is absent or much weakened in those areas of mucous membrane where these are deficient ; (2) that they are most abundant where the sense is most acute ; and (3) that section of the glosso-pharyngeal nerve which is known to be distributed to the areas of mucous membrane where taste is present is followed by degeneration of the taste­bodies. At the same time it cannot be asserted that they are absolutely essential to taste, as we can hardly suppose that those animals which have no special taste-bodies are devoid of the sense.

Taste is no doubt closely allied to smell; hence in invertebrates organs are found that may be referred to either of the senses (see Smell). Tastes have been vari­ously classified. One of the most useful classifications is into sweet, bitter, acid, and saline tastes. To excite the sensation, substances must be soluble in the fluid of the mouth. Insoluble substances, when brought into contact with the tongue, give rise to feelings of touch or of temperature, but excite no taste. The specific mode of action of sapid substances is quite unknown. The extent of surface acted on increases the massiveness of the sensation, whilst the intensity is affected by the degree of concentration of the solution of the sapid substance. If solutions of various substances are gradually diluted with water until no taste is experienced, Valentine found that the sensations of taste disappeared in the following order— syrup, sugar, common salt, aloes, quinine, sulphuric acid ; and Camerer found that the taste of quinine still con­tinued although diluted with twenty times more water than common salt. Von Vintschgau found that the time required to excite taste after the sapid substance was placed on the tongue varied. Thus saline matters are tasted most rapidly (∙17 second), then sweet, acid, and bitter (∙258 second). This is probably due to the activity of diffusion of the substance. No relation between the chemical constitution of the substance and the nature of the taste excited by it has yet been discovered, and there are many curious examples of substances of very different chemical constitutions having similar tastes. For example, sugar, acetate of lead, and the vapour of chloroform have all a sweetish taste. A temperature of from 50o to 90° F. is the most favourable to the sense, water above or below this temperature either masking or temporarily paralysing it. Taste is often associated with smell, giving rise to a sensation of flavour, and we are frequently in the habit of confounding the one sensation with the other. Chloroform excites taste alone, whilst garlic, asafœtida, and vanilla excite only smell. This is illustrated by the familiar experiment of blindfolding a person and touch­ing the tongue successively with slices of an apple and of an onion. In these circumstances the one cannot be dis­tinguished from the other when the nose is firmly closed. No doubt also experience aids in detecting slight differ­ences of taste by suggesting to the mind what may be expected ; it is not easy, for instance, to distinguish the tastes of red and white wine when the eyes are blind­folded. Taste may be educated to a remarkable extent ; and careful observation—along with the practice of avoid­ing all substances having a very pronounced taste or having an irritating effect—enables tea-tasters and wine­tasters to detect slight differences of taste, more especially when combined with odour so as to produce flavour, which would be quite inappreciable to an ordinary palate. As to the action of electrical currents on taste, observers have arrived at uncertain results. So long ago as 1752 Sulzer stated that a constant current caused, more especially at the moments of opening and of closing the current, a sen­sation of acidity at the anode ( + pole) and of alkalinity at the katode ( - pole). This is in all probability due to electrolysis, the decomposition products exciting the taste­bodies. Grünhagen found that rapidly interrupted currents fail to excite the sense ; Von Vintschgau, who has directed much attention to the sense of taste, says that when the tip of his tongue is traversed by a current there is only a tactile sensation. Again Hönigschmied, on the contrary, found that a current excited the metallic or acid taste at the anode placed on the tip of the tongue, whilst the alka­line taste of the katode was absent. The writer of this article has found that this is the experience of most persons examined by him.

Disease of the tongue causing unnatural dryness may interfere with taste. Substances circulating in the blood may give rise to subjective sensations of taste. Thus santonine, morphia, and biliary products (as in jaundice) usually cause a bitter sensation, whilst the sufferer from diabetes is distressed by a persistent sweetish taste. The insane frequently have subjective tastes, which are real to the patient, and frequently cause much distress. In such cases, the sensation is excited by changes in the taste-centres of the brain. Increase in the sense of taste is called *hypergeusia,* diminution of it *hypogeusia,* and its entire loss *ageusia.* Hare cases occur where there is a subjective taste not associated with insanity nor with the circulation of any known sweetish matters in the blood, possibly caused by irritation of the gustatory nerves or by changes in the nerve centres.

As to the comparative anatomy of the tongue, see Owen’s *Com­parative Anatomy and Physiology of Vertebrates* (London, 1868). For a full account of the physiology of taste, see Von Vintschgau’s article “ Geschmackssinn,” in *Hermann's Handbuch der Physiologie,* vol. iii. part ii. (J. G. Μ. )

TATARS. See Tartars.

TATE, Nahum (1652-1715), poet-laureate, was born in 1652 in Dublin, and was educated at Trinity College there. He afterwards removed to London, and adopted literature as a profession, succeeding Shadwell as poet- laureate in 1692. He died within the precincts of the Mint, Southwark (whither he had taken refuge from his debtors), August 12, 1715.

His name is still remembered in connexion with the *New Version of the Psalms of David,* which, in conjunction with Nicholas Brady (*q.v.*)*,* he published in 1696 (see Hymns, vol. xii. p. 590). Tate was also the author of some ten dramatic pieces (see *Biogr. Dramatica,* i. 703) and a great number of poems, including one entitled *The Innocent Epicure, or The Art of Angling* (1697).

TATIAN, one of the earliest Christian apologists, whose personality and work had an important influence on the history of the church during the period of the Antonines. He was by birth an Assyrian (according to Zahn of Sem­itic descent), but received a Greek education, and, after acquiring a very extensive knowledge of Greek literature, began to travel about the Roman empire as a wandering teacher or “ sophist. ” But his inquiring disposition and his earnest spirit remained unsatisfied alike with the religions and the philosophies he encountered, while the doings of men, their greed for amusement and pleasure, their vanity and treachery, disgusted him. In this tem­per, about 150 a.d., he reached Rome, where the Old Testa­ment fell into his hands, and at the same time he came into closer relations with the Christians ; their firm faith, chaste morals, fearless courage, and close fellowship deeply impressed him, and in the end the spectacle of their life and their monotheistic doctrine founded upon prophetic revelation completely conquered him. Henceforward the whole unchristian world, with all its philosophy and culture, presented itself to him as mere darkness and the deception of demons, but the “ barbarian philosophy ” (for so he called Christianity) as the wisdom of God. He became a convert, and soon afterwards (152-153) wrote (most probably in Greece, where he stayed for some time) his *Oratio ad Græcos,* which gained him great repute