arrived at from the clinical data as to the relationship of the pancreatic reaction to disease of the pancreas. In one patient, a case of chlorosis with widespread thrombosis, dying with a high temperature and symptoms resembling acute intra-abdominal inflammation, the reaction was negative on repeated examination, and the naked-eye and microscopic appearances of the pancreas were in all respects normal; whereas in 7 cases which gave a marked positive reaction, definite inflammatory or degenerative changes were present in the gland.

GENERAL CONCLUSIONS.

My results confirm the conclusion arrived at by Mayo Robson and Cammidge, that there is a definite and important relationship between the pancreatic reaction in the urine and disease of the pancreas. My results differ from those of Cammidge in so far that I have recorded a higher percentage of positive results in cases similar to those that may have been included in that author's list of control cases. Cammidge found in a group of cases described as miscellaneous—other than those having a direct surgical interest in relation to disease of bile ducts and pancreas—that 4 only out of 92 gave a positive reaction. The higher percentage of positive results recorded in my series may possibly be due to the fact that I made use of many serious medical cases of a nature commonly associated with advanced arterial disease, and chronic catarrhal conditions in the intestinal tract, conditions that are frequently attended with degenerative or inflammatory changes in the pancreas and other glands. My results lead me to divide the cases in which the pancreatic reaction was present in my series into the following groups:

1. A group in which there was definite clinical or pathological evidence of serious organic disease of the pancreas—for example, acute and chronic pancreatitis, usually associated with disease of the bile ducts.
2. A group in which the reaction in the urine is associated with pronounced arterial sclerosis, a condition usually accompanied by more or less sclerosis in different glands.
3. A group in which the reaction is dependent on congestion and catarrhal conditions of the gland ducts and substance, with associated toxæmia—for example, advanced heart disease, appendicitis, pneumonia, malaria, and the like.

This division is, it is hardly necessary to add, somewhat arbitrary, as most cases are in all probability of mixed origin. If these facts are kept in view, and this urinary reaction is carefully studied along with the other clinical features of a case, I have no hesitation in saying that this new test will prove of great value both to physicians and surgeons in the diagnosis and treatment of pancreatic disease.

I have much pleasure in expressing my indebtedness to Sir Thomas Fraser and other senior colleagues at the Royal Infirmary for the facilities afforded me in this investigation.

THE THERAPEUTIC USES OF NORMAL SERUMS.

By E. C. HORT, M.R.C.P. EDIN.,
LONDON.

IN two papers recently published by the *Lancet* of December 21st, 1907, and February 15th, 1908, I have shown that the ulceration and destruction of tissue which characterize many diseases may be due to a deficiency in the patient's serum of bodies that normally restrain autolysis or self-destruction of tissue. I have also shown that, acting on these lines, I have been able in a number of cases of disease, both infective and noninfective, to inhibit such self-destruction by the internal and local administration of normal serums rich in anti-destructive bodies. This internal and local use of normal serums that I have employed in order to limit cell destruction in disease is, I believe, original. So also, as I have said in the papers referred to, is the giving of tuberculin and staphylococcal and other vaccines by the mouth, a practice which I began early in 1907, and which Dr A. Latham has subsequently and independently employed.* In 1905 Well of

* It was shown, however, by Copeman in 1894 in his work on *Variola* and *Vaccinia* that in 1810 vaccine crusts given by the mouth produced in six days in a young girl 180 vesicles, all of "clearly vaccine type."

Paris gave intravenous and subcutaneous injections of normal serums in hæmophilia, hoping thereby to increase the coagulation power of the blood to a deficiency in which he, I think, on insufficient grounds, attributed the hæmorrhages. It was, in fact, this work that first suggested to me the possibilities inherent in normal serums.

In Australia M. Paton has for years been treating diseases other than diphtheria with antidiphtheritic serum, and has used "simple plasma" in tuberculous and asthenic conditions with a view to increasing nutrition. Metchnikoff, again, has for some time been using heated serum as a local application with a view to increasing phagocytosis. Of this work and of Paton's I was ignorant till after I had published my own observations, which were based on the use of untreated serum given for a very different reason.

The inhibiting power of serum on autolytic processes *in vitro* has been recently the subject of much experimental investigation. Such inhibition has been shown to be present when the serum of one animal is allowed to act on the tissues of another.

In the appended list of cases it will be seen that the arrest and cure of such lesions as are referable to auto-destruction of tissue are remarkable illustrations of the inhibiting power of serum. There can be no question, as to the direct action of the serum on local lesions such as the cases of varicose ulcer which had for many years resisted all other methods of treatment, including prolonged and absolute rest. In the cases of visceral ulcer, especially gastric, I am inclined to attribute the good results gained to the same local action.

In the cases of arrest by the serum of progressively destructive lesions caused by the tubercle bacillus, such as I observed whilst treating hæmoptysis, it seems highly probable that such arrest is due to a heightening of the inhibitory power of the blood. It is this observation, reported in the *Lancet* in connexion with a case treated in June, 1907, that encouraged me to continue serum treatment in cases of tuberculosis. This raising of the clinical index of the blood's inhibitory power is likely to prove to be the expression of the reaction of the organism to normal serum treatment in all cases of cell destruction, whether due to bacillary invasion or not. It is more than probable that the opsonic index, which after all is only a measure of ingestion prior to lysis of bacteria, will be found to be only a supplemental factor to the true antilytic index of response, which is a gauge not only of antilytic but of restrained lysis. It is conceivable that ingestion and subsequent lysis of bacteria may give rise to an undesirable escape of poisonous enzymes, unless restrained from running riot by antilytic action. Opsonic estimation is and can be only a partial indication of the organism's response to bacillary invasion or vaccine injection. An index of antilytic response may prove to be a far truer guide. It is for this reason that I have neglected the opsonic content in cases treated by normal serum or by vaccines or by both.

That tissue destruction in many bacillary diseases is referable to the development of proteolytic enzymes in the damaged cells is almost beyond doubt, and the arrest of such tissue destruction would appear to be a problem of almost as great importance as the neutralization of the bacillary intoxication. That the antiautolytic power of the serum varies in different diseases has been shown in a rough manner by Diener using Loeffler plates after the manner of Müller and Koltzschmann. It is obviously of great importance to establish an antilytic index or measure of the inhibitory power of the normal serum used, and I am informed by Dr. Golla that his method of gauging it by electrical conductivity, with which he is now investigating the subject, does establish such an index. For the fluctuating changes in the inhibitory power of a patient's serum can be readily followed during an illness dependent on autolytic processes. In dealing with such a universal and important fact as autolysis it is obvious that any power of raising the antilytic index, and hence the reciprocal resistance of the tissues, is of cardinal importance.

The action of normal serum would appear to be a sum of the two opposing actions of an antilytic and auxilytic body. The literature dealing with this antiautolytic power, as determined by experiments *in vitro*, is very large. The older observations on the antiproteolytic action of Oathcart, Landtegger, and Glaesner have

received striking confirmation from the more recent work of Baer, Opie, Müller, and Koltzschmann.

The protein constituent of the serum with which the antiautolytic body is probably in combination is still a matter of dispute, the old view that it is in combination with englobulin having been recently revived. I am at present endeavouring to have the antiautolytic protein body separated from the auxilytic globulin of the serum, but at present the difficulties of obtaining it in a sterile and atoxic condition are considerable.

SUMMARY OF CASES TREATED BY NORMAL SERUM. Full details of these cases will be published later.

Cases Treated by Local Applications of Serum.

	Results.
9 cases of long-standing varicose ulcer ...	Vide below.
1 case of eczematous fissure	Rapid cure.
1 case of rectal fissure	Cure in 14 days.
1 case of intractable bedsores	Rapid healing.
2 cases of breaking-down carcinomata ...	Results doubtful.

Cases Treated by Internal Doses of Serum.

	Results.
5 cases of chronic gastric ulcer	Entire relief from pain in 4.
2 cases of acute gastric ulcer with hæmorrhage	Hæmorrhage arrested.
4 cases of tuberculous hæmoptysis	Hæmorrhage arrested.
1 case of acute pustular eczema... ..	Rapid cure.
2 cases of chronic duodenal ulcer with hæmorrhage	Relief of pain.
1 case of chronic duodenal ulcer with no hæmorrhage	Under treatment.

Cases Treated by both Methods Combined with Vaccines

	Results.
1 case of chronic alveolar suppuration ...	Under treatment.
1 case of acute pustular eczema... ..	Vide above.
1 case of suppurating rectal fissure	Cure in 14 days.

Cases Treated by Vaccines (by the Mouth) alone.

	Results.
1 case of tuberculous sacro-iliac disease ...	Practically cured.
1 case of acne	Doubtful benefit.

CASES OF ULCERATION TREATED WITH SERUM.

The cases of varicose ulcer were mainly treated at St. George's Infirmary, where the courtesy of Dr. Muir and his assistant, Dr. Austin, who spared no trouble in the carrying out of the treatment, enabled me to observe the action of the serum under conditions eliminating the possible errors arising from the effects of recent rest and treatment. In all 7 cases were treated there, and only one failed completely to react, whilst in another the process of complete healing of the ulcer was interfered with by a papillomatous growth. In all the other cases healing was promoted to a great extent. One case, in which an ulcer of about 3 sq. in. had been without any change for eight years, and the patient had been confined to bed for some months previously, was completely healed up in about three weeks. In another, where an ulcerative condition had existed for thirty years, and healing with subsequent breaking down had last taken place two years before, the lesion was nearly completely healed after four weeks' dressing with serum when I last saw it.

The case which resisted treatment was one of a very unpromising old callous ulcer, covered by an almost horny slough. As a rule, the treatment was followed by a beginning of new skin formation at the edges within a few

days from the first application of the serum dressing, the floor of the ulcer at the same time becoming healthy-looking and red. Two other cases at St. George's Hospital are at present being treated as out-patients and show improvement, notwithstanding the unfavourable conditions and a history of some months' unsuccessful treatment with various lotions.

With the ulcers I would include a case of severe bedsores under the care of Dr. Highet at Workington, where the application of serum led to rapid healing.

A case of eczematous fissure under the breast in a woman that had been treated unsuccessfully with zinc and antiseptic powders healed up after two days' local serum treatment.

Two cases of ulceration of malignant tumours were treated with doubtful benefit by serum.

It is necessary to dwell somewhat at length on the effects of serum on cutaneous ulcerations, as it affords an easily-observed demonstration of the inhibitory power of serum on what is generally admitted to be a purely autolytic lesion. The effect of serum on simple cutaneous ulceration was similar to the results of the treatment of gastric ulceration.

One case of undoubted gastric ulcer where the patient had suffered daily pain for nine years was relieved after two days' treatment, and said that this was the first time she had been able to lie on her left side at night since the onset. Serum was then omitted for five days and the pain returned, but again left her on resumption of the serum treatment, which was continued for three weeks. After this period she appeared to be completely cured.

The second case had a history of three years' symptoms of gastric ulcer with chronic pain. After five days' treatment she declared herself free from pain.

A case of duodenal ulcer is now under treatment with marked signs of improvement.

Early in 1907 I treated a case of tuberculous sacro-iliac disease by the administration of tuberculin by the mouth. I am at present treating a case of pyorrhoea alveolaris by the combined method. When treating cases of hæmoptysis with serum by the mouth in May, 1907, I observed, in addition to the satisfactory results on the hæmorrhage that I have recorded in my previous papers, that the treatment had a distinct inhibitory effect on the destructive process. This has induced me to undertake the treatment of a large number of other cases of tuberculosis in the hope of producing still more striking effects.

HYSTERECTOMY PERFORMED UPON A PATIENT WITH GLYCOSURIA.

By JOHN D. MALCOLM, M.B., C.M., F.R.C.S. EDIN.,
SURGEON TO THE SAMARITAN FREE HOSPITAL.

WHETHER a patient with persistent glycosuria should be subjected to an operation that is not immediately necessary to save life is a question open to debate, and therefore the following notes seem sufficiently interesting for publication.

A married woman, aged 42, and the mother of three children, the youngest aged 14, was admitted to the Samaritan Free Hospital in April, 1907. She had an abdominal tumour, concerning which she consulted Dr. C. J. Beattie, who investigated the case and at once sent the patient to the hospital.

History.

She had known of the tumour and been treated for it six years. It steadily enlarged and during the last three years the menstrual flow was increasingly free. The patient was emaciated and anaemic, and her weight had fallen nearly a stone and a half. In the summer of 1906 she suffered from diarrhoea, which ceased after a week in the country. Shortly before admission to hospital she had a "cold," with cough and slight expectoration, but she had not been subject to such attacks.

Condition on Admission.

There were many fibromyomata in the wall of the uterus. Most of them were small, but in two the diameter was about 4 in., whilst a third was nearly as big. The mass rose as high as the umbilicus, the bulk of it was above the pelvic brim and with the uterus it was very freely movable in the pelvis and abdomen.

The quantity of urine excreted in twenty-four hours was between 40 and 50 oz., and its specific gravity was 1038 to 1044.