uric acid is met with in the excrement of serpents and birds, with whom it is the principal nitrogenous product of tissue waste. For the preparation of uric acid (C5H4N4O3), Guano (*q.v.*) is boiled repeatedly with a solution of borax in 120 parts of water. The filtered solution is acidified with hydrochloric acid, when impure uric acid separates out as a brown precipitate, which is washed with cold water. For its purification it is dissolved in hot dilute caustic potash or soda ley, the solution filtered, and the filtrate saturated with carbonic acid. An almost insoluble acid urate of alkali separates out, which is collected on a filter, washed, and decomposed by adding it in instalments to hot dilute hydrochloric acid. Uric acid separates out as a white precipitate, which is filtered off, washed, and dried, to be re-purified by a repetition of the alkali process or otherwise. Pure uric acid forms a snow-white micro­crystalline powder, devoid of smell or taste, soluble in 1800 parts of boiling and in 14,000 parts of cold water, but insoluble in alcohol and in ether. When heated it suffers complete decomposition.

For its detection in urine, the urine is mixed with excess of hydrochloric acid, and allowed to stand, when the uric acid separates out, generally coloured reddish by impurities. To identify the pre­cipitate, it is dissolved in a few drops of nitric acid on a watch-glass, and the solution cautiously evaporated to dryness. The residue, if exposed to ammonia gas as it comes off from the stopper of a liquor ammoniæ bottle, assumes the intense purple colour of “murexide.”

*Urates.—*Uric acid dissolves in excess of caustic potash ley as dipotassic salt, C5H2K2N4O3, soluble in 44 parts of cold water, with the formation of a strongly alkaline solution. On the saturation of the solution with carbonic acid one-half of the potash is elimi­nated as bicarbonate, and a neutral salt, C5H3KN4O3, comes down as a precipitate, soluble in 800 parts of cold water. Soda and the alkaline earths behave similarly. But more interesting than its salts are the numerous derivatives obtainable from it, chiefly by the action of oxidizing agents. Most of these were discovered and investigated by Liebig and Wohler in a classical research published in 1838. From 1861 to 1863 Adolf Bayer supplemented their work by important new discoveries. He showed that all those meta­morphoses of uric acid fall in naturally with the assumption that the molecule of uric acid consists of two urea rests—(NH)(CO)(NH)— united each by its two nitrogen affinities with a tricarbon group, (C3O), by carbon affinities of the latter. To give an example of the practical meaning of the theory,—if uric acid is oxidized cautiously with nitric acid, one of the urea rests by uniting with the 2H of an H2O is split off as urea, while the rest unites with the oxygen of the H2O and other O + H2O into alloxan,— the ureid of mesoxalic acid, HO - (CO . C(OH)2. CO) - OH. On the application of more energetic oxidizing agents, that one urea rest still survives, but the tricarbon nucleus burns down into C2O2, the radical of oxalic acid, with formation of parabanic acid,

URINE. See Urea and Uric Acid ; also Nutrition, vol. xvii. pp. 682-684.

URMIA, or Urumiah, a town of Persia, in the province of Azerbijan (Adarbaijan), lies 112 miles south-west of Tabriz and 10 from the west side of Lake Urmia, in the midst of an extremely fertile, highly cultivated, and densely peopled plain. Within the enclosures, consisting of a wall and deep ditch that can be flooded, there is a mixed Mohammedan and Christian population of from 25,000 to 30,000, while the surrounding district is studded with over 300 populous villages. Some of the streets are broader than is usual in Oriental towns and several are traversed by running water ; but, beyond a busy bazaar and two or three old mosques, there is nothing of any interest. The chief industries are weaving, dyeing, and especially tillage, abundant crops of rice, melons, cotton, and excellent tobacco being raised in the neighbourhood. Urmia has for many years been the centre of an American mission, which has had considerable success, especially amongst the so-called “ Chaldean ” or Nestorian Christians. According to an old tradition, Urmia was the birthplace of Zoroaster.

The lake, which takes its name from the town, and which is also known as the Daria-cha, or “ Little Sea,” is a completely landlocked basin, filling a shallow depression at the east foot of the Kurdish Highlands, but still about 5000 feet above sea-level. It is 90 miles long north and south, 30 miles broad, and 250 round, with a total area of 1600 square miles, but a mean depth of not more than 10 or 12 feet (45 in the deepest part sounded by Monteith), so that the whole volume is at least six times less than that of the much smaller lake of Geneva. There are as many as fifty-six islands, grouped chiefly towards the south, the largest 5 miles by 2, the smallest mere rocks, and none permanently inhabited, although they are tilled or used for grazing horses and sheep in winter. Although fed by numerous streams, the lake is intensely saline, more so even than the Dead Sea, and is consequently inhabited by no fish or other aquatic fauna, except a peculiar species of small crustacean, which affords abundant food to numerous swans and other wild-fowl. The salt, which forms extensive incrustations some inches thick round about the shelving north-eastern and southern shores, appears to be de­rived from Tertiary beds (Dr E. Tietze), and the geological formation appears to resemble that of Lake Niris in southern Persia (Blanford). The whole lacustrine basin, including the farthest sources of its in­fluents, has an area of about 20,000 square miles, and the flooded part stood formerly at a much higher level than at present, as is shown by the watermarks on the encircling heights, and by the Shahi peninsula in the north-east, which at one time was certainly an island. In recent years the evaporation has on the whole balanced the inflow, although the lake is now said to be slightly rising, owing to the larger discharge from the Jaghatu and Tatau, which were formerly to a great extent absorbed in irrigating the southern Miandab plain. Near the Selmas river and at the village of Dihkergan in the south-east occur the famous “ marble springs, ” yielding the pink, yellow, and white “marble of Tabriz,” used for ornamenting many public buildings throughout western Asia.

URQUHART, or Urchard,@@1 Sir Thomas (c. 1605- 1660), one of the most original and raciest translators from any foreign language into English, was the son of Sir Thomas Urquhart of Cromarty, the representative of a very ancient family, and of Christian, daughter of the fourth Lord Elphinstone. His birth-year is uncertain, but it is guessed at 1605, and his birthplace was the old mansion-house of Cromarty. Not much is known of his youth, or indeed of any part of his life; but he was certainly well educated, travelled over Europe, succeeded to a con­siderable, though much embarrassed inheritance, and got together a remarkable library, which, however, fell into the hands of his creditors. All his later life was disturbed by pecuniary and political difficulties. He was an enthu­siastic Royalist ; and, so far as religious matters went, his principles may be judged from his favourite signature, “ C. P.,” for Christianus Presbyteromastix. He took part in the “Trot of Turriff” in 1639, and was rewarded by being knighted on 7th April 1641 by the king’s own hand at Whitehall. He took occasion by this visit to London to see through the press his first work, a collection of *Epi­grams* of no great merit. Four years later, in 1645, he produced a tract called *Trissotetras,* a treatise on logarithms, adjusted to a kind of memoria technica, like that of the scholastic logic. In 1649 he was proclaimed a rebel and traitor at the Cross of Edinburgh ; but this does not seem to have done him much harm, and, though he took part in the march to Worcester, and was there wounded and taken prisoner, his always embarrassed affairs do not seem to have been much worsened thereby. He published in rapid succession during 1652 and 1653 a series of tracts with quaint titles and quainter contents. *Pantochrono- chanon* (sic) is an almost unbelievable genealogy of the house of Urquhart up to Adam, with the names extem­porized for the earlier ages in a kind of gibberish, which seems to be after the pattern of the giants and heathens in the *Amadis. Ecskubalauron,* supposed to be a treatise on the virtues of a jewel found in the streets of Worcester,’ is in reality a rather elaborate treatise on the virtues of the Scottish character, as shown in the Admirable Crichton

@@@1 So spelt on the title page of his first work.