together with an admirably lucid volume of popular lectures on *Recent Advances in Physical Science.* With Lord Kelvin he collaborated in writing the well-known *Treatise on Natural Philosophy.* “ Thomson and Tait,” as it is familiarly called (“ T and Τ'” was the authors’ own formula), was planned soon after Lord Kelvin became acquainted with Tait, on the latter’s appointment to his professorship in Edinburgh, and it was intended to be an all-comprehensive treatise on physical science, the foundations being laid in kinematics and dynamics, and the structure completed with the properties of matter, heat, light, electricity and magnetism. But the literary partnership ceased in about eighteen years, when only the first portion of the plan had been completed, because each of the members felt he could work to better advantage separately than jointly. The friend­ship, however, endured for the twenty-three years which yet remained of Tait’s life.

Tait collaborated with Balfour Stewart in the *Unseen Universe,* which was followed by *Paradoxical Philosophy.* Among his articles may be mentioned those which he wrote for the ninth edition of this Encyclopaedia on Light, Mechanics, Quaternions, Radiation and Thermodynamics, besides the biographical notices of Hamilton and Clerk Maxwell. ■

**TAJIK,** or Parsiwan, a subject race of Afghanistan. Underlying the predominant Pathan elements in the country, the Tajik (Tajak, or Tausik) represents the original Persian possessor of the soil, who still speaks his mother tongue and therefore calls himself Parsiwan. There are pure Persians in Afghanistan, such as the Kizilbashes of Kabul and the Naoshirwanis of Kharan; but the name Tajik (= “ stranger ”) appears to be applied only to an admixture of original Arab and Persian stock, who are the slaves of the community—hewers of wood and drawers of water. Everywhere the Tajiks are the culti­vators in rural districts, and the shopkeepers and clerks in the towns. They are a fine, athletic people, generally fair in complexion, and assimilate in aspect, in dress, and much in manners to the Afghans, but they are never nomadic. The Tajik is as much the slave of the Pathan in Afghanistan as is the Hindki (whose origin is similar) in the plains of the Indus. Yet the Tajik population of the richly-cultivated districts north of Kabul proved themselves to be of good fighting material in the Afghan war of 1879-80, and the few Kizilbashes that are to be found in the Indian army are brave soldiers. The number of the Tajiks in Afghanistan is estimated at 900,000.

The name itself originally occurs in the Pahlavi writings, and is explained to mean, first, the Arabs in general, then their descendants born in Persia and elsewhere out of Arabia, and, lastly, the Persians in general and their descendants born in Turkestan and elsewhere out of Persia. Tajik thus came to be the collective name of all communities of Iranian stock and Persian speech wherever found in Central Asia. These are co-extensive with the former eastward and northward limits of the Persian empire; but, after the ascendancy of the Turki races, they became the subject element in Turkestan, Afghanistan, Bokhara, Khiva, Kashgaria, while still politically dominant in Badakshan, Wakhan, Darwaz, Kost and Karateghin. In most of these places the Tajiks, with the kindred Galchas, seem to form the bulk of the population, the distinction being that "Tajik ” is applied rather to the settled and more civilized low­landers of modern Persian speech, “ Galcha ” to the highlanders of Ferghana, Kohistan, Wakhan, &c., who speak either archaic forms of Persian or dialects intermediate between the Iranian and Sanskritic branches of the Indo-European linguistic family.·

But, although mainly of Iranian stock, with light complexion and regular features, the Tajiks claim Arab descent, regarding the district about Bagdad as their primeval home, and considering themselves the descendants of the Arabs who overran Central Asia in the first century of the Hejira. At the same time, “ it is evident that the inhabitants of the greater part of this region (Central Asia) must from an early period have come in contact with the successive waves of Turkish (Tûrki) and even Mongol population which broke over them ; accordingly we find that, although the type is essentially Iranian, it has undergone a certain modification ” (Capt. J. Μ. Trotter, *Bokhâra,* p. 169). The term Tajik must be distinguished from *Sarte,* the latter simply meaning“ trader ”or “ shopkeeper,” and being applied indiscriminately to the settled as opposed to the nomad element, and especially to the urban populations, of what­ever race, in Central Asia. The Tajiks are known as Tâts on the west side of the Caspian (Baku, Lenkoran, &c.).

**TAKHTSINGJI** (1858-1896), Maharaja of Bhaunagar, a Rajput chief of the Gohel clan, and the ruler of a state in

Kathiawar, was bom on the 6th of January 1858, and succeeded to the throne of Bhaunagar on the death of his father, Jaswant- singji, in 1870. During his minority, which ended in 1878, he was educated at the Rajkot college and afterwards under an English officer, while the administration of the state was con­ducted jointly by Mr. E. H. Percival, a member of the Indian Civil Service, and Azam Gowrishankar Yodeyshankar, C.S.I., one of the foremost native statesmen of India, who had served the state in various capacities since 1822. At the age of twenty Takhtsingji found himself the ruler of a territory nearly 3000 square miles in extent. His first public act was to sanction a railway connecting his territory with one of the main trunk lines, which was the first enterprise of its kind on the part of a raja in western, if not in all, India. The commerce and trade, and the economic and even social development of the state, which came in the wake of this railway, confirmed Takhtsingji in a policy of progressive administration, under which educational establishments, hospitals and dispensaries, trunk roads, bridges, handsome edifices and other public works grew apace. In 1886 he inaugurated a system of constitutional rule, by placing several departments in the hands of four members of a council of state under his own presidency. This innovation, which had the warm support of the governor of Bombay, Lord Reay, provoked a virulent attack upon the chief, who brought his defamers to trial in the High Court of Bombay. The punish­ment of the ringleaders broke up a system of blackmailing to which rajas used to be regularly exposed, and the public spirit of Takhtsingji in freeing his brother chiefs from this evil was widely acknowledged throughout India, as well as by the British authorities. In 1886 he was created G.C.S.I.; and five years later his hereditary title of thakore was raised to that of maharaja. In 1893 he took the occasion of the opening of the Imperial Institute by Queen Victoria to visit England in order to pay personal homage to the sovereign of the British Empire, on which occasion the University of Cambridge conferred on him the degree of LL.D. He died in 1896. (M.M.Bh.)

**TAKIN,** the Mishmi name of a remarkable hollow-horned ruminant *(Budorcas taxicolor),* the typical representative of which inhabits the Mishmi Hills, in the south-east corner of Tihet, immediately north of the Assam Valley, while a second form is found further east, in the Moupin district. The takin, which may be compared in size to a Kerry cow, is a clumsily built brute with yellowish-brown hair and curiously curved horns, which recall those of the South African white-tailed gnu. Its nearest relatives appear to be the serows of the outer Himalaya and the Malay countries, which are in many respects intermediate between goats and antelopes, but it is not improb­ably also related to the musk-ox *(q.v.).* As it lacks the thick woolly coat of the two Tibetan antelopes known as the chiru and the goa, there can be little doubt that it inhabits a country with a less severe climate than that of the Central Tibetan plateau, and it is probably a native of the more or less wooded districts of comparatively low elevation forming the outskirts of Tibet. It is remarkable for the shortness of the cannon- bones of the legs, in which it resembles the Rocky Mountain goat.

**TAKLA MAKAN,** the Central Asian desert which lies between the N. foot of the Kuen-lun ranges and the wide curve of the Tarim river on the W., N., and E. It appears to be naturally divisible into two parts by the river Khotan-darya, and the name applied to the western part between that river and the Yarkand-darya (Tarim) is the desert of Takla Makan proper, while the part between the Khotan-darya and the line of the lower Tarim and the Cherchen-darya is known as the desert of Cherchen. The former is occupied almost entirely by sand- dunes. Sand mountains range in altitude from 60 ft. up to as much as 300 ft. The only breaks in this “ sea of sand-waves ” are a few small patches of alluvial clay. Often two distinct systems of dunes can be distinguished; one system, consisting of the larger concatenations, stretches from E. to W., while the secondary or transverse dunes run from N. to S. or from N.E. to S.W. The steeper faces of the dunes and of the dune­accumulations are for the most part turned towards the S.,