

as early as 1600. A.D. Opinions differ as to what concentrations of vapour will make the air unsafe to breath. In California (U.S.A.) permissible limit is 0.15 mg/cu.m. India has not set up any such standard so far, as the problem is not considered serious enough—except in industrial plants using mercury, where adequate precautions are apparently observed.

The Food and Drug Administration (U.S.A.) confiscates all foods with more than 0.5 ppm methyl mercury, as undesirable for even a single meal. Sweden has set higher permissible level as 1 ppm for mercury in the total diet, with a recommendation that fish be eaten only once a week. The Swedish National Institute of Health has recommended a standard of 0.2 ppm with free fish consumption or 1ppm with effective restriction on fish consumption.

The U.S.A. and U.S.S.R. have tentatively adopted a standard of 5 ppb in drinking water. The standard appears very stringent for Indian conditions, but some other standard is definitely called for.

Japan has set a limit of 10 ppb for methyl mercury in industrial waste water. The Washington State Department of Ecology (U.S.A.) set a limit of 50 ppb in 1971. India has not set any standards in this regard, but a standard is urgently called for, particularly in view of the 1300-1400 tones of mercury being discharged into our environment annually by our chloralkali industry.

The problem of escaping mercury however, can be solved. Japan and the U.S.A. have already begun to operate mercury cell chloralkali plants without any mercury discharge into the waste water. In India, D.C.M. has introduced a 'diaphragm cell' which is both cheaper and pollu-

tion free. But even if all current sources of mercury pollution are stopped, the mercury already reached in the environment will remain a problem for a long time. Bacteria will continue to methylate this mercury and fishes will continue to concentrate it. Implementing adequate standards and safeguards at this stage will, however, substantially

reduce the risk in the most affected areas.

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Alicorn or the horn of the unicorn

MOST people are familiar with the unicorn, the mythical animal, traditionally resembling a small-statured horse which characteristically bore a single, straight and forward-pointing horn on the top of the head between the ears. Not all are aware though that this horn is called an 'alicorn'. For those who believe that the unicorn actually existed, Odell Shepard, author of a famous book on the subject, mentions that its original home was the Lost

Atlantis, and that it was destroyed by the floods that submerged the Atlantic continent.

In India there is a record that Goddess Durga was depicted as having a unicorn as her vehicle instead of the present lion. The imaginary animal seemed to have the body of the wild ass and the horn of the Indian rhinoceros. In China, a unicorn is considered as an animal coming from heaven as an omen of a beneficent reign, or the birth of



Fig. 1. Viriscapture of unicorns

a great man. Pictures of the unicorn are hung in the women's quarters of millions of Chinese houses in the hope that they may exert prenatal influence and induce the birth of great men. The Oriental unicorn is placed on a higher level as an object of reverence and embodiment of goodness and it exists for its own sake, and not merely for the advantages obtained from its horn. In the western world, on the other hand, the importance of the unicorn was primarily because of the much valued horn believed to have come from the animal. The alcorn is not smooth outside as it is covered with regularly spiralling shallow grooves and ridges which make it asymmetric. The following account relates to this handedness (left or right) of the alcorn. Sufficient evidence is now available that the so-called horn of the unicorn is nothing but the tusk of the arctic whale, the narwhal (*Monodon monoceros*). The peculiarity of this tusk lies in the fact that it is always shaped like a left-handed screw. Even when the animal in very exceptional cases possesses two tusks, strangely, both of them show similar left-handed gyre.

The legendary unicorn

The legend of the unicorn is ancient. It is referred to in the Bible at several places. It also appears in an ancient natural history book called the *Physiologus* written by Ctesias. It is mentioned in this book that the unicorn is a small but very fierce animal, agile with one sharp horn on his forehead and that no hunter is able to catch him by force. The unicorn was alleged to be a male. The famous virgin-capture story which Ctesias as well as many old authors cite is that men lead a virgin to the heart of a forest where the unicorn lives, and leave her there alone. When the unicorn sees her, it runs upto her, puts its head on her lap and later goes to sleep (Fig. 1). The hunters

who are watching from a distance advance silently, pounce on it and capture it. The belief in the existence of the unicorn by the people of the middle ages was created by the western traders, missionaries and others who travelled to the Orient. Odell Shepard gives a vivid analysis, how the rhinoceros of India and the Far East, and the oryx of Arabia and N. Africa went to the making of the image of the unicorn. For almost 800 years people of Europe and England held the horn which was believed to be that of the unicorn as an embodiment of majesty and a symbol of strength and power, strong enough to resist all evils such as diseases and poisons. Consequently, the horn became incredibly priceless. Shepard writes that in the 15th and 16th centuries, a unicorn horn was worth ten times its weight in gold. This fabulous value was mainly due to the rarity of the horn. At that time there were about a dozen famous horns kept in churches or monasteries or with the royalty. The most famous of the alcorns, as they were called, was the horn of St. Denis, near Paris, which was 2.10 m long and weighed 4.85 Kg.

It is described as smooth all over and marked by bands running from end to end as on a small shell. Though the spiral ridges have been smoothed away, the grain of the ivory may still be seen to run in clockwise spirals. Other famous alcorns are those which belonged to the Medicis, Pope Clement VII, Pope Julius III, Emperor Theodore Ivanovitch, the great 'Horn of Windsor' of Britain and a few others.

Importance of alcorn

The horn fetched fabulous prices even in the form of small pieces or powder as its prophylactic properties were believed to be miraculous. A true alcorn was considered an antidote against poison and pestilential fevers and also against bites of mad dogs and stings of scorpions. In mediaeval feasts, an officer of the household of a king or noble carried the alcorn about the table, and touched the food and drink before the royal meal began. For the ordinary man who could not afford the alcorn even in powder form, the water commonly called 'Eau de licorne' was available. It was the water in which the alcorn was

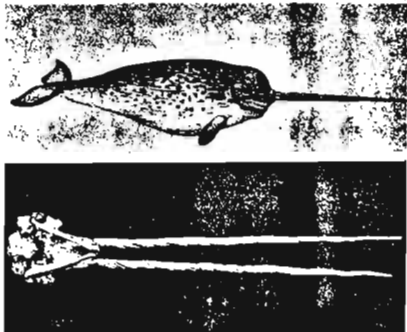


Fig. 2. (a) Narwhal bearing a single tusk (b) Rare skull of narwhal having two tusks, both twisting clockwise

dipped. Adulteration and faking of unicorn's horn was quite prevalent in those days and, one could say, human nature has been the same in every place and time. Faking was mostly done in the sale of the powdered horn and in the fragments. Horns of other animals, stone-chips and even stalactites were substituted.

The true "alicorn"

One lone voice that refuted the power of the alicorn was that of Andrea Marini of Venice who wrote in the 16th century in his book *Discorso* that the alicorn was no better than other horns and it could not remove or detect poisons, but his voice did not reach the masses to change the universal faith in the alicorn. At the end of the 16th century, Ambroise Pare, a physician in the court of Catherine de Medici showed the ineffectiveness of the alicorn by giving it to poisoned pigeons. In the 17th century, Boethius de Boodt, Caspar Bartholinus and Ole Worm asserted that the horn-stone (*lapis ceratites*) which are sometimes petrified wood, had the same medicinal properties as the alicorn. Ole Worm, an eminent zoologist of Denmark in his Latin dissertation in 1638 described the alicorn as the tusk of the sea animal narwhal, a small arctic whale. Worm proved his point by exhibiting the cranium of a narwhal with one huge

tooth at its side. As the traders in alicorn in those days were his countrymen and though exploring the truth about the horn meant cutting the income to his country, he held fast to his views. This scientific revelation did very little to shake the blind superstition about the alicorn. People simply argued that if there were a unicorn in the sea, there could be one on the land as well. The French Revolution swept off this blind belief. The lists of drugs issued by the English Royal Society of Physicians in which the alicorn found an important place had dropped only in the edition of 1746.

The adult male of these marine mammals is 3 to 5.5 m long and its single tusk of pure ivory which grows from the left side of its upper jaw is almost half the animal's body length, and always twisted left-handed (Fig. 2). In rare cases the narwhal develops another tusk on the right side whose grooves also show a left-handed twist. In females, usually both teeth are short. Like the horns and antlers of other animals, the tusks are connected with sexual selection. In the Hamburg museum one could see the oldest specimen of a narwhal, a pregnant female with two tusks, both approximately 2.1 m long (Fig. 2). The animal was said to have been brought there in 1684. The composition of the tusk of the narwhal is the same as that of the elephant tusk. But its universal left-handed gyre (even when two tusks develop in an animal), continues to puzzle scientists. A great English biologist, D'Arcy Wentworth Thompson, author of the classical *On Growth and Form*, gave the following explanation: The narwhal tusk grows continuously from a fleshy pulp in the jaw, and this pulp imparts the one-sided gyre to the tusk. The curious anomaly in this case is that when a narwhal has two

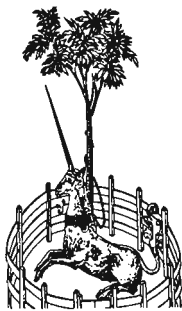


Fig. 4. The hunt of the unicorn tapestry at the Cloisters, the Metropolitan Museum of Art, New York

tusks, the twist of each is in the same direction. Thus, they are unlike all other paired spiral structures in the biological kingdom which always twist in opposite directions, e.g. twin horns of cattle, double human hair whorls, etc.

Unicorn—in emblems and art

On account of the value and the rare powers attributed to the unicorn, this imaginary animal has been honoured by depicting it in many Coat of Arms and emblems of governments, institutions and organisations, in tapestries, as well as in works of art. In the British Royal Coat of Arms, the central shield is being supported by the English lion and the Scottish unicorn (Fig. 3). The Scottish emblem has two unicorns. No significance seems to have been attached to the handedness of the gyre of the tusk. It is surprising that the unicorn in the two versions of the British Coat of Arms (printed on the same sheet of paper which was supplied to the author) has its tusk twisted clockwise in one and counter-clockwise in the other. Even in some famed tapestries, the carelessness regarding the gyre of the alicorn



Fig. 3. British Royal Coat of Arms

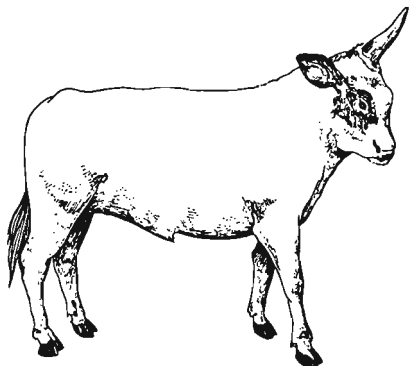


Fig. 5. Ayrshire bull sporting a single horn like the alicorn

continued to appear. As for example, of the series of six tapestries in the Cluny Museum in Paris, titled "The Lady with the Unicorn", in four (the Smell, the Touch, the Taste and the Desire), the horn is left-handed as the tusk in narwhal, and in the rest (the Sight and the Hearing), it is right-handed. 'The Hunt of the Unicorn' is another set of seven famous tapestries preserved at the Cloisters, The Metropolitan Museum of Art in New York. The unicorn appears in all but the first tapestry. In the second, fourth and the seventh (Fig. 4) tapestries, the horn of unicorn is depicted with right-handed grooves, and in the fifth tapestry the gyre is left-handed. In the sixth tapestry, the unicorn appears twice—as being killed, and as the dead animal being brought to the castle. Surprisingly, the alicorn gyre is shown differently in the same animal at the two stages. Such an error of inattention to detail nevertheless occurs even in scientific publications. As for example, in volume 12, page 1555 of *Wildlife Encyclopaedia*, a colour photograph depicts two nar-

whals. Unfortunately, by the carelessness of the block-maker and inaccurate proof-reading, the picture appears reversed, resulting in a serious factual error on the handedness of the narwhal's tusk.

The modern 'unicorn'

Franklin Dove at the University of Maine succeeded in creating an artificial 'unicorn' of an Ayrshire bull soon after its birth in 1933. When it grew up, this unique animal

was equipped with a single large horn growing out of its forehead (Fig. 5). This was the first time man has been successful in producing an animal resembling somewhat the legendary unicorn. Dove demonstrated that grafts of skin from the horn region, with or without the underlying bone, could give rise to horns in ectopic locations. He made it possible to produce extra horns by surgically subdividing horn buds and grafting the parts to separate regions of the head. Conversely, he fused the two horn buds together in the middle of the frontal bone so as to develop into a single horn—a man-made alicorn. Somewhat similar results with antlers were achieved by Zbigniew Jaszewski in Poland. By cutting off the growing tips of antler buds in fallow deer and red deer, and transplanting them to the middle of the head between the eyes, he was able to create deer bearing three antlers each. The third antler also had the annual cycle of shedding and regeneration as the normal ones.

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Thymus plays a vital role in our body

OUR body has some important endocrine glands which secrete organic substances called hormones. These glands via their secretory products play a vital role in regulating the metabolic activity of our body. Thymus is one such important gland but it differs from other endocrine

glands in that it develops and functions in our body only from birth to puberty. In the later stage, thymus completely atrophies and ceases to function, whereas other endocrine glands continue to function from birth till death. A few years ago our knowledge of the function