Levin (1968) investigated the effects of 5-fluorouracil, a fluorinated pyrimidine that has antimitotic and protein synthesis-blocking actions on the structure and functions of the small intestine. After three days of treatment with the drug, the absorption of glucose, galactose, and fructose was reduced and the intestinal maltase activity was depressed. Fine structural changes in the mucosal cells of the small intestine were revealed by electron microscopy. A number of the mucosal cells were vacuolated, others had reduced numbers of microvilli in their brush borders and many of the lateral spaces between mucosal cells were distended. Despite these functional and structural abnormalities, neither the hexose nor the amino acid transfer potentials generated across the drug-affected intestine by addition of these solutes to the fluid bathing the everted jejunal sacs were significantly different from those obtained in control intestines.

Another example of the poor correlation between functional changes and the transmural potential difference is from a study by McKenney (1968) on the effects of irradiation on the small intestine. He measured the electrical potentials across the everted intestine incubated in vitro. Under normal conditions of incubation, McKenney reported that many of the intestines removed from the irradiated animals had potentials similar to those obtained across control intestines. It was only when he used incubating buffers containing a lowered sodium concentration or made hyperosmotic with mannitol that differences could be clearly distinguished between irradiated and control intestines. Yet despite this practical normal electrical potential it is known that hexose and propionate absorption, fluid transfer, and metabolism of the irradiated intestine are all reduced (Perris, Jervis, and Smyth, 1966; Perris, 1966).

Finally, the lack of correlation between the potential and the function even of the normal intestine in situ is shown by the observations of Schedl, Wilson, and Miller (1969). These authors found that the pattern of the transmucosal potential differences in the duodenum, jejunum, and ileum did not parallel the absorption rates of sodium or water which were greater in the more proximal intestinal segments. The authors came to the conclusion that there was no evident correlation between the potential difference and the ion movements they observed and that 'the pattern of transmural potential differences showed no correlation with absorption and secretion rates'.

Bearing in mind the above observations, it is clear that in a number of conditions that alter the absorptive capacity of the small intestine, measurements of the transmucosal electric potential do not appear to be a useful index of the degree of the functional impairment of the mucosal cells. Apparently there can be large changes in absorption and secretion without concomitant effects on the electric potential. Gasser succinctly summed this up in 1933 with the statement: 'You cannot determine a process from a potential!' It is thus important to stress that future investigators measuring the electrical potential should not interpret any lack of change in this parameter as diagnostic of the functional and structural integrity of the small intestine unless other tests of the organ's absorptive and secretive functions are confirmatory.

R. J. LEVIN
Department of Physiology,
University of Sheffield,
Sheffield S10 2TN

REFERENCES


Levin, R. J. (1968). Anatomical and functional changes of the small intestine induced by 5-fluorouracil. J. Physiol. (Lond.), 197, 73-74P.


DR GEALL replies

Levin had documented evidence that in the small intestine certain agents which affect transport and structure do not alter electrical potential difference. The recent finding of normal potential differences in the jejunum in nontropical sprue is further support for this view. However,
despite this negative evidence, further studies in small intestinal diseases, particularly abdominal angina, seem indicated. We agree that the short circuit current is the ideal parameter to study but this is not possible in human studies in vivo.

M. G. GEALL,
King’s College Hospital
Medical School,
London


Notes and activities

4TH WORLD CONGRESS OF GASTROENTEROLOGY

The 4th World Congress of Gastroenterology, organized by the Danish Gastroenterology Association, will be held in Copenhagen, Denmark, and will take place from 12 to 18 July 1970.

The address of the Secretariat, from which all information can be obtained before the Congress is: 4th World Congress of Gastroenterology, c/o DIS Congress Service, Skindergade 36, DK-1159 Copenhagen K, Denmark. Telephone: (01) 11 00 44. Cables: interstud copenhagen. Telex: 5213 interstud, and during the Congress Bella-Centret, Hvidkildevej 64, DK-2400 Copenhagen NV, Denmark. Telephone: (01) 10 01 40.

The Congress headquarters is Bella-Centret, Hvidkildevej 64, Copenhagen NV. The opening ceremony will take place on Sunday afternoon 12 July 1970 in the main hall of Bella-Centret. The scientific sessions will also be held at Bella-Centret from 13 July to 18 July (both days included). The technical exhibition will be held in Bella-Centret and will be opened officially on 13 July. The exhibition closes at noon on 18 July.

SCIENTIFIC PROGRAMME The scientific programme of the congress includes symposia, quadrennial reviews, lectures, and scientific exhibits. Symposium participants will be chosen by the symposium leaders from among authors who have announced original contributions which are pertinent to the theme of the symposium. The symposia shall primarily bring together workers who wish to present the latest results of advanced research and to discuss these with persons engaged in similar work.

The quadrennial reviews will present an outline of the progress achieved since the last World Congress, within well defined current fields of gastroenterology, and will further discuss the changes in prevailing viewpoints such progress entails. The 11 quadrennial reviews will be presented by outstanding investigators within the chosen subjects and can be purchased as a comprehensive publication shortly after the termination of the congress.

Symposia These are the chosen subjects and moderators for each are:

- F. CRABBÉ (Sherbrooke) Local immunoglobulins in the intestine
- A. DAHLQUIST (Lund) Intestinal mucosal enzymes
- J. EISEMAN (Denver) Transplantation of the liver
- E. GROSSMAN (Los Angeles) Regulation of the external pancreatic secretion
- G. A. MARTINI (Marburg/Lahn) Hepatic coma
- J. INGELFINGER (Boston) Pathophysiology of the oesophagus
- CH. ROUILLER (Geneva) Electron microscopic examination of the liver
- M. SIURALA (Helsinki) Gastritis and stomach ulcer
- S. TRUELOVE (Oxford) Ulcerative colitis and Crohn’s disease
- E. WATKINS, JR. (Boston) Chemotherapy of gastrointestinal cancer
- C. E. WELCH (Boston) Polyps and polyposis of the colon
- J. A. WILLIAMS (Birmingham, U.K.) Post-vagotomy syndromes

Quadrennial reviews The speakers and topics are as follows:-

- H. BARON (London) The clinical use of gastric function tests
- W. CREUTZFELDT (Göttingen) Aetiology and pathogenesis of pancreatitis: current concepts
- D. A. DREILING (New York) Early diagnosis of pancreatic cancer
- J. B. KIRISNER (Chicago) Ulcerative colitis
- F. A. KILPATRICK (Rochester, N.Y.) Tropical sprue
- SYLVAIN LIN (Taipei) Primary cancer of the liver
- M. NYHUS (Chicago) The surgical treatment of gastric ulcer
- H. WOFFORD (New York) Current concepts of cirrhosis
- W. E. SHERLOCK (London) Causes and effects of acute liver damage
- SOAD TABAQCHALI (London) The pathophysiological role of small intestinal bacterial flora
- W. R. THAYER JR. (Providence) Crohn’s disease (regional enteritis)

Unofficial study groups Very specialized topics may be taken up by small groups on a private basis. The congress provides suitable rooms for this purpose upon request before 1 January 1970.