> ).....	0.9

*a relatives.*—There were 9,308 married deaf persons who had deaf brothers, sisters, or ancestors. Of these, 189, or 2 per cent, had deaf children, but it will be observed that the total includes all who have *a* relatives. Some of the persons referred to had also *b* or *d* relatives. To ascertain the effect of the *a* element alone we should exclude the *b* and *d* elements from consideration. Out of 6,577 married deaf who had *a* relatives alone without *b* or *d* relatives (*a* — —), 84, or 1.3 per cent, had deaf children (Table LVII).

*b relatives.*—Out of 3,344 married deaf persons who had uncles, aunts, cousins, or other more distant relatives deaf (*b*), 72, or 2.2 per cent, had deaf children; but the total includes persons who had also *a* or *d* relatives. Excluding the *a* and *d* elements, we find that

1,343 of the married deaf had *b* relatives alone, without *a* or *d* relatives (— *b* —); and of these, 14, or 1 per cent, had deaf children (Table LVII).

*d* relatives.—Out of 4,965 married deaf who had deaf husbands or wives, 159, or 3.2 per cent, had deaf children. The total includes persons who had *a* or *b* deaf relatives; and if we exclude these, we find 3,519 married deaf with deaf husbands or wives but no *a* or *b* relatives deaf (— — *d*). Of these, 77, or 2.2 per cent, had deaf children (Table LVII).

Even in this case, however, we have not eliminated the effect of *a* or *b* relatives; for many of the deaf husbands or wives considered undoubtedly had *a* or *b* deaf relatives. The census returns give us no information concerning these husbands or wives beyond the bare fact that they were deaf.

No *a*, *b*, or *d* relatives.—Out of 16,927 married deaf persons who had no *a*, *b*, or *d* relatives deaf, 151, or 0.9 per cent, had deaf children (Table LVII).

In considering the significance of deaf relatives as an indication of the liability of a deaf person to produce deaf offspring the following seems to be the order of importance of the *a*, *b*, and *d* elements considered separately: The largest proportion having deaf children is found among the married deaf who have deaf husbands or wives (but no *a* or *b* relatives); next come those having *a* relatives (but not *b* or *d*); then those having *b* relatives (but not *a* or *d*). The smallest proportion having deaf children is found among those who have neither *a*, *b*, nor *d* relatives:

— — <i>d</i> .....	2.2
<i>a</i> — —.....	1.3
— <i>b</i> —.....	1.0
— — —.....	0.9

*Combinations of a, b, and d relatives.*—From these facts we would naturally anticipate that the largest proportion having deaf children would be found among those having both *a* and *b* relatives who married deaf husbands or wives, and that the proportion having deaf children would be successively smaller where other combinations of *a*, *b*, or *d* occurred in the following order: *a b d*; *a — d*; — *b d*; — — *d*; *a b —*; *a — —*; — *b —*; — — —. And this we find to be the case. The following figures show the percentage of married deaf persons having deaf children

where these combinations of deaf relatives occurred (Table LVIII).

<i>a b d</i> .....	9.5
<i>a — d</i> .....	5.5
— <i>b d</i> .....	2.5
— — <i>d</i> .....	2.2
<i>a b —</i> .....	1.9
<i>a — —</i> .....	1.3
— <i>b —</i> .....	1.0
— — —.....	0.9

We should also expect to find a still larger percentage having deaf children where the *a b d* elements are combined with other elements found to be significant in this connection—like total deafness and deafness occurring at an early period of life, and this we find to be the case. For example: Table LVI records 181 married deaf persons who were totally deaf from birth, and who had *a b d* relatives deaf. Of these, 18, or 9.94 per cent, had deaf children.

Totally deaf from birth, *a b d*..... 9.94

The significance of the percentages will be apparent by applying the results to the whole married population of the United States. We can calculate how many families containing deaf children would be found among the married people of the United States if they had the same liability to the production of deaf offspring that is found in the case of the married deaf.

More than 13,000,000 married males are returned in the census of 1900, and more than 13,000,000 married females. If only 1 per cent of these persons should have deaf children, we would have in the United States more than 130,000 families containing deaf children.

130,000 equal	1 per cent.
260,000 equal	2 per cent.
390,000 equal	3 per cent.
520,000 equal	4 per cent.
650,000 equal	5 per cent.
780,000 equal	6 per cent.
910,000 equal	7 per cent.
1,040,000 equal	8 per cent.
1,170,000 equal	9 per cent.
1,300,000 equal	10 per cent.

For convenience of reference the percentages having deaf children for each of the classes of deaf persons mentioned in Table LVIII are given below, where they may be directly compared:

CLASS OF DEAF RELATIVES.	Total.	SEX.		DEGREE OF DEAFNESS.		PERIOD OF LIFE WHEN DEAFNESS OCCURRED.		EARLY CHILDHOOD (UNDER 5).		
		Male.	Female.	Totally.	Partially.	Childhood.	Adult life.	Total.	Birth.	After birth, under 5.
Stated.....	1.4	1.4	1.4	2.4	1.1	1.9	1.0	2.9	5.0	1.9
<i>d</i> .....	3.2	3.2	3.2	3.3	2.6	3.4	2.1	3.8	6.4	2.4
.....	1.1	1.1	1.0	1.4	1.0	1.1	1.0	1.5	2.5	1.0
<i>a d</i> .....	6.3	6.8	5.8	6.7	4.3	6.5	3.7	6.7	7.8	4.6
.....	2.2	2.0	2.4	2.2	2.0	2.3	1.6	2.7	4.9	2.1
<i>a</i> .....	1.4	1.5	1.3	2.3	1.3	1.8	1.2	1.9	2.6	1.1
.....	0.9	0.9	0.8	1.0	0.9	0.8	0.9	1.3	2.3	1.0
<i>a b d</i> .....	9.5	12.7	6.0	9.9	(1)	9.1	(1)	9.3	9.0	(1)
<i>a</i> .....	5.5	5.3	5.7	5.9	3.6	5.9	(1)	6.1	7.4	3.3
<i>b</i> .....	2.5	1.6	3.5	2.4	(1)	2.7	.....	2.9	(1)	3.3
<i>d</i> .....	2.2	2.0	2.4	2.2	2.0	2.3	1.7	2.7	5.2	2.0
<i>a b</i> .....	1.9	1.9	1.9	3.1	1.7	3.0	1.3	0.9	(1)	.....
<i>a</i> .....	1.3	1.4	1.1	2.1	1.2	1.5	1.2	2.2	2.8	1.4
<i>b</i> .....	1.0	1.1	1.0	1.6	1.0	0.8	1.2	.....	.....	.....
.....	0.9	0.9	0.8	1.0	0.9	0.8	0.9	1.4	2.6	1.0

1 Percentage not given where base is less than 100.

The above investigation relating to the marriages of the deaf and the effect upon the offspring affords a convincing demonstration of the fact that the laws of heredity which are known to apply to animals also apply to man. This has generally been assumed, but the above investigation demonstrates the proposition.

*Present age.*—The present age of the deaf is given in Table LIX, by various classifications.

About one-fifth of the deaf are under 20 years of age; of these, over 75 per cent are totally deaf, while among the number over 20, only about 33 per cent are totally deaf.

The per cent who speak is very much larger among those over 20, although the per cent who have attended school is larger for those under 20.

The figures presenting the relation of the present age of the deaf to the age when deafness occurred are found in Table LX.

Of the number now under 20, the largest per cent are the deaf from birth. Of those over 20, the largest per cent lost their hearing between the ages of 20 and 40.

The present age of the totally deaf from early childhood is compared with the present age of the entire population in Table LXI.

Table LXII gives the geographic distribution of the deaf, by present age groups.

TABLE LIX.—The deaf, classified by period of life when deafness occurred, degree of deafness, ability to speak, sex, race, nativity, school attendance, and present age.

PERIOD OF LIFE WHEN DEAFNESS OCCURRED, DEGREE OF DEAFNESS, ABILITY TO SPEAK, SEX, RACE, NATIVITY, AND SCHOOL ATTENDANCE.	Total.	PRESENT AGE.		
		Under 20.	20 and over.	Unknown.
Total.....	89,287	18,358	70,602	327
Period of life when deafness occurred:				
Childhood (under 20).....	50,296	18,358	31,763	175
Adult life (20 and over).....	35,924	.....	35,825	99
Unknown.....	3,067	.....	3,014	53
Degree of deafness:				
Totally deaf.....	37,426	13,987	23,272	167
Partially deaf.....	51,861	4,371	47,330	160
Ability to speak:				
Well.....	55,501	3,965	51,374	162
Imperfectly.....	9,417	4,566	4,809	42
Not at all.....	24,369	9,827	14,419	123
Sex:				
Male.....	46,915	9,998	36,741	176
Female.....	42,372	8,360	33,861	151
Race:				
White.....	84,361	16,702	67,397	262
Colored.....	4,926	1,656	3,205	65
Nativity of whites:				
Native.....	69,865	15,507	54,183	175
Foreign born.....	13,788	835	12,010	41
Unknown.....	710	360	304	46
School attendance:				
Attended school.....	65,717	14,200	51,228	199
Did not attend school.....	13,557	3,716	9,768	73
Not stated.....	10,013	352	9,606	55
Attended school:				
Kind of school—				
Special.....	25,197	11,349	13,753	95
Other.....	19,664	2,581	17,029	54
Both.....	237	57	178	2
Not stated.....	20,619	303	20,268	48

PRESENT AGE.

TABLE LX.—THE DEAF, BY AGE WHEN DEAFNESS OCCURRED AND PRESENT AGE.

AGE WHEN DEAFNESS OCCURRED.	Total.	PRESENT AGE.											
		Under 20.	20 and over.	Un-known.	Under 5.	5 and under 10.	10 and under 15.	15 and under 20.	20 and under 40.	40 and under 60.	60 and under 80.	80 and under 100.	100 and over.
All ages.....	89,287	18,358	70,602	327	1,021	4,551	6,710	6,076	19,457	22,172	22,146	6,751	76
Age when deafness occurred:													
Unknown.....	3,067		3,014	53					617	886	-1,164	344	3
Indefinitely stated.....	4,630	1,049	3,554	27	57	241	421	330	407	748	1,434	890	15
Definitely stated.....	81,590	17,309	64,034	247	964	4,310	6,289	5,746	18,373	20,538	19,548	5,517	58
Birth.....	14,474	7,232	7,173	69	479	1,885	2,652	2,216	3,987	2,275	835	76	
After birth, under 2.....	7,306	4,039	3,344	13	275	1,175	1,418	1,170	2,339	791	206	8	
2 and under 5.....	10,536	3,882	6,027	27	209	958	1,450	1,265	4,056	1,854	602	55	
Under 5.....	32,406	15,153	17,144	109	964	4,018	5,520	4,651	10,382	4,920	1,703	139	
5 and under 10.....	7,018	1,567	5,428	23		292	618	657	2,582	1,882	888	76	
10 and under 15.....	4,464	485	3,969	10			151	334	1,562	1,523	788	96	
15 and under 20.....	4,061	104	3,939	18				104	1,335	1,794	714	96	
20 and under 40.....	47,949	17,309	30,480	160	964	4,310	6,289	5,746	15,861	10,110	4,093	407	
40 and under 60.....	16,538		16,548	40					2,512	7,834	5,800	402	
60 and under 80.....	9,437		9,411	26						2,585	5,782	1,040	4
80 and over.....	6,595		6,578	17							3,873	2,693	12
	1,021		1,017	4							975	42	

TABLE LXI.—The total population at specified ages compared with the deaf from early childhood.

PRESENT AGE.	Popu- lation of the United States.	THE TOTALLY DEAF FROM EARLY CHILDHOOD (UNDER 5).		
		Total.	Birth.	After birth.
Stated ages.....	100.0	100.0	100.0	100.0
Under 5.....	12.1	3.2	3.6	2.9
5 and under 10.....	11.7	12.5	13.3	11.6
10 and under 15.....	10.7	16.9	18.2	15.7
15 and under 20.....	10.0	14.5	15.4	13.7
20 and under 25.....	9.7	9.3	9.0	9.0
25 and under 30.....	8.6	9.3	7.1	11.4
30 and under 35.....	7.3	7.5	6.0	9.0
35 and under 40.....	6.5	7.1	5.6	8.6
40 and under 45.....	5.6	5.0	5.2	4.8
45 and under 50.....	4.8	3.9	4.1	3.7
50 and under 55.....	3.9	3.4	3.9	3.0
55 and under 60.....	2.9	2.6	2.7	2.4
60 and under 65.....	2.4	1.9	2.2	1.5
65 and under 70.....	1.7	1.3	1.6	0.9
70 and under 75.....	1.2	0.8	1.1	0.6
75 and under 80.....	0.7	0.5	0.6	0.4
80 and under 85.....	0.3	0.2	0.3	0.1
85 and under 90.....	0.1	0.1	0.1	0.1
90 and under 95.....	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
95 and under 100.....	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
100 and over.....	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )

<sup>1</sup> Less than one-tenth of 1 per cent.

TABLE LXII.—The number deaf, by present age groups, for states and territories.

STATE OR TERRITORY.	Total.	PRESENT AGE.		
		Under 20.	20 and over.	Un-known.
Continental United States.....	80,287	18,358	70,602	327
North Atlantic division.....	28,032	4,222	24,335	75
New England.....	8,854	981	7,849	24
Maine.....	1,257	144	1,110	3
New Hampshire.....	702	37	724	1
Vermont.....	723	27	693	3
Massachusetts.....	4,015	472	3,531	12
Rhode Island.....	583	83	498	2
Connecticut.....	1,514	218	1,293	3
Southern North Atlantic.....	19,778	3,241	16,486	51
New York.....	9,946	1,713	8,205	28
New Jersey.....	2,285	276	2,006	3
Pennsylvania.....	7,547	1,252	6,275	20
South Atlantic division.....	10,193	2,745	7,385	63
Northern South Atlantic.....	5,400	1,192	4,179	29
Delaware.....	255	28	224	3
North Carolina.....	1,679	255	1,320	4
Virginia.....	507	74	430	3
West Virginia.....	1,013	489	1,410	14
	1,140	346	796	5

TABLE LXII.—The number deaf, by present age groups, for states and territories—Continued.

STATE OR TERRITORY.	Total.	PRESENT AGE.		
		Under 20.	20 and over.	Un-known.
Southern South Atlantic.....	4,793	1,553	3,206	34
North Carolina.....	1,642	626	1,000	16
South Carolina.....	952	302	648	2
Georgia.....	1,817	527	1,276	14
Florida.....	382	98	282	2
North Central division.....	34,076	6,075	27,301	100
Eastern North Central.....	21,618	4,013	17,648	57
Ohio.....	6,080	951	5,116	13
Indiana.....	3,607	644	2,951	12
Illinois.....	6,053	1,238	4,794	21
Michigan.....	3,402	622	2,772	8
Wisconsin.....	2,476	558	1,915	3
Western North Central.....	12,458	2,662	9,753	43
Minnesota.....	1,738	444	1,294	
Iowa.....	2,952	485	2,458	9
Missouri.....	3,766	849	2,907	20
North Dakota.....	256	88	164	4
South Dakota.....	430	100	320	1
Nebraska.....	1,220	278	937	5
Kansas.....	2,096	418	1,674	4
South Central division.....	12,322	3,842	8,408	72
Eastern South Central.....	6,968	2,039	4,890	39
Kentucky.....	2,619	720	1,880	19
Tennessee.....	2,026	664	1,355	7
Alabama.....	1,333	349	978	6
Mississippi.....	990	306	677	7
Western South Central.....	5,354	1,803	3,518	33
Louisiana.....	1,211	328	877	6
Arkansas.....	1,317	453	844	20
Indian Territory.....	228	74	152	2
Oklahoma.....	282	110	172	
Texas.....	2,816	838	1,473	5
Western division.....	4,064	874	3,173	17
Rocky Mountain.....	1,076	289	782	5
Montana.....	126	48	78	
Idaho.....	146	38	107	1
Wyoming.....	29	6	23	
Colorado.....	472	123	347	2
New Mexico.....	303	74	227	2
Basin and Plateau.....	455	110	343	2
Arizona.....	51	11	38	2
Utah.....	343	90	253	
Nevada.....	61	9	52	
Pacific.....	2,533	475	2,048	10
Washington.....	374	94	280	
Oregon.....	410	86	321	3
California.....	1,749	295	1,447	7

## THE DEAF.

The North Central division shows the largest number deaf in each age group. The North Atlantic shows the next largest number.

*Marital condition.*—Table LXIII shows the marital

condition of the deaf, classified by age and period of life when deafness occurred, degree of deafness, sex, and deaf relatives.

TABLE LXIII.—NUMBER AND PER CENT DEAF, CLASSIFIED BY MARITAL CONDITION, AGE WHEN DEAFNESS OCCURRED, DEGREE OF DEAFNESS, SEX, AND DEAF RELATIVES.

AGE OR PERIOD OF LIFE WHEN DEAFNESS OCCURRED, DEGREE OF DEAFNESS, SEX, AND DEAF RELATIVES.	Total.	MARITAL CONDITION.									
		Number.					Per cent.				
		Single.	Married.	Widowed.	Divorced.	Unknown.	Single.	Married.	Widowed.	Divorced.	Unknown.
Total.....	89,287	39,079	34,296	15,331	353	327	43.7	38.3	17.2	0.4	0.4
Period of life when deafness occurred:											
Childhood (under 20).....	59,266	34,248	12,924	2,791	147	186	68.1	25.7	5.5	0.3	0.4
Adult life (20 and over).....	35,924	3,839	20,690	11,780	189	86	10.7	55.8	32.8	0.5	0.2
Unknown.....	3,067	983	1,252	760	17	55	32.1	40.8	24.8	0.5	1.8
Degree of deafness:											
Totally deaf.....	37,426	26,593	8,331	2,195	104	203	71.1	22.3	5.7	0.3	0.6
Partially deaf.....	51,861	12,477	25,875	13,136	249	124	24.1	49.9	25.3	0.5	0.2
Sex:											
Male.....	46,915	21,338	19,746	5,480	172	179	45.5	42.1	11.7	0.3	0.4
Female.....	42,372	17,732	14,460	9,851	181	148	41.8	34.1	23.3	0.4	0.4
Deaf relatives:											
a or b relatives.....	25,851		10,888					42.1			
No a or b relatives.....	54,630		20,446					37.4			
Not stated.....	8,806		2,872					32.6			
Age when deafness occurred:											
Unknown.....	3,067	983	1,252	760	17	55	32.1	40.8	24.8	0.5	1.8
Indefinitely stated.....	4,630	1,840	1,407	1,346	14	23	39.7	30.4	29.1	0.3	0.5
Definitely stated.....	81,590	36,247	31,547	13,225	322	249	44.4	38.7	16.2	0.4	0.3
Birth.....	14,474	12,107	1,883	401	18	66	83.6	13.0	2.8	0.1	0.5
After birth, under 2.....	7,396	6,149	1,086	125	14	22	83.1	14.7	1.7	0.2	0.3
2 and under 5.....	10,536	7,466	2,634	368	26	42	70.9	25.0	3.5	0.2	0.4
Under 5.....	32,406	25,721	5,603	894	58	130	79.4	17.3	2.7	0.2	0.4
5 and under 10.....	7,018	3,953	2,447	561	33	24	56.3	34.9	8.0	0.5	0.3
10 and under 15.....	4,464	1,870	2,031	521	33	9	41.9	45.5	11.7	0.7	0.2
15 and under 20.....	4,061	1,171	2,291	571	18	10	28.8	56.4	14.1	0.4	0.3
Under 20.....	47,949	32,715	12,372	2,547	142	173	68.2	25.8	5.3	0.3	0.4
20 and under 40.....	16,588	2,244	10,903	3,286	119	36	13.5	65.8	19.8	0.7	0.2
40 and under 60.....	9,437	810	5,327	3,232	44	24	8.6	56.4	34.2	0.5	0.5
60 and under 80.....	6,565	421	2,710	3,435	16	13	6.4	41.1	52.1	0.2	0.2
80 and over.....	1,021	57	235	725	1	3	5.6	23.0	71.0	0.1	0.3

The marital condition of the deaf is clearly presented in Table LXIII. As might naturally be expected, the largest number of single persons is found among those who were deaf from childhood, while the proportion of married and widowed is especially large among those who became deaf in adult life. Naturally enough, also, the majority of those who remained single are totally deaf, more than two-thirds of those who are reported single being in the totally deaf class, while three-fourths of those who are married are only partially deaf. In the matter of sex males are in the majority in both the single and married class, but strangely enough there are almost twice as many widows as widowers. This may arise from the fact that the chance of remarriage is doubtless smaller for a deaf woman than for a deaf man, but the principal reason is probably to be found in the occurrence of deafness in old age among the many cases where the wife survives the husband. Whatever the cause of this preponderance may be, it is one of the interesting facts developed by this table.

By contrasting similar figures relating to marriageable population for the deaf and the total population, the following interesting percentages appear:

	Single.	Married.	Widowed.	Divorced.	Unknown.
Total population.....	36.0	55.5	7.8	0.4	0.3
The deaf.....	34.8	44.4	19.9	0.5	0.4

The proportion single and married among the deaf is slightly smaller than among the total population, while the proportion widowed is very much larger. Eliminating the deaf under 15 years of age considerably decreases the proportion single and increases the proportion married.

The relation of deafness to marital condition is shown in detail in Table 37.

*School attendance.*—Table LXIV distributes the deaf by age or period of life when deafness occurred, degree of deafness, sex, and race in relation to school attendance. Unfortunately for purposes of comparison in the total population the deaf are not classified according to literacy and illiteracy. Attendance at school is in reality a most unsatisfactory test, since many persons who have not attended school may be literate, and among the deaf it is likely that a large proportion would come within this class. However, even if it be assumed that only those of the deaf who have attended

# SCHOOL ATTENDANCE.

school are literate as a class, the deaf show comparatively little illiteracy. In 79,274 cases the question as to attendance at school was answered, 65,717, or 73.6 per cent, attending, and 13,557, or 15.2 per cent, not attending; while in 10,013 cases no answer was received. There are practical reasons, indeed, why illiteracy among deaf persons should be less than among the general population, since writing neces-

sarily forms for many the principal medium of communication. Persons who are totally deaf usually employ the sign-language or communicate by writing, the acquisition of one being about as easy as the other. In the case of the deaf, therefore, there is a definite and personal reason which operates against illiteracy. The white race shows a much larger per cent attending school than the colored.

TABLE LXIV.—NUMBER AND PER CENT DEAF, CLASSIFIED BY SCHOOL ATTENDANCE, DEGREE OF DEAFNESS, SEX, RACE, AND AGE WHEN DEAFNESS OCCURRED.

AGE OR PERIOD OF LIFE WHEN DEAFNESS OCCURRED, DEGREE OF DEAFNESS, SEX, RACE, AND PRESENT AGE.	Total.	SCHOOL ATTENDANCE.					
		Number.			Per cent.		
		Attended school.	Did not attend school.	Not stated.	Attended school.	Did not attend school.	Not stated.
Total.....	89,287	65,717	13,557	10,013	73.6	15.2	11.2
Period of life when deafness occurred:							
Childhood (under 20).....	50,296	40,448	7,974	1,874	80.4	15.9	3.7
Adult life (20 and over).....	35,924	23,700	5,109	7,115	66.0	14.2	19.8
Unknown.....	3,067	1,569	474	1,024	51.1	15.5	33.4
Degree of deafness:							
Totally deaf.....	37,426	29,348	6,480	1,598	78.4	17.3	4.3
Partially deaf.....	51,861	36,369	7,077	8,415	70.1	13.7	16.2
Sex:							
Male.....	46,915	35,476	6,987	4,452	75.6	14.9	9.5
Female.....	42,372	30,241	6,570	5,561	71.4	15.5	13.1
Race:							
White.....	84,361	63,680	11,027	9,654	75.5	13.0	11.5
Colored.....	4,926	2,037	2,530	359	41.3	51.4	7.3
Age when deafness occurred:							
Unknown.....	3,067	1,569	474	1,024	51.2	15.4	33.4
Indefinitely stated.....	4,630	2,831	726	1,073	61.1	15.7	23.2
Definitely stated.....	81,590	61,317	12,357	7,916	75.2	15.1	9.7
Birth.....	14,474	10,541	3,436	497	72.8	23.8	3.4
After birth, under 2.....	7,396	6,076	1,218	102	82.1	16.5	1.4
2 and under 5.....	10,536	8,983	1,308	245	85.3	12.4	2.3
Under 5.....	32,406	25,600	5,962	844	79.0	18.4	2.6
5 and under 10.....	7,018	5,858	843	317	83.5	12.0	4.5
10 and under 15.....	4,464	3,758	438	268	84.2	9.8	6.0
15 and under 20.....	4,061	3,401	385	275	83.7	9.5	6.8
Under 20.....	47,949	38,617	7,028	1,704	80.5	15.9	3.6
20 and under 40.....	16,588	12,929	1,725	1,934	77.9	10.4	11.7
40 and under 60.....	9,437	6,199	1,476	1,762	65.7	15.6	18.7
60 and under 80.....	6,595	3,248	1,270	2,077	49.2	19.3	31.5
80 and over.....	1,021	324	258	439	31.7	25.3	43.0
Present age:							
Under 20.....	18,358	14,290	3,716	352	77.8	20.3	1.9
20 and over.....	70,929	51,228	9,768	9,606	72.6	13.8	13.6
Not stated.....	327	199	73	55	60.9	22.3	16.8

Those whose present age is under 20 show 77.8 per cent who have attended school; as against 72.6 per cent of those 20 years of age and over.

Table LXV shows the deaf who have attended school, by kind of school, age or period of life when deafness occurred, degree of deafness, sex, race, and present age.

In 20,619 cases the kind of school attended was not stated. Of those who did state kind of school, the larger part had attended special schools. This was to be expected, in view of the fact that the great majority of those who reported schooling (40,448 out of 65,717) became deaf in childhood.

Of the totally deaf, 77.5 per cent, and of the partially deaf only 6.8 per cent, attended special schools.

A slightly greater proportion of the males than of the females attended special schools, 39 and 37.5 per cent, respectively, the latter exceeding in the proportion who have attended other schools.

Of those who lost hearing before 5 years of age, 81.5 per cent attended special schools, this proportion decreasing rapidly as age when deafness occurred increases. The percentage who did not state kind of school attended increases as the age when deafness occurred increases.

TABLE LXV.—NUMBER AND PER CENT OF DEAF ATTENDING SCHOOL, CLASSIFIED BY AGE WHEN DEAFNESS OCCURRED, DEGREE OF DEAFNESS, SEX, RACE, PRESENT AGE, AND KIND OF SCHOOL.

AGE OR PERIOD OF LIFE WHEN DEAFNESS OCCURRED, DEGREE OF DEAFNESS, SEX, RACE, AND PRESENT AGE.	Total.	NUMBER ATTENDING SCHOOL.				PER CENT ATTENDING SCHOOL.			
		Special.	Other.	Both.	Not stated.	Special.	Other.	Both.	Not stated.
Total.....	65,717	25,197	19,664	237	20,619	38.3	29.9	0.4	31.4
Period of life when deafness occurred:									
Childhood (under 20).....	40,448	24,846	10,826	225	4,551	61.4	26.7	0.6	11.3
Adult life (20 and over).....	23,700	125	8,336	10	15,229	0.5	35.2	(1)	64.3
Unknown.....	1,569	226	502	2	839	14.4	32.0	0.1	53.5
Degree of deafness:									
Totally deaf.....	29,348	22,734	3,827	181	2,606	77.5	13.0	0.6	8.9
Partially deaf.....	36,369	2,463	15,837	56	18,013	6.8	43.5	0.2	49.5
Sex:									
Male.....	35,476	13,851	10,441	132	11,052	39.0	29.4	0.4	31.2
Female.....	30,241	11,346	9,223	105	9,567	37.5	30.5	0.4	31.6
Race:									
White.....	63,650	24,308	18,974	236	20,162	38.2	29.8	0.4	31.6
Colored.....	2,037	889	690	1	457	43.6	33.9	0.1	22.4
Age when deafness occurred:									
Unknown.....	1,569	226	502	2	839	14.4	32.0	0.1	53.5
Indefinitely stated.....	2,831	893	1,057	6	875	31.6	37.3	0.2	30.9
Definitely stated.....	61,317	24,078	18,105	229	18,905	39.3	29.5	0.4	30.8
Birth.....	10,541	9,232	953	29	327	87.6	9.0	0.3	3.1
After birth, under 2.....	6,076	5,110	799	28	139	84.1	13.1	0.5	2.3
2 and under 5.....	8,983	6,521	1,908	47	507	72.6	21.2	0.5	6.7
Under 5.....	25,600	20,863	3,660	104	973	81.5	14.3	0.4	3.8
5 and under 10.....	5,858	2,511	2,448	60	839	42.9	41.8	1.0	14.3
10 and under 15.....	3,758	488	2,192	40	1,038	13.0	58.3	1.1	27.6
15 and under 20.....	3,401	96	1,895	15	1,305	2.8	55.7	.5	41.0
Under 20.....	38,617	23,958	10,195	219	4,245	62.0	26.4	0.6	11.0
20 and under 40.....	12,929	78	4,838	10	8,003	0.6	37.4	0.1	61.9
40 and under 60.....	6,199	30	1,888	.....	4,281	0.5	30.4	.....	69.1
60 and under 80.....	3,248	12	1,040	.....	2,196	0.4	32.0	.....	67.6
80 and over.....	324	.....	144	.....	180	.....	44.4	.....	55.6
Present age:									
Under 20.....	14,290	11,249	2,581	57	303	79.4	18.1	0.4	2.1
20 and over.....	51,228	13,753	17,029	178	20,268	26.8	33.2	0.4	39.6
Not stated.....	199	95	54	2	48	47.8	27.1	1.0	24.1

<sup>1</sup> Less than one-tenth of 1 per cent.

*Occupations.*—The same classification of occupations was adopted for the deaf as was used for the general population at the Twelfth Census. A comparison is therefore possible of the deaf and of the total population 10 years of age and over gainfully employed.

	Total number 10 years of age and over.	Number gainfully employed.	Per cent.
Total population.....	57,940,824	29,073,233	50.2
The deaf.....	83,388	32,142	38.5

These figures indicate that deafness is a drawback to some extent in securing employment; but they also show that the deaf as a class are by no means a burden upon the community. Few of the deaf who are under 20 years of age are engaged in gainful occupations (Table LXXII); but this is no discredit to them, for the vast majority of these cases are attending school (Table LXIV). Of those over 20 years of age 43 per cent are engaged in gainful occupations—for Table LIX shows a total of 70,602 who are over 20 years of age, and Table LXXIII shows that 30,353 of these, or 43 per cent, are engaged in gainful occupations.

Table LXVI shows the number and per cent of the deaf in each occupation contrasted with the per cent of the total population in each group.

TABLE LXVI.—Number and per cent of deaf and per cent of total population in each group of occupations.

CLASS OF OCCUPATIONS.	THE DEAF.		Per cent of total population.
	Number.	Per cent.	
All occupations.....	32,142	100.0	100.0
Agricultural pursuits.....	14,068	43.8	35.7
Manufacturing and mechanical pursuits.....	9,442	29.4	24.4
Domestic and personal services.....	5,316	16.5	19.2
Transportation and communication.....	2,236	6.9	16.4
Professional service.....	1,080	3.4	4.3

Of the deaf gainfully employed, 89.7 per cent are found in the three groups in which perfect or even partial hearing is not essential, while in the two remaining groups—trade and transportation and professional service—which require hearing and speaking power, only a small proportion of the deaf (10.3 per cent) report employment.

That the degree of deafness considerably affects the occupation is shown in Table LXVII.

TABLE LXVII.—Number and per cent of the deaf in each group of occupations, by degree of deafness.

CLASS OF OCCUPATIONS.	TOTAL.		DEGREE OF DEAFNESS.			
	Num-ber.	Per cent.	Totally deaf.		Partially deaf.	
			Num-ber.	Per cent.	Num-ber.	Per cent.
All occupations.....	32,142	100.0	12,678	39.4	19,467	60.6
Agricultural pursuits.....	14,068	100.0	4,761	33.8	9,307	66.2
Manufacturing and mechanical pursuits.....	9,442	100.0	4,583	48.5	4,859	51.5
Domestic and personal service.....	5,316	100.0	2,305	43.1	2,921	54.9
Trade and transportation.....	2,236	100.0	552	24.6	1,684	75.4
Professional service.....	1,080	100.0	387	35.8	693	64.2

The percentage for professional service is high because it includes teachers, professors in colleges, etc., and artists and teachers of art. The teachers show a very large per cent totally deaf (206 out of 294), the majority of whom probably are instructors in schools for the deaf. In nearly every other kind of professional service the totally deaf constitute a very small minority.

Table LXVIII shows the obvious connection between school attendance and the opportunity for obtaining gainful employment.

TABLE LXVIII.—Number and per cent of the deaf and of the deaf gainfully employed, classified according to schooling.

	TOTAL NUMBER OF DEAF.		DEAF GAINFULLY EMPLOYED.	
	Number.	Per cent.	Number.	Per cent.
Aggregate.....	89,287	100.0	32,142	100.0
Schooling.....	65,717	73.6	26,030	81.0
No schooling.....	13,557	15.2	3,950	12.3
Not stated.....	10,013	11.2	2,162	6.7

The deaf who have attended school show a much larger per cent of their number pursuing gainful occupations than of those who have not attended school.

The kind of employment—whether skilled or unskilled—is also largely determined by school attendance. In Table LXIX the number in each group of occupations is distributed according to schooling.

TABLE LXIX.—Number and per cent of deaf gainfully employed, by class of occupations, in relation to schooling.

CLASS OF OCCUPATIONS.	DISTRIBUTION ACCORDING TO SCHOOLING.							
	Total.		Schooling.		No schooling.		Not stated.	
	Num-ber.	Per cent.	Num-ber.	Per cent.	Num-ber.	Per cent.	Num-ber.	Per cent.
All occupations.....	32,142	100.0	26,030	81.0	3,950	12.3	2,162	6.7
Agricultural pursuits.....	14,068	100.0	10,668	75.8	2,294	16.3	1,106	7.9
Professional service.....	1,080	100.0	1,037	96.0	16	1.5	27	2.5
Domestic and personal service.....	5,316	100.0	3,903	73.4	988	18.6	425	8.0
Trade and transportation.....	2,236	100.0	1,979	88.5	119	5.3	138	6.2
Manufacturing and mechanical pursuits.....	9,442	100.0	8,443	89.4	533	5.7	466	4.9

Those engaged in professional service, manufacturing and mechanical pursuits, and trade and transportation show a very large percentage of their number schooled, ranking in this respect in the order named; while those in agricultural pursuits show next lowest, and those in domestic and personal service, the smallest percentage schooled. In the last two classes of occupations lack of schooling is no great drawback, while in the remaining three it is almost a total disqualification.

Unfortunately for purposes of comparison, the kind of school was not stated in over one-third of the cases. This failure to state kind of school was particularly marked among those in agricultural and in manufacturing and mechanical pursuits.

In Tables LXXII, LXXIII, and LXXIV the occupations of the deaf are given in detail.

Table LXX shows the deaf, by present age (10 and over, and 20 and over), period of life when deafness occurred, and degree of deafness, giving the number and percentage of each class who are employed in gainful occupations.

TABLE LXX.—The number and per cent of the deaf 10 years of age and over gainfully employed, classified by present age, period of life when deafness occurred, and degree of deafness.

PRESENT AGE, PERIOD OF LIFE WHEN DEAFNESS OCCURRED, AND DEGREE OF DEAFNESS.	Total.	GAINFULLY EMPLOYED.	
		Number.	Per cent.
Present age 10 years and over.....	88,388	32,142	38.5
Period of life when deafness occurred:			
Childhood (under 20).....	44,549	18,073	40.6
Adult life (20 and over).....	35,825	13,172	36.8
Unknown.....	3,014	897	29.8
Degree of deafness:			
Totally deaf.....	32,831	12,678	38.1
Partially deaf.....	50,557	19,464	38.5
Present age 20 years and over.....	70,602	30,353	43.0
Period of life when deafness occurred:			
Childhood (under 20).....	31,763	16,405	51.6
Adult life (20 and over).....	33,825	13,172	38.8
Unknown.....	3,014	776	25.7
Degree of deafness:			
Totally deaf.....	23,272	11,670	50.1
Partially deaf.....	47,330	18,683	39.5

From this table it appears that the deaf from childhood are more self-supporting than the deaf from adult life.

This is specially surprising when we consider the fact that the deaf from childhood include practically all of the deaf and dumb, and that most of them are totally deaf; whereas the deaf from adult life include none of the deaf and dumb (at least substantially none), and most of them are only partially deaf.

Of the deaf from childhood who were over 10 years of age, 40.6 per cent were gainfully employed, and of the deaf from adult life only 36.8 per cent (Table LXX).

These figures, however, do not fully express the discrepancy between the two classes in this respect; for all of the deaf from adult life were, of course, 20 years of age or over, because they did not lose hearing until after reaching that age; whereas many of the deaf from

childhood (12,786) were between 10 and 20 years of age, and comparatively few of these were earning their livelihood, because most were in school.

Of the deaf from childhood who were 20 years of age or over, the majority (51.6 per cent) were gainfully employed, against 36.8 per cent of the deaf from adult life (Table LXX).

Of the totally deaf who were 20 years of age or over (most of whom were deaf from childhood) 50.1 per cent were earning their livelihood, but only 39.5 per cent of the partially deaf (most of whom became deaf in adult life). (Table LXX.)

The deaf from adult life are undoubtedly better equipped by nature for the task of earning a livelihood, for most of them possess perfect speech and partial hearing; and yet the deaf from childhood seem to be more successful in this respect.

The explanation for this apparently anomalous condition of affairs seems to lie in the fact that many persons who become deaf in adult life fail to accommodate themselves to the new condition of deafness. They lose their positions on account of increasing deafness; and feeling themselves to be too old to begin life all over again in their crippled condition by seeking some new occupation with which deafness would not interfere, they lose heart and drop out of the struggle, becoming dependent upon their friends for support, or living upon the savings of former years, without entering into new pursuits.

In the case of the deaf from childhood, however, the accommodation to the environment has become complete before the dawn of adult life. Many of these persons have never experienced any other condition than that of deafness; and most of them enter upon the duties and responsibilities of adult life with that feeling of buoyancy and hope that is so characteristic of youth.

Nor should we neglect to notice in this connection the powerful influence exerted on the deaf from childhood by the special schools which have been established for their benefit.

The sentiment is very early instilled into their minds that these schools are not in any sense "asylums" or "charitable institutions," but simply "schools" for their education, analogous to the ordinary public schools of the country; and that they themselves are not—and never should be—objects of charity. The spirit of dependence is discouraged; and every effort made to stimulate a spirit of independence and self-help. The pupils are led to believe that it is the duty of every deaf boy and girl to learn some means of livelihood; and that a stigma attaches to those who become a burden upon their friends or the public.

Sentiment counts for a great deal with the young; but the special schools go further than this by providing manual training and art instruction for advanced pupils.<sup>1</sup>

These schools very generally teach the use of tools and give manual training in the form of sloyd. Mechanical drawing, too, and art instruction are given to those who manifest abilities in these lines. Many of our schools support special trade shops in which specific occupations are taught, like shoemaking, cabinetmaking, etc., although it is perhaps doubtful whether this specialization of manual training during school life is of as much value to the deaf as instruction of a more general character, embracing elements that are common to a number of trades. Comparatively few of the deaf from childhood pursue in adult life the specific occupations they were taught in school; and the very great variety in the occupations actually pursued seems to render diversity rather than specialization a desirable aim during the school period, leaving specialization into a specific occupation to come later in life, through actual work in ordinary shops, which are more likely to be up-to-date in their methods of work than the trade shops of the schools, which do not feel the stimulating effects of competition.

The Census tables relating to occupation reveal the astonishing fact that there are extremely few occupations pursued by the people of the United States in which deaf persons do not find employment. This is not only surprising, but at the same time encouraging, as widening the scope of possible usefulness for the deaf.

There can be no question that the industrial training provided by our special schools has been of material assistance to their pupils in securing employment in adult life, and it is specially worthy of notice in this connection that very many of the deaf from childhood have had the opportunity of taking this training, whereas hardly any of the deaf from adult life have attended special schools.

<sup>1</sup> *Industries taught in American schools for the deaf.*—Architectural drawing, art, baking, barbering, basket making, blacksmithing, bookbinding, bricklaying, broom making, cabinetmaking, calceining, carpentry, chalk engraving, cementing, chair making, china painting, construction work, cooking, clay modeling, cooper, domestic science, drawing, dressmaking, electricity, embroidery, engineering, fancy work, farming, floriculture, . . . . . handicraft, harness making, house-decoration, . . . . . housework, horticulture, illuminating, ironing, knitting, lace making, manual training, mattress making, millinery, needlework, painting, paper hanging, plastering, plate engraving, photography, printing, pyrography, raffia, sewing, shoemaking, sign painting, sloyd, stone laying, tailoring, tinwork, typewriting, venetian iron work, weaving, wood carving, wood engraving, wood turning, woodworking, working in iron, and the use of tools.—*From the American Annals of the Deaf.*

Out of 35,924 persons who became deaf in adult life, only 135 attended special schools; whereas out of 50,296 persons deaf from childhood, 25,071 received training in special schools (including 225 who attended both special and other schools). (Table 2.)

From this it appears probable that our special schools for the deaf are mainly responsible for the fact that the deaf from childhood no longer constitute a dependent class. The majority, or 51.6 per cent, are gainfully employed in adult life. The percentage rightfully entitled to be regarded as self-supporting is even larger than this, for the chief occupation reported by married females ("keeping house") has not been included among gainful occupations.

TABLE LXXI.—The number and per cent of the deaf 10 years of age and over gainfully employed, classified by ability to speak and degree of deafness.

ABILITY TO SPEAK AND DEGREE OF DEAFNESS.	Total.	GAINFULLY EMPLOYED.	
		Number.	Per cent.
The deaf 10 years of age and over.....	83,388	32,142	38.5
Ability to speak:			
Well.....	54,506	21,274	39.0
Imperfectly.....	8,152	2,722	33.4
Not at all.....	20,730	8,146	39.3
Totally deaf.....	32,831	12,678	38.1
Ability to speak:			
Well.....	7,727	3,094	40.0
Imperfectly.....	5,084	1,626	32.0
Not at all.....	20,020	7,958	34.7
Partially deaf.....	50,557	19,464	38.5
Ability to speak:			
Well.....	46,779	18,180	38.9
Imperfectly.....	3,068	1,096	35.7
Not at all.....	710	188	26.5

Table LXXI shows the deaf who are 10 years of age or over, by ability to speak and degree of deafness; giving the number and percentage of each class who are employed in gainful occupations.

Out of 62,658 deaf persons 10 years of age or over who were able to speak, 23,996, or 38.3 per cent, were employed in gainful occupations. Out of 20,730 deaf persons who were unable to speak, 8,146, or 39.3 per cent were gainfully employed (Table LXXI).

It thus appears that the deaf and dumb, as a class, are more self-supporting than the deaf who speak.

This is rather a startling conclusion; and it is very easy to draw false inferences from the fact. It can hardly be doubted that the deaf who speak, even imperfectly, have some advantage over those who can not speak at all; so that it is obvious that the above result arises, not from the difference of speaking power, but from other differences not specified in the table.

The fact of the matter is that all of the deaf and dumb were deaf from childhood; whereas the majority of the deaf who speak lost hearing in adult life. The deaf from adult life are inferior in self-supporting power—not of course, because they can speak, but because

of other conditions referred to more particularly in remarks concerning Table LXX; and the deaf and dumb are superior in this respect—not because they are dumb, but because of the industrial training they have received in special schools.

In order to ascertain the influence of speech upon employment, we should eliminate the deaf from adult life and study the occupations of the deaf from childhood who speak well, imperfectly, or not at all, so as to have no other substantial point of difference between the classes considered, excepting their ability to speak. Unfortunately the tabulated returns do not give us the information desired.

We can ascertain the period of life when deafness occurred, and the present age, of the deaf who speak well, imperfectly, or not at all; and also of the deaf who are gainfully employed, but we have no tables correlating the results. We may gain some light upon the subject, however, from the consideration of the fact that the totally deaf consist mainly of persons deaf from childhood, so that the totally deaf cases noted in Table LXXI were probably all deaf from childhood. Of those who could speak well, 40 per cent were employed in gainful occupations; whereas only 34.7 per cent of those who were deaf and dumb were gainfully employed. The ability to speak well was evidently of advantage.

The advantage is not so obvious in the case of the totally deaf who speak imperfectly, of whom only 32 per cent were gainfully employed. It should be remembered, however, that in these cases we are dealing largely with persons who have acquired speech artificially by instruction in school, and that the table includes many persons who are between 10 and 20 years of age.

Articulation teaching is of so comparatively recent origin that most of the deaf who have acquired speech artificially by instruction in schools are still quite young, few having passed middle life; whereas the deaf and dumb, and the deaf who speak well, contain persons of all ages—even up to extreme old age.

The difference between the three classes in respect to age may be illustrated by taking the aggregates given in Table LXXI (composed of persons 10 years of age or over), and showing the number and percentage who are 20 years of age or over:

CLASS.	10 years of age and over.	20 years of age and over.	Percent-age 20 years of age and over.
Aggregate gainfully employed.....	32,142	30,353	94.4
Speak well.....	54,506	51,376	94.2
Imperfectly.....	8,152	4,809	59.0
Not at all.....	20,730	14,419	69.5

As more than 94 per cent of the aggregate gainfully employed are 20 years of age or over, it follows that the number 20 years of age or over who are gainfully employed among the three classes named (the deaf who speak well, imperfectly, or not at all) would be only slightly changed from the figures of the table (Table LXXI); but the percentage gainfully employed would be considerably increased in the case of the deaf who speak imperfectly—in fact, almost doubled—because it would be based upon a smaller total little more than half its former value (59 per cent).

Not only does ability to speak affect the opportunity for engaging in pursuits in general, but it also, in a large measure, determines the choice of occupation. The following percentages are taken from Table 47, and show the percentage of the deaf who speak well, imperfectly, or not at all, who are engaged in the principal groups of occupations:

OCCUPATION.	ABILITY TO SPEAK.		
	Well.	Imper- fectly.	Not at all.
All occupations.....	100.0	100.0	100.0
Agricultural pursuits.....	46.1	40.9	38.6
Professional service.....	4.1	2.5	1.8
Domestic and personal service.....	14.7	19.3	20.4
Trade and transportation.....	8.8	8.6	3.3
Manufacturing and mechanical pursuits.....	26.3	33.7	35.9

The advantage of speech is most manifest in agricultural pursuits, professional service, and trade and transportation; the percentage employed in these occupations being greatest among those who speak well, least among those who do not speak at all, and intermediate among those who speak imperfectly. On the other hand, speech does not seem to be of so much consequence in domestic and personal service and manufacturing and mechanical pursuits, the order of the percentages being reversed.

# OCCUPATIONS.

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TABLE LXXII.—THE DEAF, 10 YEARS OF AGE AND OVER, ENGAGED IN EACH OCCUPATION AND CLASS OF OCCUPATIONS, BY AGE WHEN DEAFNESS OCCURRED.

OCCUPATION.	Total.	AGE WHEN DEAFNESS OCCURRED.														
		Un-known.	Indefinitely stated.	Definitely stated.	Birth.	After birth, under 2.	2 and under 5.	Under 5.	5 and under 10.	10 and under 15.	15 and under 20.	Under 20.	20 and under 40.	40 and under 60.	60 and under 80.	80 and over.
All occupations.....	32,142	807	1,104	30,141	4,086	2,053	4,003	10,142	3,105	2,118	2,098	17,463	7,227	3,570	1,756	116
Agricultural pursuits.....	14,008	382	498	13,188	1,871	809	1,324	4,004	1,116	853	838	6,811	3,287	1,937	1,071	82
Agricultural laborers.....	2,016	50	72	1,804	635	208	313	1,156	230	134	85	1,605	169	81	37	2
Dairymen and dairywomen.....	29	29	29	29	1	1	1	4	1	1	1	8	15	4	1	1
Farmers, planters, and overseers.....	11,428	306	404	10,718	1,196	577	969	2,742	843	667	700	4,952	2,951	1,762	978	75
Gardeners, florists, nurserymen, etc.....	330	16	17	297	20	6	20	46	18	23	20	107	86	61	40	3
Lumbermen and raftsmen.....	51	3	2	50	5	3	7	15	4	6	6	31	13	5	1	1
Stock raisers, herders, and drovers.....	147	3	2	142	7	12	13	32	15	15	15	77	40	17	7	1
Turpentine farmers and laborers.....	4	1	1	3	3	3	3	3	3	3	3	3	3	3	3	3
Wood choppers.....	52	6	2	44	8	2	1	11	1	5	6	23	5	7	6	1
Other agricultural pursuits.....	11	1	1	11	1	1	1	1	1	2	1	5	8	7	1	1
Professional service.....	1,080	30	44	1,006	50	44	127	230	144	94	70	538	288	120	56	4
Actors, professional showmen, etc.....	23	2	1	20	1	2	5	5	4	2	2	13	6	1	1	1
Architects, designers, draftsmen, etc.....	46	1	1	45	1	1	7	10	5	2	2	22	18	2	3	1
Artists and teachers of art.....	114	2	2	110	10	11	32	53	20	12	4	89	16	4	3	1
Clergymen.....	116	2	0	105	1	1	5	7	9	6	6	30	33	25	14	3
Dentists.....	20	1	2	18	1	1	2	7	1	2	2	8	8	2	1	1
.....	18	1	1	17	1	1	1	3	2	1	1	6	10	1	1	1
.....	43	2	2	41	1	1	3	1	2	3	3	15	13	9	4	1
.....	54	2	2	50	1	1	3	4	11	9	4	28	18	4	1	1
Lawyers.....	90	4	3	83	1	2	2	3	3	2	6	17	17	4	10	1
Literary and scientific persons.....	40	1	1	38	1	1	3	4	6	2	2	14	16	7	1	1
Musicians and teachers of music.....	39	1	4	34	1	1	3	4	2	2	8	19	12	3	2	1
.....	62	4	1	57	3	3	4	5	4	4	4	20	18	15	12	8
.....	106	4	6	96	1	4	4	5	7	3	8	20	37	27	12	8
.....	294	5	11	278	30	27	57	123	64	34	8	229	35	6	1	1
.....	15	1	1	14	1	1	1	1	4	1	1	6	7	1	1	1
Domestic and personal service.....	5,316	187	195	4,934	856	336	720	1,912	588	360	345	3,214	1,095	444	170	11
Barbers and hairdressers.....	122	3	1	118	12	19	31	62	13	7	7	80	21	6	2	1
Bartenders.....	9	1	1	8	1	1	1	1	1	1	1	6	2	1	1	1
Boarding and lodging house keepers.....	125	4	7	114	3	1	4	8	7	8	5	28	55	27	3	1
Hotel keepers.....	99	1	6	80	3	1	5	9	7	3	3	21	33	21	14	1
Housekeepers and stewards.....	230	7	10	213	35	16	30	81	20	3	12	128	60	18	7	2
Janitors and sextons.....	74	3	6	67	4	2	4	10	3	4	6	23	31	11	2	1
Laborers (not specified).....	2,718	98	96	2,524	424	187	386	997	291	175	178	1,041	546	229	101	7
Laundresses and laundresses.....	452	19	12	421	63	12	59	134	57	47	35	273	102	36	10	8
Nurses and midwives.....	57	4	2	51	2	3	4	9	3	1	1	17	18	8	8	1
Restaurant keepers.....	21	3	1	21	1	1	3	4	2	1	7	11	5	3	1	1
Saloon keepers.....	26	3	1	22	1	1	1	1	2	1	3	7	5	9	1	1
Servants and waiters.....	1,303	42	48	1,213	301	92	188	581	172	101	80	934	191	69	17	2
.....	3	3	3	3	2	2	2	2	2	2	2	12	18	5	4	1
Other domestic and personal service.....	32	2	5	30	6	1	4	11	2	5	3	22	6	2	1	1
Trade and transportation.....	2,236	61	92	2,083	129	76	206	411	187	171	226	995	661	304	117	6
Agents.....	231	10	14	207	14	4	15	33	11	17	21	82	68	39	17	1
Bankers and brokers.....	119	4	8	107	2	2	4	9	5	6	8	28	37	20	20	2
Boatmen and sailors.....	45	1	2	42	3	3	6	6	3	2	5	16	11	8	7	1
Bookkeepers and accountants.....	124	3	4	117	5	3	6	14	17	17	12	60	38	15	4	1
Clerks and copyists.....	263	1	10	252	20	18	32	70	30	25	33	153	70	20	4	1
Commercial travelers.....	33	1	2	30	3	2	2	7	4	1	5	17	10	3	1	1
Draymen, hackmen, teamsters, etc.....	206	10	7	189	18	8	24	50	18	10	17	101	58	25	5	1
Foremen and overseers.....	3	3	3	3	2	2	2	2	1	3	4	3	9	2	2	1
.....	47	3	1	43	10	1	11	22	3	3	4	32	14	9	5	1
.....	66	1	4	61	7	1	6	14	7	6	6	33	9	6	1	1
.....	30	1	1	28	1	1	3	4	2	3	3	12	9	3	1	1
.....	710	13	28	669	21	20	51	92	48	48	82	270	230	123	45	1
Merchants and dealers (wholesale).....	13	2	1	11	1	1	1	1	1	4	1	2	4	1	1	1
Messengers and errand and office boys.....	22	2	1	19	1	1	2	3	1	1	1	7	3	1	1	1
Officials of banks and companies.....	26	1	25	2	3	7	4	12	5	4	2	21	3	1	1	1
Packers and porters.....	39	1	38	10	2	4	4	16	5	2	2	25	10	1	1	1
Salesmen.....	77	4	4	69	6	3	13	22	4	4	7	37	21	11	4	1
.....	106	3	4	99	3	3	8	14	13	8	12	47	37	11	4	1
.....	15	1	15	1	2	3	5	5	3	1	4	13	1	1	1	1
.....	3	1	3	1	1	1	1	1	1	1	1	2	1	1	1	1
.....	16	1	16	1	1	1	1	1	1	1	1	4	11	1	1	1
.....	13	1	13	1	1	1	1	2	1	1	1	4	4	5	1	1
.....	21	1	19	2	2	5	9	5	1	1	1	16	2	1	1	1
Manufacturing and mechanical pursuits.....	9,442	237	275	8,930	1,171	788	1,626	3,585	1,070	631	619	5,905	1,896	774	342	13
Building trades.....	2,000	63	69	1,868	165	123	266	554	178	122	148	1,002	494	240	129	3
Carpenters and joiners.....	1,121	41	40	1,040	82	63	135	280	82	62	71	495	282	161	99	3
Masons (brick and stone).....	203	7	5	191	15	7	12	34	18	20	21	83	56	20	16	7
Painters, glaziers, and varnishers.....	399	10	10	379	42	40	82	104	50	24	27	265	76	31	7	1
Paper hangers.....	30	1	29	1	1	5	5	5	5	3	4	17	11	1	1	1
Plasterers.....	59	1	4	54	1	1	7	9	8	3	6	26	21	5	2	1
Plumbers and gas and steam fitters.....	20	1	1	18	2	1	1	3	4	3	3	13	4	1	1	1
Roofers and slaters.....	7	1	6	1	1	1	1	1	1	1	1	2	3	1	1	1
Mechanics (not otherwise specified).....	161	2	8	151	23	11	25	59	11	7	14	91	41	14	5	1
Chemicals and allied products.....	20	2	18	1	1	1	1	3	4	1	1	9	4	5	1	1
Oil well and oil works employees.....	16	1	15	1	1	1	1	1	3	1	1	6	4	5	1	1
Other chemical workers.....	4	1	3	1	1	1	1	2	1	1	1	3	4	5	1	1

TABLE LXXII.—THE DEAF, 10 YEARS OF AGE AND OVER, ENGAGED IN EACH OCCUPATION AND CLASS OF OCCUPATIONS, BY AGE WHEN DEAFNESS OCCURRED—Continued.

OCCUPATION.	Total.	AGE WHEN DEAFNESS OCCURRED.														
		Un-known.	Indefinitely stated.	Definitely stated.	Birth.	After birth, under 2.	2 and under 5.	Under 5.	5 and under 10.	10 and under 15.	15 and under 20.	Under 20.	20 and under 40.	40 and under 60.	60 and under 80.	80 and over.
Clay, glass, and stone products.....	129	3		126	16	9	26	51	13	9	9	82	27	11	6	
Brick and tile makers, etc.....	26	2		24	5	2	5	12	4	1		17	5	1	1	
Glassworkers.....	24	1		23	3	3	3	9	3	3	3	18			1	
Marble and stone cutters.....	70			70	6	3	15	24	5	5	5	39	17	10	4	
Potters.....	9			9	2	1	3	6	1		1	8	1			
Fishing and mining.....	350	7	1	342	38	17	34	89	34	32	37	192	92	33	25	
Fishermen and oystermen.....	85	2		83	16	3	3	22	6	7	9	44	25	7	7	
Miners and quarrymen.....	265	5	1	259	22	14	31	67	28	25	28	148	67	26	18	
Food and kindred products.....	297	11	10	276	21	26	35	82	30	22	32	166	72	30	8	
Bakers.....	103	3	1	99	11	14	20	45	13	6	10	74	16	6	3	
Butchers.....	91	4	3	84	4	7	5	16	11	12	9	48	26	10		
Butter and cheese makers.....	6			6	1			1		1	1	3	2	1		
Confectioners.....	36	1	1	34	1	2	4	7	3	3	6	19	9	5	1	
Millers.....	49	3	3	43	1	2	3	6	2		5	13	18	8	4	
Other food preparers.....	12		2	10	3	1	3	7	1		1	9	1			
Iron and steel and their products.....	869	37	22	810	77	42	119	238	85	59	75	457	228	84	39	2
Blacksmiths.....	348	17	9	322	23	9	18	50	28	21	38	137	115	42	26	2
Iron and steel workers.....	183	5	4	174	22	13	47	82	24	15	11	132	30	9	3	
Machinists.....	216	7	4	205	21	16	34	71	24	16	15	126	51	21	7	
Steam boiler makers.....	54	7	3	44	1	1	1	2	2	1	1	13	20	11		
Stove, furnace, and grate makers.....	7			7		2	2	4	1	1	1	6	1			
Tool and cutlery makers.....	26	1	2	23	4	2	2	11	3	2		16	6	1		
Wheelwrights.....	24			24	4	2	2	10	2	3	3	18	4		2	
Wireworkers.....	11			11	2		6	8	1			9	1		1	
Leather and its finished products.....	955	16	32	907	192	109	235	536	104	49	35	724	99	61	22	1
Boot and shoe makers and repairers.....	794	13	29	752	172	92	197	461	95	41	25	622	68	44	17	1
Harness and saddle makers and repairers.....	119	2	3	105	14	11	26	51	4	4	6	65	22	14	4	
Leather carriers and tanners.....	41	1		40	4	5	10	19	3	4	3	29	9	1	1	
Trunk and leather-case makers, etc.....	10			10	2	1	2	5	2		1	8		2		
Liquors and beverages.....	19		2	17	4	1	4	9	5	2		16	1			
Bottlers and soda water makers, etc.....	13		1	12	1		4	5	4	2		11	1			
Brewers and maltsters.....	3		1	2	1			1	1			2				
Distillers and rectifiers.....	3		3		2	1		3				3				
Lumber and its remanufactures.....	730	12	24	694	98	78	154	330	80	37	38	485	113	63	32	1
Cabinetmakers.....	180	2	4	174	29	30	47	106	25	7	6	144	14	8	8	
Coopers.....	92	1		91	12	6	20	38	13	5	6	62	21	4	4	
Saw and planing mill employees.....	110	3	5	102	15	3	17	35	10	8	7	60	24	11	7	
Other woodworkers.....	348	6	15	327	42	39	70	151	32	17	19	219	54	40	13	1
Metals and metal products other than iron and steel.....	204	5	2	197	23	16	48	87	23	14	10	134	42	16	5	
Brassworkers.....	19	2		17	3	1	6	10	2		3	15	1	1		
Copper workers.....	35	1		34	4	5	8	17	2	1		20	9	4	1	
Gold and silver workers.....	17	1		16	1	2	4	7	5		1	13	1	2		
Other metal workers.....	65	1		64	6	4	10	20	10	7	3	40	19	4	1	
Paper and printing.....	606	12	11	583	113	99	164	376	94	40	18	528	43	8	4	
Bookbinders.....	54		2	52	8	7	20	35	6	1	1	43	7	1	1	
Boxmakers (paper).....	18			18	2		8	10	2	3	1	16	2			
Engravers.....	27		1	26	3	5	6	14	8	1		23	3			
Paper and pulp mill operatives.....	31	2		29	5	4	7	16	1	1	1	19	8	2		
Printers, lithographers, and pressmen.....	476	10	8	458	95	83	123	301	77	34	15	427	23	5	3	
Textiles.....	2,214	43	64	2,107	317	180	377	874	296	166	160	1,496	425	135	46	5
Bleachery and dye works operatives.....	13	1		12	1	1	1	3	2	1	1	7	3	2		
Carpenter and joiner operatives.....	45		1	44	7	2	9	18	5	5	4	32	7	3	1	1
Cabinetmakers.....	136	1	3	132	29	12	21	62	17	9	12	100	24	7	1	
Coopers.....	31		2	29	5	4	6	15	2	2	1	20	5	2	2	
Shoemakers.....	15		2	13	2	2	3	7	1	2	1	11	4			
Wagon makers.....	86	6	2	78	8	6	10	24	14	9	6	53	17	6	2	
Wagon repairers.....	24			24	3	2	4	9	3	2	1	15	5	2	2	
Dressmakers.....	706	10	22	674	80	51	116	247	99	57	62	465	166	35	8	
Millinery.....	26	1	1	24	2	1	9	12	4	3	2	21	1	2		
Milliners.....	53	3		48	4	2	8	14	6	8	1	29	15	3	1	
Seamstresses.....	604	14	22	568	93	43	92	228	83	36	42	389	124	44	9	2
Shirt, collar, and cuff makers.....	34	1		33	9	3	10	22	5	2	1	30	3			
Tailors and tailoresses.....	402	6	7	389	71	49	84	204	53	23	23	303	44	24	17	1
Other textile workers.....	39		2	37	3	2	4	9	2	7	3	21	7	5	3	1
Miscellaneous industries.....	1,049	28	36	985	106	87	163	356	124	78	56	614	256	88	26	1
Broom and brush makers.....	45	2		43	5	3	8	16	9	2	3	30	11	1	1	
Charcoal, coke, and lime burners.....	6			6								2				
Engineers and firemen (not locomotive).....	126	4	4	118	10	2	8	20	7	10	8	45	56	15	2	
Electricians.....	18			18	2	1	3	6	1			8	6			
Wagon makers.....	248	15	9	224	2	5	20	27	7	15	22	91	83	39	11	
Wagon repairers.....	27	1	2	24	3	2	5	10	1			12	6	4	2	
Photographers.....	55			55	4	8	11	23	7	2	3	35	18	2		
Photographic engravers.....	12	1		11	3	1	3	7	1			8	3			
Photographic retouchers.....	233	3		210	30	30	46	115	30	27	9	190	21	5	3	
Printers.....	56	1	11	54	5	6	13	24	7	6	2	39	10	5		
Other miscellaneous workers.....	223	1	9	213	33	29	46	108	25	14	7	154	39	12	7	1

# OCCUPATIONS.

TABLE LXXIII.—THE DEAF ENGAGED IN EACH OCCUPATION AND CLASS OF OCCUPATIONS, BY DEGREE OF DEAFNESS, ABILITY TO SPEAK, SEX, RACE, AND PRESENT AGE.

OCCUPATION.	Aggregate.	DEGREE OF DEAFNESS.		ABILITY TO SPEAK.			SEX.		RACE.		PRESENT AGE.		
		Totally deaf.	Partially deaf.	Well.	Imperfectly.	Not at all.	Male.	Female.	White.	Colored.	10 and under 20.	20 and over.	Unknown.
All occupations.....	32,142	12,678	19,464	21,274	2,722	8,146	26,637	5,505	29,831	2,311	1,668	30,353	121
Agricultural pursuits.....	14,068	4,761	9,307	9,807	1,113	3,148	13,126	942	12,827	1,241	887	13,139	42
Agricultural laborers.....	2,016	1,218	798	722	309	985	1,813	203	1,516	500	444	1,564	8
Dairy men and dairy women.....	11,428	3,366	8,062	8,597	704	2,067	10,721	707	10,742	686	423	10,974	31
Stock raisers, herders, and drovers.....	147	31	20	27	15	38	314	16	316	14	5	324	1
Professional service.....	1,080	387	693	860	68	143	832	248	1,058	22	13	1,058	9
Actors, professional showmen, etc.....	23	16	7	14	3	6	23		21	2	2	21	
Architects, designers, draftsmen, etc.....	46	15	31	41	1	4	45	1	46		1	45	
Artists and teachers of art.....	114	60	54	68	14	32	51	63	113	1	3	110	1
Clergymen.....	116	18	98	112	3	1	112	4	108	8		114	2
Dentists.....	20	3	17	19		1	20		20			20	
Electricians.....	18	4	14	16	1	1	18		18		1	17	
Engineers (civil, etc.) and surveyors.....	43	5	38	43			43		43			42	1
Journalists.....	54	17	37	51	3		47	7	54			54	
Lawyers.....	96	7	89	87	2	1	89	1	88	2		90	
Literary and scientific persons.....	40	11	29	38	2		24	16	40		1	39	
Domestic and personal service.....	5,316	2,395	2,921	3,130	527	1,659	3,210	2,100	4,548	768	280	4,965	41
Barbers and hairdressers.....	122	74	48	55	15	52	117	5	110	12	4	118	
Bartenders.....	9	3	6	7		2	9		9			9	
Boarding and lodging house keepers.....	125	13	112	118	3	4	17	108	121	4		125	
Hotel keepers.....	96	18	78	90	6	6	74	22	95	1	1	94	1
Housekeepers and stewards.....	230	91	139	158	15	57	10	220	223	7	9	220	1
Janitors and sextons.....	74	15	59	66		7	66	8	71	3		74	
Laborers (not specified).....	2,718	1,217	1,501	1,573	264	881	2,587	131	2,424	294	144	2,560	14
Laundresses and laundresses.....	452	210	242	280	40	132	38	414	287	165	12	435	5
Nurses and midwives.....	57	9	48	48	4	5	6	51	48	9		57	
Restaurant keepers.....	21	6	15	15	5	1	20	1	19	2		21	
Saloon keepers.....	26	4	22	24	1	1	26		26			26	
Servants and waiters.....	1,303	712	591	634	172	497	159	1,144	1,040	263	100	1,177	20
Soldiers, sailors, and marines (U. S.).....	3		3	3			3		3			3	
Watchmen, policemen, firemen, etc.....	48	6	42	41	3	4	48		48			48	
Other domestic and personal service.....	82	17	65	78	4	10	30	2	24	8	4	28	
Trade and transportation.....	2,236	552	1,684	1,866	97	273	2,046	190	2,171	65	77	2,152	7
Agents.....	231	61	170	197	5	29	200	31	229	2	2	229	
Bankers and brokers.....	119	18	101	111	3	5	86	33	119			119	
Boatmen and sailors.....	45	8	37	40	1	4	45		44	1		45	
Bookkeepers and accountants.....	124	27	97	112	6	6	102	22	123	1	4	120	
Clerks and copyists.....	263	105	158	192	15	56	241	22	259	4	18	244	1
Commercial travelers.....	33	8	25	26	2	5	31	2	33			33	
.....	206	56	150	161	15	30	205	1	188	18	13	190	3
.....	3		3	3			2	1	3			3	
.....	47	24	23	25	3	19	47		39	8	4	43	
.....	66	24	42	48	4	14	59	7	66		1	65	
Livery stable keepers.....	30	3	27	29		1	29	1	30			29	
.....	710	115	595	641	23	46	666	44	702	8	11	697	2
.....	7	4	3	5		1	7		7			7	
.....	13	6	7	8	2	3	13		12	1	7	6	
Officials of banks and companies.....	22	4	18	20	1	1	21	1	22			22	
Packers and shippers.....	26	17	9	13	4	9	22	4	26		2	24	
Porters and helpers (in stores, etc.).....	39	22	17	20	1	18	39		24	15	1	38	
.....	77	20	57	63	4	10	70	7	77		3	73	1
.....	106	15	91	96	5	5	101	5	100	6	3	103	
.....	15	3	12	13	1	1	6	9	15		1	14	
.....	1		1	1			1		1			1	
.....	3	1	2	2		1	3		3		1	2	
.....	16		16	16			16		16			16	
.....	13	2	11	11		2	13		13			13	
.....	21	9	12	13	1	7	21		20	1	5	16	
Manufacturing and mechanical pursuits.....	9,442	4,583	4,859	5,602	917	2,923	7,423	2,019	9,227	215	411	9,009	22
Building trades.....	2,000	738	1,262	1,407	137	456	1,981	19	1,966	34	48	1,946	6
Carpenters and joiners.....	1,121	371	750	837	65	219	1,114	7	1,102	19	21	1,097	3
Masons (brick and stone).....	203	62	141	161	11	31	203		196	7	3	199	1
Painters, glaziers, and varnishers.....	399	223	176	213	34	162	392	7	395	4	14	383	2
Paper hangers.....	30	5	25	27	1	2	30		28	2		30	
Plasterers.....	59	17	42	47	3	9	58	1	58	1	2	57	
Plumbers and gas and steam fitters.....	20	4	16	15	2	3	20		20		2	18	
Roofers and slaters.....	7		7	7			7		7			7	
Mechanics (not otherwise specified).....	161	66	95	100	21	40	157	4	160	1	6	155	
Chemicals and allied products.....	20	7	13	15	2	3	18	2	20			20	
Oil well and oil works employees.....	16	3	13	14	1	1	16		16			16	
Other chemical workers.....	4	4		1	1	2	2	2	4			4	

TABLE LXXIII.—THE DEAF ENGAGED IN EACH OCCUPATION AND CLASS OF OCCUPATIONS, BY DEGREE OF DEAFNESS, ABILITY TO SPEAK, SEX, RACE, AND PRESENT AGE—Continued.

OCCUPATION.	Aggregate.	DEGREE OF DEAFNESS.		ABILITY TO SPEAK.			SEX.		RACE.		PRESENT AGE.		
		Totally deaf.	Partially deaf.	Well.	Imperfectly.	Not at all.	Male.	Female.	White.	Colored.	10 and under 20.	20 and over.	Unknown.
Clay, glass, and stone products.....	129	63	66	75	9	45	125	4	127	2	5	124	
Brick and tile makers, etc.....	26	13	13	14	1	11	25	1	25	1	4	22	
Glasworkers.....	24	11	13	13	1	10	22	2	24		1	23	
Marble and stone cutters.....	70	33	37	42	7	21	69	1	69	1		70	
Potters.....	9	6	3	6		3	9		9			9	
Fishing and mining.....	359	193	247	261	22	67	345	5	338	12	15	334	1
Fishermen and oystermen.....	85	22	63	62	5	18	84	1	81	4	1	83	1
Miners and quarrymen.....	265	81	184	199	17	49	261	4	257	8	14	251	
Food and kindred products.....	297	118	179	205	22	70	270	27	291	6	18	278	1
Bakers.....	103	61	42	50	10	43	90	13	102	1	7	96	
Butchers.....	91	23	68	76	3	12	90	1	90	1	8	82	1
Butter and cheese makers.....	6	2	4	5		1	6		6			6	
Confectioners.....	36	14	22	28	6	2	28	8	36		3	33	
Millers.....	49	8	41	42	1	6	48	1	47	2		49	
Other food preparers.....	12	10	2	4	2	6	8	4	10	2		12	
Iron and steel and their products.....	869	316	553	618	61	199	860	9	851	18	17	850	2
Blacksmiths.....	348	84	264	293	17	38	347	1	334	14	8	339	1
Iron and steel workers.....	183	106	77	90	18	75	178	5	182	1	5	178	
Machinists.....	216	87	129	143	20	53	215	1	215	1	3	212	1
Steam boiler makers.....	54	3	51	52	1	1	54		52	2		54	
Stove, furnace, and grate makers.....	7	4	3	4		3	7		7			7	
Tool and cutlery makers.....	26	12	14	16	3	7	26		26			26	
Wheelwrights.....	24	11	13	15		9	24		24			24	
Wireworkers.....	11	9	2	5	2	4	9	2	11		1	10	
Leather and its finished products.....	955	646	309	364	118	473	914	41	933	22	46	907	2
Boot and shoe makers and repairers.....	794	559	235	276	98	420	756	38	773	21	41	751	2
Harness and saddle makers and repairers.....	110	59	51	59	13	38	109	1	109	1	2	108	
Leather curriers and tanners.....	41	22	19	23	6	12	39	2	41		1	40	
Trunk and leather-case makers, etc.....	10	6	4	6	1	3	10		10		2	8	
Liquors and beverages.....	19	15	4	7		12	18	1	18	1	2	17	
Bottlers and soda water makers, etc.....	13	10	3	5		8	12	1	13		2	11	
Brewers and maltsters.....	3	2	1	2		1	3		3			3	
Distillers and rectifiers.....	3	3				3	3		2	1		3	
Lumber and its remanufactures.....	730	392	338	383	66	281	714	16	709	21	31	698	1
Cabinetmakers.....	180	119	61	71	18	91	180		178	2	11	169	
Coopers.....	92	46	46	51	10	31	91	1	91	1	2	90	
Saw and planing mill employees.....	110	39	71	70	9	31	109	1	107	3	6	104	
Other woodworkers.....	348	188	160	191	29	128	334	14	333	15	12	335	1
Metals and metal products other than iron and steel.....	204	107	97	121	21	62	201	3	201	3	3	201	
Brass and bell metal workers.....	19	12	7	10	3	6	18	1	19			19	
Cast iron and steel workers.....	35	18	17	18		17	35		35			35	
Other metal workers.....	17	11	6	9	1	7	16	1	15	2		17	
Tin plate and tinware makers.....	65	23	42	45	9	11	64	1	65		1	64	
Other metal workers.....	68	43	25	39	8	21	68		67	1	2	66	
Paper and printing.....	606	480	126	202	95	369	547	59	604	2	49	553	4
Bookbinders.....	54	42	12	18	4	32	34	20	54		3	51	
Boxmakers (paper).....	18	14	4	6	2	10	12	6	18		2	16	
Printers.....	27	24	3	13	8	6	27		27		2	25	
Stationers.....	31	18	13	14	3	14	24	7	30	1		30	1
Other paper workers.....	476	382	94	151	78	247	450	26	475	1	42	431	3
Textiles.....	2,214	1,101	1,113	1,296	260	658	505	1,709	2,150	64	127	2,084	3
Bleachery and dye works operatives.....	13	3	10	10	1	2	13		13			13	
Cotton mill operatives.....	45	21	24	26	3	16	24	21	45		1	44	
Woolen mill operatives.....	136	78	58	66	18	52	64	72	136		13	123	
Other textile operatives.....	31	21	10	14	6	11	8	23	31		4	27	
Silk mill operatives.....	15	9	6	7	2	6	4	11	15		2	13	
Woolen mill operatives.....	86	35	51	61	6	19	54	32	86		3	82	1
Other textile operatives.....	24	11	13	15	2	7	15	9	20	4	2	22	
Dressmakers.....	706	314	392	466	74	166	2	704	690	16	29	677	
Hat and cap makers.....	26	14	12	14	2	10	16	10	26			26	
Milliners.....	53	16	37	38	7	8	2	51	53		5	48	
Seamstresses.....	604	306	298	347	78	179	1	603	565	39	41	563	
Shirt, collar, and cuff makers.....	34	24	10	13	3	18	8	26	34		3	31	
Tailors and tailoresses.....	402	236	166	190	53	159	283	119	400	2	21	379	2
Other textile workers.....	39	13	26	29	5	5	11	28	36	3	3	36	
Miscellaneous industries.....	1,040	497	552	648	104	297	925	124	1,019	30	50	997	2
Broom and brush makers.....	45	29	16	25	5	15	43	2	41	4	4	41	
Charcoal, coke, and lime burners.....	6	1	5	6			6		6			6	
Coal miners.....	126	29	97	108	4	14	126		120	6	4	121	1
Coal miners (other).....	18	9	9	11	2	5	8	10	18		2	16	
Coal miners (other).....	248	55	193	208	19	21	243	5	248			248	
Coal miners (other).....	27	10	17	19	3	5	27		27		1	26	
Coal miners (other).....	55	28	27	35	6	14	47	3	55		1	55	
Photographers.....	12	10	2	5		5	12		12			12	
Rubber factory operatives.....	233	162	71	93	36	104	205	28	225	8	17	215	1
Tobacco and cigar factory operatives.....	56	31	25	31	5	20	55	1	56		1	55	
Upholsterers.....	223	133	90	107	22	94	156	67	213	10	20	203	

OCCUPATIONS.

TABLE LXXIV.—THE DEAF ENGAGED IN EACH OCCUPATION AND CLASS OF OCCUPATIONS, BY SCHOOL ATTENDANCE AND KIND OF SCHOOL ATTENDED.

OCCUPATION.	Total.	SCHOOL ATTENDANCE.			KIND OF SCHOOL ATTENDED.			
		Attended school.	Did not attend school.	Not stated.	Special.	Other.	Both.	Not stated.
All occupations.....	32,142	26,030	3,950	2,162	8,163	8,821	125	8,921
Agricultural pursuits.....	14,068	10,668	2,294	1,106	2,578	4,016	23	4,051
Agricultural laborers.....	2,016	1,270	630	116	569	493	0	202
Dairymen and dairywomen.....	29	23	1	5	2	8		13
Farmers, planters, and overseers.....	11,428	8,897	1,508	933	1,908	3,324	16	3,649
Gardeners, florists, nurserymen, etc.....	330	268	32	30	46	102		120
Lumbermen and raftsmen.....	51	47	1	3	22	12		13
Stock raisers, herders, and drovers.....	147	120	15	12	22	59	1	38
Turpentine farmers and laborers.....	4	3	1		1	1		2
Wood choppers.....	52	30	16	6	8	13		9
Other agricultural pursuits.....	11	10		1	1	4		5
Professional service.....	1,080	1,037	16	27	315	349	26	347
Actors, professional showmen, etc.....	23	22	1		10	5	1	6
Architects, designers, draftsmen, etc.....	46	44	1	1	8	20	4	12
Artists and teachers of art.....	114	111	1	2	56	36	1	18
Clergymen.....	116	105	4	7	8	44	1	52
Dentists.....	20	20			2			9
Electricians.....	18	17	1		4	7		6
Engineers (civil, etc.) and surveyors.....	43	40		3	2	15	2	21
Journalists.....	54	51	2	1	7	25	2	17
Lawyers.....	90	87	2	1	2	32	1	52
Literary and scientific persons.....	40	40			2	21	2	15
Musicians and teachers of music.....	39	36	2	1	1	25		10
Officials (government).....	108	99	1	2	6	23		30
	294	293	1	7	3	36		60
	15	13		2	204	46	12	31
						5		8
Domestic and personal service.....	5,310	3,903	988	425	1,369	1,328	12	1,194
Barbers and hairdressers.....	122	110	7	5	64	24		22
Bartenders.....	9	9			2	5		2
Boarding and lodging house keepers.....	125	100	11	14	9	36		55
Hotel keepers.....	96	73	10	13	6	31		36
	230	181	28	21	57	63	1	60
	74	63	8	3	8	20		35
	2,718	2,015	483	220	741	651	5	618
	452	299	112	41	88	103	1	107
	57	43	8	6	6	19		18
Restaurant keepers.....	21	16	3	2	2	7		7
Saloon keepers.....	26	20	2	4	1	6		13
Servants and waiters.....	1,303	909	309	85	368	342	5	194
Soldiers, sailors, and marines (U. S.).....	3	3				2		1
Watchmen, policemen, firemen, etc.....	48	37	3	8	5	10		22
Other domestic and personal service.....	32	25	4	3	12	9		4
Trade and transportation.....	2,236	1,979	119	138	349	727	15	888
Agents.....	231	212	8	11	33	73	3	103
Bankers and brokers.....	119	103	3	13	6	34		63
Boatmen and sailors.....	45	33	6	6	4	10		19
Bookkeepers and accountants.....	124	119	1	4	18	54	1	46
Clerks and copyists.....	283	251	8	4	84	84	3	80
Commercial travelers.....	33	32	1		7	11		14
Draymen, hackmen, teamsters, etc.....	206	165	21	20	34	63	1	67
Foremen and overseers.....	3	2		1		2		
Hostlers.....	47	28	16	3	7	16		5
Hucksters and peddlers.....	66	55	4	7	15	17		23
Livery stable keepers.....	30	26	3	1	3	12		11
Merchants and dealers (except wholesale).....	710	643	22	45	70	232	5	336
Merchants and dealers (wholesale).....	7	7			2	3		2
Messengers and errand and office boys.....	13	9	2	2	2	4		3
Officials of banks and companies.....	22	19		3	1	6		11
Packers and packers.....	26	23	2	1	12	7	1	4
Porters and porters.....	30	28	8	3	14	11		3
Salesmen.....	77	69	1	7	16	21	1	31
Steam railroad.....	106	87	12	7	7	37		43
Stenographers.....	15	15			3	5		7
Street railway.....	1	1						1
Telegraph and telegraph.....	3	3				2		1
Telegraph and telegraph.....	16	15	1			10		5
Undertakers.....	13	13			3	4		6
Other persons in trade and transportation.....	21	21			8	9		4
Manufacturing and mechanical pursuits.....	9,442	8,443	533	466	3,552	2,401	49	2,441
Building trades.....	2,000	1,778	102	120	539	545	8	686
Carpenters and joiners.....	1,121	985	59	77	258	282	4	441
Masons (brick and stone).....	293	170	17	16	26	69	1	74
Painters, glaziers, and varnishers.....	399	377	7	15	183	107	3	84
Paper hangers.....	30	25	3	2	3	12		10
Plasterers.....	59	45	9	5	7	14		24
Plumbers and gas and steam fitters.....	20	20			5	10		5
Roofers and slaters.....	7	6		1		2		4
Mechanics (not otherwise specified).....	161	150	7	4	57	49		44
Chemicals and allied products.....	20	19		1	7	6		6
Oil well and oil works employees.....	16	15		1	3	6		6
Other chemical workers.....	4	4			4			

TABLE LXXIV.—THE DEAF ENGAGED IN EACH OCCUPATION AND CLASS OF OCCUPATIONS, BY SCHOOL ATTENDANCE AND KIND OF SCHOOL ATTENDED—Continued.

OCCUPATION.	Total.	SCHOOL ATTENDANCE.			KIND OF SCHOOL ATTENDED.			
		Attended school.	Did not attend school.	Not stated.	Special.	Other.	Both.	Not stated.
Clay, glass, and stone products.....	129	118	5	6	50	36		32
Brick and tile makers, etc.....	26	24	1	1	9	9		6
Glassworkers.....	24	24			12	6		6
Marble and stone cutters.....	70	62	4	4	24	19		19
Potters.....	9	8		1	5	2		1
Fishing and mining.....	350	279	42	29	52	117		110
Fishermen and oystermen.....	85	67	15	3	4	31		32
Miners and quarrymen.....	265	212	27	26	48	86		78
Food and kindred products.....	297	263	18	16	84	99		80
Bakers.....	103	96	4	3	49	25		22
Butchers.....	91	80	6	5	14	40		26
Butter and cheese makers.....	6	6			2	1		3
Confectioners.....	36	32	2	2	7	13		12
Millers.....	49	39	5	5	7	15		17
Other food preparers.....	12	10	1	1	5	5		
Iron and steel and their products.....	869	783	48	58	228	241	5	289
Blacksmiths.....	348	295	30	23	35	117	1	142
Iron and steel workers.....	183	162	9	12	84	38	2	38
Machinists.....	216	196	4	16	74	56	1	65
Steam boiler makers.....	54	47	2	5	4	17		26
Stove, furnace, and grate makers.....	7	7			4	2		1
Tool and cutlery makers.....	26	24	1	1	10	6		8
Wheelwrights.....	24	22	2		9	3	1	9
Wireworkers.....	11	10		1	8	2		
Leather and its finished products.....	955	868	46	41	569	142	3	154
Boot and shoe makers and repairers.....	794	724	36	34	505	111	3	105
Harness and saddle makers and repairers.....	110	97	8	5	43	18		26
Leather curriers and tanners.....	41	38	1	2	15	12		11
Trunk and leather-case makers, etc.....	10	9	1		6	1		2
Liquors and beverages.....	19	16	2	1	11	2		3
Bottlers and soda water makers, etc.....	13	12	1		7	2		3
Brewers and maltsters.....	3	2		1	2			
Distillers and rectifiers.....	3	2	1		2			
Lumber and its remanufactures.....	730	666	37	27	338	152	5	171
Cabinetmakers.....	180	175	3	2	118	27	1	29
Coopers.....	92	79	7	6	34	20		25
.....	110	97	8	5	28	38	1	30
.....	348	315	19	14	158	67	3	87
Metals and metal products other than iron and steel.....	204	187	11	6	88	43	2	54
.....	19	18	1		12	4		2
.....	35	35			17	5		13
.....	17	15	2		10	4		1
.....	65	59	4	2	15	23		21
Other metal workers.....	68	60	4	4	34	7	2	17
Paper and printing.....	606	591	6	9	443	81	9	58
Bookbinders.....	54	51	1	2	38	9		4
Boxmakers (paper).....	18	18			10	4		4
Engravers.....	27	27			21	2	1	3
Paper and pulp mill operatives.....	31	25	4	2	13	7		5
Printers, lithographers, and pressmen.....	476	470	1	5	361	59	8	42
Textiles.....	2,214	1,950	161	103	781	642	13	514
Bleachery and dye works operatives.....	13	11	1	1	3	5		3
Carpet factory operatives.....	45	36	7	2	14	11	1	10
Cotton mill operatives.....	136	110	19	7	53	25		32
Hosiery and knitting mill operatives.....	31	26	3	2	15	8		3
Silk mill operatives.....	15	13	2		6	5		2
Woolen mill operatives.....	86	71	7	8	24	30	1	16
Other textile mill operatives.....	24	20	3	1	10	5		5
Dressmakers.....	706	663	22	21	227	255	5	176
Hat and cap makers.....	26	23	3		11	4		8
Milliners.....	53	46	2	5	13	15		18
Seamstresses.....	604	512	61	31	191	175	4	142
Shirt, collar, and cuff makers.....	34	30	2	2	21	6		3
Tailors and tailoresses.....	402	358	24	20	188	86	2	82
Other textile workers.....	39	31	5	3	5	12		14
Miscellaneous industries.....	1,049	945	55	49	362	295	4	284
Broom and brush makers.....	45	36	5	4	19	8	1	8
Charcoal, coke, and lime burners.....	6	5	1		3	3		2
Engineers and firemen (not locomotive).....	126	102	15	9	14	39		49
Glovemakers.....	18	16	1	1	5	1		10
Manufacturers and officials, etc.....	248	220	9	17	29	92		108
Model and pattern makers.....	27	25	2		8	10		7
Photographers.....	55	54		1	22	16	1	15
Rubber factory operatives.....	12	11	1		3	5		1
Tobacco and cigar factory operatives.....	233	215	10	8	122	59	1	33
Upholsterers.....	56	55		1	26	13		16
Other miscellaneous industries.....	223	197	18	8	109	52	1	35