indicating that a potentiation of the effects of NA had occurred. When the plasma was washed out, the curve returned towards normal. This pattern was repeated in all of the 5 kidney experiments and 5 artery experiments. No potentiation was seen in 8 control experiments when normal plasma was perfused.

Many constituents of plasma are increased in jaundice, and these results would suggest that one or more of them was potentiating the effect of NA. One possibility was thought to be the steroids. It has been shown in heart muscle that cholesterol and other steroids potentiate the effects of NA by inhibiting the catecholamine's extraneuronal uptake and metabolism[3]. As jaundice shows an elevation in total cholesterol[4] associated with an elevation of β-lipoproteins, we have also considered the effects of a hyperlipidaemic plasma.

In FREDRICKSON's[5] type II hyperlipidaemia, there is an increased plasma cholesterol similar to that occurring in jaundice. 60 ml samples of heparinized plasma were taken from fasting patients with FREDRICKSON's type IIa hyperlipidaemia, and 3 of these samples pooled to perform an artery experiment. Figure 2 shows a log dose/response plot of the effects of NA on an artery before, during and after perfusion with the hyperlipidaemic plasma. An NA potentiation was found in this experiment and in 5 others when the plasma was perfused. No potentiation was found when using normal human plasma.

Thus our results would suggest that the altered renal perfusion found in jaundice (particularly during periods of hypotension[6]) may be due to a potentiated pressor response to circulating catecholamines. One possible constituent causing this could be the increased β-lipoprotein and cholesterol. Hypercholesterolaemia may well be more intimately related with pathological tissue ischaemias, such as cardiac infarction, than we yet realise.

Summary. Jaundiced plasma and plasma from hyperlipidaemic patients was perfused into an isolated artery or kidney preparation. The responses of the artery to doses of noradrenaline when Krebs solution was perfused were compared to the responses when the plasmas were perfused. It was found that both jaundiced and hyperlipidaemic plasmas potentiated the effects of noradrenaline on the isolated arteries and kidneys.

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Relative Distribution of Types A and B Atrial Receptors in Dogs, Cats, Monkeys and Rabbits

PAINTAL[1] described mainly two types of receptors in the walls of the cardiac atria. The type A receptors fire during atrial contraction and the type B fire during atrial filling. In addition, he recognized an intermediate type with bursts of discharge during both phases. The impulses from all these receptors are transmitted in vagal afferent fibfes. The occurrence of the intermediate type of receptor leads to the possibility that the two main types belong to the same population. It was suggested by PAINTAL[2] that, if the two types of receptors were functionally similar, then, in a random sample study, the intermediate type should occur more frequently than the 'pure' types, viz. the A and B types. This possibility was examined in this study on dogs, cats, monkeys and rabbits. The results of this study have been presented in an abstract elsewhere[3].

Methods. In anaesthetized animals breathing spontaneously, nerve impulses were monitored from the cervical vagal afferents using convential techniques[1]. The main criterion for identification of atrial receptors was the time relation of their discharge to the ECG. Other criteria described by PAINTAL[1,4,5] were also used. Since every one of the endings identified as an atrial receptor with intact chest has been located in the right or left atrium after opening the chest[1,2,4,6], punctate location[1] was considered unnecessary in this study to establish the location of the receptor.

Results and discussion. The results are summarized in the Table. It is clear that the relative distribution of the two main types of atrial receptors is different in different animals. One type can occur to the relative or nearly total exclusion of the other. This suggests that they differ functionally. This is also supported by the observation that the intermediate receptor does not occur more frequently than the 'pure' types.

The type A: type B ratio of 1:1.8 in cats in the present study is comparable to PAINTAL's[2] ratio of 1:1 and to the ratio of 5:8 seen in the data of ARNDT et al.[7]. The ratio obtained in monkeys is in reasonable agreement with the figures of CHAPMAN and PEARCE[8], who found 8 type B receptors to one of type A.

Our failure to find any electrophysiologically identifiable atrial receptors in the aortic or vagus nerves of the rabbit is in keeping with the observation[9] that nerve endings in the atrial endocardium of the rabbit are scant in number, and the few that are present are illformed compared to those in cats and dogs. However, it must be noted that we have been looking only for afferent activity with a cardiac rhythm. There may be atrial endings with an irregular discharge.

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Frequency distribution of different types of atrial receptors

Animals	Anaesthesia	No. of animals	No. of atrial receptors		Intermediate	A:B ratio
			A	B		
Cats	Nembutal or chloralose	14	35	61	11	1:1.8
Dogs	Nembutal	20	3	47	2	1:16
Monkeys	Nembutal or chloralose	8	0	8	0	0:8
Rabbits	Nembutal or urethane	20	0	0	0	0:0

The possibility of atrial afferent fibres in the laryngeal communicans has to be considered in view of the observations of CASTENFORS, KNUTTSON and SJOSTRAND[10] in rats. Though the laryngeal communicans in the rabbits has not been screened in the present study, ANDREW[11] did not find in it any fibres with a cardiac rhythm. This makes it unlikely that there are atrial afferent fibres coursing via this route.

This study does not rule out the possibility of atrial receptors with non-medullated afferent connections. This is because, in that case, the activity would not have the same relation to the ECG as when the afferent fibres are medullated. The slower conduction velocity of the non-medullated fibres would make the type B activity liable to be mistaken for arterial baroreceptor activity. But AARS[12] found that afferent fibres with a baroreceptor pattern of activity in the depressor nerve of the rabbit had conduction velocities in the medullated fibre range.

CLEMENT, PELLETIER and SHEPHERD[13] showed reduced renal sympathetic activity in response to dextran infusion and increased activity in response to bleeding in rabbits. These responses were abolished by vagotomy or cooling the vagi to 2–5 °C. They suggested the possible involvement of receptors in the low pressure system, implying the classical atrial receptors. From our results, it seems more likely that their responses were mediated through some other afferent fibres, e.g. non-medullated vagal fibres from the heart or elsewhere which would also be blocked at a temperature of 2–5 °C (PAINTAL[14]).

In conclusion, our results suggest that the type A and type B atrial receptors are different functional categories.

Summary. The difference in the frequency distribution of the A and B types of atrial receptors in different laboratory animals suggests that the two types belong to functionally separate categories.

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Study on Sex-Specific Transferrin Polymorphism and on the Identification of Transferrins by Radioactive Labelling

The electrophoretic separation of mouse serum has shown the genetic polymorphism of serum-β-globulin[1,2]. By labelling the proteins with ^{59}Fe, the β-globulin fractions were autoradiographically identified as transferrin bands[3]. The transferrin locus (Trf), which shows the genetic polymorphism, consists of 2 alleles (Trf^a and Trf^b). They can be distinguished by the anionic electrophoretic migration of the β-globulins. Trf^a is represented by the 3 faster moving bands, Trf^b by the 3 fractions moving more slowly.

In order to investigate the transferrin polymorphism, we separated the serum proteins by means of polyacrylamide gel electrophoresis, similar to the method of ABRAHAM et al.[4] (Modifications: Length of the gel 7.5 cm; total monomer concentration 6.08/100 ml; grade of polymerization 0.86%).

For this study a non-inbred mouse population was used[5]. The population was completely homozygote with respect to the transferrin locus (Trf^b/Trf^b). However, in the β-globulin fractions some sex-specific differences could be observed.

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