

## RESEARCH ITEMS

## Roman Policy in Northern Britain

THE extent to which recent archaeological excavation demonstrates the development of policy in Roman Britain and the underlying causes, upon which recorded history is supplemented, is indicated by I. A. Richmond in *Antiquity* of September 1940. The political character of northern Britain in the period is determined by two closely related factors—forest and fell—which gave cover to enemies and prevented the growth of flourishing agricultural communities capable of developing social instincts receptive of civilization. From A.D. 43–69 the Romans depended upon alliance with the independent Brigantes centring in West Yorkshire. The problem of controlling the north did not arise until the alliance was broken by the Brigantes themselves. York was then occupied, permanent advance posts established, and Rome committed to the policy of Highland conquest which culminated in the conquest by Agricola of the country south of the Caledonian Highlands and the building up of an elaborate network of roads and a system of forts manned by auxiliaries acting as a police force. The reduction in the legionary forces weakened this system until A.D. 122 when the frontier was withdrawn and Hadrian's Wall was built, at first in turf and then in stone. This produced, however, a stalemate which led to a reversion to the policy of annexing southern Scotland. A turf wall was built by Antoninus between Forth and Clyde, with outposts beyond, controlling routes to the Highlands. The resulting tranquillity allowed the growth of prosperity and orderly life among the Brigantes. At the close of the second century Roman imperial politics drained Britain of troops. This led to tribal incursions from Caledonia and disasters lasting for ten years until order was restored by Severus in a peace which endured for a hundred years, and brought with it a change in outlook. Local recruitment for the auxiliaries converted them from a dominating to a territorial force, while the border tribes became Roman protectorates. The tribe was merging into the nation. The final stage came when the Picts broke through the Wall; and after their devastations had been checked, Rome delegated the north to a strong local administration in which the Brigantes enjoyed an Indian summer of prosperity, and communal instincts were fostered by a steady inculcation of responsibility.

## Pre-Portuguese Bronze Castings from Benin

At the time of the conquest of Benin and for some time after, it was assumed that the Beni had learned their bronze casting from the Portuguese. This is not justified by a comparison with contemporary Portuguese technique. From about A.D. 1150 until A.D. 1280 all bronze and brass work at the court of Benin was made at Ife, but eventually Oba Oguolu sent to Ife for a worker to establish bronze and brass work in his country. Ighe-igha was selected to go to Benin. Not only was he a great artist but he was also a great teacher; and at his death he was deified and to this day he is worshipped by the brass smiths at Idunmwu Igun Eroumwo, the quarter of the royal brass founders. Three examples of early

bronze casting have been described by Eva L. R. Meyerowitz (*Man* of September 1940). They are in the possession of the Oba of Benin and were excavated in recent years when additions were being made to the royal palace which stands on the ancient cemetery. Of these the first is a badge of office of a priest of Olokun. These badges in older days were housed in a shrine dedicated to the god Olokun in Benin and carried by the priests on ceremonial occasions. The badge is a large bronze casting in semi-circular shape showing Olokun, god of the waters, supported by two attendants, a characteristic theme in Benin art. The Obas identified themselves with Olokun, but their representations are to be distinguished from those of the god by the fact that their feet are human while the limbs of the deity usually branch out into catfish. For stylistic and other reasons this specimen is assigned in date to A.D. 1350–1450. The second example is a badge of the Shango priests, a large bronze casting of semi-circular shape with a ram's head. It probably belongs to the same period. The third casting is a triple dagger surmounted by three heads, representing Olokun on the left, Elusu with a fish body in the middle and Olokun's second wife on the right. Elusu, a sea-goddess, is mainly worshipped at the coast around Lagos, and it may be that this dagger did not originate in Benin.

## Antihormones

THE term hormone is widely known to the layman as is the fact that these substances can be used in the treatment of certain disturbances of the endocrine system, but what is not so generally realized is that animals can also produce neutralizing substances to which the name antihormones has been applied. J. B. Collip, H. Selye and D. L. Thomson have furnished a very useful survey of what is known of these substances (*Biol. Rev.*, 1940), particularly the antigonadotrophic and antithyrotrophic hormones, since these have been the subjects of the most intensive researches. The authors emphasize that it has been definitely established that "pretreatment with certain hormones will cause the appearance in the blood of principles antagonistic to these hormones". The presence of neither the primary organ itself, that is, the gonad or the thyroid gland nor of the hypophysis is necessary to the production of these substances. Whether they are antihormones or antibodies as some authorities claim is difficult to determine, and in any event is perhaps largely a question of definition, but they are definitely specific in their action. In addition to the main antihormones of these two groups which are fully dealt with, the possible existence of a number of others is considered.

## A New Bird from Virginia and its Fate

THE first new species of bird to be discovered in the continental United States in twenty-one years has just been found in West Virginia by Karl W. Haller, according to the Smithsonian Institution news service. The new species, *Dendroica potomac*, resembles the yellow-throated warbler in colouring, but its song is like that of the parula warbler. It is

odd that a fairly conspicuous bird, not particularly shy in its habits or habitats, should have remained unrecognized for many generations, but it may have escaped notice because of its resemblance to other warblers. There is the other possibility that this new species may be that rarely observed new creation, a fertile cross between two species. The species is founded on two specimens. Mr. Haller was attracted first by the song of a male bird, which he shot. "The real significance of the find came when another bird was shot . . . a female almost identical with the male, and unquestionably fertile. She would soon have laid eggs if not collected." So for all we know, possibly one of Nature's rare achievements, a fertile cross, may have been exterminated even before it was described. But at any rate it is represented by a name in scientific nomenclature, a description, and two skins in a museum.

#### Reactions of Miracidia of Sheep Liver-fluke

IN the course of experiments testing some reactions of the ova and miracidia of *Fasciola hepatica*, Henry J. Griffiths exposed many representatives of eleven species of Canadian molluscs to miracidia (*Canadian J. Research*, 17, 205; 1939). Individual molluscs were exposed and kept under observation during exposure, being killed later and examined for stages of the parasite. These examinations as well as attempted mass infections in 25 tanks of snails yielded no evidence that any of the species harboured the liver-fluke. Yet on exposure to miracidia all the species were attacked, those belonging to non-Lymnæa groups almost as readily as the Lymnæa types themselves; but the parasite, which attached itself to any exposed portion and might remain attached for 10 minutes endeavouring to penetrate the host's tissue, ultimately dropped off. Although the attacks were deliberate in many cases, in others they were accidental, and miracidia were often seen swimming close to the snails, and even to a known vector *Gyraulus ferruginea*, without showing any sign of attraction or of attempt at attachment. This is in agreement with the conclusions of Mathes, that although miracidia avoid hard bodies such as stones, they show no sign of chemotaxis in finding the intermediate host.

#### The Eriophyidæ or 'Gall-Mites'

DR. KEIFER'S "Eriophyid Studies" (Pts. 1-9; *Bull. Dept. Agric.*, Sacramento, Calif., U.S.A., 1938-1940) constitute one of the most important contributions to this subject published, even surpassing those of the great Viennese zoologist, Dr. Alfred Nalepa. He describes numerous new genera and more than one hundred new species. Those who may have overlooked these valuable and very well illustrated papers, containing 139 plates of more than 1,000 figures, will be pleased to learn that Dr. Keifer proposes at a later date to republish these "Studies" as an "organized whole". Dr. Keifer regards the term 'gall-mites' "a misnomer for the group, as less than 10% of the species cause plant deformations".

#### Cytological Studies of Salix Hybrids

A. HÅKANSSON (*Hereditas*, 24, 1-31; 1940) has published the results of his cytological studies of hybrids between species of *Salix* which were made by Heribert-Nilsson. Among the hybrids were two which arose from crossing eight different species of *Salix* together. These two shrubs were tetraploid and had

a regular meiosis. Some other hybrids involving several diploid species were diploid and showed a regular meiosis. In the  $F_2$  of the cross *S. viminalis* × *S. caprea*, both of which are diploid, there was a shrub with a similar morphology and cytology to the tetraploid species *S. cinerea*. Even the cross *S. viminalis* × *S. phylicifolia*, a cross between a hexaploid and a diploid species, produced a tetraploid plant which had a regular meiosis.

#### Structure and Formation of Antibodies

A PAPER propounding a theory of the structure and process of formation of antibodies was read by Linus Pauling before the annual meeting of the U.S. Academy of Sciences held during April 22-23. This is based on structural information about simpler molecules, and is considerably more detailed than any earlier theory. The theory accounts for many facts, such as the observed antibody-antigen ratios in precipitates, the inhomogeneity of antibodies to a given antigen, and the independence of action of antigens in an immunizing mixture. Among the predictions based on the theory are the following: that the denaturation of antibodies is irreversible; that different antibodies on denaturation and attempted denaturation become identical; that decrease in specificity of the antibody and decrease in antigenic power (amount of antibody produced) accompany increase in number of strong groups in the antigen; that a non-protein and non-polysaccharide substance may have antigenic power if it contains suitable groups and its molecules or particles are sufficiently large; that the synthesis of antibodies *in vitro* might be achieved by denaturing serum globulin and removing the denaturing agent in the presence of an antigen or haptene.

#### The Probability Concept

THE probability concept was considered in a paper read before the annual meeting of the U.S. National Academy of Sciences (April 22-23) by E. C. Kemble. The long-standing controversy over the nature of probability may be resolved by the type of operational analysis so fruitful in physics. Probability is related to our subjective sense of expectancy in much the same way that a thermometer reading is related to our subjective sense of heat and cold. Probability can be defined as a number derived by standardized mental operations from a definite state of information. In so far as it is dependent on information it is subjective. In so far as the evaluation of probabilities from given data is standardized in a manner acceptable to many persons the concept becomes objective. There is no *a priori* necessity for a single rule for evaluating probabilities from all states of information, and one must admit that where the information is vague no calculation of an acceptable probability is possible. Evaluation of probabilities on the basis of a principle of indifference is appropriate to one type of informational situation, whereas calculation from relative frequencies in a collective is appropriate to another. There is use for both types of probability in practical and scientific matters. Either one can be used with the standard calculus of secondary probabilities from primary probabilities. However, there is a sharp distinction between the totality of implications which can be drawn from the two corresponding states of information. Failure to observe this distinction is a common and serious error in probability calculations.