

asylums—an undoubted saving of public money, and it could also preserve the home from being broken up, until convalescence was fully established, and would thus greatly tend to diminish pauperism. In all the countries of Europe these societies organised on the basis of private initiative, and started more than seventy years ago, have thrived and developed marvellously, which demonstrates the great necessity for their continued existence.

I personally think it best that our own Society should, as organised and carried out, be independent of any one asylum, for such a constitution ensures for it national support and a wider representation on its Council. It is for each one of us to maintain its efficiency and to see that its treasury is provided with means. Although other claims are numerous, London, the largest city in the world, should remember its duty towards the most necessitous, if not the most deserving, of its helpless dependents.

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Observations on the Blood-Pressure and Vascular Disease in the Female Insane. By JOHN TURNER, M.B., Senior Assistant Medical Officer, Essex County Asylum.

Introduction.

THE mere accumulation of facts is useless unless some attempt is made to interpret their significance; therefore in this paper I propose to examine my observations on blood-pressure with the design of seeing whether its routine estimation in the insane is worth while; whether from it any fairly trustworthy conclusions can be drawn as to the condition of the circulatory apparatus during life, or as to the prognosis, not only with reference to the mental disorder, but as to the prospects of the duration of life, or whether the time spent in this direction might not more profitably be otherwise employed; and further, to ascertain whether the results obtained tally with those of previous workers.

At the very outset we are met with the important question whether the method is one on which reliance can be placed? Controversy is still active on this vexed point. The introducers and upholders of blood-pressure gauges all contend that they give accurate or approximately accurate results, and that differences in the thickness of the arterial wall count for little (5 mm. of Hg.), and may be neglected. On the other hand there are many who do not believe that the figures obtained correspond even approximately with the actual blood-pressure. Dr. William Russell (1), as the result of experiments made on dead arteries, holds that the influence of the thickness of the arterial wall is so great (from 100–150 or more mm. Hg.) as to entirely vitiate the results obtained by blood-pressure instruments. Herringham and Womack (2), also as the result of experiments on dead arteries, find that the resistance of the wall of the brachial artery may vary from 4–34 mm. Hg. In the discussion on their paper Mr. P. Lockhart Mummery mentioned a very striking series of experiments carried out by him on dogs of various ages, some of which appeared to have very thick arterial walls. He connected the femoral artery on one leg of the dog with a mercurial manometer and the pressure in the artery of the other leg was taken by a sphygmomanometer. By means of a screen the person taking the pressure was prevented from seeing the manometer. The figures that he got under these conditions from the mercurial manometer and the sphygmomanometer were practically identical.

In my opinion these experiments of Mummery carry much greater weight than experiments on arteries removed from the dead body, and go far to show the trustworthiness of the instruments. Marked thickening of the blood-vessels will necessarily result in greater resistance to their occlusion, but unless this thickening is not only very marked but also very widespread over the arterial surface the results given by pressure-gauges will, I believe, be approximately correct—quite correct enough for clinical purposes.

I have employed, for the estimation of the pressure, Martin's modification of the Riva-Rocci apparatus. The observations were made daily for a week between the hours of 10 and 11 a.m., the subject sitting with her right arm, to which the bag was attached, resting on the table. The pressure was

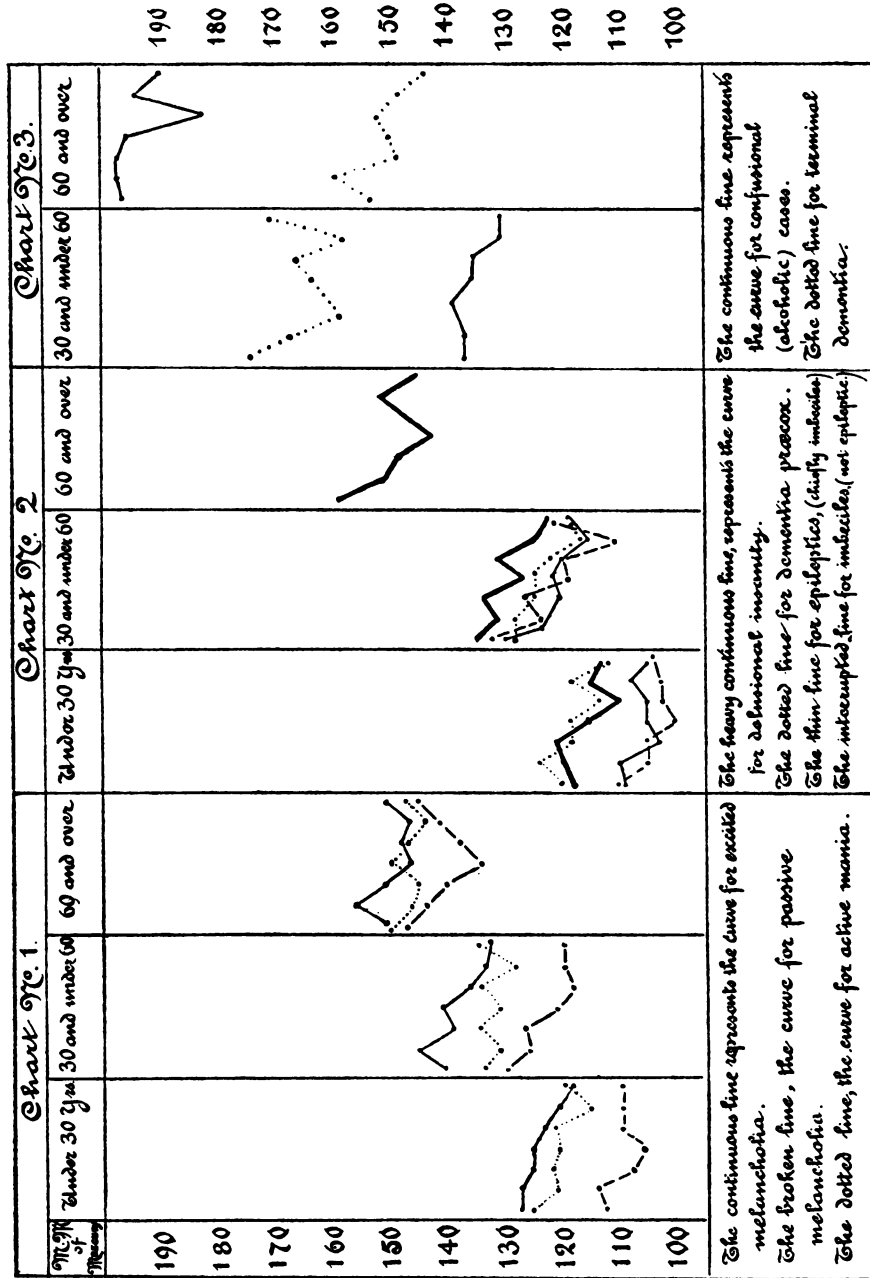
taken by my colleague Dr. de Steiger and myself on alternate days. In a very large number of cases the pressure for the first one or two days was higher than for the remainder of the time; so frequent was this that it impresses itself on the average curves, as may be seen in the charts. W. R. Dunton (4) noticed the same thing, which he was inclined to attribute to an element of fear in the subject.

The Blood-Pressure in Different Forms of Insanity.

Melancholia and mania.—Ever since M. Craig (5) published the results of his observations on the blood-pressure in the insane, it has been taken almost without question that in melancholia the pressure is high, and in mania low. Pilcz, in 1900, is stated by Dunton to have confirmed these conclusions, but I have not seen his paper. Dunton (4) states that he also finds a low pressure in motor restlessness or mental excitement, and high in depressed conditions, but judging from the few illustrations that he gives, unless he takes a very low standard for the normal, the exceptions would seem to be more numerous than the rule.

My observations do not bear out Craig's contention. I have tabulated (see Chart 1), in the three age-divisions suggested by Sir T. Clifford Allbutt, the average daily morning pressure for a week each of 42 cases of excited melancholia, and of 56 cases of passive melancholia, and 48 cases of active mania, and I find that in each age-division the cases presenting passive melancholic symptoms have the lowest pressure, the cases presenting excited melancholic symptoms the highest, and that the curve for the maniacal cases takes a position intermediate between the two. In the first age-period (under 30) the levels of all three curves are respectively lower than the three curves in the next period (30 and under 60), and these, again, are lower than those in the third period (60 and over). I may mention that practically the same results were obtained ten years ago with the aid of Hill and Barnard's apparatus; at that time, however, the pressure was taken on one occasion only in 443 persons.

In my classification all cases included under melancholia were decidedly depressed at the time the observations were made on them, and the maniacal cases were in a state of



excitement with exaltation. No melancholiacs or maniacs have been included under either head, simply because they may have been labelled under one or other of these divisions, unless at the time of observation there was an excess of emotional tone.

As has been already stated, the pressure was taken on alternate days by myself and my colleague, and except in those cases where there were marked daily variations in emotional tone, the readings for the week, unless they have been fairly constant, have not been used. Furthermore, in order to eliminate as far as possible the bias of the personal factor, each of us separately and independently worked out the seven days' pressure-curves for the cases, and although naturally the two lists did not exactly correspond, some ill-defined cases of melancholia being regarded as passive by one and excited by the other, and some cases suffering from delusional or other forms of insanity which the one did not look upon as showing sufficient emotional tone to be classified as mania or melancholia, as the case might be, were included by the other. But in spite of these discrepancies, inevitable when two independent observers endeavour to make out a list of such a character, the main trend of the figures in each list was the same.

At the present time, by the majority of alienists, melancholia is looked upon merely as a symptom, and the melancholiac of to-day is the maniac of to-morrow. Some altogether deny the existence of melancholia even as a persistent symptom, and would classify all such cases as phases in the great group of maniacal-depressive insanity. If this be true, and a high systolic pressure is characteristic of or associated with melancholic states, we should expect, in accordance with Craig's view, that in the maniacal (exalted) phases of the same individual the pressure would be low. This is not my experience. In a number of cases where the pressure has been taken in the same person at different times when labouring under different emotional states, although in one or two cases the variations corresponded to Craig's results, in the great majority of cases they did not. It was found that, generally speaking, the subject with a high pressure continued to have a high pressure whatever her emotional tone might be, and similarly the subject with a low pressure continued to have a low pressure.

We can, it is true, by the administration of drugs or by

appropriate diet alter the pressure temporarily and to a relatively slight degree, but these alterations only continue so long as the drug is exhibited or the diet persisted in.

I have been able to collect only two cases which gave results in accordance with Craig's view, and in one of these the difference between the average pressure when depressed and when exalted was only 12 mm. Hg. On the other hand I can cite eight cases where the reverse was the case, or where with marked and rapid alterations in emotional tone no corresponding change was found in the pressures.

(1) A woman, æt. 74, with a continually high pressure varying between 155 and 180 mm. During the week under observation she varied emotionally between a state of composure and cheerfulness to one of the most acute misery.

(2) A woman, æt. 35, whose pressure varied between 120 and 140. During two days whilst melancholic and lachrymose it averaged 120. During the five days whilst bright and cheerful it averaged 131.

(3) A woman, æt. 33; during a period of profound depression her pressure varied between 100 and 115. Three months later, when convalescent and bright, it varied between 112 and 120.

(4) A woman, æt. 53; during a period whilst profoundly depressed her average pressure was 108; six months later, when convalescent, the average was 124.

(5) A woman, æt. 47; during a period of profound depression her average pressure was 129; two months later, when convalescent, the average was 149.

(6) A woman, æt. 46; during a period of profound depression her average pressure was 102 (never above 105). Four months later, when cheerful and composed, the average was 111.

(7) A woman, æt. 43; during a period of profound depression averaged 103 (highest reading was 110); a year later, when exalted, garrulous, and flighty, it averaged 135.

(8) A woman, æt. 30; during a period of maniacal exaltation her average pressure was 135. Three months later, when profoundly depressed and quiet, it was 119.

The paramount factor in connection with high pressure is advancing age, and as states of melancholia are most common in advancing middle age it is easy to collect a number of cases showing a raised pressure, but my contention is that this is not

a direct or causal association of high pressure and melancholia, but an association of high pressure and advancing age. Again, taking, as some observers do, a low normal standard, it is also easy to collect together a large number of melancholiacs whose pressure exceeds this standard, more especially if no account of age is taken. The normal pressure is such a variable quantity in different observers' hands that the question whether in melancholic states there is or is not a raised pressure can only be properly estimated by a comparative view of the average pressure curves of different forms of insanity, classified under distinct age-periods, such as has been done in the construction of these tables.

Craig's belief that melancholic states are dependent on alterations in the circulation leading to high pressure is largely discounted by the frequency with which melancholia occurs with low pressure, by the frequency of high pressures in maniacal states, by the frequency of cases with marked variations of pressure without variations of emotional tone, and *vice-versâ*, and above all by the fact that there is a fairly large class of cases, mostly of middle age, in which, with exceptionally high pressure, the greatly prevailing emotional tone is markedly euphoric, namely the alcoholic confusional cases.

Other forms of insanity.—Charts 2 and 3 show the relative positions of the curves of pressure in systematised delusional insanity, in confusional insanity, terminal and organic dementia, dementia præcox, and congenital defect (imbecility with and without epilepsy). The only points that I need specifically refer to are the very low pressures in congenital deficiency and the high pressures found in the confusional cases.

As regards the first of these points, no doubt the small, ill-developed heart associated with imbecility is accountable. As regards the second it should be pointed out that all the cases grouped as confusional were alcoholic, and all (unless we must except two of delirium tremens) were instances of Korsakoff's polyneuritic psychosis. Ascherson (6), in his valuable monograph on alcoholism, states that in polyneuritic psychosis the pressure is low. This has not been my experience in the majority of my cases. I find two groups: in one, much the smaller, the pressure is normal or low; in the other, much the larger, it is very markedly raised. And as all the characteristic symptoms of this disease, especially the euphoria, and the

amnesic disorders are as well shown in the one group as in the other, it would seem as if one was justified in not attributing these symptoms to alterations of pressure.

TABLE I.

	Average blood-pressure.		
	Under 110.	Between 110 and 130.	Over 130.
Emotional tone :			
Apathy	13	15	6
Composure	26	19	20
Exaltation	22	35	32
Depression	33	27	39
Delirious	6	1	3
Varying	—	3	—
Pulse-rate :			
50-59	2	—	—
60-69	9	5	8
70-79	30	21	26
80-89	29	36	25
90-99	13	27	21
100-109	9	10	16
110-119	6	1	3
120-129	2	—	1
Irregular	6	8	11
Albumen in urine	38·1 per cent.	29·8 per cent.	53·3 per cent.
Average age	31	34·5	48

Table I gives an analysis of three hundred persons ranged under three divisions as regards pressure : (1) Those in whom the average pressure was below 110 (low) ; (2) those with an average between 110 and 130 (normal) ; (3) those with an average above 130 (high). The emotional tone at the time of observation is given, the pulse-rate and regularity, the results of the examination of the urine for albumen, and the average age. In the compilation of this table no attempt has been made to separate the excited from the passive melancholiacs—there were more depressed cases in the third (high) column than in the second (normal), but on the other hand there were more melancholiacs in the first column (low) than in the second. I believe that the greater number of cases in the third column is due to the incorporation of excited cases with passive, the

former having, according to my experience, the highest average pressure of the three affective classes. The average age rises with rise in pressure. The albumen figures are rather curious; whilst there are 53·3 *per cent.* showing albumen in the urine amongst cases with a raised pressure (H. Batty Shaw [7] found it in all but one of twelve cases under his care), the next highest percentage is not among the cases with normal pressure, but among those with the lowest. Possibly this may be accounted for by the fact that shortly before death the pressure is apt to fall as compensation gives out, so that in this column are liable to be included a greater number of sick persons. As bearing this out it may be mentioned that five of the cases in this column which had albumen in the urine died shortly after admission (from one to three months), and two more were general paralytics.

These figures, however, concerning albumen can only be looked upon as a rough approximation, for in the majority of cases the urine was only tested once.

Charts 1, 2, 3, and Table I show that, however we may classify our cases, the one great characteristic is the gradual rise of pressure with advancing age. To this statement the only exception is with terminal dementia when the average pressure in the second age-division is higher than that in the third division, but this may probably be accounted for by the fact that the average in the second division represents only four cases, whilst the average in the third is the average of thirteen; with larger numbers probably the height of the curve would be considerably lowered.

Relation between Coagulation-rate and Blood-pressure.

Observations have been made on the coagulation-rate of the blood by Wright and Paramore's method in forty-five cases of insanity and seven control cases (nurses). Each case was examined for fourteen days, and three samples tested on each day between the hours of 11 a.m. and noon. The blood was kept at a temperature of 37° C.

Although T. Addis (8) has recently cast doubts on the trustworthiness of Wright's method, it would appear from the examination of my results (representing over two thousand observations) that although occasionally errors may creep in,

on the whole the results are sufficiently reliable for clinical purposes.

My reasons for making this statement are : (1) that the average rate for the same subject on different occasions is fairly uniform ; (2) the average difference between the sample of blood which coagulated in the quickest time and the sample which coagulated slowest of the three samples tested each day is fairly uniform, in other words the cases whose blood show the shortest minimum average also show the shortest maximum average, and *vice-versâ*. If the method was not in the main trustworthy such uniform results would scarcely be expected.

A serious drawback to Addis's method, even if its reliability is established, is that its elaborate character, and the rather cumbrous apparatus required for it, disqualify it for clinical purposes. There is no doubt that a serious drawback also to the apparently simple procedure in Wright and Paramore's method is in the direction of the personal factor of the operator, and until one has become sufficiently expert so that approximately the same time is taken filling the tubes, and the same time on each occasion of testing when they are withdrawn from the warm water, the results cannot be depended on. For this reason, and because few independent workers will be equally quick and expert, too much dependence cannot be placed on a comparison of the results of one observer with another as to the normal time of coagulation in individual cases, but the comparative results of any one worker who has fulfilled the necessary requirements for carrying out the tests will, I believe, afford valuable information on the question of the coagulation-rate of the blood and its variations under different circumstances.

My results show that there is a slight tendency for the higher blood-pressures to be associated with slower coagulation. Thus in the 20 cases in which the coagulation-rate was the slowest the average was 153 seconds, whilst the average blood-pressure was 127 mm. Hg. In the 20 cases in which the coagulation-rate was quickest the average was 128 seconds, whilst the average blood-pressure was 121. In several cases the daily variation between height of pressure and slowness of coagulation, and *vice-versâ*, were fairly constant. The above relationship is, however, liable to be masked by other factors ; still, it is sufficiently well shown to indicate

that a quickened tendency to coagulate is not correlated with greater viscosity of blood.

It does not seem at all necessary from *a priori* reasoning that a greater viscosity should imply a greater tendency to coagulate, for probably the production of coagulation is dependent on the formed elements of the blood, and the corpuscles may imprison a substance without the aid of which coagulation cannot take place, and until this substance is set free coagulation remains in abeyance. The greater tendency to coagulate might therefore depend on a greater tendency of the corpuscles to disrupt and shed their clot-producing substance; under these conditions it would be quite possible for a lowered viscosity to coincide with greater tendency to coagulate.

Correlation of Blood-pressure Observations and Post-mortem and Microscopical Examination of Cases.

A *post-mortem* examination was made on 43 cases in which the blood-pressure had been taken during life. In 25 of these there were signs of a more less general arterio-sclerosis.

TABLE II.—*Showing the Age-incidence of General Arterio-sclerosis in Relation to Height of Blood-pressure.*

Average blood-pressure.	Age.					
	20-29.	30-39.	40-49.	50-59.	60-69.	70-85.
Above 130 mm.Hg.	1	—	2	6	2	6
Below 130 mm.Hg.	—	4	1	1	1	1

In 17 the pressure was raised, in 8 (32 *per cent.*) it was not. Groedel, of Nauheim, quoted by Sir T. Clifford Allbutt (9), found no rise of pressure in 35 *per cent.* of his cases of arterio-sclerosis.

Atheroma of the aorta was found in 28 out of 42 cases (66·6 *per cent.*) in increasing numbers with advancing age (see Table III). The average pressure was over 130 in 17 of the 28 affected cases, and below 130 in 11. It is worthy to note that

3 out of 9 general paralytics, æt. respectively 42, 45, and 51, had perfectly healthy aortas, so far as could be ascertained by naked-eye inspection, so that the proportion of general paralytics in this list who had atheroma of the aorta was exactly the same as the general average.

TABLE III.—*Showing Incidence of Atheroma of Aorta.*

Average blood-pressure.	Age.											
	15-19.		20-29.		30-39.		40-49.		50-59.		60 and upwards.	
	Ab-sent.	Pre-sent.	Ab-sent.	Pre-sent.	Ab-sent.	Pre-sent.	Ab-sent.	Pre-sent.	Ab-sent.	Pre-sent.	Ab-sent.	Pre-sent.
Above 130 mm.Hg.	—	—	1	—	—	—	1	2	—	5	—	10
Below 130 mm.Hg.	1	—	1	—	3	4	4	1	2	1	1	5

In 27 of the cases the kidneys were small and granular, and in 12 of these there was no rise of pressure found during life; nevertheless, if one takes into consideration the pressure and the weight of the heart and kidneys in a number of cases, it is found that the height of pressure is in direct relation to the weight of the heart, and in inverse relation to the weight of kidney substance. In 40 of these cases it was found that in 21, where the average pressure was low (116, the highest being 122), the average weight of the heart was 231 grammes, and of the kidneys 253 grammes. In 19 cases where the average pressure was raised (157) the average weight of the heart was 268 grammes, and of the kidneys 191 grammes.

The very important part which circulatory disorders play in the ætiology of insanity is indicated by the very great frequency with which affections of the renal vessels occur. In 34 female cases (including 7 general paralytics) where a microscopical examination of the kidneys was made, 27 (79 *per cent.*) showed endarteritis frequently in a very marked degree. The accompanying table gives the age-incidence of the cases, and the large proportion affected in the second period shows that the condition is not solely a result of involuntional changes accompanying senility.

TABLE IV.

Renal vessels.	Age.				
	10-19.	20-29.	30-39.	40-49.	50 and over.
Endarteritis	1	6	5	5	10
Natural	2	2	1	2	—

In all these cases, although the livers also were examined microscopically, the number of cases in which alterations of the blood-vessels, especially in the direction of endarteritis, was met with was very few, showing that the affection of the renal vessels was the result of a local and not of a general cause.

According to O. Klotz (10) there are two forms of arterio-sclerosis which have been established experimentally. In one, the Mönckeberg type, the alteration is primarily and essentially a degeneration of the middle coat, any intimal change which may occur being only secondary. In the other, Jores' type, the alteration is essentially an intimal change. Klotz mentions enteric fever and streptococcal infections as producing an arterio-sclerosis of the second type. It is an interesting speculation whether there may not be a causal relation between the endarteritis, so common in the renal vessels, and intra-vascular toxins. As the kidney is the great depurative organ of the body, it might be that the chief stress of these toxins is exerted on the vessels of this part, resulting in a localised endarteritis.

In twenty cases in which the brain (and frequently the cord) was examined microscopically, alterations in the smaller blood-vessels were noted in half the number. In two of these there did not appear to be any thickening of the walls, but merely the infiltration of the peri-adventitial space with cells, characteristic of general paralysis; in the other eight there was hyaline degeneration and thickening, and in one (alcoholic) case marked endarteritis as well.

In six of these twenty cases the pressure during life was high, and among these six the cerebral arteries were natural in three.

A normal pressure, or at all events a pressure varying between 100 to 120, may coincide with apparently all the

factors generally considered requisite for the production of a high pressure.

The accompanying table gives the age-incidence of these twenty cases.

TABLE V.

Cortical vessels.	Age.				
	10-19.	20-29.	30-39.	40-49.	50-63.
Natural	1	2	3	3	3
Diseased	—	1	3	1	3

Concerning the Factors which Control the Blood-Pressure.

Although the problem as to the cause or causes of alteration in blood-pressure is mainly one to be resolved by experiment, clinical observation in conjunction with changes found in the vascular mechanism are also of considerable value in forming an opinion, if only from the point of view of tests, as to the truth of experimental research.

The factors which control the blood-pressure are: (1) Primary, the force of the heart; and (2) secondary, the viscosity of the blood and the peripheral resistance of the vessels.

Although the secondary causes can only come into play as raisers of blood-pressure, in conjunction with the primary, it is evident that existence can be no longer possible when the pump is unable to force the blood through the channels which are offering increased resistance, and therefore there must be with this latter a corresponding augmentation of the force of the heart-beats.

Increase in the viscosity of the blood appears to be a potent factor in raising the pressure. It has been shown by McCasky (10) that the viscosity undergoes considerable fluctuations as the result of physiological changes connected with food, drink, and exercise, and under pathological conditions these changes are much greater. In the majority of cases of chronic Bright's disease it is lowered, but probably in

earlier stages it is increased. Venesection lowers it ; alcohol increases it.

It is chiefly from the point of view of increasing the peripheral resistance that alterations in the circulatory mechanism have been studied experimentally, by producing lesions in the vessels whereby their elasticity is impaired and their lumen diminished. Josue, in 1903, showed that injections of adrenalin into the vessels of animals not only raised the pressure but also produced atheroma and calcification of the aorta. Barium chloride produces similar effects.

Some important experiments by Vincent and Sheen, Tigerstadt and Borgmann, and H. Batty Shaw (7), show that when once the parenchyma of an organ reaches the circulation changes take place in vascular tension, generally depressor, but with kidney parenchyma the effect is pressor, and striking in extent and duration, and one experiment by Batty Shaw, where the vagi were cut, seemed to show that the rise was not due to a central stimulation of the heart, but to a peripheral effect.

The general opinion at the present time would seem to be that elevation of blood-pressure alone is incapable of directly causing degenerative changes in the vessels. Batty Shaw states that there is no experimental evidence that it can do so, and Dr. Newton Pitt (12) remarks: "If it were the main factor the changes would be diffuse and not patchy. A permanently high pressure, however, by exhausting the elasticity of the tissues would predispose them, in the presence of noxious agents, to undergo degeneration."

It has been shown that the rise of pressure produced by the intra-vascular injection of adrenalin has nothing to do with the degeneration in the coats of the vessels, for if sufficient amyl nitrate to neutralise the pressor effects of the adrenalin is injected at the same time, although no pressor effects follow, yet the degenerative changes are unaltered.

In the opinion of H. Batty Shaw, clinical and experimental observations support the view that maintained hyper-tension may be due to entrance of kidney substance into the circulation, and I shall point out that probably gland-cells from the kidney and liver are commonly met with in the blood-stream. Arterio-sclerosis (using the term in its clinical form merely to denote thickened arteries) is unassociated with raised pressure

in from 33 to 35 *per cent.* of the cases. And as regards granular kidney, although, as might be expected, the contraction of such a large vascular organ would influence the pressure, and although doubtless it does so in many cases, yet, as I have shown, the number where no rise occurs falls little short of half.

Thus it would appear that conditions resulting from general arterio-sclerosis or granular kidney, that is to say, conditions affecting the size of the lumen of the peripheral vessels are not always adequate to account for heightened pressure, and in many cases there must be some other factor at work, and there is histological evidence which points to this factor being, as Batty Shaw suggests, the entrance of gland-cells into the blood-stream.

Salaman (13) in 1907 drew attention to the presence of free cells in the sinusoids of the liver, which he considered as "almost certainly" "gland"-cells. I also have frequently noted free cells in the larger vessels of the livers of the insane which appear to be identical with gland-cells. It is not difficult to account for these cells in this position when we recall the mode of development of the hepatic sinusoids, where, as Schäfer (14) remarks, the endothelium may in places become defective, so that the blood within the sinus comes into actual contact with the cells of the organ.

In the larger vessels of the kidney appearances indicating the presence of shed gland-cells are quite as common as in the case of the liver. Not only single cells apparently identical with the parenchyma are seen, but sometimes quite long strips of five or six cells joined end to end, a condition which appears as almost conclusive evidence that these elements are indeed gland-cells shed *en masse* from the tubules. If these cells, therefore, can gain access to the blood-stream, and if they have the properties which Batty Shaw and others have claimed for them, we have here a means by which the blood-pressure may be profoundly affected, this affection taking the form of a rise of pressure when the kidney-cells predominate in the blood-stream. But inasmuch as numerous clinical and histological observations show that resistance to the peripheral circulation is not always adequate to account for persistent rise in pressure, it would seem probable that the pressor effects of the renal cells must be due, in part at least, to a central or stimulating effect on the heart, although, as I have mentioned, Batty Shaw

records one experiment which appeared to point to the effect being entirely peripheral.

As the result of the presence of hepatic substance in the blood-stream is to produce a depressor effect on the pressure, and as free liver-cells are quite as frequently seen in the blood-vessels of the liver, it may well be that whether or no a raised or lowered pressure is met with is in part at least due to the preponderating effect of either kidney or liver substance in the circulation.

Summary and Conclusions.

(1) That there is no definite relation between pressure and exalted or depressed emotional states, but the very general occurrence of higher pressures with the first few readings on consecutive days in any individual case suggests that there is some nervous condition at work which has the effect of interfering with the pressure.

(2) The only condition revealed by collating a number of sphygmomanometer observations which has a constant relation to height of pressure is advancing age.

(3) From pressure observations alone only a very rough opinion can be educed as to the structural alterations of the circulatory mechanism.

(4) Height of pressure and slow coagulation-rate are generally associated, but this is a rule to which there are many exceptions.

(5) The high percentage of the smaller blood-vessels, especially renal, which present microscopically structural changes, points to the great importance of vascular lesions in the histogenesis of insanity.

(6) Evidence, in the form of free gland-cells in the blood-stream, is recorded which lends support to H. Batty Shaw's view that in some cases heightened blood-pressure may be due to the entrance of kidney substance into the circulation.

In view of the fact that vascular changes are so frequently met with in the insane, I think that the routine record of the blood-pressure in conjunction with histological examination of the blood-vessels is likely to result in a better understanding of the factors which control the circulatory mechanism, and if only for this reason is a measure which fully justifies the time it occupies.

I am under great obligations to my colleague, Dr. de Steiger, for her assistance in taking pressures, in compiling the charts, and preparing the paper for publication.

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- (14) E. A. Schäfer, F.R.S.—*Elements of Histology*, p. 198.

DISCUSSION

At the Quarterly Meeting in London, May 18th, 1909.

Dr. Dawson said he had made observations in a small way on the blood-pressure in the insane, but not in so thorough-going a manner as Dr. Turner, partly because that could not very well be attempted in the case of private patients. But he was able to say that up to the present, almost without exception, the melancholiacs had been found to show high blood-pressure. When one came to deal with cases which were maniacal, there was, in his experience, no very constant form of blood-pressure found. Cases of pure acute mania in youngish people would be those in which one would expect to find low blood-pressure constantly if Dr. Craig's theory were correct. He remembered, however, a case of mania with high blood-pressure, in which, when the patient recovered, the pressure went still higher, so that one would have to compare the blood-pressure in health, when the patient recovered, with that during disease, in order to determine whether it was lower or higher than usual during the attack. There were many interesting points in Dr. Turner's paper, and he regarded it as a most valuable contribution to the subject. Yet, at the same time, the number of observations which others had made seemed to show that there was a general connection between high blood-pressure and conditions of mental depression and stupor, and, on the other hand, between low pressure and conditions of simple exaltation and excitement. These observations would have to be accounted for in some way, and therefore he did not think the matter could be quite so easily dismissed as Dr. Turner appeared to think.

Dr. GREENLEES said that some years ago he tried experiments on his patients in regard to blood-pressure; and although in some points his observations agreed with those of Dr. Turner, in others they did not. In his own cases of mania, as a rule the pressure was low, while in melancholia, especially of the stuporose form, high. In the majority of his cases of general paralysis, in the first stage, the pressure was low, in the middle stage it was high, while in the last stage very low. In dementia the pressure was high. In one curious respect his observations did not agree with Dr. Turner's, namely, in regard to imbecility. In even comparatively young subjects he had found high blood-pressure. He did not know whether Dr. Turner had investigated that very much. He formed the idea that the condition was due to resistance in the ultimate capillaries, probably from increased tissue around and in them, a condition of the brain somewhat similar to that found in the kidney in cirrhosis. He had listened with great pleasure to Dr. Turner's paper.

The PRESIDENT said he was sorry that that very interesting and laborious paper had not led to a more discursive discussion. The reason might be that some of those present had been sitting in the building practically continuously since 10 a.m. With regard to the matter of the paper, he had found in a good many experiments that there was no very constant relation between the blood-pressure and the state of exaltation or depression of feeling. If, however, instead of taking the absolute pressure, one took the pressure in comparison with what it was likely to be, what the normal was at that time of life, then he thought results which were a little more constant would be obtained. He meant that one often finds, in a case of melancholia in a young person, that the pressure was low, *i.e.*, low considered for a person in advanced life, but not low for a young person. In the great majority of cases of mental depression he thought the blood-pressure was raised; but the converse was by no means true; and there were many cases in which blood-pressure was raised to a high pitch, and in which there was no depression at all. He remembered a case in which the blood-pressure was 235 mm., and the patient was excited, joyous and buoyant. In his own mind he was convinced that there was no constant relation at all between a low blood-pressure and a sense of well-being, or between low blood-pressure and bodily vigour. Not infrequently there was low blood-pressure with a sense of well-being; but, on the other hand, the converse might be the case—low blood-pressure with, not great depression, but some dulness. The coagulation-times he had been investigating for a long time, and he had been very interested to hear Dr. Turner's results, and to learn from him that he considered Wright's method satisfactory. He, Dr. Mercier, did not know of any method of estimating the coagulation-time which would give uniform results. He did not care what method was used. If one took blood from the same person at the same sitting, under the same conditions as far as it was possible to judge, it would be found that the blood in different specimens coagulated at different times—times differing by as much as 10, 15, 20, and 30 *per cent.* That being so, it seemed to him that the estimations of coagulation-time were of little value, and unless the observations were very numerous indeed the experimental variations could not be excluded. Even after a large number of experiments the extremes still remained very widely different. He did not think it was safe to draw any conclusions from coagulation-times. *A priori*, it seemed absurd to suppose that different portions of the same drop of blood, and different parts of the blood out of the same blood-vessel drawn at the same time, could have different clotting times. And it was very unlikely that different portions of the blood, circulating as it did and being intimately mixed, and practically stirred up together, and therefore presumably uniform throughout, should be so differently constituted as to coagulate in widely different times. One must suppose that the difference was in the conditions after the blood had been withdrawn from the body. But with the most scrupulous care to render those conditions completely uniform he had failed to produce uniform coagulation-times, even in different portions of the same drop of blood. And if that had been found impossible in the same drop of blood how could one expect trustworthy coagulation-times in blood drawn from the body at different times? Even when the conditions were as uniform as one could make them, and when everything was considered—the tubes made chemically clean and exactly calibrated (because the latter was a very

important matter) and the length of time during which the blood remained in the tube—it would be very difficult to obtain anything like uniform results. He did not think that observations concerning the coagulation-times were of any great value, especially now that it seemed fairly well-established that those drugs which were thought to have an influence on the coagulation-time, although they produced the clinical effects with which they were credited, acted in some other way than by affecting the coagulation-time.

On the Wassermann Reaction, and especially its Significance in Relation to General Paralysis.⁽¹⁾ By CARL HAMILTON BROWNING, M.D., Lecturer on Bacteriology in the University of Glasgow, and IVY MCKENZIE, M.B., Carnegie Research Fellow. (From the Pathological Laboratory of Glasgow University and Western Infirmary, Glasgow.^[2])

THE discovery by Schaudinn of the *Spirochæta pallida* was the starting-point of an extensive series of investigations which have thrown much light on the nature of syphilitic infection and its consequences. Reliable authorities are agreed as to the ætiological relationship between this organism and syphilitic disease, and its presence can with ease be demonstrated in chancres, syphilides, and the tissues of cases of congenital syphilis. In tertiary lesions its presence has been noted in gummata and in aortitis, though only in a very few cases. In the so-called para-syphilitic diseases it has not yet been seen. If it be the case that the presence of the organism be indispensable to the production of tertiary and para-syphilitic lesions, the difficulty of demonstrating it may be due to one or both of the following causes: (1) The organisms may be present in another form representing a different stage in their life cycle; or (2) they may be so few in number as to render demonstration extremely difficult, as is the case with the tubercle bacillus in the lesions of chronic fibroid phthisis. The difficulty consequent on a paucity in numbers may be enhanced by difficulty in staining. Two methods of staining the spirochæte are in use—Giemsa's stain for film preparations, and a silver impregnation method for the examination of tissues. It is a remarkable fact that tissue which shows enormous numbers of silver impregnated organisms may show very few or none at all in the films stained by Giemsa's method, while on the other hand