was found ('normal' group) the mean nitrite concentration was 1.7 ± 0.5 (mean ± se) μmol l⁻¹ and the mean hydrogen ion concentration was 43.6 ± 5 mmol l⁻¹. These values did not differ from twenty-one patients with duodenal ulcer in whom the NO₃ concentration was 1.3 ± 0.3 μmol l⁻¹ and the H⁺ concentration 41.3 ± 4.4 mmol l⁻¹.

In twelve patients with gastric ulcer the NO₃ concentration 7.9 ± 4.1 μmol l⁻¹, was significantly higher than both 'normal' (P < 0.05) and DU groups (P < 0.05) and the H⁺ concentration, 21.3 ± 7.7 mmol l⁻¹, was significantly lower (P < 0.05 for both).

In six patients with gastric carcinoma the NO₃ concentration, 38.8 ± 14.7 μmol l⁻¹, was significantly higher than the GU group (P < 0.02) and the H⁺ concentration, 4.8 ± 4.24 mmol l⁻¹, was significantly lower (P < 0.05).

In twelve patients the only abnormality found was a low H⁺ concentration in the fasting juice. The H⁺ concentration, 1.97 ± 0.6 mmol l⁻¹, and the NO₃ concentration, 25.6 ± 3.6 μmol l⁻¹, did not differ significantly from the cancer group.

Considering all sixty-nine specimens together there was an inverse relationship between NO₃ concentration and H⁺ concentration.

Twentу of the total sixty-nine specimens had a H⁺ concentration less than 6 mmol l⁻¹, and in this group of hypochlorhydric subjects the NO₃ concentration, 30.4 ± 4.9 μmol l⁻¹, was significantly higher than in the other forty-nine specimens, NO₃ concentration 1.69 ± 0.28 μmol l⁻¹ (P < 0.001).

The mean thiocyanate concentration in the fasting gastric juice of sixty-three patients was 1.46 ± 0.14 mmol l⁻¹. There were no major differences between the various diagnostic groups. However, the mean thiocyanate concentration in thirty-eight smokers, 1.57 ± 0.63 mmol l⁻¹, and the NO₃ concentration, 25.6 ± 3.6 μmol l⁻¹, did not differ significantly from the cancer group.

In this group of hypochlorhydric subjects the NO₃ concentration, 30.4 ± 4.9 μmol l⁻¹, was significantly higher than in the other forty-nine specimens, NO₃ concentration 1.69 ± 0.28 μmol l⁻¹ (P < 0.001).

These results show an inverse relationship between the H⁺ concentration and NO₃ concentration in fasting gastric juice. If nitrosation occurs in vivo the reaction rate would be greatly accelerated by thiocyanate in the concentration found (Boyland & Walker, 1974, Nature, 248, 601). The reaction rate is also dependent on substrate concentration (Mivirsh, 1970, Journal of the National Cancer Institute, 44, 633) and thus the high NO₃ concentration found in hypochlorhydric subjects would increase tyramine yield. This could be a factor in the known association between gastric neoplasm and hypochlorhydric states.

**PANCREATICO-BILIARY SECRETIONS: ARE THEY TROPHIC TO THE INTESTINE?**

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Mucosal hypoplasia and diminished function develop in the small bowel of animals fed exclusively by the intravenous route (Feldman, Peters, McNaughton & Dowling, 1974, Gastroenterology, 66, 691). Theoretically, this could be due directly to the absence of food from the gut or indirectly to the resultant decrease in pancreatico-biliary secretions which are trophic to the intestine (Altman, 1971, American Journal of Anatomy, 132, 167). We therefore measured jejunal and ileal villus height (VH), crypt depth, enterocyte density, mucosal enzymes [¹⁴C] leucine absorption by mucosal slices incubated in vitro for 2 and 5 min in a 1 mmol l⁻¹ solution and in vivo galactose absorption (64 mmol l⁻¹ solution) in two groups of Beagle dogs before and 6 weeks after exclusive parenteral nutrition; (1) five with i.v. feeding alone, and (2) six with IVF + pancreatic stimulation (1 unit secretin + 1 unit CCK, 0.27 kgBW⁻¹ infused i.v. for 1 h per day).

Without pancreatic stimulation, jejunal VH fell from 939 ± SEM 47 μm to 683 ± 42 μm (P < 0.005) and ileal VH from 878 ± 51 to 597 ± 71 (P < 0.05) with corresponding changes in crypt depth. However, the number of epithelial cells/unit length villus did not change and, correspondingly, there was no change in α-glucosidase or catalse specific activities (U mg⁻¹ and U mg DNA⁻¹) or in leucine absorption when expressed per unit weight intestine. For example, at 2 min, jejunal leucine uptake (μmol.g wet wt mucosa⁻¹) was 1.7 ± 0.29 before, 1.8 ± 0.33 with IVF alone and 1.6 ± 0.37 with IVF + CCK秘密in. In contrast, jejunal galactose absorption (μmolole.²⁻¹) was increased by CCK-secretin when expressed cm length intestine⁻¹ from 390 ± 58 to 539 ± 75 (P < 0.05).

Conclusion. CCK/secretin stimulated pancreatico-biliary secretions are trophic to the intestine. They prevent the mucosal hypoplasia seen in parenteral nutrition and enhance absorption/unit length intestine⁻¹.

**PHYSICAL CHARACTERISTICS AND VENTILATORY FUNCTION OF COMMERCIAL DIVERS OPERATING IN THE NORTH SEA**

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There is an urgent need to obtain information on the physical characteristics and lung function of commercial divers. The demand for their professional skill is increasing every year while the conditions in which they work impose greater dangers as the depth of operation increases in the search for oil.

We have analysed the morphometric data of 404 commercial divers obtained as part of their annual medical examination. In addition simple ventilatory function was measured using an 81 dry spirometer (Vitalograph) to obtain the forced vital capacity (FVC), the forced expired volume in 1 s (FEV₁) and the FEV₁/FVC ratio. These results were compared with predicted values based on sex, age and height (Cotes, 1975).

Our findings for the group were as follows:

1. They were all males of European or North American origin.
2. The mean height (176 ± 9.6 cm) was not significantly different from a similar U.K. male population but the mean weight (77.1 ± 10.1 kg) was 3 kg above the predicted value (Monteguir, 1968, Annals of Human Genetics; Documenta Geigy, 7th edn).
3. The average commercial diving experience was 7 ± 1 years; only 11% having less than 1 year’s experience.
4. The mean FVC was 120% of the predicted value showing that they have exceptionally well developed lungs and this was related to their maximal operating depth.
5. The FEV₁/FVC was 71% of the predicted value; only four individuals having less than 83% of the predicted value.
6. The FEV₁/FVC was less than 75% in 16% of the group and this was related to age not to diving environmental factors.

Hence our analysis shows that commercial divers have abnormally large dynamic lung volumes probably secondary to the increased work of breathing at depth.