



Fig. 1. Distribution of introduced deer in New Zealand and location of poison trials, 1957-61 (modified from Wodzicki, 1961)

Following these trials, three poison trials using 1080 in 1,100 kgm. of chopped raw carrot at a rate of 0.23 kgm. per 227-455 kgm. of bait were carried out. For effective distribution the bait was dropped by plane over the clearings. The total number of deer found dead was 247, representing kills of 60-90 per cent of the deer on the clearings at the time. None of the deer was found more than 280 m. from the poison line. The amount of bait in the rumen varied from a trace to more than 1.80 kgm. In the second poison trial, in which 70 deer were killed, the mean amount of bait eaten by the bucks was 1 kgm. and for the does only 0.5 kgm. Bleeding at the nostrils occurred in 33 per cent of the bucks and 10 per cent of the does. This difference is significant at the 2½ per cent level of probability. Taking the lethal dose for deer to be similar to that for sheep, 0.45 mgm. per 1 kgm. of body-weight, and the average weight for this species as 45-55 kgm., the amount of 1080 for a lethal dose would be 20-25 mgm. At the dosage used this amount would be contained in about 40 gm. of bait¹⁹. Some of the deer had consumed more than 30 lethal doses, causing severe bleeding at the nostrils and death within 2-3 hr. without convulsions. An examination of heart, liver and muscle tissue was made, and it was concluded that secondary poisoning from human consumption of deer meat poisoned with 1080 at the level used

could not occur¹⁹. Other mammals poisoned in the trials included several red deer, rabbits, hares and opossums. No native birds were found dead.

These trials were followed by similar ones in the North Island on red and Japanese deer. Those on red deer¹⁸ were held on the eastern boundary of Kaingaroa planted pine forest (Fig. 1). Poisoned carrots were distributed from a truck along several miles of road with scrub on one side and ponderosa pines on the other. A total of 61 red deer were poisoned in 6 trials. Success varied from 0 to 75 per cent in the trials. Disturbance by shooters and abundant spring growth lowered the expected kill. The trials on Japanese deer²⁰ were held along grassy river terraces and in the adjacent *Nothofagus* forest about 940 m. up on the central plateau of North Island (Fig. 1); 192 deer were poisoned on the grassy clearings and 42 in the forest. Probably many more were poisoned but not found. These represent about 80 per cent of the deer feeding on the areas at the time. This was the first indication that deer could be poisoned in indigenous forest.

From these trials considerable experience has been gained in handling and distributing large quantities of poisoned bait by plane. The knowledge that concentrations of deer on grassy clearings can be effectively and economically reduced is valuable. Further trials will have to be undertaken on goats, opossums and deer to determine whether a root bait or a pollard bait is the most effective for the different seasons in various localities. Also, knowledge of movements and concentrations of deer when attained will be of immense help in poisoning operations against deer in densely forested country. The question as to whether deer, goats, pigs and opossums can be effectively controlled by these methods, in many hundreds of square miles of mountainous and forested country, remains the problem of the future.

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OBITUARIES

Colonel P. A. Clayton

COLONEL PATRICK ANDREW CLAYTON died on March 17 at the age of sixty-five. He was educated at University College School and went on to the University of London. But, in 1915, his studies were interrupted by the First World War and, with the Royal Field Artillery, he saw service in Greece and Turkey. On demobilization, he joined the Survey of

Egypt and his next few years were spent mapping the plateau of El-Tih in Central Sinai, which, rather unexpectedly, was found to attain a height of more than 5,000 ft. In 1927, he became surveyor to a Boundary Commission on the Egypto-Italian frontier and demarcated it by a line of 187 cairns (replaced in 1938 by concrete pillars) running south for 200 miles from the Mediterranean deep into the Sand Sea.

Later in that year he was associated in the contouring of the great Qattara Depression which his colleague G. F. Walpole had just shown to lie below sea-level and so to be a potential source of hydro-electric power. Next, Egypt's southern frontier claimed his attention and, in 1930-31, he extended the Nile Valley triangulation net for 350 miles to the extreme south-west corner of Egypt at 'Uweinat, observing 143 stations in 171 days. At 'Uweinat, he found and repaired a car which Major Bagnold's private expedition had abandoned and filled it with starving refugees, mostly women and children, who had already covered 200 waterless miles in a panic-stricken flight from the Italian bombing of Kufra Oasis. For their rescue King Fuad rewarded him with a gold medal *pour actes méritoires*. Among these activities Clayton found time for a bold reconnaissance of the west side of the Gifl Kebir, a great sandstone plateau the east side of which had first been sighted by Prince Kamal el-Din in 1926. A cave with rock paintings was found and, from the Sheb-Tarfawi area 100-150 miles west of Wadi Halfa, he brought back numerous querns, hand-axes and pottery sherds of neolithic and protodynastic age.

In 1932, Clayton took leave to accompany a private ground and air reconnaissance of the Gifl Kebir. His companions were the Hungarian Count Almasy, Sir Robert Clayton East Clayton (no relation) and Squadron-Leader Penderel. From the air various wadis were seen to dissect the plateau, and Almasy at once proclaimed that they had found "the lost oasis of Zarzura". In 1933, back with the Survey, Clayton set out from 'Ain Dalla and not only succeeded in reaching one of these wadis, Wadi 'Abd el-Malik, on the ground, but also actually made his way through the whole Sand Sea to Kufra. This passage was to prove of inestimable value to the Long Range Desert Group in the War to come.

That same year Orde Wingate had set out from Dakhla Oasis with a camel caravan to find Zarzura. After days of battling through a monotonous landscape of sand he at last sighted something dark on the western horizon which mirage exaggerated to a row of palms. But, as he got nearer, it dwindled again until it became a model *T* car, one of Clayton's, perched on a dune. There was a camp beyond but the mercurial Wingate never saw this. Instead, he turned straight back and made for Dakhla. His tracks, however, gave him away and that night the pursuing Clayton overtook him and made friends.

On the same expedition, scattered in the troughs of the Sand Sea, near the western frontier, Clayton picked up many tektites, weathered lumps of silica glass. This excited so much interest that a second trip was made to the site in company with Dr. L. J. Spencer and Dr. O. H. Little, the head of the Egyptian Geological Survey. Many museum specimens were brought in, some of which had been fashioned by Acheulean man into beautiful transparent hand-axes.

Italy's attack on Ethiopia in 1936 sounded a warning note, and both Clayton and Walpole were sent to commence what was to end up as a comprehensive survey of the 50,000 square miles of desert over which the Eighth Army and the Afrika Corps were to meet in battle. That, however, was accomplished by other hands. 'Egyptianization' overtook both Clayton and Walpole and they left the Survey in 1938—Clayton to join the Survey Department of Tanganyika.

In 1940 he was recalled from this to join Bagnold's Long Range Desert Group and was soon in his beloved Libyan Desert again, thrusting through the gap

discovered in 1933 to raid the Italian communications between Jalo and Kufra. In January 1941, in command of *G* and *T* patrols of the Long Range Desert Group, he made contact with a small Free French force under Col. d'Ornano. On January 11 they raided the oasis of Murzuk, 1,100 miles from their base in Cairo. Three aircraft were destroyed on the ground; but two of the raiders were killed, one of them d'Ornano. A bloodless victory was scored next day at Traghen; but other posts proved too strong and had to be left alone. On January 31, Clayton with *T* patrol met a slightly stronger Italian motorized party at Gebel Sherif, 60 miles south of Kufra. The intervention of three Italian aircraft turned the tide of battle, and three of his cars were set on fire. Clayton with two men were wounded and taken prisoner.

While a prisoner in Italy Clayton learnt of his promotion to Lieut.-Colonel with the award of a D.S.O. The Royal Geographical Society also honoured him with its Founder's Medal in 1941 "for surveys in the Libyan Desert and his application of this experience to desert warfare".

With the Italian collapse in 1943 Clayton escaped but was soon retaken. He spent the rest of the War in a German Stalag where his great skill as a draughtsman made him popular as a forger of passes for would-be escapers. After the War he was employed by the War Office in their Hirings Department, first as a serving officer and, after his retirement in 1953, as a civilian. He died on the day of his namesake, St. Patrick, March 17. His widow and a son survive him.

G. W. MURRAY

Mr. C. L. Hinton

CYRIL LANGLEY HINTON, formerly superintendent of research of the British Food Manufacturing Industries Research Association, died on March 15, at the age of seventy. He had retired from the Association's staff at the end of 1958 after nearly thirty-nine years of service.

Hinton was one of the three original members of the staff, the other two being the director, T. Macara, and L. E. Campbell. At that time the Association was connected primarily with the confectionery and jam trades, and his work on variations in the melting point of cocoa-butter, on the manufacture of fondant, and on the composition of fruits and jams will be long remembered. He became an authority on sugar analysis and was the author of the Department of Scientific and Industrial Research Food Investigation Special Report No. 48 on pectin and of a paper on the polyuronides in the *Annual Review of Biochemistry*, 1951. At various times he was chairman of the Technical Commission of the International Association of Confectionery Manufacturers, and therefore largely responsible for the work leading up to the publication of *Methods of Analysis* by that body. For many years he was a member of the Society for Analytical Chemistry's Sub-Committee for the determination of metallic impurities. He had a flair for foreign languages and became an acknowledged authority on international food legislation.

In his retirement C. L. Hinton found much to occupy his time and was author of the first number in Food and Agriculture Organization Food Additive Control Series *Food Additives Control in the United Kingdom*. He was up to the time of his death engaged on another work for the Food and Agriculture Organization on the utilization of sugar.