greater in catarrhal jaundice than in jaundice due to other causes (gall stones, cancer). He considers it a test of liver function in catarrhal jaundice. Bondi and König,[21] Riess and Jehn,[22] and Hirose[23] confirmed this, believing it to be of importance in this connection. [329]

The work of Falk and Saxl,[24] v. Frey[10] and Hirose[23] shows that the results of the test are very inconstant in diseases of the liver other than catarrhal jaundice.

In general, the shortcomings and disadvantages of carbohydrate tests, as they have been utilized, might be summarized as follows: (1) The use of arbitrary amounts of sugar without consideration of the normal tolerance of the individual patient; (2) the difficulty of keeping the patient on a carbohydrate free or a carbohydrate constant diet at the time of the test; (3) the practical difficulties of administration (nausea, vomiting, diarrhœa); (4) the disregard of such complications as portal obstruction, autonomic nervous derangement and disturbances of internal secretions influencing carbohydrate metabolism.*

Urea, Amino Acid, and Ammonia Nitrogen.

Glaessner[25] showed in 1907 that in most instances of liver disease an unusually high excretion of amino acid N occurred and that the ratio of amino N to total N was also increased. Whereas normally he found the amino N constitutes only 0.2 to 0.4 per cent,† in pathological conditions of the liver it is decidedly higher, *e. g.*, secondary cancer of the liver 12.4

* Strauss (Deutsche med. Wchnschr., 1903, xxxix, 1780), presents further evidence to establish the value of the levulose test, and insists upon the adoption of a constant amount of galactose (30 gm.) in utilizing Bauer's test in order that the finding of the other tests may be compared.

† Henriques[26] using Sorensen's formol titration method, states that the amino acid N in man on an ordinary mixed diet constitutes 2 per cent of the total N. Levene and Van Slyke[27] place the normal amino acid content of urine as 1 per cent to 2.8 per cent of the total N.‡

‡ Kober (J. Am. Chem. Soc., 1913, xxxv, 1567), utilizing his new method for determining amino N places the amino N at 2.7 to 3.1 of the total N.