The test may further be of assistance in deciding the length of the treatment required and the permissible extent of future activities. Wingfield and Goodman¹ have suggested that the test should prove of great value to the physician in the out-patient department, the dispensary, and in private practice, in pondering over such difficult questions as "Is this patient holding his own or not?"; "Am I justified in putting the patient to the trouble and expense of a more drastic form of treatment than I am giving at present?" Trail² is of the opinion that the B.S.R. should prove of value in assessing the length of home treatment required after the patient leaves the sanatorium. With these points of view I am in entire agreement. Moreover, repeated estimations will, in my experience, provide useful information in deciding as to the patient's future activities as regards occupation and exercise.

Finally, comes the question of after-care in cases of pleural effusion. All authorities are agreed that the majority of cases of sero-fibrinous pleurisy are due to the tubercle bacillus. It is also established that within a few years an appreciable number of these cases develop active tuberculosis of the lungs. Attention to the sedimentation rate during convalescence from pleural effusion should help the physician both to determine the length of

convalescence desirable and to regulate the patient's activities. Patients who have had a pleural effusion should be warned to return for examination if at any time symptoms suggestive of pulmonary involvement or of toxæmia appear, and, on such occasions, a sedimentation estimation should always be included in the routine examination.

CONCLUSIONS

The blood sedimentation rate is of proven value in the management of cases of pulmonary tuberculosis.

The technique is very simple. Readings at the end of the first hour are usually sufficient.

Regular and repeated estimations are essential.

It is strongly urged that the information provided by such estimations should be carefully considered when prescribing rest and exercise, particularly in patients whose temperatures and pulse rates are within normal limits. It is the writer's opinion that attention to this point will tend to minimize the risk of relapse.

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ESSENTIAL HYPERTENSION: A REVIEW OF 100 CASES *

BY

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The following paper is the result of an attempt to trace the after-histories of a group of persons who were in-patients in the Royal Victoria Hospital, Belfast, during the years 1926-30, and in whom a diagnosis of essential hypertension had been made. Cases of gross disease of the kidneys and of gross arterio-sclerosis have been excluded. The cases are presented in the form of tables, with commentary.

TABLE A.—Males, 42; average age, 59.3. Females, 58; average age, 53.3. Total cases, 100; average age, 55.6.

	1926	1927	1928	1929	1930
Males	4	14	5	9	10
Females	6	8	13	10	21
Deaths	2	8	4	2	3
Average duration of life after leaving R.V.H.	3 years'	2 yrs	11 months	4 months	7 months
Did not report ...	3 months	3	3	2	3

TABLE B.—Age Distribution

	20-30	30-40	40-50	50-60	60-70	70-80	80-90
Males	1	0	3	19	15	3	1
Females	2	4	13	22	14	3	0
Deaths: Males ...	—	—	—	3	5	—	—
„ Females	—	2	3	3	3	—	—

Tables A and B require no comment other than the statement that the figure opposite the entry "Deaths" refers to the number of patients for each year who are now known to be dead. The higher death rate in females differs from the findings of Blackford, Bowers, and Baker¹ (70 per cent. in males and 39 per cent. in females), and those of Paullin² (48.7 per cent. in males and 9.2 per cent.

* Chairman's address, Belfast Division, British Medical Association, December 10th, 1931.

in females). Inquiry into occupation revealed nothing; the men followed twenty-seven different vocations, and the women were almost all married and engaged in housework. No one was employed in the manufacture or sale of alcohol, and in only eight cases could an "alcoholic" history be obtained.

TABLE C.—Family History of Cardio-vascular Disease

*Parent died of "stroke"	9
Parent died of "heart disease"	7
Sister or brother died of "stroke"	3
Sister or brother died of "heart"	2

* In one case both parents.

The above figures, too, are in contrast with those of Blackford, Bowers, and Baker, who found a family history of cardio-vascular disease in 33 per cent. of their cases.

TABLE D.—Previous Illnesses

Scarlet fever	17	I pneumonia	7
Measles	13	Typhoid	6
"Rheumatism"	12	Gonorrhoea	2
Influenza	10	Syphilis	1

Table D confirms the observations of Nuzum and Elliott,³ who found typhoid fever and syphilis relatively rare precursors of hypertension. Councilman,⁴ Thayer,⁵ and Barach⁶ have stressed the importance of typhoid infection. Of the seventeen cases with a history of scarlatina, three had transient albuminuria, and one ultimately developed azotaemic nephritis.

In interviewing the patients who attended for re-examination I inquired whether they had been subject to palpitation or had easily excitable hearts in early life, as it has been suggested that it is the people who have "D.A.H." in youth who develop hypertension in middle life; I could not find that this applied to the patients under review.

TABLE E.—Principal Symptoms

Headache	62	Hemiplegia, monoplegia, or aphasia	12
Dyspnoea	42	Epistaxis	12
Digestive disturbances	30	Praecordial pain	11
Visual disturbances	19	Insomnia	11
General weakness	19	"Paraplegia"	3
Palpitation	15	? Syncopal attacks	3
Vertigo	15	Head noises	1

In Table E it will be seen that shortness of breath was almost as common as headache. I was surprised to find that so few had complained of dizziness, and feel sure that it occurs in more than 15 per cent. of cases. The three cases of paraplegia were unusual: all three were males; none showed gross vascular change in the limbs, none showed any physical sign of lesion of spinal cord or peripheral nerves, but all complained of weakness of the legs and of inability to walk.

CLINICAL AND LABORATORY FINDINGS

TABLE F.—Blood Pressures

	In-patients (all cases)		Fatal Cases		Review Cases
	Average Highest Recorded Pressure	Average Lowest Recorded Pressure	Average Highest Recorded Pressure	Average Lowest Recorded Pressure	
Systolic ...	209	176	213	185	222
Diastolic ...	123	103	129	101	127

The blood pressures recorded showed considerable variation, not only between individual cases, but between the various readings in each individual case, and there was as much variation in the diastolic pressure as in the systolic. These results differ from those of McCloud,⁷ who found the diastolic pressure much more constant than the systolic. Careful examination of the renal function did not show that the high diastolic figures observed were a proof of gross renal incompetence, although, as Hay⁸ says, "The extent of renal damage must be considerable before there is measurable increase in the non-protein nitrogen or a clear depreciation of the concentrating power of the kidneys." I was disappointed to find that, almost without exception, the pressures of the patients under review were as high as or higher than those obtained on their original admission to hospital, even in cases which had shown a satisfactory fall during in-patient treatment. In estimating diastolic pressure I made my reading at the end of the so-called fourth phase, when the sharp sound gives place to the dull thud which usually precedes the complete disappearance of all sound. With regard to the other phases of sound-change described by Korotkoff, I am inclined to agree with Korn⁹ that "it is the exception rather than the rule to find sound-sequences which display the supposedly characteristic phase differentiation."

TABLE G.—Electrocardiographic Findings (67 Cases)

Normal electrocardiograms ...	18
Left ventricular predominance ...	18
Inverted T in lead 1 only ...	15
Inverted T in leads 1 and 2 ...	5
Inverted T in leads 2 and 3 ...	3
Inverted T in leads 1, 2, 3 ...	3
Coronary lesion type ...	3
Right branch-bundle block ...	1
Extrasystoles only ...	1

The high proportion of normal electrocardiograms surprised me. I expected that almost all cases would show left ventricular predominance. Twenty-nine cases had some disturbance of T. The association of inversion of T in leads 1 and 2 was demonstrated by Willis.¹⁰ He states, however, that auricular fibrillation is very common in cases of hypertensive disease, whereas in this series of 100 cases no single case was observed to have auricular fibrillation. In three cases an aortic diastolic murmur, and in seventeen an apical systolic murmur, was heard.

Blood urea estimations were carried out in eighty patients during their in-patient period, the average figure being 43.4 mg. per 100 c.cm. In fifty review cases the average figure was 31.5 mg. Many of these patients with no albuminuria and normal blood urea admitted to

nocturia. Vaquez¹¹ states that "This is an important symptom of arterial hypertension, but . . . may coincide with complete integrity of the function of the kidney."

TABLE H.—Ophthalmoscopic Examination (50 Review Cases)

Nothing abnormal detected ...	25
Optic atrophy ...	8
Sclerosis of retinal vessels ...	6
Disks blurred ...	5
Papilloedema ...	4
Disks blurred: old haemorrhages ...	2

The above are my own findings, but were in many cases confirmed by my ophthalmological colleagues. They are much at variance with those of N. M. Keith,¹² who found retinitis in every one of eighty-one cases whose diastolic pressure exceeded 130; he describes a sequence of hyperaemia, papilloedema, retinal exudates, and optic atrophy, and further states that "papilloedema is the striking feature of all the cases." I think it probable that in occasional cases even expert opinion may be in doubt as to whether the appearances of the retina are due to arterial hypertension, gross renal disease, or the increased intracranial tension of a cerebral tumour. Minor degrees of oedema may account for some blurring of the outline of the disk, but haemorrhages and retinal exudates appear to be relatively rare in essential hypertension.

FACTORS IN PROGNOSIS

Of the nineteen patients now known to be dead, six probably died of a cerebral vascular lesion, one of a coronary lesion, and there were four others whose history strongly suggested a cardiac death. It is regretted that the fate of the others is obscure.

The renal risk in these cases appears to be considerably less than the cardiac or vascular. Keith's¹² and Paullin's³ figures confirm this view, as does Hay's⁸ dictum that "the normal termination of a case of persistent hyperpiesia is cardiac defeat." One of the factors which make for difficulty in prognosis is that the severity of the patient's symptoms is not necessarily proportionate to the gravity of his case from the physician's point of view. What surprised me most in my interviews with the fifty-eight patients who actually attended for re-examination, with an average blood pressure of 227/127, was that no fewer than fifteen insisted that they felt better than when they were originally admitted as in-patients. In every one of these fifteen cases the pressures, both systolic and diastolic, showed an increase over the pressures first recorded. I am aware of two factors which must be considered. First, the psychical stimulus to blood pressure, for which a special visit to hospital was probably responsible. I did my best to discount this by taking repeated readings of the pressures while trying to distract the patients' attention from the matter in hand. Secondly, they may have been afraid that I should want to curtail their liberty by suggesting readmission. But I submit that there is yet another explanation—namely, that these patients are more liable to symptoms of distress, such as dizziness or headache, during the earlier stage when the blood pressure is rising, and less liable to symptoms when their circulatory symptoms have acquired a certain tolerance to the altered conditions under which the circulation is being maintained. There is a parallel for this in other cardio-vascular conditions, notably in complete heart-block, where the patient suffers from Stokes-Adams attacks more frequently during the development of the condition than when it has developed and the circulatory system has accommodated itself to it.

In few of the papers which I have read has consideration been given to this question of subjective improvement in relation to blood pressure level. Alexander and Ullmann,¹³ in a paper on the prognosis of essential hypertension in women, conclude that, while in the majority

of cases in which an improvement of symptoms was found a diminution in blood pressure was also found, in a much smaller group improvement of symptoms occurred with no change, or even with a rise in pressure. Such apparent improvement in symptoms did not always coincide with an improvement from the physician's point of view.

Again, many of these patients have not only labile systolic pressures, but also have an optimum level—that is, a level at which they are most free from symptoms. I have known this level to be as high as 280 mm. Hg. One possible reason for this is that the pressure must be maintained at a certain height in order to maintain an efficient coronary circulation. As a corollary to this, I suggest that one should always try to obtain evidence of the condition of the circulation in the coronary arteries before attempting any treatment which may suddenly reduce the pressure—for example, in some patients venesection lowers the systolic pressure more rapidly than in others, and I have seen a very alarming syncopal attack follow venesection for the relief of hypertension in a patient with an unsuspected coronary lesion.

While a sudden lowering of tension is one of the most characteristic features of a coronary embolism, it is not a constant one; but to find that a patient's systolic pressure has dropped 60 mm. since his last examination should always prompt careful inquiries as to an unusual "bilious attack," or unexplained sternal or epigastric pain, suggestive of an unsuspected coronary catastrophe.

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CONSERVATIVE MASTOIDECTOMY FOR CHRONIC SUPPURATIVE OTITIS MEDIA

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Although preventive measures such as the establishment of aural clinics at schools and hospitals, the removal of tonsils and adenoids or other sources of infection in the nose and nasopharynx of children, and the proper care of patients during the exanthematous fevers have done much to reduce considerably the prevalence of chronic otorrhoea both in children and adults, there still remain a large number of individuals who continue to suffer from this distressing and potentially dangerous complaint.

Sometimes this chronic condition is due to disregard of cleansing methods of treatment during the early stages of the disease, or to the failure to remove from the nasopharynx those causes which tend to maintain the source of infection. More often, in spite of the many well-known methods of dealing with the local infection, such as cleansing treatment of the ear, use of vaccines, ionization with zinc or other metallic compounds, introduction of various powders, minor operative measures for the purpose of promoting better drainage, as, for example, the removal of polypi and granulations, or the incision

of the drumhead, the inherent chronicity of the disease prevails, and few, if any, of these methods of treatment have any effect. This chronicity depends upon the fact that, after eliminating the possibility of constant re-infection via the Eustachian tube, the pathological anatomy of the attic and antral regions of the middle ear is such that it does not permit easy access of cleansing or bactericidal fluids to these areas, whether the disease is established in the mucosal lining alone or, as is more commonly the case, in both the mucosa and underlying bone. Even the advocates of treatment by ionization do not claim success in these cases, but confine themselves rather to the treatment of those regions of the middle ear—that is, the tympanum proper—where the disease is readily accessible to the influence of the zinc ions. What, then, is to be done further for those cases which do not respond to any of the simple methods of treatment, but which drag on interminably from year to year, the patients suffering not only the discomforts of a discharge and of impaired hearing, but also the effects of a chronic systemic infection, and in which there is always the possibility of extension of the infection to the mastoid, the labyrinth, or the intracranial contents?

It is the purpose of this article to advocate in such cases an operation which aims not only at the eradication of the disease and its possible sequelae, but also at the preservation of hearing. The operation is a modified form of the so-called conservative mastoidectomy first advocated by Heath in this country more than twenty years ago, and nowadays termed transantral attico-tympanotomy. It is an extension of the simple (Schwartz) mastoid operation to include the opening up of the attic and tympanic regions of the middle ear by removal of the bridge of bone over the aditus, together with the bone that forms the outer wall of the attic, conserving at the same time the integrity of the soft parts of the external auditory meatus and the continuity of the latter with the tympanic membrane. Thus diseased areas of osteitis in the antrum or attic can be exposed and curetted, granulations and necrosed ossicles removed if necessary, the whole area cleansed, and the soft structures replaced almost in their former anatomical positions. Fresh adhesions will have to be formed between the postero-superior margin of the tympanic membrane and the denuded inner wall of the attic, the aim of this being to restore to the tympanic cavity its former closed state, containing air that is shut off from the external auditory meatus. To promote these adhesions the meatus is kept firmly packed for a few days with narrow ribbon gauze soaked in spirit; the mastoid wound is drained posteriorly in the usual manner. The daily dressing is simple, causing a minimum of discomfort or pain to the patient. Healing is generally complete in two to three weeks, when the patient is able to resume his normal occupation.

The advantage of this operation over the older classical radical or complete mastoidectomy is beyond question; hearing is preserved and there is a better prospect of obtaining a dry ear.

The types of cases most suitable for operation are those in which the greater part of the tympanic membrane remains intact and where the perforation, usually marginal, is situated either in the superior or attic area or posteriorly, when a chronic antritis may be suspected. Cases of chronic suppuration with a very large destruction of tympanic membrane are not suitable for this form of operation; moreover, since the condition is usually a safe one, owing to the free drainage that exists, treatment by simple cleansing methods is adopted. The classical radical operation is becoming a relic of the past, and should now be reserved only for those exceptional cases where a cholesteatoma has totally destroyed the middle-ear contents, or where a graver complication, such