

## **Practical suggestions to the medical examiners of the New-York Life Ins. Co.**

### **Contributors**

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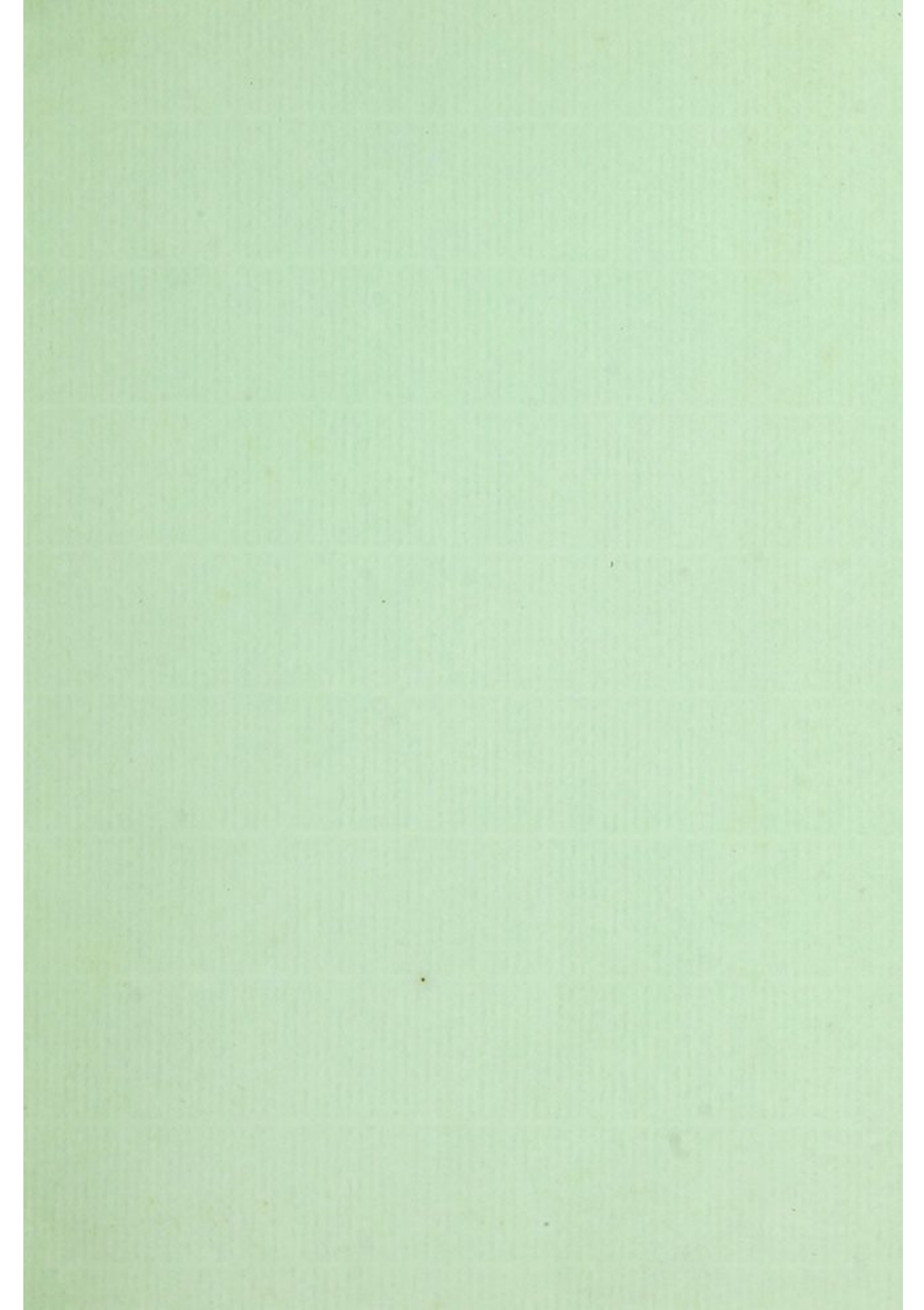
Wellcome Collection  
183 Euston Road  
London NW1 2BE UK  
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E [library@wellcomecollection.org](mailto:library@wellcomecollection.org)  
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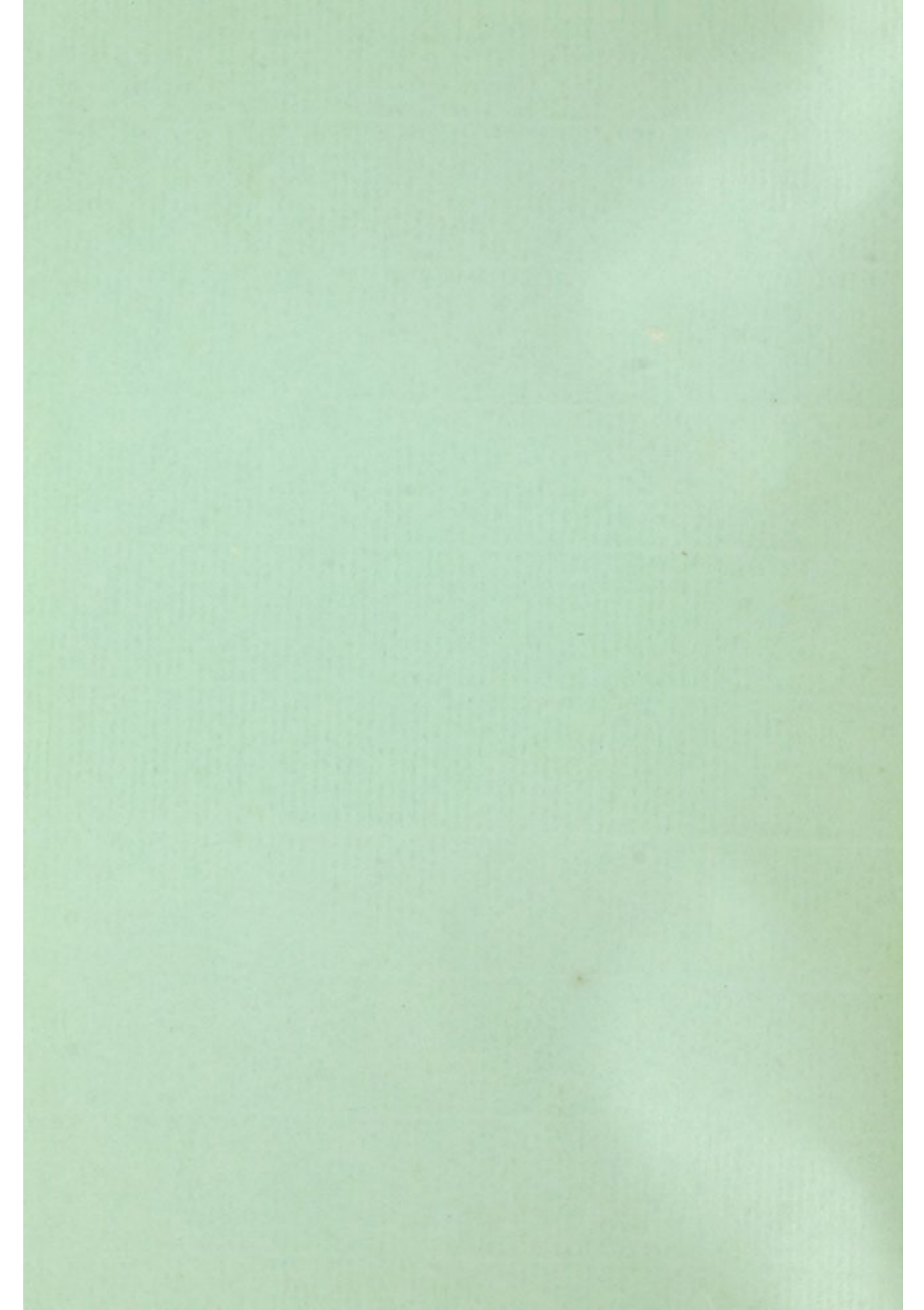
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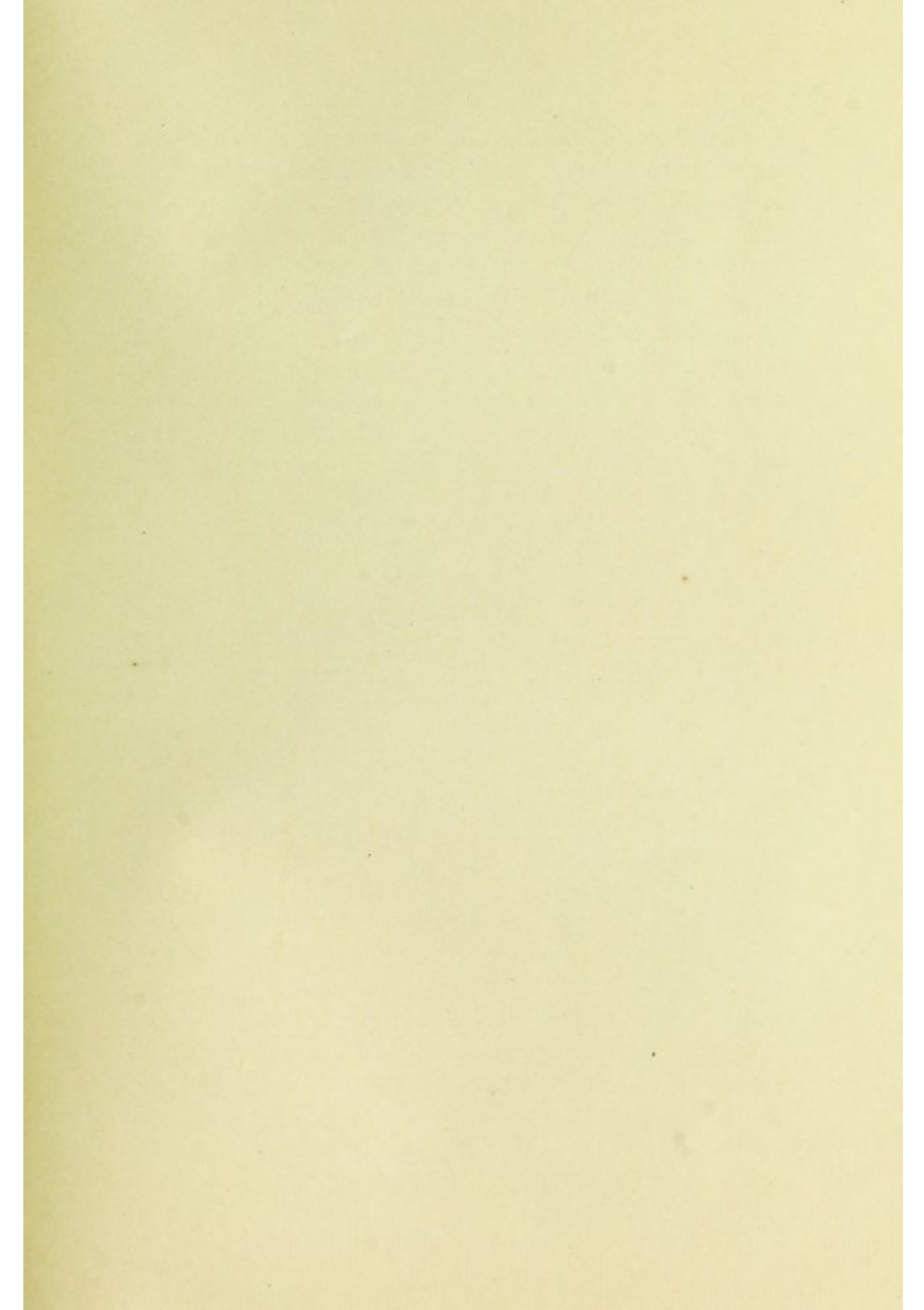
*Practical Suggestions*  
*to the*  
*Medical Examiners*  
*of the*  
*New York Life Insurance Company*  
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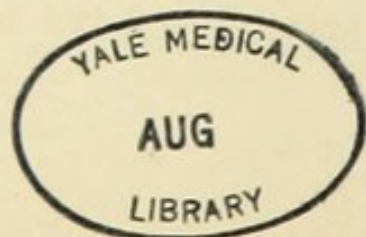
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*346 & 348 Broadway, New York.*

## **SPECIAL NOTICE**

**I**T sometimes happens that the Applicant or the Examiner wishes to have facts of a peculiarly delicate or confidential character omitted from the report, and brought to the attention of the Medical Board alone. In these rare cases, the Examiner may omit them from his report, provided he sends them under confidential cover to the Company, giving the ***name, date of birth, occupation*** and ***residence*** of the applicant.

This information must be mailed at once, so that it will reach the Home Office in advance of the regular papers in the case. The Examiner is held strictly to account for any failure to comply with this requirement. Blank forms are furnished by the Company for the convenience of the Examiner in such cases.

***It is not necessary that the Examiner shall disclose to any one the result of his examination.***



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## To the Medical Examiners of the New-York Life Insurance Company.

It has heretofore been the custom among the American Life Companies, to refuse insurance to all persons presenting any marked impairment either of physical condition or family history. From 10% to 15% of all applicants for insurance have thus been denied its benefits. For several years this Company has been perfecting a plan for insuring these sub-standard lives, and during the last three years has been gradually extending the practical application of this plan, until now it undertakes to grant to every reasonably healthy life a form of policy so adjusted as to treat the applicant fairly, and at the same time with perfect safety to the policy-holders of the Company.

In taking this step the Company has in no way departed from its former conservative attitude in the selection of risks; for in order that an applicant may obtain one of our standard policies, he must still possess the same degree of physical excellence as was formerly required. The Company separates its standard from its sub-standard business with the same care that it formerly exercised when it refused insurance to the latter class, and has made this radical change with a view simply to extending the benefits of insurance, not only to normal lives, but also to that large number of sub-standard lives which heretofore have been denied insurance.

From this it will be seen that the Company no longer expects a Medical Examiner to recommend the acceptance or rejection of a risk. Aided by his special training in the practice of his profession, the Examiner collects and records the facts upon which is based the valuation of the risk for insurance. He is relieved of the embarrassment of rejecting a sub-standard risk, but is responsible for the accuracy and completeness with which the records of the personal history and physical condition are laid before the Company. The Company assumes the responsibility of treating the risk justly, while the Examiner must assume the responsibility of submitting to it *all the facts*.

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### LIFE INSURANCE.—THE APPLICANT.

The business of Life Insurance is based on the fact that, while the longevity of a single individual is uncertain, there is a fixed law, determining, within narrow limits, the average age at death of large numbers of individuals of the same age; and that, under this law, it may be expected that any man in sound health, of temperate habits, with a good family history, and a healthful occupation, will live as long as the average of those of the same age, *i. e.*, will live out his "Expectation of Life."

In the same way among the impaired lives, whatever be the character or degree of the impairment, there will be the same uncertainty about the duration of the individual life, and the same certainty among large groups of lives of the same kind and degree of impairment.

Involving, as it does, the purely medical questions of the past and present health, the family history, the

habits, hygienic surroundings and occupation of the individual, the business of Life Insurance requires for its successful prosecution the assistance of those whose lives are spent in the study of such questions—Medical Practitioners; and because of the large sums of money involved, and the dangers of fraud, it is necessary that the Medical Examiners of a life insurance company should possess, besides a good medical knowledge, the most upright character and the soundest judgment.

One of the most important factors in the success of a life insurance company, is the maintenance of a high standard in the selection of its risks. This is possible only where the Examiners in the field exercise diligence to discover and lay before the Company all the facts in each case, and where the Home Office by rigid separation of the standard from the sub-standard lives, assesses each life according to its true valuation.

With regard to most of the factors which make up a risk, such as physical condition, habits, medical history and occupation, the Medical Examiners are able to fully inform themselves. As to the question of build of an individual, this so rarely presents itself to the Examiner for consideration, that we give on pages 15 and 16 tables of heights and weights, which will be found convenient for reference.

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## **MEDICAL EXAMINERS.**

Medical Examiners are selected solely for their moral and professional standing in the communities in which they reside. They hold their appointments direct from the Company, and retain their positions as long as their services prove satisfactory to it.

They are the trusted advisers of the Company, and their relations with the Medical Department are personal and confidential. It is their duty to examine applicants for insurance, and to furnish on the blanks provided for that purpose a full and complete report of the physical condition, of the family and personal histories, and any other facts that have any bearing upon the value of the risk. For such examinations they receive the fixed fee of the Company, and this fee is paid whether the risk is insured by the Company or not. The fees are paid by the Company, and not by the applicants or agents, and Examiners are not dependent for their appointment, dismissal or fees, upon either applicants or agents.

They are not required to insure their lives in the Company, or to actively interest themselves in canvassing others for insurance. Indeed, they will do well to avoid identifying themselves with the business of Life Insurance, excepting in their professional capacity. Medical Examiners, however, cannot expect to retain their positions if they show any opposition to insurance, and especially to insurance in this Company.

It is to the interest of all concerned that the relations of the Examiner towards both applicants and agents should be cordial and friendly. To the applicants his position should be of the same delicate and confidential nature as that shown to patients who entrust themselves to his professional care; and, while it is often the duty of the Medical Examiner to lay before the Company facts which the applicant or the agent wishes to conceal, yet, by the exercise of tact and judgment, and especially by firmness in his convictions, he should be able to avoid serious friction, and thereby maintain that harmony so essential to a pleasant intercourse and to satisfactory business results.

He should always bear in mind that the agent's income depends on his ability to secure new business for the Company, and that he naturally looks to the Medical Examiner for reasonable co-operation, that he may secure the fruits of his labor.

To the agent belongs the task of securing new business for the Company, and to the Examiner that of making so critical a study of these risks, and of reporting the results with such care, as to enable the Company to grant to each applicant the form of insurance to which the facts in his case entitle him.

The Medical Examiner should have constantly in mind two important differences in mental attitude between the patient and the applicant for insurance. In the first place many, especially at their first examination or among the younger applicants, are extremely nervous; the idea that the examination may reveal some hidden ailment so takes possession of their minds as to disturb considerably the nervous equilibrium—to induce, as it were, a mild degree of shock. In such cases the pulse may be found extremely rapid or intermittent; there is apt to be pallor or muscular tremor. The picture is one of nervous debility or of a want of normal bodily vigor. Whenever an Examiner meets with this condition he should be able, by tactful handling, to re-assure the applicant, and to re-establish the normal nervous balance; at any rate, he should make due allowance in his report for the disturbed mental state of his subject.

As to the other difference to which we have referred, when he consults his physician the patient endeavors to describe every detail of the disease of which he complains. He conceals nothing. His mental attitude is one of unreserved co-operation. When he is

a candidate for life insurance, the case is very different ; his memory for details is less acute ; his state of mind is one of antagonism. He believes himself to be a good risk, and his bias of mind in that direction is so strong as—no doubt, unconsciously—to color his entire history. On this account a medical history for life insurance is a very different matter from that which is obtained from a patient. The patient assists his physician—the applicant for insurance does not assist the Examiner. It requires time for any physician to adjust himself to this difference in mental attitude. The skilled Medical Examiner has learned this lesson.

It is on this account particularly that the Examiner for life insurance must bring to his task complete independence of character, absolute integrity, and the ability to detect attempts at fraud. He must constantly bear in mind that he is the guardian of the interests of the Company, and that upon his vigilance, judgment and integrity depends, largely, its success or failure.

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## MEDICAL EXAMINATIONS.

The object of the medical examination of an applicant for life insurance is to secure such information in regard to the family history and the past and present health of the applicant as will enable the Medical Board at the Home Office to place a correct insurance valuation on the life.

This is best secured by following a general routine, to be varied as the experience of the Examiner or the special circumstances in any individual case may indicate. We therefore call your attention to the subjoined

## RULES AND INSTRUCTIONS FOR THE GUIDANCE OF MEDICAL EXAMINERS.

**Pensions.** Whenever you examine a pensioner, you should endeavor to secure the fullest possible information regarding the grounds upon which the pension was granted, and their bearing on the longevity. The fact that a person draws a pension is *prima facie* evidence that he is an impaired or hazardous risk.

**Promptness** in keeping appointments and in making examinations must be strictly observed, as any delay may cause a loss to the Company, to the agent or the applicant, for which you will be held responsible.

Competition in Life Insurance is so acute that, while we wish the examinations to be made at your office whenever possible, we cannot insist upon having the applicants brought to you, but are obliged to ask you to make examinations at any suitable place within reasonable distance and at any reasonable hour.

**Privacy.** We must also insist that examinations be made in a place free from noise and strictly in private, the agent or any third person not being permitted to be present.

**Self-written.** Both the answers of the applicant and your report must be made out entirely in your own handwriting; and where corrections are made, you should indicate that they are made by yourself, by adding your initials; but you are not to fill in any part of the application blank itself.

**Relationship and Pecuniary Interest.** If you are related to either applicant or agent, or if you have a pecuniary interest in the proposed insurance, you must refuse to make the examination, and should refer the agent to some neighboring Examiner.

## ANSWERS MADE TO THE MEDICAL EXAMINER.

When an applicant appears before you for examination, you should take him into your private office or into a quiet room, provided for that purpose, where you should begin the examination by reviewing in detail the statements made in the application as to the full name, the date of birth, occupation, etc., of the applicant, and satisfy yourself as to his identity, and that the application is correctly filled out and properly signed.

The Company requires that applications be filled out and placed in your hands before the examination, and you should consent to waive this rule only where some urgent reason is apparent. The Company cannot be held responsible for the medical fees in cases examined without a signed application.

**Occupation.** This question should develop fully whether the applicant is engaged, or is likely to engage, in an occupation involving unusual hazard, or confinement to dusty, ill-ventilated rooms, or cramped or unhealthy postures, exposure to sudden variations of temperature, etc., or whether he is, or has been, engaged in the manufacture, sale or personal handling of alcoholic liquors.

**Habits.** This question is of so great importance, that we are obliged to take the position that an Examiner fails to do his full duty who does not place us in possession of all unfavorable information which may be reasonably accessible to him. If personally acquainted with the applicant, you should be able to give all the facts; if not acquainted, and you have reason to suspect excess, you should not depend upon his statements, but should secure further information through mutual acquaintances. In suspicious cases you should also be

particular to inquire if the applicant has ever resorted to the so-called "Gold Cure" or other treatment; if so, the date and result of such treatment should be given. This Company grants sub-standard insurance, adjusted to meet the degree of impairment, to persons who use alcohol to excess, but it has reason to know that even occasional or slight excesses in its use markedly impair the value of a risk. We consider the habitual use of Opium, Chloral, Cocaine and the like, as much more serious even than intemperance in the use of alcohol, and you should investigate such cases with the greatest care.

**Female Risks.** Women are less desirable risks than men, probably because in the majority of cases they are less carefully examined. The reasons for this are apparent, but should not deter the Examiner from making thorough, complete examination. Pregnant women, under the rule of the Company, are not accepted during the period of pregnancy.

In the examination of women you should insist upon the removal of corsets and any other articles of clothing which interfere with a careful physical examination. We are satisfied that examinations of female applicants are too superficial.

**Personal Record.** You should secure a complete statement of each of the important diseases from which the applicant has suffered, with a view to determining not only its effect upon the constitution of the applicant, but also its liability to recur.

Write clearly the *name of each disease, the number of attacks, the date and duration of each, its severity, and results, if any.*

All answers should be complete, but as concise as possible. The aim should be to give the facts, but avoid

trivial details. Certain diseases, very important from a life insurance standpoint, often fail for some reason to receive satisfactory description. They are as follows:

**Asthma.** State cause (if possible), when first attacked, the frequency and severity of the seizures, and the date of the last attack. The Examiner should distinguish between true Asthma and Hay Fever. The frequency with which Asthma occurs as a symptom of other diseases should also be remembered.

**Blood Spitting.** No medical question in the entire range of our business requires the exercise on the part of the Examiner of greater care in securing a detailed answer, and no question is more frequently answered imperfectly. It is only after a careful study that we are able to distinguish accurately between attacks which may be safely disregarded and those which constitute decided impairment. You should, therefore, differentiate between true Haemoptysis and the blood-stained sputum of Pneumonia, or of severe Bronchitis, or a Hemorrhage of the nose or throat. In all cases the cause, the number of attacks and the extent of each Hemorrhage should be recorded.

**Dyspepsia.** This question is very often misunderstood and imperfectly answered. We *do not wish* to know if the applicant has suffered from an indigestion due to over-eating at some time or other, but we *do wish* to know if he has suffered from *any marked functional disorder*, or from *organic disease* of the digestive organs. If so, a detailed history, and your opinion as to its bearings on his longevity, are required.

**Rheumatism and Gout.** Repeated attacks are of much greater significance than a single attack. Be particular, therefore, to give the number of attacks and

the date of each, indicate whether severe or not, or accompanied by any serious complication. It is necessary also to distinguish between Articular and the so-called Muscular Rheumatism.

**Syphilis.** Never refer to Chancroid as Syphilis. Have in mind that one is simply a *local*, and the other a *constitutional*, disease. Give the date and character of the primary lesion; the character and duration of the secondary or tertiary lesions; the treatment employed, and when it was finally discontinued.

This Company's experience with insured syphilitics has been quite unfavorable. They are decidedly sub-standard lives, and consequently require to be studied with extra care. The Company makes use of a special blank on which to record the detailed history of these cases.

**Medical Treatment.** Ascertain from the applicant whether he has found it necessary to consult a physician for any ailment, and if so, give the name and address of the physician, the nature of the ailment, and the date of treatment.

**Family Record.** If the applicant describes the health of living relatives as "fair," or "poor," find out in *what respects* they are not in good health. Where the cause of death is said to have been "change of life," or "childbirth," or "exposure," or where any such indefinite term is used, satisfy yourself as to the exact facts, and record them as concisely as possible.

Where the final illness of any member of the family has been a protracted one, you should determine whether death was due to tubercular disease. Indeed, the importance of the cause of death in connection with family history lies principally in the direction of measuring the extent of the liability to Tuberculosis.

**Signature.** If the applicant's signature is tremulous, you should ascertain and record the reason therefor. Be careful to distinguish between the irregular, jerky signature of one who is unaccustomed to the use of the pen, and the uniformly tremulous signature of a subject of functional or organic disease of the nervous system.

**Amount of Insurance.** If the amount of insurance applied for seems to you to be out of proportion to the applicant's circumstances, you should send a confidential notice to that effect to the Home Office. It is as important to protect the Company against speculative insurance as it is against diseased risks.

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## MEDICAL EXAMINER'S REPORT.

**Pulse.** This question has been placed first in the "Report" in order that the rate and character of the pulse may be observed while the applicant is still seated, and before it has been disturbed by the incidents of the physical examination.

**Measurements.** The height, and the dimensions of the chest and abdomen should be carefully *measured*, and *not estimated*. The weight should be taken without coat or vest, and where for any reason it is necessary to estimate, the word "estimated" should be inserted along with the figures; otherwise the Company assumes the weight to be exact.

**Gain or Loss of Weight.** It is important to know whether the applicant has recently gained or lost weight and, especially in the case of loss, the cause should be carefully investigated. Loss of weight is frequently the first manifestation of Tubercular disease.

**Build.** A careful study of all the facts available on this subject has demonstrated the very great influence upon longevity of considerable departures from the normal height and weight. When, therefore, the applicant is markedly over- or under-weight, the heights and weights of other members of the family must be recorded, so that the significance of the peculiarity may be properly estimated at this office. Failure to do this always involves additional correspondence.

## NEW-YORK LIFE STANDARD TABLE OF HEIGHTS AND WEIGHTS AT VARIOUS AGES.

### MEN.

Height	Age 20	Age 30	Age 40	Age 55
5- 0	114	121	125	128
- 1	117	124	129	132
- 2	121	128	133	136
5- 3	124	132	137	140
- 4	128	136	141	145
5	132	140	145	149
5- 6	136	144	149	153
- 7	140	148	154	158
- 8	144	153	158	163
5- 9	149	157	163	167
-10	153	162	168	172
-11	158	167	173	177
6- 0	162	172	178	183
- 1	167	177	183	188
- 2	172	182	189	194
6- 3	177	188	195	200

# WOMEN.

Height	Age 20	Age 30	Age 40	Age 55
4- 9	100	105	110	118
-10	103	108	113	121
-11	106	111	117	125
5- 0	109	115	120	128
- 1	112	118	124	132
- 2	116	122	128	136
5- 3	119	126	132	140
- 4	123	129	136	145
- 5	126	133	140	149
5- 6	130	137	144	153
- 7	134	141	148	158
- 8	138	146	153	163
5- 9	143	150	157	167
-10	147	154	162	172
-11	151	159	167	177
6- 0	156	164	172	183

**Age.** If the applicant appears older than the age given, the fact should be recorded, as it will influence considerably the valuation placed upon the life.

**Identification.** The complexion, color of hair, color of eyes, and also any striking or distinguishing mark by which the applicant may be readily identified, should be recorded. Some physical peculiarity, scar or mark, the shape of the teeth or the nose, etc., are valuable for that purpose.

**Deformity or Maiming.** In consequence of an increased liability to accident, a risk otherwise good is often considerably impaired by deformity or maiming.

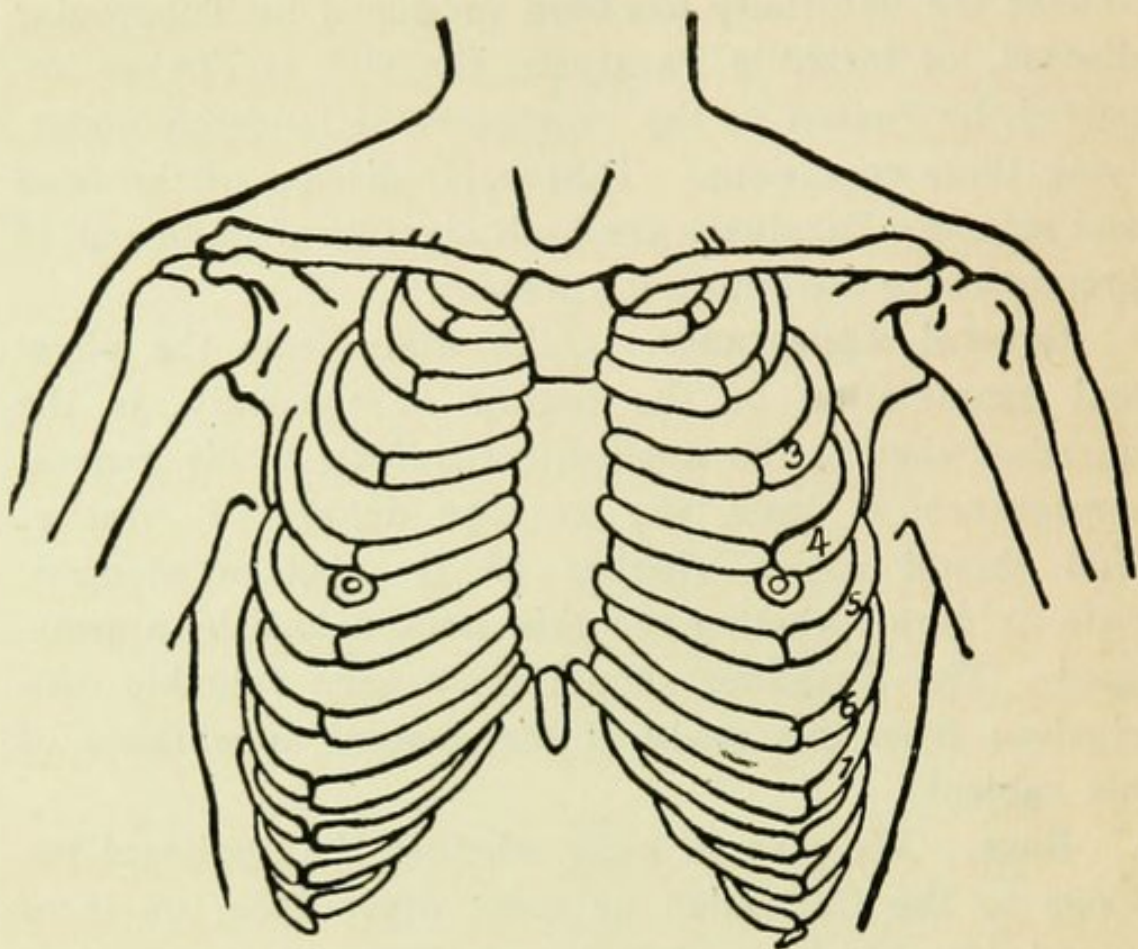
Where the deformity has been produced by Tubercular disease, or infantile Paralysis, the risk is further impaired, by reason of the constitutional tendency underlying these conditions. Tubercular disease of the bone and infantile Paralysis are both significant quite out of proportion to the deformity present.

**General Appearance.** Quite aside from the physical examination of the organs of the body, is the question whether the applicant manifests in his general appearance at least the average degree of vitality. You should notice whether he is erect or stooped, pale or florid, whether the skin is of a healthy appearance. The Examiner should draw very valuable conclusions from this study of the general appearance of his subject.

**Race.** We wish to know whether the applicant belongs to the Caucasian or some other race, or is of mixed blood. It is well known that some races are much more resistant to disease than others, and also that mixed races possess by no means the resistance of either of the parent stocks.

**Brain or Nervous System.** Besides any evidences of disease of the nervous system, you should be on your guard to detect any mannerisms or striking mental peculiarity.

**The Heart.** This Company takes the position that persons with heart disease are proper subjects for life insurance. We endeavor to make a careful study of each case, and to place an equitable valuation upon each life. In no other part of the physical examination is the skill of the Examiner put to a greater test. For the sake of greater accuracy we make use of a "heart blank," of which the subjoined is an illustration,



*Indicate Location of Apex by X*

*Indicate Direction of Transmission by /*

*Indicate Area over which Murmur is Heard by ○*

*Is the Murmur Systolic or Diastolic?*

*Indicate Point of Greatest Intensity by ○*

*Give Rate and Character of Pulse After Vigorous Exercise.*

on which we ask our examiners to record the results of their findings. Your judgment of the prognosis in the cases which you examine, will strongly influence our valuation.

**Lungs.** In cases of Asthma, chronic Bronchitis, Emphysema, cured Phthisis and the like, or, where the family or personal history of the applicant shows a Tubercular tendency, you should examine the lungs with special care. It is the desire of the Company to offer

insurance to such lives, and the character of your examination and report will contribute quite as much to that end as the statistical data on which the Company bases its present liberal treatment of sub-standard lives.

**Stomach and Abdominal Organs.** Where there is a history of Colic, you should satisfy yourself whether it was Renal, Hepatic or Intestinal in character, and give the duration and severity of each attack. When a history of Appendicitis is given, palpate carefully in the region of the appendix for either induration or tenderness. We especially desire to know the number of attacks and date of each, their severity and duration. Where there is a Hernia, it is important to know whether it is reducible or irreducible and whether a suitable truss is worn.

**Skin, Middle Ear, Eyes.** Any serious or suspicious skin affection should be described. Middle Ear disease is of importance, especially in view of the liability to Mastoid Abscess. The frequency of the attacks, their severity, the character of the discharge, are all of importance. Blindness and deafness impair a risk by reason of increased liability to accident.

**Genito-Urinary Organs.** URINE. See that the specimen is voided under circumstances that will leave no doubt in your mind that it is the urine of the applicant. Under no circumstances should a report be based upon a specimen the origin of which is in doubt.

MICROSCOPIC EXAMINATION OF THE URINE is not required unless called for by the Home Office.

**STRICTURE.** You should secure a detailed history in such cases, satisfy yourself as to the character and efficiency of the treatment. It is particularly important to ascertain whether the flow of urine is now free.

**Intemperance.** No question is of greater importance, and few are more often overlooked or neglected by the Examiner than that of the use of alcoholic beverages. We wish to know whether the applicant is an abstainer, a moderate or an immoderate user, a steady drinker, or whether often or only occasionally to excess. We know that such risks are insurable, but we cannot estimate their value correctly without careful, conscientious assistance from our Examiners.

**Review.** It is often a matter of surprise to us that some of our best Examiners submit to the Company reports in which there are glaring omissions, or in which the facts are only partially recorded. This always causes delay and extended correspondence.

After you have completed your report of a case, it is a good plan to endeavor to place yourself in the position of the Medical Department of the Company; to read the papers as if you had no other knowledge of the case than that contained in the records before you, and to ask yourself if you get from them the same idea of the risk that you obtained from the examination itself. If you do, your report will prove satisfactory at the Home Office; if not, it is incomplete.

**Incontestability.** This Company now writes policies which are incontestable from the date of issue, and, as they are issued based upon your report, you will see at once how important it is that it should contain all the facts which have any bearing upon the value of the risk.

**Place of Examination.** It is sometimes necessary that we should know just where the examination was made. You should, therefore, describe the place as follows: "at my office"; "at his residence"; "at his office"; "at his farm, 3 miles south of——"; and so on.

**Field of Operation.** The Medical Examiner is expected to act only in the community where he resides, and should not make examinations in the territory of another Examiner except when the latter is for any reason unavailable. In such event, he should add to his report a statement of the circumstances which seemed to him to warrant his irregular action.

**Appointment.** This Company does not give formal commissions of appointment to its Examiners, and it reserves the right to make from time to time such changes in its staff of Examiners as seem for the best interests of the Company.

**Fees for Medical Examinations.** Immediately upon his appointment, the Medical Examiner is notified by the Company of the fees which are allowed, as follows:

\$3.00 for each examination, where the amount applied for is \$3,000 or less;

\$5.00 for each examination, where the amount applied for is over \$3,000 and less than \$25,000;

\$7.50 for each examination, where the application is for \$25,000 and less than \$50,000;

\$10.00 for each examination, where the application is for \$50,000 or more.

These fees will be paid for each *completed* examination whether the risk is accepted or refused by the Company. An examination is not considered complete unless it contains all the information necessary to an accurate valuation of the life. No extra fees will be allowed for furnishing necessary additional information. Completeness also includes the ordinary certificate of health for the delivery of the policy at any time within three months of the date of the original examination. (The number of cases requiring such certificate is very

small.) When a health certificate is required within three months on account of additional insurance, the fee allowed for the completed transaction is the same as if the total sum had been applied for at the time of the original examination. The Company will not be responsible for any extra charges unless incurred under instructions from the Home Office direct.

When additional insurance is applied for within two months of the last examination, the medical fee shall be calculated on the basis of the entire amount of insurance written.

Fees for medical examinations necessary for the reinstatement of lapsed policies, or for paid-up insurance, are paid by the applicant and not by the Company.

**Bills.** To enable the Company to properly check and audit your accounts, the completed papers of each case are required at the Home Office. Bills are payable monthly at the Home Office, and blank forms on which to present them are supplied on request.

**Supplementary Report.** Whenever, on account of your personal or business relations with the applicant or agent, you find it necessary to omit from the examination papers any part of the medical history or the results of your examination, you are at liberty to forward all papers direct to the Home Office; or, allowing the papers to go through the agent's or manager's hands, you may send to the Company a supplementary report mailed to the Home Office. (See Special Notice, page 2.)

**In conclusion,** what has already been said may be summarized as follows :—

1. This Company now insures under-average as well as selected lives. It offers insurance to practically all who apply.

2. In each case it adjusts the plan of insurance to the insurance value of the risk.

3. The Medical Examiner's Report serves as a basis of valuation, and determines the plan upon which the insurance is offered.

Therefore your report should present a pen-picture of the life so accurate and complete that the Medical Department at the Home Office, without seeing the risk, may place the correct valuation upon it, and may grant a policy fair and equitable to both the applicant and the Company.

S. OAKLEY VANDERPOEL, M. D.,  
*Medical Director*

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For the convenience of the Medical Examiners of the Company, we add the following in regard to the

### EXAMINATION OF URINE.

As quickly as possible after it is passed, the specimen of urine should be examined with respect to each of the following points:

- |                          |                      |
|--------------------------|----------------------|
| 1. Quantity in 24 hours. | 4. Reaction.         |
| 2. Color.                | 5. Transparency.     |
| 3. Specific Gravity.     | 6. Albumen or Sugar. |

1. **The Quantity** of urine passed by an adult in good HEALTH is about 45 to 50 ounces in 24 hours; but it is subject to variations within considerable limits, depending upon such conditions as the temperature and humidity of the atmosphere, the activity of the skin, the amount of the expiratory exhalations, and the amount of fluids or of liquid foods ingested.

In DISEASE it varies from the enormous quantities passed in diabetes, in hysterical polyuria and in the amyloid and the old granular kidney, to the scanty flow of the febrile state and of some forms of disease of the kidneys.

2. **The Color** is usually a pale yellow or amber, though it varies with the quantity of urine voided. With a copious flow the color is very pale; with a scanty flow it may be very dark.

In DISEASE it varies from the dark, smoky-brown of acute Bright's disease, through the high-colored urine of the febrile state, and the pale straw color of diabetic urine, to the almost colorless urine of the hysterical state, and of some cases of contracted kidney.

3. **The Specific Gravity** of urine may be stated at 1,020, under ordinary circumstances, although it may vary in health between 1,010 and 1,025, dependent upon the same causes as those which influence the variation in quantity and in color. Since the amount of solids excreted by the kidneys is fairly constant, this variation in specific gravity is approximately in inverse ratio to the amount of urine voided.

The Specific Gravity is best obtained by means of the URINOMETER. This instrument is usually graduated between 1,000 (the specific gravity of distilled water) and 1,060, and, when used, care should be taken that it is perfectly clean and that it does not cling to the side of the vessel in which the test is made.

In DISEASE this range is increased. In diabetes it may be 1,040, 1,050 or higher. In the earlier days of acute Bright's disease, and in the febrile state, it is high, and from that it ranges to that of the cirrhotic and the amyloid kidney, of diabetes insipidus or of the hysterical state, where the specific gravity may be 1,005 or less. Since, however, urine with specific gravity 1,010 has been found to contain sugar, and since the normal specific gravity has often been noticed in old cases of Bright's disease and in severe diabetes, the specific gravity cannot be relied on as an accurate guide to disease. But an average daily specific gravity of 1,025 or over is always suggestive of the presence of sugar, and of 1,015 or under, of chronic Bright's disease.

4. **The Reaction** of normal urine is usually acid—due, probably, to acid phosphate of soda—but it may be neutral or alkaline.

The reaction is determined by the use of litmus papers. The red becomes blue in the presence of an alkaline urine, and the blue paper becomes red if the urine is acid. When the reaction is not well marked, both the red and blue papers should be used. The acidity of urine is increased by an albuminous diet, and vegetable foods decrease it or render the urine alkaline.

In DISEASE the acidity is decreased in Anæmia and in some nervous affections, and is increased in diabetes and fevers.

5. **Transparency.** The urine is naturally transparent, but, within the limits of HEALTH, it may be more or less opaque, on account of the presence of

**A. Earthy Phosphates,  
B. Mixed Urates,**

**C. Mucus,  
D. Bacteria.**

A. The EARTHY PHOSPHATES may cause normal urine, at the moment it is voided, to be opaque. Shortly afterwards they subside and form a bulky, flocculent sediment, with clear urine above. They may be recognized by the fact that the application of heat will increase the opacity, while a few drops of Nitric or Acetic Acid will cause it to disappear.

B. The MIXED URATES often render a cold urine turbid. They subside quite rapidly and form a white or pinkish deposit at the bottom and on the sides of the containing vessel, much more dense in character than that of the phosphates. A gentle heat causes this opacity to disappear.

C. MUCUS from the genito-urinary tract may occur in sufficient quantity, within the limits of health, to cause some opacity in the urine. It forms a light, flocculent sediment, much like that produced by the phosphates, but which may be distinguished from the latter by the fact that alkalies, heat and strong acids have no effect upon it, while Acetic Acid increases the opacity by coagulating the mucin.

D. BACTERIA. When a specimen of urine is allowed to stand for some time, especially in hot weather, it becomes opaque on account of beginning decomposition and the development of Bacteria. This change is important because it interferes with the delicacy of the tests for Albumen; and it is on this account that a specimen of urine should be examined while fresh.

When, however, it becomes necessary to examine for Albumen a specimen of turbid urine, which is not rendered transparent by filtration, it should be treated by the method suggested by Hofman & Ultzman, which is as follows: Add to a portion of the urine, in a clean test-tube, about one-quarter its volume of Liquor Potassae, boil the mixture and filter. Should this filtrate be not quite clear, add one or two drops of Magnesian Fluid,\* warm again and filter. This filtrate always appears clear and transparent. The presence of Albumen may then be detected by the Nitric Acid test.

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\* The formula of the Magnesian Fluid is as follows: Magnesium Sulphate and Ammonium Chloride, of each one drachm; Liquor Ammoniac, one drachm; Distilled Water, one ounce. Mix.

In DISEASE, the urine may be opaque on account of the presence of—

*a.* PUS. This forms a deposit which often resembles that of the urates. It is distinguished from it by the fact that heat increases the opacity of purulent urine, and from phosphatic deposit by the fact that it is not cleared up by the addition of a few drops of acid.

*b.* DECOMPOSITION, as in old cases of cystitis, in which the urine contains bacteria, pus, mucus, epithelium and, perhaps, shreds of disorganized tissue.

*c.* FAT, as in chylous urine. Fat is recognized by the well-known power of ether to dissolve it.

6A. **Albumen.** The presence of Albumen in the urine is always suggestive of such grave pathological conditions that its recognition becomes one of the most important features in the examination of urine. Many tests have been brought forward for this purpose, and have had their earnest advocates, but those which have become most generally recognized for simplicity and effectiveness are the Nitric Acid test and the heat test.

**The Nitric Acid Test.** Into a clean test-tube about half an inch of pure, colorless Nitric Acid is poured. The test-tube being then held at a considerable angle, a quantity of clear urine is allowed to flow from a pipette slowly down the inclined side of the tube, until an inch of urine overlies the acid. This must be carefully done, so that there shall be no mixture of the acid and the urine. The presence of Albumen is indicated by a sharp, white band or zone of coagulated Albumen in the urine AT the line of contact of the acid with the urine. In order to recognize this band, where the amount of Albumen is small, the tube should be held in a good light against a dark background. Sometimes this zone of coagulated Albumen develops very slowly, and it is, therefore, always well to look at the specimen again 15 minutes after the test is made, having placed it carefully aside for that purpose.

**ERRORS.** A specimen of urine which contains a large amount of Urates may show a whitish zone above the line of contact. This is caused by the formation of Acid Urates, and is distinguished by the fact that the zone is not so sharply defined as that formed by Albumen, but fades gradually into the clear urine; also, because it disappears on the application of a gentle heat.

The presence of resin, not unusual after the use of such drugs as Balsam of Copaiba, Turpentine, etc., produces a whitish zone similar

to that produced by Albumen. The addition of a few drops of Alcohol will redissolve the resin.

**The Heat Test for Albumen.** A clean test-tube is filled about two-thirds full of urine. To the upper part of this urine, heat is applied by means of a spirit-lamp. If, when the urine has boiled, any diminution of transparency is noticed, it is due to Albumen, Mucin or the Earthy Phosphates. Then add a few drops of Acetic Acid and boil for a few moments. If the cloud is due to Phosphates, it will disappear; if caused by Albumen or Mucin, it will persist. Next add carefully to the top layer of the urine, one drop of Nitric Acid. If the cloud still persists, it is due to Albumen; if it disappears, it is caused by Mucin.

N.B.—The urine must be acid in reaction before boiling. If not, add one or two drops of Acetic Acid.

**ERROR.** If the urine is slightly turbid from decomposition and the presence of Bacteria, any delicate change in its opacity cannot be seen, and it must be filtered before applying the heat. If, after filtration, it still remains turbid, it should be treated according to the suggestions already made under 5D, BACTERIA. If the specimen is alkaline, Acetic Acid should be cautiously used, and if strongly acid, Liquor Potassae may be added, so as to render the urine only slightly acid.

If ALBUMEN is not found in a specimen of urine subjected to both of these tests, it may be safely affirmed that it is not present.

**6B. Sugar.** Although many excellent authorities maintain that the presence of a small quantity of sugar in the urine may be entirely physiological, yet it is so often the first evidence of diabetes that its recognition is of the utmost importance in examinations for Life Insurance.

Of the various tests which have been devised for that purpose, the Copper test—as in the form of Fehling's Solution\*—and the Bismuth

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\* Fehling's Solution is made after the following formula: 34.64 grams of c. p. Sulphate of Copper are dissolved in 200 grams of distilled water; 173 grams c. p. Neutral Tartrate of Soda are dissolved in 500 grams of Sodid Hydrate of a sp. gr. 1.12, and to this alkaline solution the copper solution is slowly added. The mixture is then diluted to one liter. The solution is made and sold by all the large drug houses. Perhaps the best preparation is that put up by Dr. E. R. Squibb, of Brooklyn, N. Y., and the Medical Examiners of the Company are requested, whenever possible, to use this preparation.

Whenever it is impossible to obtain a reliable preparation of Fehling's Solution,

test, deserve special mention. The composition of Fehling's Solution is based upon the fact, not only that sugar has the property of reducing the Oxide of Copper to a lower state of oxidation, but also that a definite quantity of the former will react upon a known quantity of the latter (1 c. c. of Fehling's Solution is reduced by .005 grams of sugar), and it is equally useful for qualitative and quantitative analysis.

It is an alkaline fluid, of transparent, deep blue color, somewhat easily decomposed by exposure to the air and to light and warmth, therefore requiring, for its preservation, to be kept in small, closely-stoppered bottles, in a cool, dark place.

**The Test.** A small quantity of the solution is poured into a clean test-tube, diluted with two or three times its volume of pure water, and boiled for a few seconds over a spirit-lamp. If the mixture becomes turbid, or a yellow or brick-red precipitate forms, it has probably been kept too long or has been improperly prepared. If, however, the mixture retains its transparent, deep blue color, it may be relied upon, and the test is proceeded with. To the hot mixture the urine is added, drop by drop, and the heat is occasionally applied, until a volume of urine has been added equal to the volume of the mixture. If sugar is present in quantity, the first few drops will usually cause a yellow opacity to appear, which spreads through the mixture, changing slowly to red as it settles to the bottom of the test-tube. A small quantity of sugar causes this reaction to take place more slowly. If no reaction takes place, the urine, clinically speaking, is free from sugar.

**ERRORS.** *a.* The urine must be fresh. A small quantity of sugar may fail to cause the reaction in an ammoniacal urine.

*b.* Albumen interferes with the reaction and must be removed before the test is made. This may be done by heating the urine, previously rendered only faintly acid, and filtering it. Care must be taken not to boil the specimen too long.

*c.* The changes produced by the earthy phosphates must not be confounded with the sugar reaction. The former produce a flocculent precipitation in the midst of a transparent, greenish amber fluid.

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a fairly good substitute for qualitative work may be made as follows: 1 drachm of Sulphate of Copper, 2 drachms of Neutral Tartrate of Potash, 3 ounces of Liquor Potassae. Mix. Keep this closely corked and in a cool, dark place. It is to be used as detailed above for Fehling's Solution.

**The Bismuth Tests** are based upon the fact that the action of sugar upon the Bismuth salts is the same as upon the Salts of Copper. They have advantage over the Copper tests of being less sensitive to the decomposing power of other organic compounds.

**The Test**, which is ordinarily employed (Boettger's), is conducted as follows: the urine is mixed with an equal volume of Liquor Potassae or Sodae, a small quantity of Bismuth Subnitrate is added, and the mixture is boiled for a short time. If sugar is present, insoluble black Oxide of Bismuth is formed and deposited on the sides of the test-tube; or if the quantity of sugar is small, the white Bismuth powder becomes tinged with gray.

**ERRORS.** Only a very small quantity of Bismuth should be used, as an excess of Bismuth, if the amount of sugar is small, may conceal the reaction.

If Albumen is present in the urine, a reaction, due to the formation of the black Sulphide of Bismuth, may take place, which resembles that produced by sugar and may be mistaken for it; the Albumen should, therefore, be removed from the urine before the test is made.

**Another Test for Sugar.** Mix equal parts of urine and Fehling's Solution in a test-tube and let them stand in a moderately cool place for twelve hours. If there is any orange-red deposit, sugar is present. This test is useful mainly as corroborative of others.

To insure greater certainty in all doubtful cases, *both* the Bismuth and Copper tests should be employed.

**Microscopical Examination.** The value of such examination of course depends upon the knowledge and skill of the microscopist, and as only those thoroughly familiar with such examinations will, naturally, be called upon to make them, there is no necessity for any instructions as to the paraphernalia or technique required.



# EXAMINER'S PERSONAL RECORD OF EXAMINATIONS.

NAME	DATE	RESULT

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