Like many anthropologists, Professor Herskovits is concerned over the psychologist's use of the term "race." In commenting on my brief note,[6] Professor Herskovits offers an original—to say the least—if somewhat whimsical solution to the whole problem of race differences. One can not, he writes, speak of race differences as between Negroes and Whites, since there is no Negro race in this country, but instead a group of more-or-less African ancestry. At first glance, this view seems reasonable enough, though upon examination it is clearly a quibble over terms. Surely a group does not have to possess unmixed ancestry (be racially "pure") before the term "racial" is applicable. The anthropologist speaks understandably enough of the factor of economic status, although the economic condition within a given group is never a constant and may vary widely. By the same token, the psychologist may speak sensibly of the factor of race when the group being described does not possess biologically pure ancestry. Except for small groups of transitional types, the American Negro constitutes a recognizable and clearly defined group; and the criterion of membership in this group is (more-or-less) African ancestry. To repeat what I said in my note, studies in this country over the past forty years have regularly and consistently found differences as between the American Negro and the American White. These differences, to be sure, are subject to a number of interpretations; but the fact of their existence can not be denied.

Although the extent of race mixture in this country has probably been fairly large, I do not believe that Professor Herskovits's oft-quoted estimate of the degrees of admixture possesses much validity. Professor Herskovits writes that ". . . it would be hazardous to place the proportion of those among the American 'Negro' population of unmixed African descent—that is biological Negroes—at more than 30 per cent., with the large probability of a much smaller percentage of unmixed Negroes to-day." In view of the method by which this figure was obtained, I think it would be hazardous to accept it as anything more than a guess. Incidentally—and finally—I hope that Professor Herskovits, having now clarified the term "race" for psychologists, will proceed to clarify the even more nebulous concept of "culture" for his fellow anthropologists.

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[6] SCIENCE, n.s., 101: 200.

MARINE FOULING AND ITS PREVENTION

THE fouling of ships reduces their speed, curtails their availability (by dry docking) and increases expenditure on fuel and labor. The 1943 report, issued by the joint anti-fouling subcommittee of the Iron and Steel Institute and the British Iron and Steel Federation, deals mainly with the anti-biotic properties of the copper and mercury components of protective paints.[1] The report shows that the progressive reduction in the effectiveness of such paints is not due to the exhaustion of their metallic constituents, but to the blocking of their active surface by slimy or cement-like formations largely of organic origin. This evolution of a natural "antidote" by marine organisms demands the revision of the whole idea of organic and inorganic poison paints as applied to fouling. The significance of these marine deposits becomes still more apparent when it is realized that they are not only products of marine life, but form the habitat or anchorage of many other types of flora and fauna. As to the nature of the slime, cement, coral and shell formations—they consist of organic, silicious and calcareous material in which the last predominates, whilst the first stabilizes the colloidal state, as in the case of mother of pearl. Again, apart from quantitative considerations, the ability of calcium carbonate to exist as a colloid in an inorganic medium (in its liquid-colloid-solid transition cycle)[2] gives it a dominant place in our problem. This is borne out by the effect of the "cleaning ports," treatment of dock basins infested with calcareous organisms, the geology of the area and such chemical influences as dissolved carbon dioxide, "soft" water, etc., upon the extent and type of fouling.[3] It would therefore appear that any measure calculated to hinder or inhibit the deposition of calcium salts would automatically counteract fouling. Such a preventive measure may possibly be found in a paint, incorporating zeolite or sodium permutit in a suitable medium, to be applied on top of the usual anti-corrosion protective covering. We may expect here the automatic combination of the two distinct processes operating in water-softening, namely, (1) the conversion of the sodium aluminium silicate into calcium aluminium silicate in presence of calcium bicarbonate and (2) the regeneration of the sodium aluminium silicate by the action of sodium chloride upon the calcium aluminium silicate. In other words, the normal salinity of seawater, exceeding its calcium carbonate content, may be sufficient to protect the anti-fouling paint and prevent the deposition of calcium carbonate. Such catalytic action would leave the sodium permutit paint apparently unaffected, with its surface free from gelatinous calcium carbonate.

[1] See also Bengough and Shepheard, Paper No. I on "The Corrosion and Fouling of Ships," published by the Iron and Steel Institute, 1943; Ewart Bowles v Bengough, *Nature*, 152: 159, 1943.

[2] M. Copisarow, *Jour. Chem. Soc.*, 123: 785, 1923; 222, 1927; *Kolloid Zeits.*, 49: 309, 1929.

[3] *Idem, Chem. and Ind.*, Nov. 18, 1944.

In the case of siliceous adhesions counteracting measures could perhaps be found by incorporating aluminium powder or aluminium hydroxide in the anti-fouling paint. The former may be expected to function as a mechanical buffer against diatomaceous matter (compare with silicosis treatment), whilst the latter could probably exert a neutralizing action upon sponge products (silicic acid gels) in their transition to flint-like consolidations.

In addition to regular progressive fouling we have adventitious attachment of floating seaweed. Under the influence of mechanical forces drifting vegetation is anchored mainly on the ship's sides, the types of algae being graded into zones by photochemical action. This raises the question, whether biological orientation and even inhibition could not be attained by the control of refraction or absorption of selected spectrum bands (basic to such photochemical activity), which may be affected by the addition of specific pigments or luminescent materials to the anti-fouling paint. Again, a paint containing zeolite and any of the already tried anti-biotics or such agents as boron compounds and prussian blue could perhaps be useful in this direction.

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ENCYSTMENT AND EXCYSTMENT IN CHAOS

In September of 1942, a fairly strong culture of *Chaos chaos* Schaeffer, in 200 cc of Hahnert's solution, was accidentally misplaced, and when examined about two months later no active forms were observed. Instead, about 600 small white translucent spheres, that looked like cysts, were found. These were relatively small, measuring, as a rule, from 80 to 150 micra in diameter.

A few hundreds of the cysts were selected with a micropipette and placed in fresh Hahnert's solution together with concentrated paramecia and chilomonas, and after about a week, two active specimens were observed. In other experiments it has taken at times from four to eight weeks and even longer for excystment. The smallest observed excysted forms were 500 to 550 micra when expanded. Only a very small percentage of the cysts excysted.

Encystment can be induced by lack of food. After the food has disappeared, chaos gradually gets smaller, but this reduction in size may be due in part to fission, as division has been observed in specimens placed in food-free Hahnert's solution up to ten days after transfer. As the size decreases, chaos occasionally takes on a spherical form, then returns to its characteristic shape. Eventually it gets so small that it may be mistaken for an ameba. Stained specimens show that there has been a constant reduction in the number of nuclei. The smaller forms usually have fewer than twenty nuclei, and in 41 specimens with fewer than twenty nuclei, six had between eleven and twenty, fourteen between six and ten, ten between three and five nuclei, but eleven showed no nuclei, though the last may have been due to weak staining.

These small forms eventually roll up into a sphere and encyst. Stained specimens of cysts show one nucleus as a rule, but thickness of the cyst wall makes staining difficult. This wall is crystal clear in living specimens, but sections of cysts show that it is a double structure.

Since excystment is rather rare, only two specimens were killed and stained. These showed about 25 nuclei. At present, work is in progress to discover how the number of nuclei is reduced before encystment, how the number is restored, together with other nuclear changes occurring during the process of encystment.

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AN INORGANIC "BOUNCING PUTTY"

Concentrated sodium silicate solutions show nearly the same physical properties as "bouncing putty."[1] A sample of sodium silicate, accidentally obtained from a more dilute solution by slowly drying for several months, containing 10.9 per cent. Na_2O, 35.0 per cent. SiO_2 and 54 per cent. H_2O, exhibited these properties to a remarkable degree. The material was a transparent rubbery liquid. It could be shaped into a ball and bounced off a hard surface like so much rubber. It was not sticky, and a ball formed from it could be bounced off a surface of the same material. A lump of this concentrated sodium silicate flattens out slowly if it is placed on a table top. In five minutes a ball of the material one inch in diameter will have a surface of about ⅞ inch diameter in contact with the flat surface. It will wet glass or ceramic materials if given a few minutes to do so, but will not wet them instantaneously. The sodium silicate solution retains its ability to bounce indefinitely provided it is protected from loss of water by evaporation; but it dries out in a few hours when exposed to air, becoming brittle and losing its ability to bounce.

The viscosity of this material was determined in an apparatus used for the determination of the viscosity of molten glass. The apparatus uses the concentric cylinder method. The viscosity was found to be 1.1×10^6 poises at 19° C. and was independent of the rate of shear.

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[1] *Chem. and Eng. News*, 22: 2016, 1944.