

(a) It is lethal for mice when administered by intravenous injection.

(b) It produces a characteristic necrotic reaction on intradermal injection into guinea-pigs.

(c) It is hæmolytic *in vitro* for sheep red cells, the hæmolysin being oxygen-stable and requiring the presence of calcium ions for the full development of its action².

(d) It reacts specifically with normal human serum³ and with egg-yolk solution to give a characteristic turbidity².

This reaction also requires the presence of calcium ions and is probably due to the action of a lecithinase which splits phosphocholine from lecithin⁴.

These various reactions appear to be due to the action of one substance designated as the *alpha* toxin and they can be neutralized by *alpha* antitoxin.

The *alpha* toxin has long been recognized as the main element in the pathogenic action of *Cl. welchii* type A⁵.

(2) A second hæmolysin has been recognized in *Cl. welchii* filtrates which has properties distinct from those of the *alpha* toxin :

(a) It exhibits a slight but irregular action when administered intravenously to mice, owing to the presence of natural antitoxin in this and other experimental animals.

(b) It produces a hæmorrhagic reaction, but it is not necrotic in action on intradermal injection into guinea-pigs.

(c) It is hæmolytic for sheep red cells *in vitro*; the hæmolysin is reversibly oxidizable, the hæmolytic activity declining with the ageing of filtrates; the hæmolysis is independent of the action of calcium ions.

(d) It does not give a reaction with human serum or egg yolk solution.

(e) It resembles closely streptolysin O.

(f) The reactions produced by this second hæmolysin are neutralized by high titre antihæmolysin O as well as by the homologous antiserum.

It was agreed that this second hæmolysin should be designated as *theta* hæmolysin, and that it should be clearly recognized as being distinct from *alpha* toxin of *Cl. welchii*.

The first mention of this type of hæmolysis is made by Neill⁶ but no special nomenclature was adopted. Prigge erroneously called this hæmolysin *alpha*⁷ and this mistake was repeated in the League of Nations Bulletin of the Health Organisation (8, 797; 1939).

The letter *theta* was first used as a designation for this hæmolysin in the literature by Macfarlane, Oakley and Anderson², and its properties have been clearly defined by Todd⁸.

The use of *zeta*⁷ for what is obviously the *alpha* toxin is therefore discarded according to the ordinary usages of nomenclature.

No assumption is made that these two elements are the only 'toxins' present in filtrates from all strains of *Cl. welchii*, type A.

RECENT WORK ON THE GEPHYREA*

DR. A. C. STEPHEN has published two memoirs relating to this group. He had a difficult task before him, for it is well known that its members are extremely elusive owing to their habitat and that the few specimens usually available are frequently damaged—a fact borne out by a species sometimes only being represented by an isolated introvert or flattened skin. It is therefore specially to be appreciated that so many specimens were brought up whole and undamaged and that colour notes made at the time of capture are available. The Discovery species are mainly from southern waters but some of the Sipunculids were secured in the Atlantic on the outward and homeward runs. Only one species is recorded in both reports—*Pyscosoma nigrescens* Keferstein, a widely distributed form in tropical waters, now obtained for the first time from Ascension and Tristan da Cunha. There are two new species from deep water from the Gulf of Oman and off the Maldive Islands, and one from the Gulf of Aden; also one new species of *Thalassema* from the Antarctic. The most interesting records, however, are those relating to bipolar species.

It has been known for some time that there is a close similarity, amounting in many cases to specific identity, between arctic and antarctic species belonging to the Echiuridæ, Sipunculidæ and Priapulidæ, and this is further exemplified in the Discovery collections. Of the twenty-three species known from the Antarctic and here listed (a few obviously warm-water forms being excluded from the list) half are either northern species or very closely related to them and ten of these are identical with, or regarded as varieties of, arctic species, and two are very closely related to arctic forms but are still regarded as specifically distinct. In this list species collected by the British, Australian and New Zealand Antarctic Research Expedition are included, the report of which by the same author is now in the press. Of the ten which are identical with, or regarded as varieties of, arctic species, four are included in the Discovery Collections.

The author directs attention to the fact, which stands out and may represent a real condition, that in the Antarctic most of the bipolar species seem to be confined to the South American quadrant.

The known range of distribution in several cases has been considerably extended, thanks to the wide area over which investigations were conducted by the Discovery ships. The Echiurids especially are interesting. Only three species of this group were known from the Antarctic. Now three species are added, two of which, *Hamingia arctica* and *Thalassema faex*, are well-known species which have not so far been found in other than Northern seas, and the third is a new species, *Thalassema arcticum*.

Both monographs are illustrated by good photographs.

* The Echiuridæ, Sipunculidæ and Priapulidæ collected by the Ships of the Discovery Committee during the Years 1926 to 1937, by A. C. Stephen, D.Sc. Discovery Reports, Vol. 21, pp. 235-60, Plates VII, VIII. 1941. Issued by the Discovery Committee, Colonial Office, London, on behalf of the Government of the Dependencies of the Falkland Islands (Cambridge University Press). Sipunculids and Echiurids of the John Murray Expedition to the Red Sea and Indian Ocean, 1933-34, by A. C. Stephen, D.Sc., John Murray Expedition, 1933-34. Scientific Reports, Vol. 7, No. 4, 1941. (British Museum (Natural History), London.)

¹ NATURE, 147, 87 (1941).

² Macfarlane, Oakley and Anderson, *J. Path. and Bact.*, 52, 99 (1941); van Heyningen, 1941, about to be published.

³ Nagler, *Brit. J. Exp. Path.*, 20, 473 (1939).

⁴ Macfarlane and Knight, *Biochem. J.*, 35, 884 (1941).

⁵ Glenny, Barr, Llewellyn-Jones, Dalling and Ross, *J. Path. and Bact.*, 37, 53 (1933).

⁶ *J. Exp. Med.*, 44, 199, 215, 217 (1926).

⁷ *Z. Immunitätsforsch.*, 91, 457 (1937).

⁸ *Brit. J. Exp. Path.*, 22, 172 (1941).