stimuli, each of which is more or less similarly affected by the operations concerned. Since quite divergent types of reactions were involved and because the patterns of response were unaltered by the operations, one may deduce that this role

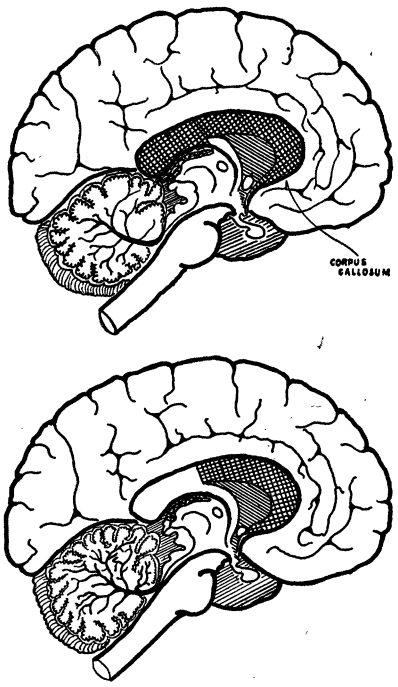

FIG. 2. The extent to which the fibers of the corpus callosum were cu in cases with complete section (top) and in a case with the least extensive lesion (bottom).

is one of dynamic regulation rather than discrete participation in the essential nerve channels of the responses.

TABLE 1

RESPONSE TIME (HUNDREDTHS OF A SECOND) IN DIFFERENT PSYCHOLOGICAL REACTIONS BEFORE AND AFTER SURGICAL SECTION OF THE COMMISSURAL PATHWAYS

Psychological reactions	Preop.		Postop.		M_d	t	Level of confidence	Diff. (%)
	M	σ	M	σ				
Simple reaction time	.18	.042	.29	.078	.11	4.68	.01	+61
Visual discrimination reaction time	.38	.074	.44	.062	.06	1.85	*	+16
Word association	1.62	.372	1.82	.507	.20	1.10	*	+12
Visual discrimination reaction time (uncrossed)	.37	.076	.43	.066	.06	1.88	*	+16
Visual discrimination reaction time (crossed)	.39	.076	.45	.067	.06	2.17	*	+15

* Indicates a value below an acceptable level of confidence.

Crossed sensorimotor reactions and verbal associations are not significantly affected by the surgical section of the commissural neurones. These are the functions which should be radically disrupted by lesions of the intercortical nerve bands if the cortex, in fact, functioned as an array of specific association pathways. Accordingly, the results tend to support the view that the associative mechanism of the cortex acts in terms of generalized patterns of excitation rather than as a system of specific pathways between sensory and motor centers. Such patterns of neural activity evidently include the subcortical centers, at which level integration between the two sides of the brain can be made when the cortical commissural paths are destroyed.

The results found for simple response times appear to explain the persistence of inertia in patients with surgical lesions of the commissural pathways of the cortex. This defect in response time is the only well-established disturbance resulting from destructions of these pathways.

A more detailed statistical treatment of the present results is in preparation.

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Penicillin Site of Action

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In a recent article, C. S. Leonard (*3*) has criticized some views postulated by our group on the mechanisms of antibiotic action, particularly with reference to the action of penicillin.

A principal fallacy in Leonard's arguments is that he apparently presumes that all agents which inhibit growth of microorganisms by interaction with sulfhydryl groups should demonstrate more or less equal toxic manifestations in animals and should inhibit the same types of organisms. For this to be true, one needs to assume that there is only one type of sulfhydryl-active enzyme present in all species of organisms. It could also require that only one type of chemical reaction occur between inhibitor and sulfhydryl group.

There is evidence that many sulfhydryl enzymes occur (*1*) and that all sulfhydryl groups are not equivalent. Sulfhydryl groups might be expected to differ in availability and reactivity depending upon whether they are superficial or deep in a protein, and depending upon the nature of neighboring groups capable of adsorbing or activating an inhibitor. We have shown (*2*) that marked differences exist in reactivity of sulfhydryl groups toward some antibiotics, including penicillin, depending upon the nature of other groups (such as the amino) present in the vicinity of the —SH.

The theory of antibiotic inhibition of enzyme-SH groups has not been postulated for all antibiotics, but only for a large group which has the common feature of reactivity toward one or more types of —SH compounds. Even in this group there may be members in which the —SH reaction is not the primary inhibition mechanism. Although it would be possible to classify antibiotics on the basis of other reactions, such as reactivity toward acids, alkali, or thiosulfate, our group feels that although the others are interesting, the most significant from a mechanism-of-action standpoint are those which have a direct biochemical significance, such as the —SH reaction. This investigator knows of no biological system in which thiosulfate plays a role.

Some of Leonard's conclusions are puzzling. In our work,

not only pyocyanine but all the other antibiotics tested were observed for reactivity with thiols *in vitro*. *In vivo* tests (antibacterial action) were used only as an analytical tool in measuring disappearance of antibiotic activity. We were primarily interested in inactivation as a measure of chemical reactivity.

The relevance of thioglycolate stimulation of penicillinase action or of the rapid excretion of penicillin to the mechanism of action of penicillin is nebulous at present and is certainly not evidence for or against a sulfhydryl inhibition mechanism. We do not agree that thiol inactivation of penicillin cannot proceed in broth or other such media provided sufficient inactivator is used; such media may, however, require more inactivator.

We agree with Leonard that it has not been proven that penicillin binds protein —SH groups, and it is this lack of proof which leads us to call —SH inhibition by penicillin only a theory. This author disagrees, however, with the statement that penicillin needs to bind protein —SH in direct proportion to the number of —SH groups in proteins, since we have shown that some types of —SH groups react only sluggishly or not at all with penicillin. It may be this very selectivity of the —SH reactions which endows penicillin with specificity of inhibitory action.

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Leptospiral Infection Among Rodents in Micronesia

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Murine leptospirosis is a problem of public health importance because the causative organism, *Leptospira icterohemorrhagiae*, is capable of infecting humans and producing Weil's disease. Leptospirosis is gradually gaining recognition as a common disease of man giving rise to, among other things, jaundice, muscular tenderness, or comparatively mild symptoms. It is believed by several workers (*3*, *4*, *5*) that this disease is by no means rare, and the infrequency with which it has been reported is probably due to failure of recognition.

Although many surveys have been conducted on the incidence of leptospirosis in various parts of the world, notably Australia, Europe, India, Japan, and the continental United States, very little is known of the incidence of murine leptospirosis in the Pacific Islands. In recent years it has been shown (*1*, *2*) that murine leptospirosis is present in the Hawaiian Islands, especially in areas having high rainfall and an abundance of rodents. Awareness of this fact indicated the need for further study of this disease in other islands of the Pacific. During July and August 1946, a preliminary survey was conducted by the writer under the sponsorship of the University of Hawaii Pacific Islands Research Committee to determine, among other things, the possible occurrence of murine leptospirosis on the island of Moen of Truk Atoll and on the island of Ponape, both of the eastern Carolines. Of 22 rats trapped on Moen and 18 trapped on Ponape, 3 and 2,

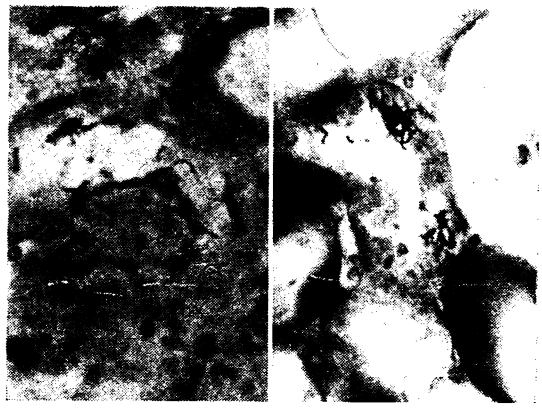

Fig. 1. Sections of kidney of rat from Truk showing leptospirae in the urinary tubules.

respectively, showed presence of leptospirae in the urinary tubules (Fig. 1). The diagnosis was based on examination of kidney tissues fixed in formalin and stained by the silver impregnation technique (*2*).

As far as is known to the writer, this report represents the first record of murine leptospirosis in any of the islands of Micronesia and lends support to the belief that Weil's disease occurs in man in that area. Mumford and Mohr (*6*), in summarizing various diseases of man recorded from the Japanese mandated islands, state that according to the 1930 Report of the League of Nations, two cases of Weil's disease occurred in 1929 among Japanese in those islands. They also mentioned the possibility that the above cases might have been those of "infective hepatitis," and, conversely, cases which had been reported previously by other workers in the Marshalls as "catarrhal icterus" might have been cases of Weil's disease.

Although further research studies in Micronesia are necessary, the present finding points out that human leptospirosis is probably present in the area and more common than heretofore believed. The combination of high rainfall and abundance of rodents in Micronesia presents factors which are very favorable to the spread of the disease.

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