the first case may have an underlying endocrinopathy as an aetiological factor.

Endocrines and Ophthalmology

In 1938 Sir Walter Langdon-Brown gave a lecture to the Oxford Ophthalmological Congress reviewing the ocular manifestations of endocrinopathies as they present themselves to the ophthalmologist. Parathyroid, pineal, pituitary, thyroid, adrenal medullary, gonad, and pancreatic disorders may all show ophthalmological signs, and these may for a time be the presenting feature.

Endocrines and Cancer

Experiments in small animals, such as mice, indicate that oestrogens in large doses over long periods may induce neoplastic growth in genital and other organs. Thus Allen (1942) records cancer of cervix uteri (mice), uterine fibromyomas (guinea-pigs), mammary cancer (mice), interstitial cell tumours of the testis (mice), adenomatous tumours of the pituitary (rats and mice), tumours of the suprarenal cortex (mice), and osteogenetic transformations of bones including tumours (mice). Such neoplastic changes are not found in monkeys, and there is no clinical evidence of the endocrines being responsible for malignant changes in the genital or other organs in man.

Endocrine Therapeutics in Non-endocrine Disorders

Hormones have been used with success in a number of non-endocrine disorders. Thus insulin is anabolic in some thin people, and recently Sargant (1942) has found it useful in a group of neurotics who have lost much weight and have broken down after a long period of stress, showing "a peculiar mixture of anxiety, hysterical, and reactive depressive symptoms." Insulin has also been used in the vomiting of pregnancy and in thyrotoxicosis. Insulin-shock therapy is apparently more beneficial than electric-shock therapy in early schizophrenia. It is claimed that cortical extract has proved of value in surgical shock and shock from burns, the blood chemistry in both instances having some similarity with that of Addison's disease. Apparently the corticosterone carbohydrate influencing factor is more important than the desoxycorticosterone factor. In infections the adrenal cortex loses lipoid and undergoes congestion and degeneration. Cortin has therefore been advocated for the acute stages of a variety of infections, especially malignant diphtheria, and for post-infection debility. It is also said to be of value in meningococcal septicaemia of infants, as is illustrated in the Waterhouse-Friderichsen syndrome. Oestradiol appears to be of value in a group of menopausal rheumatoid arthritics. Testosterone I have found of value (Simpson, 1938) for its anabolic nitrogen-retaining effect in hyperthyroidism associated with much wasting. It has also been used for menorrhagia and mastitis. Both testosterone and stilboestrol are effective in suppressing lactation. Adrenaline is of course specific in asthma. Pitressin has been used for chronic pyelitis, and in obstetrics.

Conclusions

I think we must conclude from the above review that the manifestations of endocrine diseases extend throughout the whole domain of medicine, including in that term surgery and gynaecology and the various "special" branches of medicine; that endocrine disorders do not necessarily appear as complete syndromes; and that unless an awareness of the possibilities is present they may remain unrecognized as endocrinopathies when the presenting feature is not obviously endocrine. In the opposite direction one sees a tendency to ascribe the origin of obscure chronic disease, especially of a functional character, to endocrine disorders which are not really present, and the necessity for a knowledge of existing methods of differentiation and the development of more specific chemical, metabolic, and biological tests.

Endocrinology, however, viewed from any angle, is no longer merely a lusty infant. It has grown to maturity, and is at least as well founded on scientific data as many other older accepted specialties. I doubt whether it would gain from the founding of a special hospital for its study—rather would it tend to flourish as special centres or clinics in large hospitals, remembering that such centres for accumulating clinical material from large areas are essential for progress in this field. Such centres or clinics, however, must not be auxiliary adjuncts in the charge of assistants, created merely to give an air of modernity or progress. Endocrinology is one of the most difficult specialties. Its practice, and even more so its teaching, require wide general clinical experience and judgment, as well as personal experience and continuous familiarity with the enormous and ever-widening field of experimental research and a specialized knowledge of endocrinopathies, which can only be obtained by those who have had special facilities and opportunities for their study. An endocrine clinic should be an important integral part of a hospital, and should serve as a model for modern methods of investigation, research, and therapy in disease.

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USE OF AMPHETAMINAE SULPHAS IN FACILITATING ELECTRICALLY INDUCED CONVULSIONS

BY

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The use of electricity for inducing convulsions in the treatment of mental disorders has revealed a significant factor in connexion with the electrical stimulus. The electrical convulsion threshold has been found to vary, so that not only do successive applications of electricity require increasing strengths of current, but also there is a wide variation in the initial effective amount necessary. In some patients, more noticeably those suffering from certain types of disorder, a very high threshold either obtains from the outset or rapidly develops. In view of the possibility that electricity, particularly in high strengths, may not be altogether harmless, it seems desirable to discover methods by which the electrical convulsion threshold may be lowered. This to some extent may be achieved by increasing the interval between successive treatments, but at least in the cases exhibiting a high initial threshold recourse cannot be had to this method. Moreover, the period of the treatment would be much prolonged. Other ways of achieving the same objective are suggested by the fact that certain drugs have a stimulating effect on the cerebral cortex, and, owing to the results obtained with amphetaminae sulphas (benzedrine sulphate), experiment in the use of this drug was thought likely to be effective, and was therefore undertaken. Before the results of this procedure are examined it is profitable to consider the theoretical basis of this ascertained variation in the electrical convulsion threshold.

So complex has the nomenclature in psychiatry become, and so difficult is it to fit cases into definite disease entities, that it is often more useful to consider symptom-complexes. Particularly is this so in relation to therapeutic measures.

Variations in Cerebral Activity in Psychotic Disorders

Certain types of psychotic disorders exhibit the symptom of diminution of motor activity. This occurs particularly in depression and in schizophrenia. It may be of any degree from lassitude and a disinclination to do anything to apathy and even stupor. When such a prominent feature presents

itself, it is pertinent to seek a reason for it, particularly when it occurs in such widely different types of mental disorders as manic-depressive and schizophrenic psychoses. In the former there is a true depression with often suicidal tendencies; in the latter there is an absence of emotional tone, with a consequent apathy. Both of these lead to a diminution of activity, which in an extreme degree is manifested by stupor. A consideration of the stupor reveals two different types—that occurring in depression being more often of the anergic type, in which there is a loss of muscular tone and in which mental processes such as perception, memory, and ideation appear to be in abeyance; whereas that occurring in schizophrenia is usually of the resistive katatonic type. Here there is a retention or even an increase of muscular tone, causing the posture of the patient to remain as arranged, undetermined by gravity, and the mental processes are not in abeyance, so that mannerisms and stereotypy occur and outbursts of excitement and impulsive behaviour interrupt the stupor. Apparently in the anergic stupor the cerebral activity is lowered so that there is a diminution of sensory stimuli to, and a reduction of more impulses from, the brain, with an associated paucity or lack of motor function. On the other hand, in the stupor associated with schizophrenia there is a retention of the muscular tone and cerebral activity as shown by mannerisms, stereotypy, and impulsive behaviour. Thus the mechanism of the two conditions appears to be entirely different—that associated with depression being due to a reduction of cerebral activity, and that occurring in schizophrenia being due not to a reduction of cerebral activity but to failure of integrity.

Causes of Lowered Cerebral Activity in Depression

From these observations it is possible to conjecture about the likely causes of this lowered cerebral activity which occurs in cases of depression. One such view has already been advanced—namely, that it is due to inhibition of cerebral function. Thus Pavlov (1941), who attempted to apply his findings in animal experiments to mental disorders, considered that in depression there was a state of positive inhibition, which with advancing years ceased to be effective, so that the patients with depression and diminished motor activity in earlier life became excitable and unrestrained in their behaviour when old age overtook them.

This supposition that cerebral activity is diminished in these cases of depression appears reasonable, and it was hoped that, with the induction of fits by the electrical method of Cerletti and Bini (1938), the measurement of the resistance of the head preparatory to applying the shock current would be an indication of the cerebral resistance and inhibition. This, then, would be not only a useful guide to the effective amount of current required to produce a fit, but an index to the degree of cerebral inhibition in different mental states. Unfortunately this hope was not realized, and, although the factors responsible for this head resistance are not yet completely understood, enough data are available to connect it with changes in the skin and underlying structures. Thus Krause (1936) found that the resistance of impedance of the head depends on the skin, muscle, and periosteum, and that no difference occurred when the brain was replaced by a wet sponge. That the skin is the most important of these factors is the opinion of McGregor (1941) and Walter (1942), which is supported by the fact that the resistance is appreciably lower in hypoglycaemic states, when there is excessive sweating, than when the skin is dry. Atmospheric conditions also appear to affect the resistance, as, of course, does the degree of contact of the electrodes. Thus the measurement of the head resistance is no measure of the resistance of the brain, and certainly the apparatus supplied on the Solus machine is inadequate for this purpose. Hence any hope of using the measure of the head resistance as a guide to the degree of cerebral resistance, and therefore of inhibition, was not possible. Hemphill and Walter (1941) experienced the same difficulty when assessing the effect of epanutin in relation to electrically induced fits. They considered that the product of the voltage and the time of application of the current was a more useful index of cerebral resistance.

Shortly after the use of the electrical method to induce fits a great variation in the electrical convulsion threshold was found, and as in the case of the chemical methods, using cardiazol and triazol, a tolerance developed which raised the threshold. Besides this, however, different individuals varied widely, even in the initial threshold. The reason for this was not at first understood, but careful observation has shown it to depend upon two main factors—age, and the type of mental disorder. Naturally other factors may also operate to some extent, such as the difficulty, already mentioned, of the exact diagnosis, and the degree of contact of the electrodes. Nevertheless the following tables appear to be most suggestive.

TABLE I.—*Showing Variation of Average Electric Convulsion Threshold (expressed as the Product of Volts and Duration of Stimulus in Relation to Age, in 110 Patients, irrespective of Type of Mental Disorder*

Age Group :	16–20	21–25	26–30	31–35	36–40	41–45	46–50	51–55	56–60	61–65
Average V.×T. ..	18·3	20·2	23·2	23·4	24·4	26·9	28·9	30·9	34·5	42·1
No. of patients ..	10	8	17	23	8	3	11	16	9	5

TABLE II.—*Showing Relation of Average Electric Convulsion Threshold to Type of Mental Disorder, and Average Age of Each Group*

Diagnosis:	Schizophrenia	Depression	Delusional	Obsessional	Toxic	Mental Defect	Mania
V.×T.	21.9	29·5	26·9	20·9	20·4	23.6	24
No. of cases ..	32	55	7	9	4	2	1
Average age of each group (years) ..	27·8	46	44	30·8	29·5	23	46

From Table I it is seen that the electric convulsion threshold increases with age. This suggests that an organic factor is operating. This is unaffected by sex, since the average threshold for females as compared with males is 26.9 to 24.7 in 110 cases, of which 75 were females and 35 were males. From Table II it is apparent that this threshold is increased in cases of depression as compared with other types of mental states, and that the average age for these cases of depression is the highest of any of the groups. This is significant, for it suggests that the increased threshold in cases of depression depends more upon age than on the actual mental state. It is still necessary, however, to attempt to discover why the threshold should increase with age and why depression should be more common in later life. One might surmise that organic changes occur with increasing age that make the cortex of the brain more resistant to stimuli, with correspondingly increased inhibition, and that when a certain degree of inhibition is present a state of depression occurs. This would explain the lack of adaptability and the dislike of change which occur in later life, and thus supports the theory advanced by Pavlov. Certainly the increased threshold is not due to the depression itself, for it does not occur in all cases, being more commonly found in the older depressed patients—between 40 and 60—as may be seen by comparing the average threshold in depressed patients younger than 40 with those over 40. It was 23.1 and 33 respectively. Further, if the raised threshold depended upon the depression, it should tend to become lower as improvement occurred. This was not found, and even if the condition of tolerance, which itself raises the threshold, tended to some extent to mask any lowering of the threshold due to the mental improvement, this latter must be extremely small or it would, at least, have compensated for the rise due to the tolerance. The increased electric convulsion threshold appears, therefore, to be brought about by changes in the cerebral cortex as a result of age, which at first are reversible but which later become irreversible, as seen by the lack of response to treatment in the more chronic cases.

Tests with Amphetaminae Sulphas

If, as has been suggested, the increased electric convulsion threshold is due to changes in the brain, they should be capable of modification by drugs known to act on the brain. It is now common knowledge that sedative drugs, such as the barbiturates, by depressing cortical activity, increase the electric convulsion threshold, as shown by Hemphill and Walter (1941) in the case of disodium diphenyl hydantoinate. It was therefore

considered useful to test the effect of a cerebral stimulating drug on the electric convulsion threshold, and in view of the improvement that occurs from amphetaminae sulphas (benzedrine sulphate) alone in certain cases of depression, it was decided to employ this drug. Accordingly 5 mg. was given by mouth to each patient, to test their susceptibility, and thereafter 10 mg. was given one hour before the electrical treatment. The results in 6 patients are tabulated below:

Case I, aged 56

No. of T'ment:	1	2	3	4	5	6	7	8	9	10	11	12
Volts × Time ..	26	45	48	80	80	75	75	75	45	24	24	24
Milliamps of current passed ..	30	81	104	225	250	162·5	175	200	78	35	28	26
Amphet. sulph. in mg.									5	10	10	10

Case II, aged 42

No. of T'ment :	1–16	17	18	19	20	21	22	23	24	25	26
Volts × Time	26	39	26	45	45	45	45	30	30	45	45
Milliamps of current passed	30	93	32	78	87	87	93	38	35	99	78
Amphet. sulph. in mg. ..			5		10	10	10	10	10		

Case III, aged 54

No. of T'ment :	1–4	5	6–8	9–19	20	21	22	23	24
Volts × Time	26	52	48	52	36	26	26	26	26
Milliamps of current passed	29	104	112	122	82·5	35	33	35	34
Amphet. sulph. in mg. ..					5	10	10	10	10

Case IV, aged 62

No. of T'ment :	1	2	3–10	11	12	13	14
Volts × Time	24	24	45	60	30	60	60
Milliamps of current passed	30	30 .	86	109	38	120	147
Amphet. sulph. in mg. ..				5	10		

Case V, aged 52

No. of T'ment :	1	2	3	4	5	6	7	8	9
Volts × Time	45	45	30	30	45	39	39	39	39
Milliamps of current passed..	105	87	40	40	102	67·5	72	75	72
Amphet. sulph. in mg. ..			5	10	10	10	10	10	10

Case VI, aged 44

No. of T'ment :	1	2	3	4	5	6	7	8	9	10–14
Volts × Time	12	12	12	26	28	28	14	14	42	42
Milliamps of current passed	9·5	7·5	10	35	36	34	9.5	9.5	75	69·5
Amphet. sulph. in mg. ..						5	10	10		

Comments on Results

In Case I it is obvious that amphetaminae sulphas produced a lowering of the electrical convulsion threshold, as measured by the product of the volts and duration of the stimulus: it was reduced from 75 to 45 with 5 mg. and to 24 with 10 mg. A corresponding reduction occurred in the milliamperes of current passed.

In Case II the threshold fell from 39 to 26 with 5 mg.; but 10 mg., two treatments later, failed to achieve any effect; three treatments later the threshold fell to 30 on two occasions, but rose again to 45 when the drug was discontinued. A possible explanation of the absence of effect of the drug in treatments 20, 21, and 22 may be that a phase of tolerance was developing which masked the effect, for 5 mg. had previously been effective.

Cases III and VI are good examples and require no explanation. The immediate rise in the threshold when the drug is discontinued is seen in Case VI.

In Case IV some explanation is required, for the threshold increased when 5 mg. of the drug was given. The reason for this is that a too optimistic lowering of both the volts and the length of the stimulus was made, so that it was reduced from 150 volts and 0.3 sec. to 120 volts and 0.1 sec., and five further shocks had to be given before arriving at the effective shock of 150 volts and 0.4 sec. This meant that the factor known as "extinction phenomenon" came into play. After the brain has been stimulated, a phase of negativity develops so that stimulus of greater strength must be given to be effective. This phase lasts 1/2 to 1 hour, so that if the stimuli are given in quick succession the effective amount of current is much greater than if an interval had been allowed between the shocks. On the next occasion, however, when the strength of the current was not altered and only the duration was changed from 0.3 to 0.2, it was effective. The threshold rose again when the drug was omitted.

Case V at first showed a lowering of the threshold, but two treatments later this rose again, and it is likely that tolerance was developing.

In every case, therefore, a reduction of the electrical convulsion threshold occurred, and even in Case II, when it did not occur until the drug had been given on four consecutive occasions, it was eventually reduced below the level obtaining before the drug was given.

Mode of Action of Amphetaminae Sulphas

The manner in which amphetaminae sulphas stimulates the brain is not clear, but since it resembles ephedrine very closely it might be assumed that it acts similarly. Gaddum (1938) has suggested that ephedrine acts in conjunction with adrenaline by a process known as "substrate competition," by which the amine oxidase which is thought to be present in the so-called adrenergic nerves destroys adrenaline, just as choline esterase destroys acetylcholine in the so-called cholinergic nerves. On this supposition it may be assumed that amphetaminae sulphas performs a similar function and that its action is central rather than peripheral.

The effect of other substances on cortical activity has been investigated, and Miller, Stavraky, and Woonton (1940) believe that acetylcholine and physostigmine salicylate, which have a stimulating action on the cortex, exert their effect by a similar process of "substrate phenomenon," the physostigmine preventing the destruction of acetylcholine, since a stronger stimulation results when they are given together than when given separately. Atropine inhibits their action, as it does that of all choline esters. McKail, Obrador, and Wilson (1941) and Williams and Ritchie Russell (1941) confirmed the cortex-stimulating action of these substances and considered that they acted centrally rather than peripherally, for respiratory, blood, sugar, and acid-base changes showed no real effect.

The question of the influence of the change in blood pressure on cortical activity has been studied by Beecher, McDonough, and Forbes (1938), who found that a fall of blood pressure was accompanied by a diminution of electrical activity, whereas McKail, Obrador, and Wilson found that sodium nitrite and amyl nitrite stimulated the cortex. These conflicting findings suggest that the blood pressure has little or no action on cortical activity. The blood pressure was examined in the cases reported here, and readings were made before and one hour after the administration of the amphetaminae sulphas. They are as follows:

	Before	After
Case II	150/80	130/70
„ IV	140/90	160/100
„ V	210/120	240/120
„ VI	160/98	166/110

How far these changes were operative it is not possible to say, but in view of the findings already reported it is possible that they were not so important as the central effect. This is the view of Miller (1937) in the case of physostigmine salicylate, the effect of which was local, facilitating transmission through the cortical synapse, the threshold being reduced.

Summary and Conclusions

On the basis that the initial electrical convulsion threshold varies in different individuals, that a condition of tolerance during treatment occurs resulting in a rise of the threshold, that amphetaminae sulphas is one of a group of drugs which have the property of stimulating the cortex, and that it seems desirable to retain a reasonably low threshold and thus limit the strength of the electrical stimulus, the question of the

cause of the heightened threshold in certain types of cases was raised. Assuming that the diminished motor activity associated with depression is due to increased cerebral inhibition, in contrast with that which occurs in schizophrenic disorders, a heightened electrical convulsion threshold might reasonably be expected to result from this inhibition. Now, it is shown by this investigation that cases of depression generally have a higher threshold than cases of other disorders. Investigation also showed that the threshold increased with age, and as depression itself is more commonly found in older age groups there are two possibilities: (*a*) that certain forms of depression raised the threshold *per se*, or (*b*) that age alone has this result. It is impossible to say definitely which factor operates the more strongly, or, indeed, whether the age factor is not really the determinant of the psychosis.

Amphetaminae sulphas, being a known cortical stimulant, was utilized in an attempt to lower the electrical convulsion threshold; in this it was found to be effective, and smaller strengths of electricity could be used.

As regards the mode of action, considerations were discussed showing the likelihood that it exerts its effect centrally rather than by any accompanying peripheral changes, such as the heightened blood pressure. The possibility of the achievement of the central action by a process of "substrate competition," as suggested by Gaddum in the case of ephedrine, was advanced.

In two cases there was some post-convulsion excitement. This was never very great, and may not have been due to the drug, since such excitement has been present after the convulsion when the drug was not employed. No other undesirable effects were observed from the use of the drug: even in the patient with a blood pressure of 210/120 no harm appeared to result with the doses given.

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ACUTE DISSEMINATED LUPUS ERYTHEMATOSUS: RECOVERY WITH SULPHANILAMIDE

BY

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The following case is reported because few records have been found of successful treatment of acute lupus erythematosus with sulphanilamide.

Case History

The patient, a married woman, first attended the Middlesex Hospital Dermatological Department in 1933, at the age of 31. She showed lesions of chronic lupus erythematosus on the cheeks, hands, and sternal region which had developed after sunbathing 4½ years previously. During this period she had suffered from toxic hepatitis and anaemia following arsenical treatment for her skin complaint. There was no family or personal history of tuberculosis. Constant supervision and treatment at the Middlesex Hospital included several courses of quinine iodobismuthate intramuscularly, quinine and stovarsol tablets by mouth, and injections of gold thiosulphate, which had to be discontinued owing to a febrile reaction with a rash after the fourth injection. With this treatment her skin condition was kept well under control.

On July 25, 1940, the patient was admitted as an emergency to an E.M.S. hospital. A few days previously she had been taken suddenly ill with acute dissemination of her rash. On admission her temperature was 100.4°, pulse 90, and respirations 20. There was a diffuse patchy erythema, affecting chiefly the cheeks, nose, upper lip, neck, and limbs, some of the lesions showing scaling; the finger-joints were swollen, stiff, and painful; and there was generalized lymphadenopathy, most marked in the cervical glands. In the first 8 days 27 g. of sulphapyridine were administered, and though she felt better, her temperature, which remained swinging, had risen to 103°, and she had more extensive joint pains. Many original skin lesions had faded, but numerous others had appeared, some being discoid in nature.

On the ninth day a macular rash, becoming confluent in places, started on the neck, thighs, and trunk, and rapidly became diffuse: although it was thought to be an erythematous phase of her lupus, the possibility of drug rash was considered, and as the sulphapyridine had evidently had no beneficial effect it was discontinued. A blood culture taken on the fifth day proved sterile apart from a contaminating *Staph. albus*, and a blood count showed red cells 4.5 millions, Hb 86%, leucocytes 7,500 (neutrophils 63%, lymphocytes 37%).

Her condition rapidly deteriorated, and on the twelfth day she was very drowsy, her cerebration was slow, and the temperature reached its peak of 105.4° and remained between 104 and 105° for 36 hours. Pulse 110-124; respirations 24-28. She became completely irrational and delirious, and the tip of the spleen was easily palpated. The position was desperate, and it was decided to attack a possible streptococcal infection anew.

A drip blood transfusion of 1 pint initiated intravenous therapy, and during the next 8 days she received intravenously 21 pints of glucose-saline, 35.5 g. of soluseptasine, and 50 c.cm. of pentnucleotide, with daily intramuscular injections of 6,000 units of antistreptococcal serum. She became rational again, but was very weak, and a stomach tube for feeding purposes was necessary for a further 10 days. During the four weeks after the start of her intravenous treatment she received the following: 35 g. of soluseptasine (first week) and 93 g. of sulphanilamide (last three weeks); 225 c.cm. of pentnucleotide intravenously or intramuscularly; and 144,000 units of antistreptococcal serum intramuscularly. Apart from a few chronic lesions her rash faded completely; her arthropathy disappeared; her haemoglobin fell from 92% to 57%; daily white cell counts showed an almost constant leucopenia, the lowest being 2,500; and almost all her hair fell out. When a rise of temperature to 101°, with a macular drug rash on the trunk, occurred at the end of this period, a blood transfusion of two pints appeared to do good, and a steady recovery followed, although a mild attack of rubella caused a slight scare. The only possible septic focus discovered during her stay was pyorrhoea affecting five teeth in the lower jaw. Extraction was purposely postponed until July, 1941, when it was performed uneventfully.

In Dec., 1941, a tuberculin patch test proved negative, but within five days she had a recurrence of her arthropathy and lymphadenopathy. These subsided under sulphanilamide treatment without any spread of her skin lesions, but further tuberculin tests were considered unjustifiable. Apart from this setback she has remained in apparently good health since her acute attack.

Discussion

Barber (1941) considered that chronic lupus erythematosus can be produced by reaction either to the tubercle bacillus or to a streptococcus; Kelvin (1941) implied that tuberculous toxin can be held responsible for all cases. It is difficult to believe that the latter theory accounts for many of the acute forms of the disease. Sequeira (1927) certainly said that evidence of tuberculosis, including acute miliary and glandular types, could be found in about two-thirds of the patients, but also stated that "the possibility of a non-tuberculous origin of some cases must not be overlooked." Roxburgh (1933) went further in attributing five deaths to streptococcal septicaemia. This termination with or without acute endocarditis has come to be recognized, and although it cannot be taken to prove that the streptococcus is the cause of the whole clinical picture, it is at least suggestive, and is presumably the reason why the sulphonamides were first given a therapeutic trial in this condition. Success has been reported in a small proportion of the patients so treated in America by Weiner (1940), Wile and Holman (1940), and Hopkins (1941), sulphanilamide being the compound chiefly used. In four of the fatal cases on which necropsies were performed tuberculosis was conspicuous by its absence, while a variety of acute lesions were encountered, including pericarditis, pleurisy, splenitis, and glomerulo-tubular nephritis.