

Australasian forms of the Neuroptera and Mecoptera, both in the adult and pupal stages, have enabled him to suggest amendments which may be expected to win general acceptance. His insistence on the importance of the earliest pupal tracheation, and on the recognition of the longitudinal nervures by the presence of characteristic strong bristles (the *macrotrichia*), which are absent on the cross-nervules, and the scars of which can be distinguished in fossil wings, is particularly weighty.

The three extinct orders mentioned above are regarded by Dr. Tillyard as arising collaterally with the Mecoptera and Neuroptera in Permian times, one Permian fossil (*Permochorista*) from the coal-beds of New South Wales being definitely referred to the Mecoptera, and another (*Belmontia*) from the same beds to the new order Paramecoptera (see Proc. Linn. Soc., N.S.W., vol. xliv., part 2, 1919); while *Protopsychopsis* and *Archepsychops* from the Upper Trias of Queensland are classed with the planipennian Neuroptera, the Lower Triassic *Triadosialis*—a

European (German) fossil—standing near the base of the megalopteroid group. The extinct Paramecoptera are believed by Dr. Tillyard to be ancestral to both the Trichoptera and the Lepidoptera, while Upper Triassic fossils from Queensland (*Aristopsyche*, etc.) belonging to the Paratrachoptera suggest that this latter order gave rise to the Diptera (see *t.c.*, part 1, 1919).

From this summary it will be realised that all the principal orders of metabolous insects (the Endopterygota of Sharp), with the exception of the Coleoptera and the Hymenoptera, are brought into a series of reasonably probable relationships. Even if later discoveries may compel some modifications in the details of Dr. Tillyard's genealogical scheme, it seems impossible to doubt that he is on the track of real affinities, and that the other two great metamorphic orders, the beetles and the Hymenoptera, will ultimately be shown to have such relationship to this "Panorpoid complex" that the whole endopterygote assemblage cannot but be regarded as forming a natural monophyletic group. G. H. C.

Oil in Western Sinai.

By H. B. MILNER.

THE opening up of a new petroliferous region in any country is usually a matter of more than ordinary interest, not only to oil technologists, but also to the general business public. In Western Sinai we recognise one of the latest developments of oilfield enterprise, and from our knowledge of the Egyptian fields (to which this new region is geologically similar), as well as from the data published by the Petroleum Research Expedition of Egypt in a Preliminary General Report on Western Sinai (Cairo: Government Press, 1920), the prospects in this part of the peninsula would seem to be exceedingly promising.

For some time past it has been known from surface and other indications that the tract of country stretching southwards from Suez along the western coast of Sinai is petroliferous in many places, but it has remained for Dr. Hume and his staff of geologists to carry out the necessary geological investigations in elucidation of the structure of the country and for the selection of the most favourable localities for drilling test wells.

The actual belt of country examined lies between Suez and El Tor, a distance of about 220 km. along the coast. Of the various localities at which oil indications are promising those of Abu Durba and Gebel Tanka seem to be pre-eminent, and in the former instance a well-site has already been fixed; in the Gebel Tanka area there are three separate oil prospects which have received attention, and two sites for deep test wells are indicated at present.

With regard to the relative geological positions of the various oil horizons within the belt, from the information supplied in the report it is evident that there are at least two of these, an upper situate between the Middle Eocene limestones and Lower

Miocene marls and a lower occurring at the junction of the Cretaceous beds with the underlying Nubian sandstones. In the Gebel Tanka area both the upper and lower horizons are present, but drilling to the lower oil-bearing strata is advocated, as the Eocene limestones are not deemed here to be profitable commercially. In the Abu Durba area only the lower horizon is present, but drilling would not be to such a depth as in the former case, as the Tertiary beds are absent.

Tectonically, so far as present evidence shows, two definite systems of folding have been established within this region, one known as the Hammam Faraûn-Useit anticline and the other as the Gebel Araba anticline. The former is the more important feature from the oil point of view, since many of the reported indications (including those of the Gebel Tanka area) are associated with it. The latter is more doubtful in this respect, as the surface indications are less numerous, but it is evident that with progress in mapping a great deal more information will be obtained which should define the system with more precision, and thus indicate the chances of future exploration for oil in the sediments affected thereby.

Not only has the Petroleum Research Expedition done valuable work in reporting on the oil potentialities of this region; it has also made an important contribution to our geological knowledge of Western Sinai which, even if the oil prospect prove unfavourable, well warrants the survey made. Two other reports of the expedition (Bulletins 3 and 4) deal in greater detail with the oil occurrences at Gebel Tanka and Gebel Nezzazat (Sinai), and should be read in conjunction with the general report (Bulletin 2) described above.

Genetics of Cereals.

SINCE the well-known experiments of Biffen, in which the rust resistance of wheat to *Puccinia glumarum* was shown to behave as a simple Mendelian recessive character, numerous amplifying investigations have taken place. In Swedish experiments Nilsson-Ehle obtained less regular results,

finding usually a lack of dominance and segregation in indefinite ratios. In the meantime, extensive studies have been made of the black stem-rust, *Puccinia graminis tritici*, which causes enormous losses in American wheat crops. It has been shown that numerous biologic forms of this fungus exist