

THE British Secretary of State for the Colonies has appointed a tsetse fly and trypanosomiasis committee to consider and advise on the coordination of action, including research, directed against human and animal trypanosomiasis, and, in particular, against the tsetse fly as the chief vector. The committee, on which the Dominions Office and the Sudan Government are represented, will report from time to time to the Secretary of State for the Colonies, and on all matters affecting research its recommendations will be referred

to the Colonial Research Committee for comment and advice before submission to him.

THE name of Professor A. C. Waters, geologist of the U. S. Geological Survey, was accidentally omitted from the article in SCIENCE of August 11, p. 126, giving the names of those who received stars for the first time in the seventh edition of American Men of Science.

DISCUSSION

IMPROBABILITY AND IMPOSSIBILITY

M. LECOMTE DU NOÛY, of the Paris Ecole des Hautes Etudes, in his remarks on this subject¹ has proceeded on the assumption that the evidence which gave the Heisenberg "principle of uncertainty" gave also the quietus to "the old determinism" and rendered the joint determination of the position and the velocity of an electron "a matter of absolute impossibility." But since what is an "absolute impossibility" is evidently determined, M. du Noüy feels at a loss and invites the comments of others.

The "uncertainty" about the behavior of an electron is ours, not necessarily the electron's. If the method for discovering this behavior happens to obscure half of it, that does not signify it to be undetermined. Neither does it signify "absolute impossibility" so far even as the discovery of the obscured portion is concerned. The discovery seems theoretically possible still, like, for example, observation of the other side of the moon.

In order to pronounce anything impossible, on empirical grounds, exhaustiveness of empirical knowledge pertaining to it is required. If we say that is itself impossible, we then presuppose it in the mere assertion. This shows that a judgment of impossibility on empirical grounds involves either a certain omniscience or else self-contradiction.

Now self-contradiction is the criterion of impossibility, on *a priori* grounds—the *a* which is not *a* is impossible. The notion of empirically ascertained impossibility is thus seen to entail the notion of purely logical impossibility. In logic there is an interesting distinction between kinds of implication, namely, the formal, or necessary, and the material; a distinction which powerfully illuminates the import of possible and impossible. Suppose a proposition entails another, as in the composite example: If it is October 13, it is a day of ill luck; then, by necessary implication, it is impossible that it be October 13 and not a day of ill luck, while by material implication it is possible (1) that it is not October 13, yet is a day of ill luck, and (2) that it is not the one and likewise not the other. The reason for (1) and (2) is just

that they are contradicted by nothing before, hence are not known to be not the case; which allows the contingency of their being the case. Such contingency is synonymous here with possibility. In general, whatever is not irrational will be considered possible, in thought. This is an indication that possibility is legislated by thought.

Metaphysically the question (possibility) is equally interesting, and it has been a subject for eminent thinkers from before Aristotle to our own day. The solution proposed by Aristotle in his theory of entelechies, and other solutions from different viewpoints by numerous modern philosophers from Leibniz to Whitehead, have rendered the category of 'possibility' into clear terms.

M. du Noüy's question about the color of the emulsion in an unexposed photographic film, and his further question of whether color is determinable in strict objective terms or must be considered subjectively, are questions, no doubt, of epistemological significance. Color might be variously defined, and it is conceivable (hence possible), that some one of the definitions would permit a determination of the emulsion's color, if any, without exposure; likewise that the definition would enable a physicist to tell whether a given substance was colorless. Should M. du Noüy require spectral hues for anything he would call color, and should it be known that the photographic film lacked these, that would be an instance of the colorless. Again, if perception were a requirement of the definition, and were always lacking, the question would be unanswerable. The definition of color is of course not one to be given on logical grounds merely; but since whatever is not illogical is possible, a definition permitting an answer to M. du Noüy's question is within the bounds of possibility.

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PSYCHOLOGICAL DIFFERENCES AS AMONG RACES

PROFESSOR ASHLEY MONTAGU'S recent comments¹ on race differences leaves me with the feeling that I have misunderstood him or failed to understand him.

¹ SCIENCE, n.s., 100: 383-384, 1944.

¹ In SCIENCE for October 13, 1944, p. 334.

In the early part of his paper, Professor Montagu quotes from an observation by Professor Strandkov to the effect that if the concept of "races" has any validity, the presence of physiological and "inherent response differences" among such groups would seem to be almost inevitable. Commenting upon this statement, Professor Montagu writes that the results of forty years of psychological testing have failed to reveal differences as among races, whenever these studies have been made by "unprejudiced workers." Apart from the somewhat gratuitous reference to unprejudiced workers, this statement as it stands is certainly misleading and I believe it is definitely incorrect. Psychologists, to be sure, have not always known what their tests were measuring, and some of their methods have not been above reproach. But investigations of race differences in this country have regularly and consistently found differences as between the Negro and white. Such differences are, of course, subject to a variety of interpretations. But the *fact* of their existence can not be denied. I think this distinction between fact and interpretation should be clearly made.

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THE DISCOVERY OF COELOPLANA ON AMERICAN SHORES

SPECIES of Ctenophores belonging to the *Platyctenea*, of interest to zoologists by reason of their degenerate structure, creeping habit and possible evolutionary relationship with the *Turbellaria*, have not

previously been reported from the shores of the American continent. During the month of August, however, a Ctenophore belonging to this group was found to exist in considerable numbers at Miami, Fla.

Some unusual marine invertebrates were recently brought to me for identification by Mr. William Sutcliffe, a student at the Marine Laboratory. I was surprised to find that they were a species of *Coeloplana*, or a closely related genus. They were identified by the flat creeping form, the lack of comb plates and the presence of oral papillae. While moving they reached a length of 8 mm and when fully extended the tentacles measured up to 20 mm. The identification was confirmed by Dr. Libby Hyman, of the American Museum of Natural History.

The specimens upon which identification was based were found crawling in considerable numbers over the surface of algae and hydroids grown in tanks supplied by the laboratory sea water supply. Since their identity and importance became known, Mr. Charles Weiss has informed me that animals answering to their description had previously been observed and photographed by him and that they have frequently been taken from his floating collectors and rafts in the sea water adjacent to the laboratory.

A careful description, based upon more detailed examination, will be published at some future date, and in the meanwhile attention is being paid to the biology and habits of this unusual and interesting animal.

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SCIENTIFIC BOOKS

CANCER

The Riddle of Cancer. By CHARLES OBERLING. Translated by W. H. WOGLOM. 196 pages. Yale University Press. 1944. \$3.00.

A FEW decades ago cancer research had little to say to the interested public and little to offer to the average investigator, who needs a guiding idea on which to build. Transplantation of tumors had clarified some features of neoplastic growth but confused others, as it is in many respects a mere tissue graft, which, unlike the individual's own cancer, not infrequently regresses. The virus-induced tumors of chickens had no homologues among the mammalian tumors, and even their cancerous nature was doubted. The production of cutaneous tumors by painting the skin with tar merely confirmed human observations. Few suspected that the action of tar was more than that of chronic irritation and that tar contained hydro-

carbons which in minute amounts were capable of transforming normal cells into cancer cells; that these hydrocarbons would be synthesized and that their follow-up would bring steroid hormones and bile acids into the orbit of cancer research. Or that the sailor's and farmer's skin cancer was related to exposure to ultra-violet rays, reproducible experimentally at will and the carcinogenic dose expressible in terms of wave-lengths and quantity of irradiation. Or that viruses would be identified in mammalian growth and that their presence might be masked to such an extent that every mammalian tumor would come under suspicion of harboring a virus. Thus cancer research has become an expanding branch of science and of great interest to the general public.

Oberling tells his tale simply and vividly, giving the historical background of cancer research and explaining fully developments in other sciences which have made advancement in cancer research possible.