

munication could, and almost certainly did, take place in the following way.

The crest of the spur of the Ust Urt plateau, which formed the southerly limit of the now desiccated gulf Abougir, is about fifty feet above the present level of Lake Aral. Once filled up to that level, if the lake continued to receive more water than was evaporated from its surface, *i.e.* more than 3,400 cubic yards per second, an overflow would take place into the country now traversed by the channel called Uzboy, which has a gentle slope to the south of less than four inches per mile.* It is probable that the lands stretching from Uzboy westwards to the foot of the elevations encircling Karaboogas would have been flooded. Perhaps at this high level Aral may have discharged at its extreme north-western point also, and have flooded the country stretching round the northern foot of Ust Urt. On the north, it may have topped the low transverse ridge which now divides the northern and southern drainage. And if, in addition, the level of the Caspian was at that time some few feet higher than it now is, its waterspread would have advanced to meet the overflow from Aral, and Ust Urt and its narrow southern spurs, which run along the east shore of the Caspian, would have been isolated among marshes and shallow water. The classical geographers would thus have had ample grounds for the description they have handed down to us of the Sea of Hyrcania, as well as good reason for giving but a single name to the waterspread of the sea, since the separation of its basin from that of Aral would have become evident only after the fall of the level of this lake.

Until the separation became evident, this Aralo-Caspian Sea would have presented all those aspects which history tells us it has had. As the level gradually fell in Lake Aral, the inundated ground would become dryer; and in the first century of our era, as reported by the Chinese, the banks of the "Western Sea" would have been surrounded with great marshes. It may be doubted whether the Palus Oxiana of Ptolemy and the Oxian Marsh mentioned by Ammianus Marcellinus should be placed in this locality; but there is more probability that the Sinus Scythicus of Mela is identical with Lake Aral and its former southern marshy appendage, of which Uzboy is the axis.

The waterspread of such an Aralo-Caspian Sea would have added an area of about 70,000 square miles to the limits of the Caspian of to-day; and the evaporation from such a surface would have absorbed a supply from the rivers then feeding Lake Aral of about 7,000 cubic yards per second; in other words, a volume of water three-and-a-half times greater than that discharged by the mouths of the Amú and the Syr together at the present time.

If it be considered that at this epoch the greater, if not indeed the entire volume of the Oxus passed directly westwards into the Caspian, the difficulty is somewhat increased in finding an answer to the important question, where the large volume of water mentioned came from?

However, it is very probable that the Tchuy and the Sary Su discharged at that time into Lake Aral, instead of losing themselves, as they now do, in the sand. The Kenderlik of the great Russian chart, as well as the Demous, the Baskatis, and the Araxetes of the classics, together no doubt with many other minor streams, have disappeared in these countries, though their waters formerly would have fed Aral. Their disappearance seems to have been contemporaneous with the desiccation of the Oxus branch of the Caspian, at an epoch when those irruptions of Mongol hordes from the north-east were taking place, which swept away early Central Asian civilisation, and which subsequently caused the destruction of the Greco-Bactrian Monarchy. Whether this ruin of ancient social culture was accompanied by the destruc-

tion and wreck of a system of hydraulic works which were necessary for the cultivation of the soil, is a question whose answer possibly bears very nearly on the causes of the desolation which Nature now wears in the countries of Western Turkestan.

HERBERT WOOD

THE COMMONS EXPERIMENTS ON ANIMALS BILL

THE Bill for the prevention of cruelty in experiments on animals, made for the purpose of scientific discovery, prepared and brought forward by Mr. Lyon Playfair, Mr. Spencer Walpole, and Mr. Evelyn Ashley, is of a very different character from that introduced by Lord Hartismere in the House of Lords and commented on in our last issue (*NATURE*, vol. xii. p. 21). In it no legislative interference is proposed in the case of operations performed for scientific purposes under the influence of anæsthetics, provided that the insensibility is continued throughout the experiment; immediately after which the animal is to be killed if it has been in any way seriously injured. In the case of operations performed on animals in which it is impossible to employ anæsthetics, it is proposed that those who wish to conduct them shall be required to obtain a license authorising their undertaking them, to obtain which from the Secretary of State a certificate must be produced signed by one at least of the following persons, *viz.*: the President of the Royal Society, or the Presidents of the Royal Colleges of Physicians or Surgeons of London, Edinburgh, or Dublin; and also by a Professor of Physiology, Medicine, or Anatomy in Great Britain. In the case of the applicant being himself one of the just-named professors, or an authorised lecturer on the same subjects, such a certificate is not to be required, but in its place his application would have to be signed by the registrar, president, principal, or secretary of the university or college with which he is connected. The license requires renewal each five years, except in the case of professors, with whom it lasts during their tenure of office. It extends to any person assisting the holder of the license, provided that the person assisting acts in the presence and under the direction of the holder of the license.

The penalty proposed for any contravention of the Act is a fine not exceeding fifty pounds, or imprisonment for a term not exceeding three months.

The whole tenour of this Bill is so much in accordance with our own feelings that we can say nothing against it. Physiological operations on the lower animals, when conducted under the full influence of anæsthetics, cannot shock the most sensitive-minded; and supposing the Bill passes, it will be in the power of all to see that nothing of a painful nature is undertaken. No definition of what is meant by pain is given, it is true; and the only improvement we can suggest is that one be added which prevents the employment of curare as an anæsthetic until its pain-killing power is demonstrated.

BALLOONING AND SCIENCE

THE number of aeronautical ascents in France has been greatly increased since the *Zenith* catastrophe attracted public notice to aerial questions. On Sunday, the 9th of May, not less than three different balloons went up in different places.

These ascents took place at Ivry, close to Paris, at 5.30, at Nantes at 5.40, and at Algiers at 3.45. In the three cases the balloonists experienced a change in the direction of the wind, varying greatly with altitude. The general direction of the Nantes balloon was south-east. The Paris balloon had a less velocity with a greater number of circuits, having ultimately run a distance of ten miles in two hours. The greatest velocity of the air was in close vicinity to the earth; this is an indication of a special current probably pro-

* See *NATURE*, vol. xi. p. 231.