

From 3,400 necropsies 312 stomach sections, hematoxylin and eosin stained, were chosen in order as they were found. Of the 242 remaining sections, after discarding 70 on account of autolysis, 103 or 43% were found to contain spirochetes. Only 11 showed great numbers of organisms, the usual finding being a very few spirochetes after long and careful search of the entire section. These spirochetes are shorter than those in monkeys and the spirals are less sharp and few in number. The usual number of spirals was 2 or 3. Autolysis made it impossible to attach any significance to the presence of these organisms in the human stomach. Suggestive granules were observed in parietal cells in a small number of these sections.

A remarkable feature, noted by several investigators, is that such spirochetes in gastric glands are readily seen in ordinary preparations and do not require silver impregnation for their demonstration. This may be due to the special physico-chemical properties of the environment.

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Mental and Behavioral Changes Following Male Hormone Treatment of Adult Castration, Hypogonadism and Psychic Impotence.

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(Introduced by Edgar Allen.)

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Previous work indicates that the administration of male hormone substance produces behavioral as well as organic changes. In baby chicks, aggressiveness, strutting and crowing have been induced.¹ In man, greater capacity for penile erection² and increased aggressiveness, energy and self-assurance have been noted.³ This paper reports additional data on mental and behavioral changes during treatment with testosterone propionate* of 2 adult castrates, 2 cases of hypogonadism and 2 cases of apparently psychic impotence. Tes-

¹ Hamilton, J. B., *Proc. Am. Soc. Physiol.*, 1937, 88.

² Hamilton, J. B., *Endocrinology*, 1937, **21**, 744.

³ Hamilton, J. B., *Endocrinology*, 1937, **21**, 649.

* Furnished by the Ciba Company under the trade name Perandren.

tosterone propionate was administered subcutaneously from 3 times weekly to once daily in doses of 20 mg dissolved in 1 cc of peanut oil. As controls, of which the patients were not informed, injections of oil without hormone were given for periods before and during treatment.

Before treatment all patients were definitely lacking in any conscious goading sex drive, in the capacity for penile erection and even in the ability to enjoy sexual sensations from acts such as kissing and embracing. While the 4 patients who had once been normal could occasionally muster enough penile erection to effect vaginal entrance, these were too brief and weak to bring satisfaction to either their wives or themselves. With complete absence of either penile sensitivity or general emotional responsiveness, they reported that intercourse had become mere "arduous work."[†]

All patients were disturbed, anxious and broken in spirit. They ranged from moderate to severe states of mental depression. The 4 definitely organic cases displayed additional symptoms. These patients suffered from vasomotor disturbances (hot flashes), such as women may experience at the menopause, and manifested very definite emotional instability characterized by sudden uncontrollable shifts in mood, by tendencies to break down into tears, by periods of extreme irritability and, sometimes, by sullen anger. They also exhibited moderate to extreme degrees of both physical and mental fatiguability. They complained of difficulties in concentration and of general apathy.

Administration of testosterone propionate produced a marked increase in the erectile capacity and sensitivity of the penis, in the strength of the sex urge and in the capacity to respond with the proper emotions not only to intercourse but also to other acts such as kissing or embracing. During adequate treatment, the 2 castrates appeared restored to normal in these respects. While the hypogonadal cases are somewhat less clear-cut, one patient did show definite effects and the other married and eventually achieved partial orgasm. One psychogenic case (E) was restored to low normal sex drive and erectile capacity. The other patient, who had managed before treatment to escape from the environmental situation partly responsible for his difficulties, appeared to be restored to complete normality.

Normal sex function and motivation were accompanied by great changes in the entire mental attitude of all patients. Their previous despondency gave way to definite elation, which in one psychogenic

[†] Cases with symptoms much less severe are, of course, frequently reported.

case (E) tended to wear off.‡ All patients were less broken in spirit and were more spontaneous in their interests and activity. It is particularly interesting to note that additional changes occurred in the organic cases which were not observed in those without demonstrable hormonal abnormalities. The symptoms listed as peculiar to the organic cases were alleviated. They exhibited more rational aggressiveness and less irrational irritability and sullen brooding. Nervousness and emotional instability were replaced by greater stability and control. Abnormal physical and mental fatiguability disappeared. Energy and stamina returned.

Before treatment, none of the cases had reacted appreciably to control injections. During subsequent control periods, the one psychogenic case who had changed his environment, remained normal; but the symptoms of the other cases returned in unabated form, save that now hope was manifested instead of despair.

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Red Cell Resistance to Lysins in Pernicious Anemia.

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Since there is evidence that there is an *in vivo* hemolytic process involved in pernicious anemia,¹ we have carried out measurements of the resistance, to saponin and other lysins, of red cells from cases of pernicious anemia in relapse and in remission.

The methods used were those described by Ponder.² Suspensions of red cells from normal oxalated blood and from the oxalated blood of cases of pernicious anemia are made by suspending the thrice-washed cells in sufficient 1% NaCl (or buffered Ringer at pH 7.0) to give $2.5(10^8)$ cells/cc. A series of dilutions of saponin, or of another lysin, is then prepared in 1% NaCl, and time-dilution curves

‡ It seems probable on theoretical grounds that there should be some psychic cases which, if their impotence (*i. e.*, adjustment to need for escape or revenge, etc.) could be destroyed, might go into some other, more severe form of neurosis.

¹ Rhoads, C. P., *Cold Spring Harbor Symposia on Quantitative Biology*, 1937, 5, 410.

² Ponder, E., *The Mammalian Red Cell and the Properties of Hemolytic Systems*, *Protoplasma Monographien*, No. 5, 1934.