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REPORTS

ON THE

PHYSICAL CONDITION

OF THE

POLICE FORCE OF ST. LOUIS

MADE TO THE

BOARD OF POLICE COMMISSIONERS

BY

GEO. HOMAN, M. D.,

Medical Examiner.

(ILLUSTRATED WITH CHARTS.)

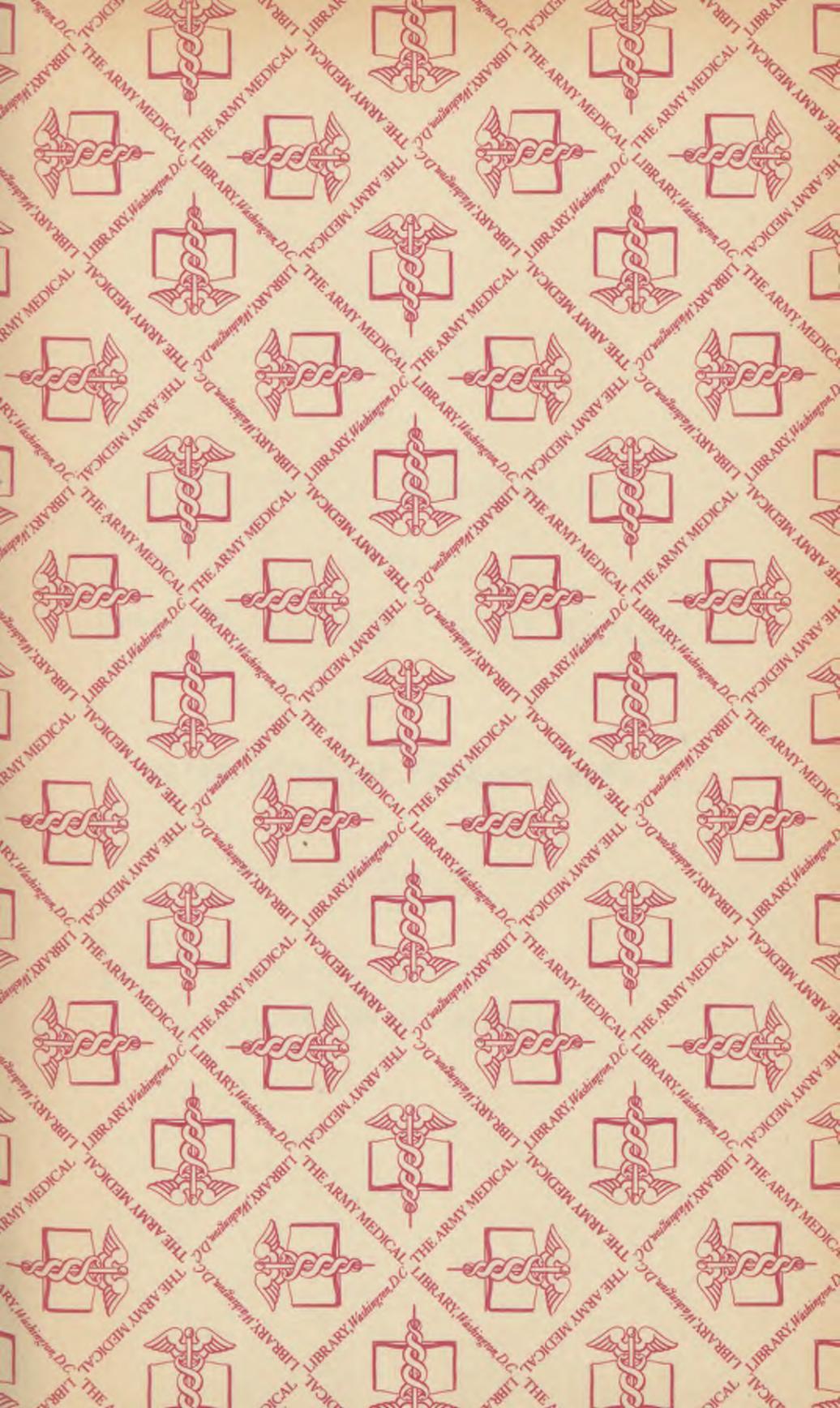
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R E P O R T S

ON THE

Physical Condition of the St. Louis Police Force

To the Honorable Board of Police Commissioners:

I have the honor to submit herewith for your information the results of the physical examination of 476 members of the Police Department made by me in obedience to your letter of notification to that effect dated Nov. 7, 1887.

The work was conducted on the same general principles and in accordance with the rules observed in the previous examination as regards method, measurement, rating, etc. — the benefit of any doubt in every case being invariably given to the department.

A definition of the existing circumstances and physical conditions in each case, which, in the exercise of my best judgment and discrimination, determined the classes into which those examined fell, was offered at the time the results of the former examination were submitted, but it may not be out of place to repeat it here, as follows: —

The term Good was used to designate one whose age was under forty-five years, who was sound in all vital organs and functions, and temperate in his mode of life; having, perhaps, some minor imperfections, but able to perform intelligently and well all the duties, routine and extraordinary, to which his calling subjected him.

Fair denoted (1) one whose age was above forty-five and whose physical powers, after a good record, had somewhat

passed their full vigor and activity without showing evidence of serious impairment or disease in any vital organ or function; or (2) one under forty-five who exhibited only general signs of lowered constitutional vigor and lessened activity; or liability to physical failure, under ordinary strain, due to or following imperfect recovery from illness or injury legitimately contracted or received in the discharge of official duty.

Doubtful comprised those of any age who manifested a degree of physical deterioration and whose record might show considerable time lost through sick leave; or those in whom appeared indications of impending disability or serious disease. Also, those whose weight greatly exceeded a proper relation to the height without accompanying implication of any vital organ.

Unsound indicated those showing undoubted enfeebling constitutional taint, and certain evidences of serious diseases or imperfections of important or vital parts or organs. Also those who plainly showed the effects of over-indulgence or excesses of whatever kind.

In the class Bad were those who by disease or injury were unfitted for the performance of ordinary police duty.

The subjoined tabulated showing exhibits in condensed form the gross results arrived at by Districts, together with the totals of the several ratings, percentages, etc.

SUMMARY OF CLASSIFICATIONS BY DISTRICTS.

Rating or Classification.	Central Dist.	3d Dist.	4th Dist.	5th Dist.	2d Dist.	1st Dist.	Totals of Classes.	Percent. of Grand Total.
Good	12	3	6	11	2	1	35	7.35
Good to Fair.....	49	35	18	21	16	8	147	30.88
Fair.....	54	33	33	25	20	6	171	35.92
Fair to Doubtful.....	13	10	6	11	8	4	52	10.92
Doubtful.....	13	11	8	10	4	1	47	9.87
Doubtful to Unsound.....	4	3	1	4	2	0	14	2.94
Unsound	2	1	1	3	2	0	9	1.89
Unsound to Bad.....	0	0	0	0	0	0	0	0.00
Bad	0	0	0	0	1	0	1	0.21
Total	147	96	73	85	55	20	.....	.....
Grand total.....	.....	.....	.....	.....	.....	.....	476	.....

Total rated Fair and upward, 353; per cent. of grand total 74.15. Total rated below Fair, 123; per cent. of grand total 25.84.

The mortality record of the department for the last ten or more years taken in connection with a study and analysis of results reached by the former examination, together with the ascertained tendency of police life toward producing impairment of breathing capacity, especially in those new in the service, satisfied me some time ago that pulmonary mischief constitutes a principal weakening cause operating among the members, and that especial note should be taken of any thing indicating beginning or actual deterioration in this direction. Accordingly in the conduct of the examination great care was exercised to ascertain the condition of the lungs, and the same degree of care was observed in taking the measurements of the chest.

Other things being equal the pulmonary conditions found, and the chest measurements, materially influenced the rating made in each case.

In comparing the individual chest measurements taken in the two examinations it was found that those of the later examination showed with few exceptions a general shrinkage—the expansibility, pliancy, or mobility of the chest walls being decidedly impaired. This showing was so general, even in the cases of those long connected with the service, as to excite a degree of surprise, as I was scarcely prepared for such marked differences as frequently appeared, and when all possible care had been taken to secure accurate data for comparison.

The extent of respiration (inspiration and expiration) was as a rule abridged at both extremes—that is chest expansion and contraction—and I have been unable to satisfy myself fully as to the cause of this, but am inclined to think that difference of season plays some part in it, as the first examination was made in summer, while the last one was made in cold weather. This is only a surmise, however, as I have consulted authorities in physiology without being able to find any expression in regard to possible seasonal influence upon respiratory capacity. Should further investigation prove the

truth of the conjecture, it would apparently constitute a new fact in the physiology of human respiration.

I am now engaged in further study and comparison of the results of both examinations, and hope in a supplemental report to develop this point more fully, and make it plain to the eye by means of charts or graphic representation.

Of course if it should become apparent that the decrease of free play of chest is physiological, and not a portent of disease, those who suffered in rating on this account would be entitled to credit for the assumed shortage, and reparation in grading to correspond.

While many members suffered in physical grading for the reason stated some, on the other hand, through improved habits and attention to appropriate means of physical exercise, considerably improved their bodily condition and rose accordingly in the assigned rating.

Among the important physical changes noted may be mentioned the apparently radical cure of rupture in several instances by the use of suitable appliances; also, that cases of enlarged veins of the legs induced by certain prior forms of employment are much relieved by police duty, while the same defects, when due to constitutional fault or organic disease, are greatly aggravated by such service.

I hope at a future day to be able to offer further details in regard to police physique, and deficiencies or excesses therein observed, that influenced the respective ratings made in this examination — some being temporary in nature, others lasting in their duration.

All of which is respectfully submitted.

GEO. HOMAN,
Medical Examiner.

ST. LOUIS, MO., April 3, 1888.

To the Honorable Board of Police Commissioners:

Agreeable to the intimation given in my report of April 3d last, I have the honor to hereby submit a supplemental statement in which sundry details of the several examinations made are more fully elaborated, and an attempt made to explain the bearing and significance of certain physical facts observed and recorded on those occasions.

It is a painful and notable fact that a heavy mortality rate from lung diseases has prevailed in the department for many years, with necessarily a proportionally heavy sickness rate from the same causes.

This being the observed condition for a long period, as shown by the official records, the presence of such results naturally argues the existence of an efficient and constantly operating cause, or causes, and from the material collected since my connection with the department begun I have prepared several charts which, I believe, throw some light on the matter, and tend to show how the beginnings of insidious maladies arise, and the gradual course of physical deterioration in a certain direction among members of the force.

The progressive curtailment of power and capacity to breathe freely and deeply, as an observed fact among policemen, certainly stands in a causative relation to the development of disabilities and deaths in the department from lung diseases; and while individual habits and predispositions in this direction play their part, still an important share of such results must, I think, in justice be ascribed to prominent features of department routine and management — among which may be mentioned the long hours of duty required; the changing from day work to night work and *vice versa*; the omission from department regulations of provision in time and means for individual hygiene, especially in regard to the regular systematic exercise and development of important parts and vital organs necessary to keep them in a condition to with-

stand the wear and fatigue of hard service, the changes and inclemencies of season and weather, and the sudden physical strains and emergencies to which policemen are constantly liable. While but little, if any, attention has been given to this matter until quite recently, it is true that extenuation of this omission is found in the fact that the department has been too weak and poor numerically to be economical of its resources in health and life; and the adjustment of means to ends has been made, without, perhaps, due regard to the maintenance and improvement of health and vigor among the members of the force.

As remarked on a former occasion I believe there are good reasons for believing that the colds, coughs, catarrhs, congestions, consumptions, pleurisies and pneumonias that have told so heavily on the efficiency and vitality of the force bear a constant and definite relation to hygienic faults in the department administration, which, undesignedly, have favored the initiation and development of pulmonary disabilities and diseases.

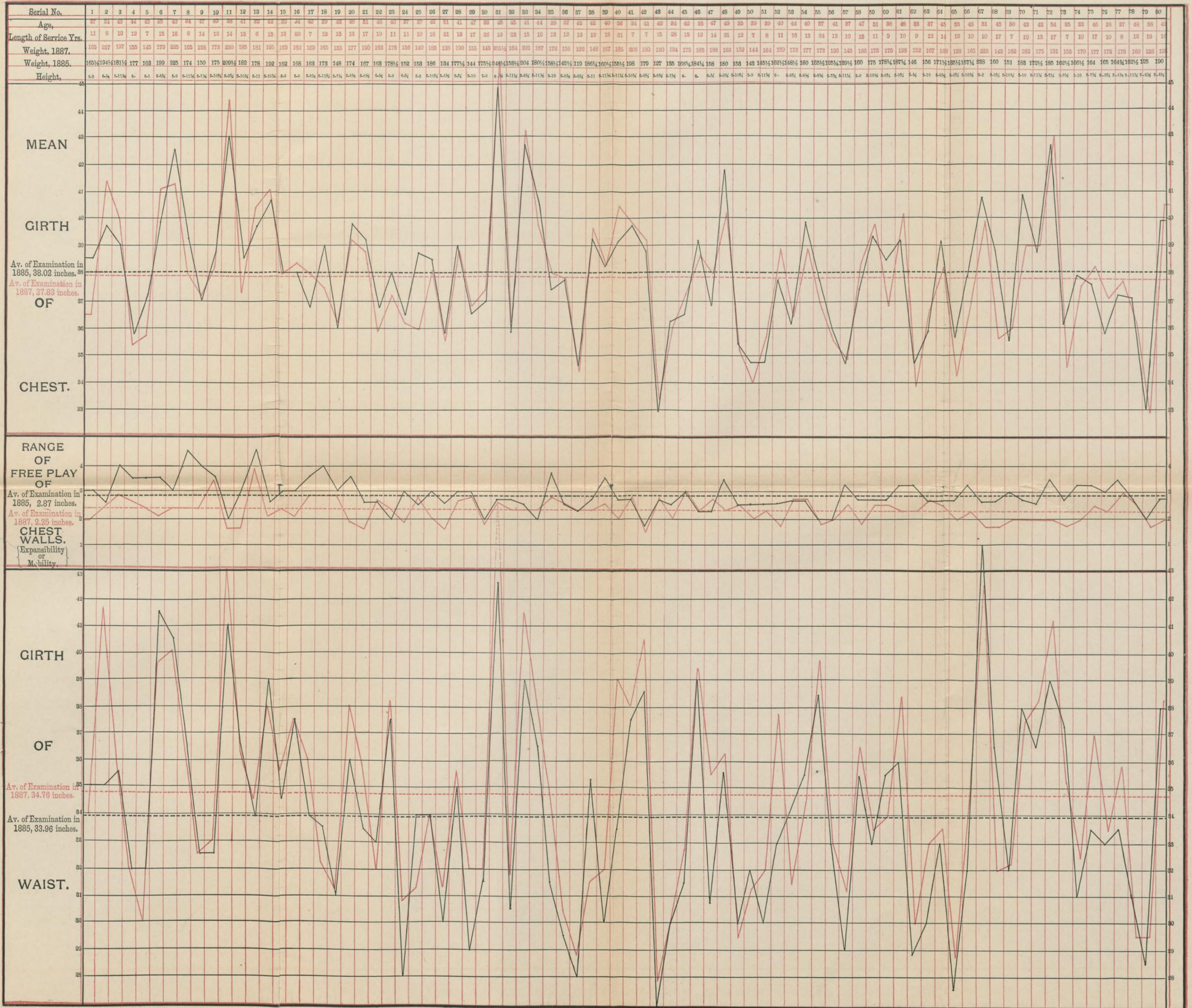
In order to show indisputably the influence of police employment upon the respiratory apparatus I have selected for the purposes of illustration the examination records of eighty men who had served for five or more years, twenty being taken from each of the four principal districts, the only conditions governing the selection being that the subjects had served sufficiently long, and had undergone examination by me during the years 1885 and 1887.

The serial numbers at the top of the sheet represent individuals, and all the personal data concerning any one therein appearing as age, length of service, weight, height, mean girth of chest, etc., may be found in the vertical column corresponding to his number. The measurements of chest and waist in both examinations are given, those of 1885 being shown in black, those of 1887 in red. The sheet is ruled in sub-divisions representing eighths of an inch, and the side figures denote the dimensions; in using the form a dot is placed in the appropriate column and on the proper line according to the indication of the measurements to be illustrated. The zig-

DATA of 1885 in BLACK.
DATA of 1887 in RED.

Chart No. 1.

EXHIBITING THE COMPARATIVE RELATIONS OF AND VARIATIONS IN CERTAIN PHYSICAL MEASUREMENTS, WITH OTHER DATA, IN EIGHTY POLICEMEN OF FIVE OR MORE YEAR'S SERVICE; BASED ON OFFICIAL EXAMINATIONS MADE IN THE YEARS 1885 AND 1887.



zag lines have no significance in themselves, they being used simply to enable the eye at a glance to recognize the respective relations of the various measurements, and the variation occurring in them.

On Chart No. 1 showing the mean girth of chest the average of the whole for each year is indicated by means of dotted lines, that for 1885 being very near the 38-inch line (38".02), and that for 1887 (37".92) falling about a fourth of one inch below it. I am inclined to regard this shrinkage in chest volume as indicating a retrograde vital change of some moment, as, while certain individuals show some increase in this measurement, upon inspection this will appear to be adventitious, as fat laid on externally, and that no gain in actual breathing capacity has been secured.

This untoward tendency is further emphasized in the diagram or division of chart showing the range of free play of the chest walls, or extent of breathing capacity. It will be observed that the red line of individual measurement rises above the corresponding black line in only three instances, and for very short distances, the greatest being only half an inch, and even then the maximum falls below three inches, not reaching the 1885 line of common average.

The parallel dotted lines of common average show a difference of about five-eighths of an inch. In calling attention to this fact in the report made in April, I was not prepared to offer any explanation of it,— suggesting, however, that inasmuch as the last examination was made during cold weather this may have had an influence in its causation. I am, however, not prepared to believe that an average of only two-and-one-quarter inches represents the normal standard in chest play and breathing power in any body of sound and healthy men whose average age is only forty-two and a half years. The question whether or not the shrinkage shown is physiological could, perhaps, only be settled by a re-examination of these men in warm weather, due account being taken of all the circumstances and conditions which at the time might influence the findings.

The average length of service of these veterans is a little over thirteen years, and no discrimination, except as to before-named conditions, being exercised in their selection they are fair representatives of the physical condition of the force.

The waist measurements of this group of men further corroborate the untoward tendencies shown by the preceding data. Upon inspection it will be found that the red line (1887) rises above the black one (1885) sixty-one times, while in five instances the measurements of the two examinations coincide.

The general tendency to overweight is illustrated by the lines of common average, that of 1885 being 33".96, while that of 1887 is 34".76 a rise of four-fifths of an inch. In quite a number the increase in waist girth is considerable, the tendency to take an adipose being marked in some individuals who were already overloaded in this respect.

By comparison of the various data given it will be seen the rule is that as the waist swells the breathing power shrinks, and the actual capacity of the chest cavity diminishes — "fat and scant of breath" as the saying is — and this condition of plethora beyond question impairs immediately the physical activity and efficiency of a policeman, while predisposing to various forms of dangerous disease.

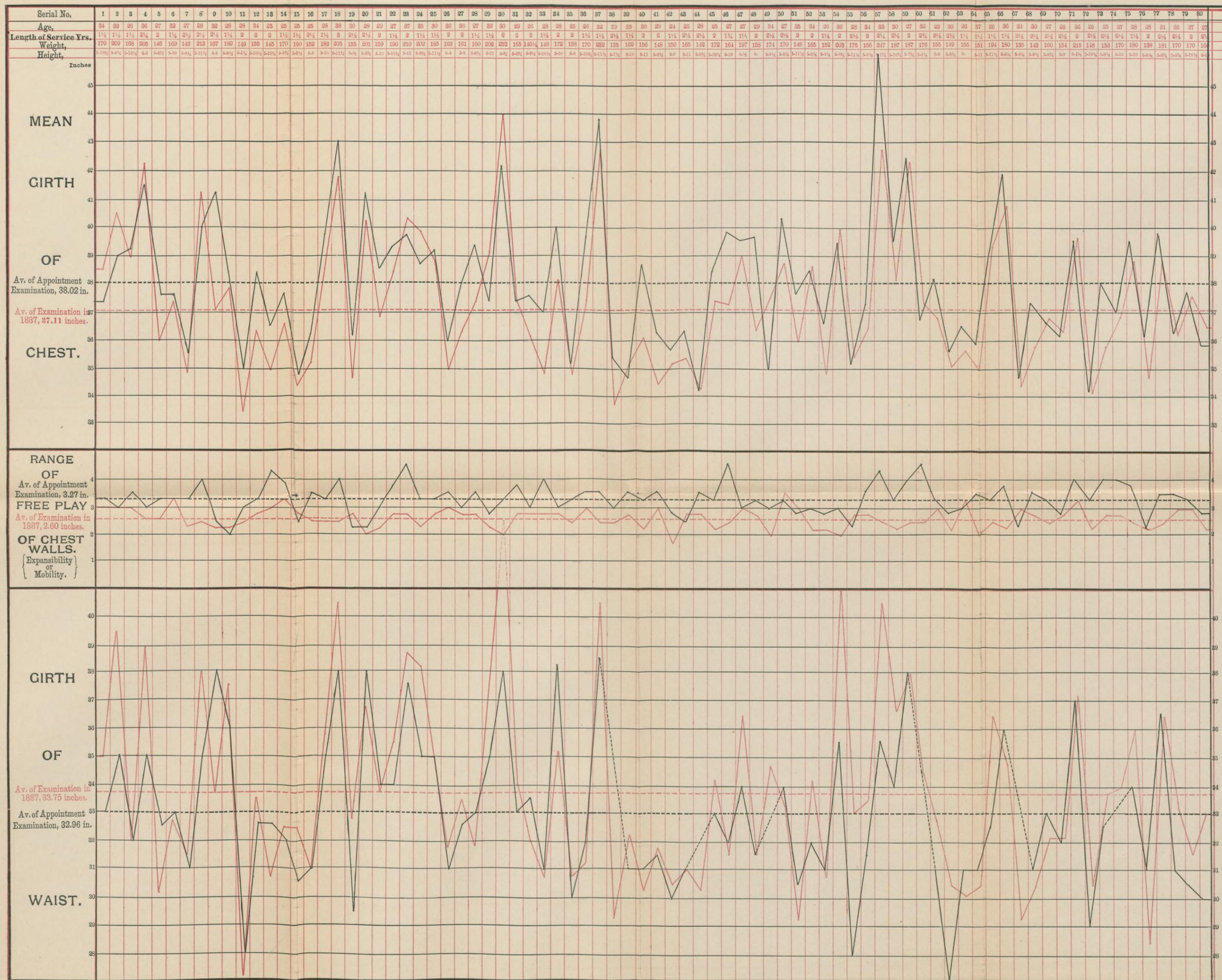
In order that the physical condition of men entering the service, or newly on the force, may be contrasted and compared with that of those of veteran years in such work, I have prepared a second chart on which appear the measurements corresponding to those on the first one, the respective data shown being derived from the examinations for appointment and the general examination of last year.

In the division of the chart showing the mean chest girth it will be seen that fifty-five individuals show a decrease in this respect from the first examination; although, as before intimated, this loss is not so significant as is indicated by the set of measurements showing the mobility of the chest — the difference in the lines of common average in chest girth being

Data of Appointment Examination in Black.
Data of 1887 in Red.

Chart No. 2.

EXHIBITING THE COMPARATIVE RELATIONS OF AND VARIATIONS IN CERTAIN PHYSICAL MEASUREMENTS, WITH OTHER DATA, IN EIGHTY RECRUITS APPOINTED TO THE POLICE DEPARTMENT, BASED ON EXAMINATIONS FOR APPOINTMENT AND LAST OFFICIAL EXAMINATION.



that between 38.02 inches (appointment examination) and 37.11 inches (last examination), or about seven-eighths of one inch.

In the range of free play of chest walls or expansibility, it will be observed that the red line rises above the black one only eight times, while they coincide in five instances.

The extent of the decline in power and capacity to breathe freely and deeply is about five-eighths of an inch, or the difference between the two lines of common average, that of the first examination being 3.27 inches, that of the second 2.60 inches — the average of the latter examination showing, however, a difference of one-fourth of an inch in favor of this group of men as compared with the veterans.

In the lines indicating the common average of waist girth that of the last examination rises above the line of the first one about three-fourths of an inch, the difference between 33.75 in. of 1887, and 32.96 in. of the appointment examination.

This shows the general tendency to increase of bulk at the expense of respiratory power and space, the average weight of this group of men in 1887 falling but little short of the veterans, the former being 170 lbs., the latter 171 lbs. The average weight of the former in 1885 was 167 lbs.

The breaks in the line of individual waist girth for the first examination, which are represented by dots, indicate the first six men examined by me for appointment and in whom this measurement was not recorded.

From the average of the veterans already given as regards chest girth and weight—the height being five feet nine and three-fifths inches—it would appear, judged by the accepted standard of regular life insurance companies, that a prejudicial disproportion exists in the relation of these respective data, there being an excess of from ten to fifteen pounds in weight, and a deficiency of about two inches in girth of chest as compared with the normal proportion to the given height.

In this connection the question arises What is the amount of breathing space normally requisite in men of this particular occupation to enable them to ward off the unduly heavy percent-

age of disability and death from pulmonary diseases? — and while the answer cannot now be definitely given some brief considerations relating to the subject of chest dimensions and play, or vital capacity, may be of interest.

Draper estimates the amount of air respired by a man of average size breathing sixteen times a minute to be equal in volume to thirty-nine cubic inches, while Dalton puts the amount somewhat higher.

For several reasons I am disposed to regard the measurements of police recruits as somewhat nearly representing the average normal standard of breathing capacity and power among human adult males. If this be so and there is evident a progressive decline in chest elasticity occurring in about two years amounting to the difference between the measurements of the two examinations then there must be a proportionate reduction in the amount of air respired by each average man; and this decline is, I believe, as before indicated brought about by the peculiar conditions of service in the force, and the lack of means and measures that should be used to combat the decided tendency to deterioration shown under the existing regulations regarding routine service.

The decrease in expiratory muscular power and inspiratory capacity taken in connection with co-operating untoward influences are, I believe, sufficient to account for the pulmonary affections that visit the force so heavily and tell so severely upon its physical powers and endurance.

From data furnished by the Secretary, Mr. F. R. Tate, it appears that during the last eighteen years there was a mortality from all causes excepting casualties of 65, of which 40 or 61.53 per cent., were from various forms of pulmonary disease, 34 being returned as due to consumption alone.

The average age of the decedents from this disease for the period stated was a little over 41 years (41.20), while their average years of service was somewhat above ten (10.94).

If the men appointed members of this force have always been selected with reference to physical fitness and soundness (as is presumably the case) such a melancholy showing con-

stitutes a serious indictment of routine department methods ; for the fact stands out with emphatic clearness that in a chosen body of men, a large majority of whom are in the prime of life as regards age, the death rate from pulmonary tuberculosis amounts to more than one-half of the total mortality from disease.

The significance of the fact stated may perhaps be more fully realized when it is remembered that during the last eighteen years in this city, as shown by the official records of the health department, among all classes and conditions of people the deaths from consumption amounted only to between ten and eleven per cent of the total mortality, while 52.30 is the corresponding percentage among policemen.

Those members of the force who died of lung diseases other than consumption lived to an average of over 43 years (43.83,) their average length of service being about one year more than the consumptives, while it is a fair inference that the duration of their fatal illness was much shorter.

Indeed, in the case of consumptive members of the force there is, in a majority of instances, usually not less than a year of more or less complete disability or invalidism preceding death ; and the loss of efficient service to the department thus incurred, together with the individual expense and suffering entailed are points not to be forgotten in this dismal picture.

For if the foregoing statements are true, and correct deductions have been made, past experience justifies the expectation that about half of all those who join the St. Louis police force and serve ten years will sicken and die of consumption soon after reaching 40 years of age ; and this probability, with the added contingency of being shot or otherwise injured, adds nothing to the cheerfulness of this form of employment.

The remedy for the evils shown lies mainly, I believe, in the direction pointed out by me when submitting the results of the first examination, in which report measures of precaution and prevention were suggested and advised.

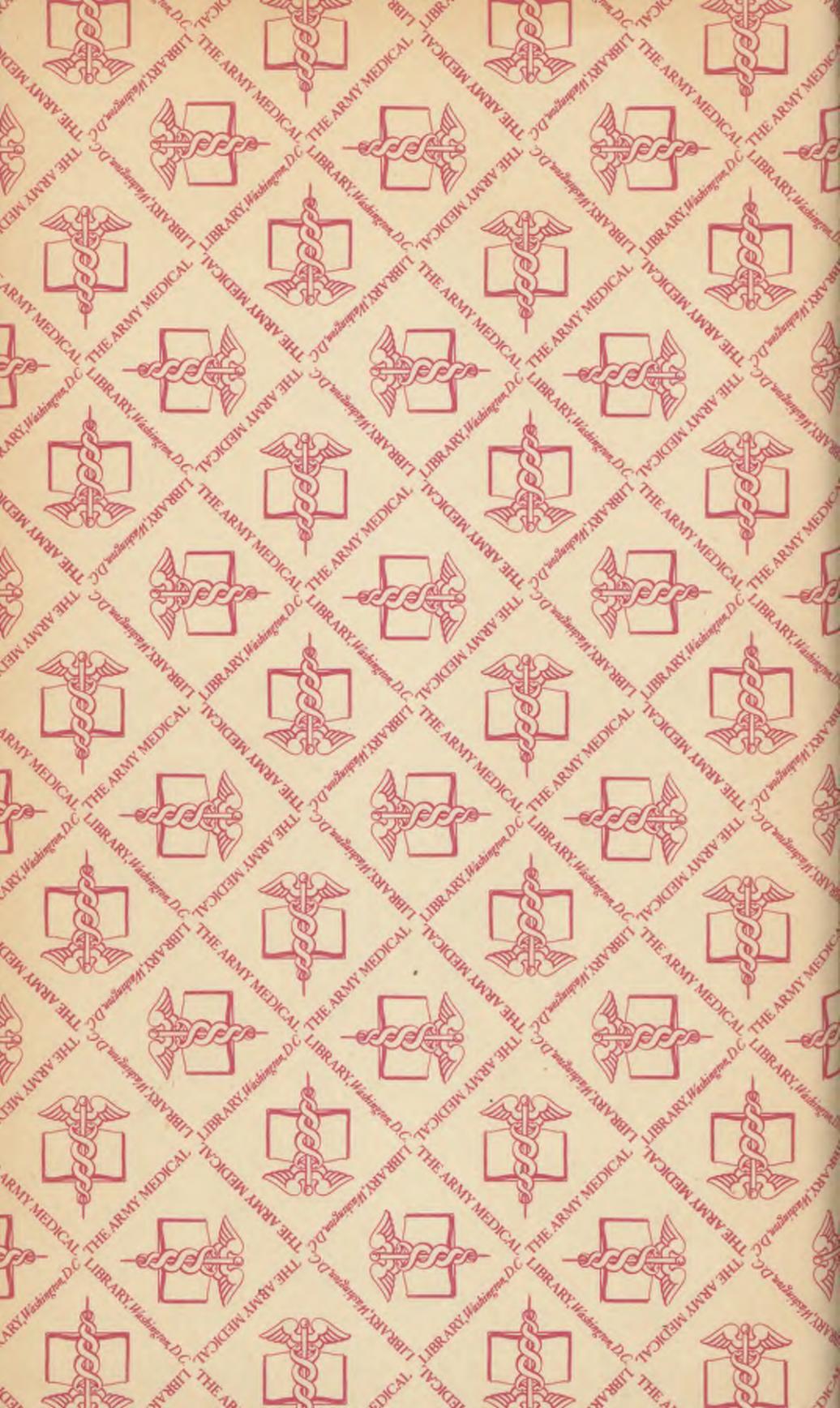
The state of facts revealed being discreditable in a hygienic sense, further study of the subject has only served to more fully indicate the wisdom and necessity of reformation in this respect.

All of which is respectfully submitted.

GEO. HOMAN

Medical Examiner.

ST. LOUIS,
November 12, 1888.



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