may, of course, be present in the same case. When there is doubt, examination in the sitting or standing posture should clear up the point.

Prognosis.

Many women with constant pain in the sides have healthy children one after another and have good health in other respects. The pain generally disappears at the change of life, but until that is reached there is no prospect of permanent relief in pronounced cases. The slighter cases are amenable to treatment in some degree. The important factor is the patient's nervous system. The hyperaesthetic woman, especially if she has a kind husband and sympathetic relatives, is likely to transfer her patronage from one doctor to another until, after descending a scale of faith-healers and quacks, she ends up a hopeless neurasthenic, bereft of her appendix and both her ovaries. The ordinary patient, after having her discomfort explained by a wise medical adviser, will adjust her life according to his instructions, take care of her general health, keep her bowels loose, and put up with the aching when she cannot avoid it.

Treatment.

A careful and sound prognosis is the essential element in the treatment of this condition.

Unfortunately the diagnosis of ovaritis has often led to mistaken treatment of varicocele. For the word ending in "itis" suggests inflammation. The idea of inflammation suggests the use of hot douches and glycerin plugs, which make the patient much worse. Who would blister the scrotum for varicocele and who would remove the testis? Yet square yards of blisters have been used and multitudes of ovaries have been excised for the same condition in women.

Bunches of dilated veins in the broad ligaments have often been tied and excised with temporary benefit; but the pain generally returns sooner or later, with disappointment as the result. It must be allowed that there is at present no local or surgical treatment available. The patient should be told to keep her bowels loose and to avoid standing, but to take plenty of active exercise—work or play. The most useful drugs in my experience are the two old-fashioned mixtures—cascara, belladonna, and strychnine; and quinine, iron, and Epsom salts. Many patients find peace by taking a small saline aperient every morning. A change of employment often works like a charm.

ON FORECASTING.

A CONTRIBUTION TO THE PROGNOSTICS OF SOME ANOMALIES OF THE HEART AND OF THE URINE.

BY

W. P. S. BRANSON, C.B.E., M.D., F.R.C.P.,

PHYSICIAN, ROYAL FREE HOSPITAL; MEDICAL OFFICER,
SUN LIFE ASSURANCE SOCIETY.

FORECASTING is a treacherous business, especially when chronic affections are at issue. But we cannot escape it; for a patient's interest in the remoter future of his health is only second to his interest in being cured outright, and, when a cure appears to be unattainable, the problem of the future fills his field of vision.

Moreover, forecasting is potent for good or for evil, according as it is judicious or the reverse. Well men have been made sick men by ill-judged interpretations of unimportant anomalies, and sick men have been made much better by well-chosen yet honest prophecies; for "there are ways and ways," as the saying goes, of breaking bad news. I have heard it said of a well-known physician, no longer living, that a patient, consulting him for, say, Bright's disease, would leave with the conviction that Bright's disease was reserved only for the luckiest among men. Surely the height of compliment—or so it seems to me.

I will assume, then, that the first essential of a judicious prognosis is a correct interpretation of abnormal findings.

The second is, that the observer should have access in his mental library to a good supply of apposite life-histories on which to base his forecast. But these are hard to come by. We are taught certain standards of

physical health, standard interpretations of physical abnormality, and standard forecasts of disease, and spend the rest of our lives amending them in the school of experience. In this slow school we learn, among other things, two lessons which are vital to breadth of view. The first concerns the number and extent of the departures from standard normality which are compatible with health. The second is that standard prognosis is but the vaguest generalization, and necessarily leaves out of account the one factor which more than all else determines the event—namely, the response of the individual to the disease he carries. This factor is itself one of the utmost variability, moulded as it is by a hundred subtle influences—heredity, temperament, success or failure, labour or ease, sobriety in living or its reverse, and who shall say what other accidents of change and chance? So we need not wonder that standard prognosis of chronic affections helps us little, nor that forecasting should be, in practice, so difficult as it is.

The third essential to judicious forecasting is optimism—strained to the furthest limits of honesty, except in the case of the patient whose native hopefulness is such that nothing short of a good fright will make him take the precautions necessary for his safeguarding. Fortunately, if I may judge by my own evolution in this matter, experience makes for optimism, on the whole. Perhaps in one's early days one's view is coloured by recent memories of many autopsies, in which were revealed the fatal end-results of diseases, but not the conditions of life and the long intervals of time which had been required to develop them to their lethal pitch. Certainly I am more sanguine now than I used to be.

I have said that apposite life-histories upon which to base a reasoned forecast are hard to come by. It is only the old in years and experience who have had the opportunity to collect at first hand an abundance of facts on this important subject. Even at second hand precise data are not very accessible, though a wealth of them must be reposing in the memories of the fathers of our craft throughout the country. So I have been tempted to record in this essay a few facts which have a bearing on the prognosis of some abnormalities of the heart and of the urine, together with some tentative opinions.

Most of the facts are drawn from experience gained during the last sixteen years at the headquarters of a large life assurance society. It is a form of experience which gives a good insight into "the normal," for a very large majority of the people who submit themselves for examination believe themselves to be well. At all events they are active and busy members of society, and represent the average of the workaday non-invalid community. Moreover, owing to the fact that the same individual is occasionally re-examined at intervals of years for fresh assurances, one is able sometimes to date approximately the emergence of disease and to mark its progress and duration. Lastly, the examiner in this sphere of medicine has the advantage of an instructive custom somewhat favoured by the rejected of insurance offices, or such of them as prefer not to die punctually of their disabilities. Their custom is to revisit the scene of their sentence years after its delivery, and to flaunt their continued well-being before their judge or his successor. This practice, however doubtful in taste, serves a very useful purpose in correcting preconceptions.

For a good many of the facts that follow I am indebted to Dr. W. E. Risdon, until lately my senior colleague at the Sun Life Assurance Society, who has been good enough to put at my disposal instances drawn from an experience probably unique in its extent. To him, and to the directors of the society for permission to make use of records, I wish to express my acknowledgements.

ABNORMALITIES OF THE HEART.

1. Of the Impulse.

All things considered, the position of the heart's impulse is wonderfully constant in adult life. If it is in the fourth space it tends to be in the nipple line, but if, being in the fifth or sixth space, it is displaced outwards even a little, one is entitled to be suspicious. Yet occasionally a slight outward displacement in these spaces seems to be no more than a physical idiosyncrasy. I have met it a good many times in circumstances which offered no explanation of it. For instance—a man, aged 35, had an impulse in the nipple line in the sixth space; no increased

force, no murmur, no albumin. He had previously been charged an extra rate by another office on account of his heart. He was re-examined on four occasions within the next eleven years, and at the age of 46 was in good health and physically unaltered. On the other hand, I believe that a nipple-line impulse when combined with any increase of force must be regarded as pathological, whether it be in the fifth space or the sixth. It is a singular thing that most athletes, even those who have indulged largely in the most taxing sports, such as rowing, do not exhibit any palpable increase in the force of the heart's impulse. A sixth-space impulse within the nipple line is not infrequent in them, but its force is average. I am driven to conclude that in the healthiest hearts the increased efficiency demanded by violent exercise is met by a physiological reserve which spares the necessity for gross hypertrophy; and that when in such people hypertrophy does occur to a palpable extent, it is evidence that the heart has overdrawn its balance. If this be a correct inference, then the so-called "athlete's heart" is a heart which has proved unequal to the strain put upon it.

2. Abnormalities of Rate.

(a) *Hurry*.—All grades of hurry are met with, some being so extreme as to make examination of the heart sounds impossible. Minor degrees of hurry are of no account, being merely an expression of the mild panic into which the prospect of a medical examination throws plenty of healthy people. But it is otherwise with the extreme grades. At least, there is some evidence that hearts which habitually race on small excuse may do damage both to themselves and to the vascular system in course of time. For example:

A man, examined for the first time at the age of 24, was noted as having "very neurotic heart sounds," but no murmur nor albumin. Five years later, when he was 29, the heart's impulse was "a little too forcible and extensive." There was still no albuminuria. Eighteen years after the first examination, when he was 42, the impulse was in the nipple line and increased in force, and there was albuminuria.

In this connexion I may mention the case of a woman who said that she began to suffer from palpitation of the heart at the age of 18. This lasted for some seven years and then ceased. Eleven years later, in her thirty-sixth year, it recurred. At 38 she developed an enlargement of the thyroid gland and a few months later exophthalmos. When I saw her at the age of 40 she was an example of severe exophthalmic goitre, with a pulse rate of 144 at the end of the examination. At about this time a hemithyroidectomy was performed on her by Mr. James Berry. I examined her again seven years later, when she was 47. She was practically free from thyroid symptoms, her pulse rate was 80, and her general condition good; but her heart was greatly hypertrophied and her systolic blood pressure high (165 mm. Hg). There was no albuminuria.

(b) *Slowness*.—The habitually deliberate pulse is commonly taken to make for longevity. The belief is reasonable if there is truth in the adage that it is the pace that kills, and is supported by cases like the two last mentioned if the inferences I have drawn are to be trusted. I have one fairly complete record of a slow pulse. A man had at the ages of 31 and 35 a pulse rate of 48. He was re-examined at intervals throughout his life. At the age of 46 his pulse rate was 68, at 60 it was 54, and at 67 it was 58. He died in his 72nd year from heart failure.

3. Abnormalities of Rhythm.

Occasional extra-systoles are common at all ages. In young and otherwise normal people, when the presumption is against degenerative affections of the heart, one can disregard them with an easy mind. But as age advances and the presumption becomes more and more in favour of an organic basis for cardiac abnormalities, it is not so easy to take a lenient view. Nevertheless, irregular hearts in people who have passed middle age may be capable of years of good service. For instance:

A man was first examined at the age of 47. His heart was normal, and he was in all respects well. A year later, at 48, he exhibited extra-systoles in some abundance. Four years later again, at 52, the irregularity persisted, but no other fault could be found. He was still alive at the age of 64, sixteen years after the first appearance of the irregularity.

Again. A man aged 58, who had an impulse in the nipple line, but not increased in force, exhibited an arrhythmia not of the common extra-systolic type. In other respects the heart sounds were natural, and he was unaware of the irregularity till it was brought to his notice. Examined again five years later, at the age of 63, he gave a history of two attacks of gout

in the interval. His heart was again irregular and apparently unaltered. He was still living, in his 70th year, twelve years after the first detection of the arrhythmia.

4. Abnormalities of Sound.

(a) Systolic murmurs at the pulmonary orifice are, of course, very common among sick people, and are considered, rightly, as of little account. But they are also common among well people, and are sometimes so loud and harsh as to raise a strong suspicion of their gravity. On several occasions I have felt constrained to advise the imposition of an extra rate for these exceptionally harsh pulmonary murmurs. Yet I do not recall a single example of an untoward ending to such cases, and incline to think that even the harshest of them, in the absence of symptoms, has no ominous significance.

(b) Apical systolic murmurs are common, especially when the heart is emotionally disturbed. Some of these appear only at the height of inspiration, and others can only be dismissed by forced expiration. But I have had no reason to believe that these murmurs which are influenced by respiration are of any consequence. There are others about which it is hard to form an opinion as to whether they represent a leak at the mitral orifice or not. Every observer has his own standard of the quality which establishes in his mind the conviction that an apical murmur is organic, and I do not think it permits of description. But I have twice in after-years re-examined hearts which I had previously regarded as being the seat of mitral regurgitation, only to find them normal. This experience is common among sick people, but it is unexpected among those well enough to be about their business. I conclude that relative incompetence of the valve, due to lack of muscular tone in the heart, is not confined to the obviously debilitated and those suffering from recent infections, and that it is well not to be too positive as to the permanency of this murmur. Here are the instances:

A man examined at the age of 22 had what I considered to be a definite organic mid-systolic murmur, without any history of precedent illness. Ten years later his heart appeared to me to be perfectly sound.

A man was declined for life assurance, on the score of his heart, at the age of 25. The following year I examined him and considered that he was suffering from leakage at the mitral orifice. I re-examined him two years later and could find no fault in his heart beyond a suggestion of increased force in the impulse.

I have notes of a third case. At the age of 32 a man was considered (by a very experienced examiner with whose standard I am well acquainted) to be suffering from mitral regurgitation. His heart's action was excited, but this was specifically discounted in the record. There was a systolic apical murmur, audible also in the left posterior axillary line. Twenty-three years afterwards I examined him, at the age of 55, and could detect no fault. The original examiner, seeing this man again at the age of 61, passed his heart as healthy.

(c) There is occasionally to be heard over the base of the heart a loud, almost humming, systolic murmur—very striking indeed. This murmur is banished by a deep breath and shows no disposition to recur. I do not know its explanation, but it is of no consequence. Conversely, there is another murmur called into being by deep inspiration. It is systolic in time, and heard immediately below the clavicles—a harsh murmur, resembling that heard over a traumatic aneurysm. It is of no moment, and is due, I fancy, to distortion of the great vessels at the root of the neck by the muscular or fascial tension set up by deep breathing.

(d) It is well known that mild mitral regurgitation may be regarded favourably, especially when it can be definitely ascribed to rheumatic fever in the remote past. I have notes of a man who had rheumatic fever at the age of 19. When I saw him, at the age of 51, his heart was the seat of a pronounced apical regurgitant murmur without hypertrophy. This, it is to be presumed, had been in existence for 32 years—that is, since his rheumatic fever—and had given no trouble, nor promised any. Another had been rejected at the age of 32. I examined him when he was 40. He then had mitral regurgitation. Thirteen years later I examined him again. He was then 53, and his heart had undergone no perceptible change and was behaving well.

(e) Aortic valvular disease is justly regarded with more apprehension, yet even here there is room for optimism,

prudently applied; and many victims of the lesion in its milder degrees live comfortably for indefinite lengths of time if they can look after themselves and have reasonably good luck. For instance:

A man who, at the age of 30, had been accepted as healthy, was examined by me twenty years later. He was then 50, had a jerky pulse, an impulse in the sixth space, just within the nipple line, a loud double aortic murmur, and albuminuria. I was intimidated and rejected him. But fourteen years later, at the age of 64, he asked that I might be made aware that he was still alive and well.

I have another note of a man, aged 75, whose mother (probably) and four brothers and sisters had died of phthisis. This man was said by his doctor to have had slowly advancing phthisis of both lungs for fifty years, and to have a systolic aortic bruit, developed within the last twelve months. Nevertheless, he was still living and "well" eleven years later, at the age of 86.

ALBUMINURIA.

Albuminuria has long been a battleground, and has caused many hard things to be said of doctors who examine for life assurance by doctors who do not. The current teaching of the laboratory is that when globulins are preponderant the symptom is negligible. But for the present this is little more than an *ex cathedra* dictum, awaiting the test of time.

Meanwhile, it is certain that some albuminurias do not affect health visibly, even after many years. For example: A man, aged 49, had been found albuminuric at the ages of 17, 31, and 41; yet at 49 his urine was normal, and so was his vascular system. This may be taken to represent the probable upshot of adolescent albuminuria. But one is reminded occasionally of ominous possibilities. A man, aged 22, had been declined on account of albuminuria one year previously. I examined him, and noted nothing amiss except that the impulse was under the sixth rib, yet inside the nipple line. Three years later, at the age of 25, he died of "chronic nephritis."

But on the whole I have been more impressed (in this sphere of the presumably healthy) by the longevity of albuminurias than by the reverse event. A man, weighing more than 17 st., and subject to winter bronchitis, was albuminuric at the age of 54. Here was a case surrounded by every circumstance of prognostic gloom, except that he was temperate in alcohol and came of long-lived stock. Yet (thanks to these saving clauses perhaps) he persisted in being alive fourteen years later at the age of 68. Another was consistently albuminuric on four occasions between the ages of 55 and 66, and seemed none the worse for it. Yet another was albuminuric on three occasions between the ages of 31 and 42. This last, as I understand the modern view, ranks as a probable nephritic; for his urine, though giving a pronounced reaction with cold nitric acid, gave none with cold dilute acetic acid. None the less he declined to be damaged by his albuminuria, served with infantry during the war, and returned still albuminuric and apparently nothing the worse. His systolic blood pressure at age 42 was 120 mm. Hg.

Even when accompanied by glycosuria albuminuria may be relatively benign. A man who at the ages of 46 and 54 passed both sugar and albumin, was alive at 60 and had every outward appearance of health. At this age the glycosuria had gone; but albuminuria persisted, and signs were not wanting that his vascular system was beginning to suffer.

Albuminuria due to, or at least associated with, intemperance can be conquered by faithfulness in sobriety, even when the case looks black. A man who was grossly intemperate between the ages of 32 and 40 was albuminuric at 32 and 37, tremulous, and grossly obese. He stood 5 ft. 9 in. and weighed 18 st. 11 lb. when, at the age of 40, he gave up alcohol. Four years later he was healthy to the eye, no longer albuminuric, and had lost 2 st. in weight. So the struggle was worth while.

GLYCOSURIA.

Glycosuria, like albuminuria, is a symptom hard to appraise, at all events within the limits of the tests admissible in life assurance work. It may be that blood-sugar estimations will throw an enduring light on this dark quarter. But here again some years must elapse before we can safely accept without reserve conclusions drawn from this source. Certain it is that some people

pass sugar in fairly early life, and pass it for years without being appreciably the worse.

A man whom I examined at the age of 71 gave the following history: At the age of 30 he was told that he was suffering from diabetes by the senior physician of a London hospital. He was dieted for three months, during which period sugar was found, he believed, on many occasions. It then disappeared for good, and there was no glycosuria when I examined him forty-one years later.

Another, aged 36, and of average physique, passed urine which caused some reduction of Fehling's solution and yielded osazone crystals. He was examined again at the ages of 42 and 43, when his urine was found to be exactly as before. Yet later in the same (43rd) year of his age he passed a specimen free from sugar.

Another, of average physique, reported that sugar had been found in his urine when he was 30 years old. He was examined at 37, and was definitely glycosuric on two occasions. But at 38 and 39 no sugar was to be found.

The fat "alimentary" glycosurics who make little of their disability are well illustrated by one who, at the age of 58, passed a urine of which one drop sufficed to reduce the Fehling's solution used for the test. He came of long-lived stock, and is still living eighteen years later, aged 76.

Another fat man, at the age of 40, passed a urine which caused slight reduction of Fehling's solution. At 50 he passed a urine giving a similar reaction and yielding osazone crystals. He was almost an abstainer, and seemed well.

Another, of the same fat type, at the age of 60 passed sugar on two occasions, and on one of them albumin also. Yet he lived for twenty-two years longer, dying at 82.

But there is a reverse side to this picture, and glycosuria, apparently of the "alimentary" type, is capable of becoming malign.

A fat man was held up for life assurance on account of sugar at the age of 38. At this time, and very likely on this account, he became a total abstainer. Seven years later, at the age of 45, he was still grossly obese (5 ft. 6½ in., 15 st. 10 lb.), but his urine was free from both albumin and sugar. Yet he died of diabetes and gangrene of the scrotum at the age of 54.

This case, with others of the same sort, leads me to believe that inheritance plays an important part in determining the outcome of glycosurias of middle age. This man's mother had died at 63 of diabetic coma. Another, whose mother had died of diabetes at the age of 66, passed a reducing substance at the age of 61, but no osazone crystals could be recovered from the specimen. The reaction was accordingly disregarded, but he died of diabetic coma eleven years later, aged 72.

That there is a relation between glycosuria and arterio-sclerosis is well recognized, and in cases of this sort it is generally the vascular lesion which counts. A fat man of 56 was glycosuric, and remained so in spite of dieting. Yet he lived for sixteen years, and died at 71, not from diabetes, but from renal cirrhosis and arterio-sclerosis. Another very fat man had sugar in his urine at the age of 52, and lived nineteen years, to die of Bright's disease at 71.

It will be understood, I hope, that this little series does not claim to represent the average behaviour of the abnormalities concerned, but it gives some insight into the possibilities, especially the more favourable ones. This is the most that can be looked for, since, as I have said already, the behaviour of chronic affections is swayed by factors of too much diversity to admit of ready averaging. Take, for example, senile atheroma of the aorta, and consider the extent to which the local incidence of the lesion (which we may call chance) dictates the patient's future. Place the lesion where it spares the origins of vital arteries, and then, even though the aortic valves should suffer, the process remains relatively benign; but let it encroach upon the coronary arteries, and how different does the prognostic picture become!

The same element of chance is apparent everywhere. A fit of rage, a race for a train, a bad cold, a heavy lunch, or any one of a thousand such incidents, may disconcert a forecast legitimate enough on the physical merits of the case. And conversely, when circumstances shelter them and give them peace, lives that are damaged may remain perched—and not uncomfortably—upon the very edge of the grave for surprising lengths of time, confounding all surmises. Indeed, the longevity of invalid annuitants has passed into a proverb.

It is not to be expected, then, that even the cleverest prophet in this field will escape without stumbles, but we can do something to secure our feet. So I hope that others will be prompted to amplify this attempt to provide much-needed information on an elusive subject.