= Hugh B. Cott =

Hugh Bamford Cott , (6 July 1900 ? 18 April 1987) , was a British zoologist , an authority on both natural and military camouflage , and a scientific illustrator and photographer . Many of his field studies took place in Africa , where he was especially interested in the Nile crocodile , the evolution of pattern and colour in animals . During the Second World War , Cott worked as a camouflage expert for the British Army and helped to influence War Office policy on camouflage . His book Adaptive Coloration in Animals (1940) , popular among serving soldiers , was the major textbook on camouflage in zoology of the twentieth century . After the war , he became a Fellow of Selwyn College , Cambridge . As a Fellow of the Zoological Society of London , he undertook expeditions to Africa and the Amazon to collect specimens , mainly reptiles and amphibians .

= = Life and career = =

Cott was born in Ashby Magna , Leicestershire , England , on 6 July 1900 ; his father was the rector there . He was schooled at Rugby . In 1919 , he graduated from the Royal Military College , Sandhurst , and was commissioned into the Leicestershire Regiment . Between 1922 and 1925 , he studied at Selwyn College , Cambridge .

He had intended to become a priest , and went to Cambridge to read theology , but after his first year he went on the university expedition to South America , where he studied natural forms in eastern Brazil in 1923 , led by the entomologist Frank Balfour Browne , where he became fascinated by natural history , and changed his studies to zoology on his return . He then went on an expedition to the lower Amazon (1925 ? 1926) , and on research trips to the Zambesi river area in Africa (1927) , including Mozambique , Zambia and East Africa , and Lanzarote (1930) . He married Joyce Radford in 1928 . He was a lecturer in Zoology at Bristol University from 1928 until 1932 , when he moved to Glasgow University . He studied under another advocate of military camouflage , John Graham Kerr . His thesis , which he completed in 1935 under a Carnegie Fellowship , was on ' adaptive coloration ' ? both camouflage and warning coloration ? in the Anura (frogs) . In 1938 he was made a Doctor of Science at Glasgow , and he became a Zoology lecturer at Cambridge University and Strickland Curator of Birds at the university 's Museum of Zoology .

Cott served in the Leicestershire Regiment of the British Army as a camouflage expert from 1919 ? 1922 , and , during the Second World War , with the Royal Engineers as a camouflage instructor from 1939 ? 1945 . Cott was chief instructor at the Camouflage Development and Training Camp at Helwan , Egypt , under filmmaker Geoffrey Barkas from its inception in November 1941 .

After the war , Cott returned to Cambridge , becoming a Fellow of Selwyn College in 1945 ; he worked there until he retired in 1967 . He gave the Fison Memorial Lecture of 1958 on ' Protective Coloration in Animals ' . He continued to work from time to time after his retirement , for instance conducting a survey of crocodile nests on the Victoria Nile for the Uganda National Parks in 1972 . He died at the age of 86 on 18 April 1987 .

= = Camouflage = =

While trying to photograph a hen partridge on her nest , Cott waited for hours for the bird to return , finally taking some pictures of the empty nest before giving up . On developing the photographs , he realized the bird had been there all along , perfectly camouflaged .

As a camouflage expert during the Second World War , Cott likened the functions of military camouflage to those of protective coloration in nature . The three main categories of coloration in his book Adaptive Coloration in Animals are concealment , disguise , and advertisement . He studied , described and presented examples of such diverse camouflage effects as obliterative shading , disruption , differential blending , high contrast , coincident disruption , concealment of the eye , contour obliteration , shadow elimination , and mimicry . In his wartime lectures at Farnham Castle , he described nine categories of visual deception :

merging , e.g. hare , polar bear

disruption , e.g. ringed plover
disguise , e.g. stick insect
mis @-@ direction , e.g. butterfly and fish eyespots
dazzle , e.g. some grasshoppers
decoy , e.g. angler fish
smokescreen , e.g. cuttlefish
the dummy , e.g. flies , ants
false display of strength , e.g. toads , lizards

Cott 's account of all this (illustrated by his own pen and ink drawings) is the 550 @-@ page book Adaptive Coloration in Animals (1940) . It was proof @-@ read by Kerr , who commented on its publication ' It is by far the finest thing of the kind in existence ' . His co @-@ workers ' first @-@ hand accounts of his work in military camouflage can be found in the memoirs of two of his fellow camoufleurs : Julian Trevelyan and Roland Penrose .

Peter Forbes wrote of Cott 's book :

Cott 's Adaptive Coloration in Animals must be the only compendious zoology tract ever to be packed in a soldier 's kitbag . The book also marks the apotheosis of the descriptive natural history phase of mimicry studies . Although Cott does report experiments on predation to test the efficacy of mimicry and camouflage , the book is essentially a narrative of examples plus theory .

The book was written as war loomed , and published in wartime . Cott makes use of his knowledge of natural history to draw parallels between survival in nature and in war , and to advise on military camouflage , for example commenting :

Various recent attempts to camouflage tanks , armoured cars , and the roofs of buildings with paint reveal an almost complete failure by those responsible to grasp the essential factor in the disguise of surface continuity and contour ? in nature vigorous disruptive contrasts are frequently seen at work , and their wonderful effectiveness in hindering recognition needs to be experienced in the field to be fully appreciated .

Forbes notes that Adaptive Coloration in Animals is a narrative , short on the experimentation that followed after the war , but Forbes continues :

But Cott 's book is still valuable today for its enormous range , for its passionate exposition of the theories of mimicry and camouflage .

Cott attempted to persuade the British army to use more effective camouflage techniques , including countershading . For example , in August 1940 , with the Battle of Britain imminent , he painted two rail @-@ mounted coastal guns , one in conventional style , one countershaded . In aerial photographs , the countershaded gun is essentially invisible . Cott was triumphant , announcing :

These photographs furnish most convincing proof of the effectiveness of countershading , and are especially valuable in that we have in them a direct comparison between the two methods .

However (like Kerr before him in the First World War) , Cott did not succeed in influencing policy on camouflage , and he resigned from the Camouflage Advisory Panel in 1940 .

= = Artwork = =

Cott was a founding member of the Society of Wildlife Artists , and a fellow of the Royal Photographic Society . From material gathered in field expeditions , he made contributions to the Cambridge University zoological museum .

Cott possessed considerable artistic skill . Like Abbott Thayer , he used his artistry in his scientific work , including in Adaptive Coloration in Animals , to help argue the case he was making . For example , his black @-@ and @-@ white potoo shows this rainforest bird sitting motionless on a mottled tree trunk , its behaviour and disruptive pattern combining to provide effective camouflage . The philosopher and jazz musician David Rothenberg wrote of Cott 's art :

Back to Hugh Cott 's marvelous engraving of a potoo hidden in a black and white Costa Rican forest , frozen vertically like the tree trunk on which it hides . In nature the visible and invisible dance back and forth with each other , depending on how much we have learned to see . The science and

art of this magic merge into one at the moment we grasp it .

= = Legacy = =

The journalist and author Peter Forbes praised Cott 's balance of science and artistry :
.. in the conflict between artists and biologists , he was both . Cott was a competent illustrator as well as a biologist . Without having Nabokov 's precisianism and anti @-@ Darwinism , he brought an artistic sensibility to bear on these phenomena . His text is radiant with the wonder of these adaptations .
Over 60 years after its publication , Adaptive Coloration in Animals remains a core reference on the subject ; the Evolutionary biologists Graeme Ruxton , Thomas Sherratt and Michael Speed conclude their book on animal coloration by writing
The study of animal coloration and associated anti @-@ predator adaptations has a long history ... this field of research has been blessed from the earliest years with the insights of particularly gifted scientists . The writings of Wallace , Bates , Müller , Poulton and Cott truly stand up to the test of time : these individuals deserve even better renown not just as great natural historians but as exceptional scientists too .
The biologist Steven Vogel commented that
The zoologist Hugh Cott had the final word in Adaptive Coloration in Animals (1940) , a definitive synthesis of everything known about camouflage and mimicry in nature . Cott ruffled fewer feathers [than Trofim Lysenko or Vladimir Nabokov] , and his well @-@ organized and unfanatic ideas proved militarily effective , even under the scrutiny of improved techniques for target detection . Thayer ? s principles reemerged in more temperate and rational terms , and camouflage schemes based on them survived both photometric analyses and enemy encounters . Biomimetic camouflage took its place as yet another technique in a sophisticated armamentarium of visual deceptions .

= = Writings = =

In addition to Adaptive Coloration in Animals , Cott wrote two essays on camouflage : ? Camouflage in nature and in war ? in the Royal Engineers Journal (December 1938) , pp501 ? 517 ; and ? Animal form in relation to appearance ? in Lancelot Law Whyte , ed . Aspects of form : a symposium on form in nature and art (London : Percy Lund Humphries , 1951) . As a scientific illustrator and photographer , he also wrote three other books : Zoological photography in practice (1956) ; Uganda in black and white (1959) ; and Looking at animals : a zoologist in Africa (1975) . He became interested in the relationship of bird colours with their role as warning colours , an idea that arose when he observed hornets attracted to some birds being skinned while ignoring others . This led him to study the palatability of birds and their eggs . Among his papers were several studies on the relative palatibility of the eggs based initially on the preferences of ferrets , rats and hedgehogs and later on the use of a panel of expert egg tasters . In one study he found that of 123 species of bird , the kittiwake eggs scored highly with 8 @.@ 2 out of 10 .

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