the pressure applied in the single-prick-through-drop technique used throughout the experimental series could not have been responsible for the results recorded following D.S.U.H.

Conclusions

It is concluded that instant inhibition of the I.T.H. response can occur in certain individuals by direct suggestion under hypnosis. One experiment indicated that inhibition of this response could eventually be produced in a larger proportion of individuals, if treatment were continued over a longer period by repeated suggestion in this way. Further work to investigate the significance of psychic factors in relation to the Prausnitz-Küstner reaction and the delayed-type hypersensitivity response has also been carried out and the results of these experiments will shortly be published.

Summary

Direct suggestion under hypnosis was employed as an experimental tool to investigate psychological control of the immediate-type hypersensitivity response in a series of experiments in which the normal allergic response was measured in the waking state on one arm, and again on the other arm, after giving direct suggestion under hypnosis that the subject would not react. The temperature change of the reaction was measured with thermocouples and the oedema with skinfold-thickness callipers, and a record of the colour change was kept by colour photography. The results showed evidence of very marked to moderate degrees of instant inhibition in 8 subjects out of 12. Deep-trance subjects had the greatest ability to inhibit the response in this way. It is concluded that instant inhibition of the immediate-type hypersensitivity response is possible in certain individuals by direct suggestion under hypnosis.

My thanks are due to Dr. O. G. Edholm, head of the Division of Human Physiology of the Medical Research Council, for his help and for the special facilities provided in the M.R.C. Laboratories at Hampstead; and to Dr. J. H. Humphrey, head of the Immunological Division of the Medical Research Council, for his criticism and advice. The work was supported by a grant from the Medical Research Council.

REFERENCES

- Coca, A. F., and Grove, E. F. (1925). *J. Immunol.*, **10**, 445.
Cullen, J. H. (1960). In *Progress in the Biological Sciences in Relation to Dermatology*, edited by A. Rook, p. 197. Cambridge Univ. Press, London.
Freeman, J. (1950). *Hayfever*. Heinemann, London.
Lewis, H. E., Masterton, J. P., and Ferres, Helen M. (1958). *Clin. Sci.*, **17**, 369.
Mason, A. A., and Black, S. (1958). *Lancet*, **1**, 877.
von Pirquet, C. (1906). *Münch. med. Wschr.*, **53**, 1457.
Prausnitz, C., and Küstner, H. (1921). *Zbl. Bakt.*, **86**, 160.
Wilson, E. (1856). *Diseases of the Skin*. Churchill, London.
Wolberg, L. R. (1948). *Medical Hypnosis*, **1**, 116. Grune and Stratton, New York.

The ideal operator for a certain lathe should be four and a half feet tall and have an arm span of eight feet. This example of one of the many problems facing machine designers is given in the first of a new series of booklets published by the Department of Scientific and Industrial Research on ergonomics for industry. *The Industrial Use of Ergonomics* is by W. T. Singleton, lecturer in ergonomics at the College of Aeronautics, Cranfield, who discusses why and how industry should use ergonomics. Among other titles to be published shortly in this series are *Instruments and People*, *The Design of Work for the Disabled*, and *Ergonomics v. Accidents*. (Available free from D.S.I.R., Warren Spring Laboratory, Stevenage, Herts.)

E

MILK IN DIVERTICULA OF COLON

BY

D. C. CORRY, M.D., F.R.C.S.

Surgeon, United Oxford Hospitals

This paper is based on 120 cases of diverticulitis treated as out-patients or admitted to a 40-bed unit during the years 1953-61. Twelve of the patients, aged 52 to 88, were suspected of having carcinoma of the left side of the colon because of pain and frequent loose stools containing mucus and occasionally blood; their symptoms were cured by cutting out completely or reducing the raw milk in their diet.

In cases of diverticulitis of the colon milk can cause morning diarrhoea with two or three small loose motions containing an excess of mucus, occurring soon after rising. In a more severe reaction blood as well as mucus may be passed, so mimicking absolutely a carcinoma of the left side of the colon. In a milder form only looseness and slight increase of frequency of the motion occurs. All types are liable to be associated with sigmoid colon pain, which is a recurrent colicky pain felt on either the left or the right of the hypogastrium, or occasionally on both sides.

Case Reports

Case 1.—March 25, 1952. Senior colleague, aged 66. For six years looseness and frequency of bowel action. For past six months soft formed stool on awakening and then small loose stool with lot of mucus before and after shaving and after breakfast. If he lit a cigarette a colicky pain occurred on the left side of the hypogastrium, lasting half a minute and recurring. Occult blood: large amount first specimen, moderate amounts next two. Barium enema (Dr. F. Kemp): multiple diverticula of sigmoid. Sigmoidoscopy to 9 in. (23 cm.): no growth. Two small piles capable of bleeding, injected. Subsequent occult bloods: one, traces only; two, negative. Two months later three occult bloods were all negative. He was assured it was not carcinoma of the left side of the colon, as all growths of the left side of the colon cause persistent occult blood, usually in large or moderate amounts, in two at least of the three specimens sent. Diverticula can bleed, but the bleeding stops. In a week or two the three occult bloods will become negative. The colicky sigmoid pain and morning diarrhoea continued. September, 1952: after an attack of pain he observed in a loose stool several small pellets about 4 mm. long, shaped like date-stones. Biochemical report of pellets was fat and protein. The patient had for many years drunk 1 to 2 pints (570 to 1,140 ml.) of Jersey milk every night, and stopping this was curative. He has remained well since.

Case 2.—September, 1952. A male personal friend aged 65. Two to four loose bowel actions with much mucus, chiefly before 10 a.m. Sigmoid colon pain. No occult blood in three specimens. X-ray examination revealed about 60 pea-sized diverticula, essentially in the sigmoid. Advised to stop all raw milk, including that put in tea, for a trial period of one week. Symptoms at once ceased and bowels became perfectly normal, acting once a day. He died of a coronary thrombosis in 1957. Moderate butter and fully cooked milk, such as baked custards, did not cause symptoms.

I have since always advised patients with diverticula with irritable sigmoid symptoms and no definite x-ray evidence of malignant disease, and especially no occult blood in three specimens, to have a trial period of one to two weeks without raw milk.

Seven other cases, in patients aged 59 to 76, were similar to the above two cases, with a history of hypo-

gastric colicky pain with loose stools for 3 to 12 months. In all cases three occult bloods were negative or there was only an occasional trace. They were relieved by a diet free of raw milk and cream.

Three other patients, aged 55 to 72, had been taking up to 2 pints (1,140 ml.) of milk a day to control chronic duodenal ulcers and were referred because of suspected carcinoma of the colon. Stopping raw milk helped the colonic symptoms but aggravated the ulcer. Since undergoing 50% Polya gastrectomy with ligation of all short gastrics except the fundal branch, they have been able to take a milk-free diet and have remained symptom-free.

It is probably the fat and not the protein of the milk which is at fault, as similar stools occurred in infants and children when Channel Island milk with its high fat content became readily available in Oxfordshire. It caused frequent loose stools with much mucus. When put back on to their ordinary milk the infants lost their symptoms.

Summary

In a series of 120 cases of diverticulitis sent for a surgical opinion were 12 patients (10%) aged 50 to 66 suspected of having carcinoma of the left side of the colon because of the passage, mostly in the early morning, of frequent loose stools containing mucus and sometimes blood. They were cured by cutting out or reducing raw milk and cream from their diet.

Preliminary Communications

Cadaveric Renal Transplantation

Renal transplantation from living donors has now been performed successfully in the United States, Canada, France, and Great Britain. Immunological rejection has, however, occurred in most cases of allogeneic transplantation, and doubts have arisen about the advisability of asking a healthy donor to sacrifice a kidney in the present state of knowledge. We decided therefore to re-evaluate the use of cadaveric material, for if successfully developed this method may give wider scope than by obtaining organs from living donors. This approach, however, poses additional problems such as a longer period of ischaemia, and availability and suitability of the donated kidney.

Initially we investigated methods of prolonging renal survival during acute ischaemia.* The rabbit was used and a practical method of renal perfusion was devised by one of us (C. M.). After right nephrectomy the left kidney was subjected to one and a half hours of ischaemia under a variety of conditions. The greatest protection was noted in that group which had an initial cooling perfusion of isotonic heparinized dextran containing glucose, electrolytes, papaverine, and 0.15 M "tham" at 10° C. This combination of renal perfusion and cooling appeared to protect renal function by reducing metabolism, countering ischaemic acidosis, and preventing renal-artery spasm and small-vessel thrombosis.

In applying this technique to cadaveric renal transplantation we considered it essential that the kidney be

obtained immediately renal blood flow ceased. The donor should also be young, have no infectious, malignant, or renal disease, and death must not be preceded by severe trauma, prolonged anoxia, or hypotension, which predispose to acute renal failure. These factors severely limit the use of cadaveric material. We chose patients who had had recurrent subarachnoid haemorrhage not amenable to surgery. These patients, having been in hospital long enough to allow full investigation, satisfied the above criteria. When death occurred, and with the full consent of the relatives, the left kidney was removed immediately and cooled by the perfusion technique described above.

Two cases of transplantation have been performed using these procedures.

CASE 1

The recipient was a 37-year-old man who had terminal chronic glomerulonephritis which was proved by biopsy. The blood urea nitrogen was 301 mg./100 ml. on admission, urine output was less than 500 ml./day, and the blood-pressure was consistently elevated at 180/120. Five haemodialyses were required over seven weeks while severe oral and other sepsis was eradicated. His blood group was A Rh positive. No relatives were available as donors. The donor (a normotensive woman aged 44, blood group A Rh negative) had been admitted in coma with a subarachnoid haemorrhage from an aneurysm which was found to be inoperable. The left kidney was removed immediately death occurred and perfused and stored at 13° C. The operation on the recipient was started as soon as the donor kidney was found to be suitable for transfer. The renal vein was anastomosed to the right external iliac vein and the renal artery to the internal iliac artery. The total period of ischaemia was 133 minutes. On re-establishing the circulation the kidney became immediately pink and a small amount of urine was excreted. The renal capsule was partially stripped and the ureter anastomosed to the bladder.

Post-operatively the donated kidney developed acute renal failure. Haemodialysis was performed on the sixth post-operative day, but by the fourteenth post-operative day renal function was returning and progress into uraemia was halted on the twenty-first day. By the twenty-fifth day renal function decreased and the patient died on the thirty-third day.

Dr. C. K. Anderson removed the transplanted kidney 15 minutes after death. He reported: "The kidney was slightly enlarged and the three anastomoses were well healed and patent. Histological examination showed extremely severe hypertensive disease ranging from muscular hyperplasia with splitting and necrosis of the internal elastic lamina in the renal artery and its main branches to extreme intimal hyperplasia of the interlobular arteries and hyaline thickening and fibrinoid necrosis of the arterioles. The glomeruli were diffusely thickened and there was focal fibrinoid necrosis of many of the malpighian tufts. There were no signs of immunological rejection. A biopsy of the donor's contralateral kidney, taken at the time of transplantation, showed no significant lesion. The recipient's kidneys showed advanced chronic glomerulonephritis with hypertensive changes in the vessels of the kidneys and many other organs, but these changes were much less severe than in the transplanted kidney."

CASE 2

The recipient was a 37-year-old male orphan with infected bilateral renal polycystic disease. The blood-pressure was normal. The blood group was A Rh positive. The blood urea nitrogen was 248 mg./100 ml. Despite a urinary output of 2.5–3.5 l./day intermittent haemodialyses were required to control recurrent uraemia. After four months renal function deteriorated rapidly, the urinary output fell to less

*U.S. Public Health Service Research Grant N.I.H. (Surg.) H-6506.