red blood corpuscle is also found to vary with the life-cycle of the parasite. The average size of a noninfected cell is about 5 μ, that of the infected ones is usually 6 to 7 μ. The maximum size is reached in the mature schizont stage (Fig. 6), when the red blood cell measures about 9 to 10 μ.

This brief note describes the results of a preliminary attempt to make malaria parasites visible under the electron microscope while they are still within the erythrocyte. The electron micrographs reproduced here show that the hydrolysis of the fixed cells as described in a foregoing paragraph reduces the masking effect of the cytoplasm to a marked extent. The intracellular parasites are then clearly visible. Such treatment has little effect on the parasites themselves, since mild acid hydrolysis with HCl is a standard cytologic procedure for the study of internal details of cells.

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6. This research was supported by grants from the Ministry of Education, Government of India. We are indebted to M. N. Saha, director, Institute of Nuclear Physics, and to R. N. Chaudhury, director, School of Tropical Medicine, for their interest in this work.

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5 April 1954.

Effect of Azide and Cyanide on the Respiration of a Species of *Mycobacterium*

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Clifton and coworkers (*1–3*) and Winzler (*4*) have shown that sodium azide acts like dinitrophenol in preventing assimilation of added metabolites by certain microorganisms. Instead, the metabolites are oxidized completely to carbon dioxide and water. According to Clifton (*1*) cyanide inhibits the rate of oxidation, although a slight increase in oxygen uptake may occur. The effect of azide and cyanide on autorespiration was not studied.

The question of autorespiration has been somewhat troublesome to workers in bacterial metabolism. Does the cell utilize its stored foodstuffs in the same way as it does added metabolites? And how does the added metabolite affect the autorespiration? An answer to these questions was attempted by studying the effect of azide and cyanide on the respiration of *M. tuberculosis* ATC. No. 8420. Thoroughly washed suspensions of this organism have a relatively high rate of autorespiration, which is increased by both azide and cyanide. It has been shown (*5*) that the addition of certain nitrogen compounds, such as methylamine or ammonium ion, whether assimilated or not, increases the autorespiration. In order to differentiate this effect from that of the drugs, it was shown that the azide and ammonium ion effects were additive (the assimilation of the latter is completely inhibited by azide) and that azide and cyanide allow for the more complete oxidation of added metabolites, such as acetate, caproate, pyruvate, and trehalose, whereas the ammonium ion does not. This increase in the oxidation of added metabolites occurs over and above that caused by the drugs on autorespiration. It therefore appears that these so-called "resting cells" are continuously breaking down, oxidizing, and resynthesizing their stored foodstuff and that these processes are not materially affected by the addition of metabolites.

The organism was grown in 20 ml of Long's synthetic medium for 4 to 6 days. The cells were harvested, and the masses were thoroughly broken up and washed with water by two centrifugations in Hopkins tubes. Seven-tenths milliliter of packed cells was suspended in 7.0 ml of 0.05*M* Na-K-phosphate buffer *p*H 6.0, and 0.5 ml of the suspension was used in each Warburg vessel which had a final fluid volume of 2.0 ml. The effect of azide and cyanide was greater at *p*H 6.0 than at 7.8.

Cyanide concentrations are difficult to keep constant, and it is possible to state only that amounts of KCN varying from 6.0 to 12.0 μg/ml increased the autorespiration on the average 10 percent, and 25 to 37 μg/ml increased it 20 percent after a slight initial depression that lasted 20 to 40 min. Larger amounts depressed for a much longer period of time. Azide was more effective. It increased the autorespiration 25 to 100 percent when 0.1 to 0.5 mg/ml were added, and

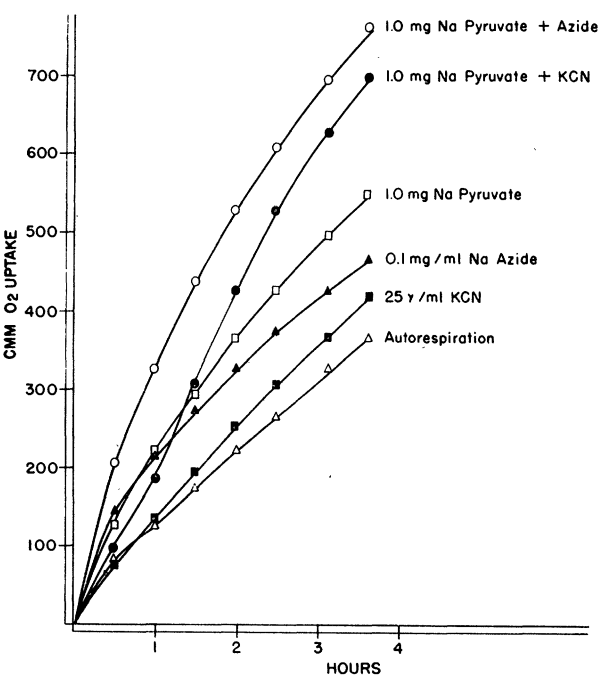

Fig. 1. Effect of cyanide and azide on the autorespiration and on the oxidation of pyruvate.

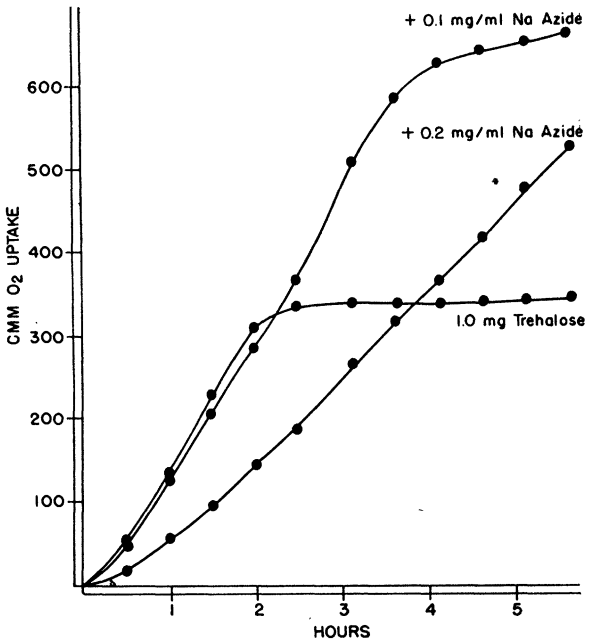

Fig. 2. Effect of two concentrations of azide on the oxidation of trehalose. The respective control respirations have been subtracted.

even the highest concentrations used caused no initial inhibition.

Figure 1 shows the effect of azide and cyanide on the autorespiration and on the oxidation of pyruvate. Pyruvate took up a little less than 2 atoms of oxygen per molecule. The drugs increased this to more than 3. The oxidation of trehalose stopped when 10 to 12 atoms of oxygen per molecule were taken up. This was increased to 18 to 22 by the drugs (Fig. 2). Their effects on the oxidation of the fatty acids such as acetate and caproate were much less striking. The final oxygen uptakes were increased by only a very small amount, and oxidation rates were depressed for several hours. The oxidation of the fatty acids stopped when 50 to 60 percent of the theoretical uptake had been reached. In the absence of added metabolites, both cyanide and azide raised the R.Q. from 0.82 to 0.91, which indicates that the endogenous carbohydrate metabolism is also preferentially affected.

The azide and cyanide effect on autorespiration was not altered after the cells were exposed for 3 min in a sonic vibrator at 9000 cy/sec. The rate of formation of the adaptive enzyme for benzoic acid was decreased 50 percent by this treatment. Exposure for 10 min eliminated the effect of the drugs, although pyruvate was still oxidized at about 25 percent of the normal rate. Neither 1.0 mg/ml of versene nor 0.05 mg/ml of 8-hydroxyquinoline affected the action of the drugs. Ferrous sulfate ($FeSO_4$) in a concentration of 0.5 mg/ml did not inhibit the effect of azide and cyanide on the autorespiration. Cupric sulfate ($CuSO_4$) inhibited respiration and this was not reversed by the drugs. Cyanate had very little effect and azide was neither reduced to ammonia nor oxidized to nitrite.

Summary. Azide and cyanide affect the autorespiration of these organisms in the same way as they do the oxidation of added metabolites. The effect of these drugs on the autorespiration occurs in the presence of the added metabolites.

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21 May 1954.

Site of Conversion of Desoxycorticosterone Acetate to Progestin

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The progestational action of parenterally administered desoxycorticosterone acetate (DCA) has been known for some time. Within recent years, however, it has been demonstrated that DCA has no progestational activity when applied locally to the endometrium of the rabbit (*1*) or mouse (*2*). From a consideration of the chemical configuration, Pfiffner (*3*) has suggested that desoxycorticosterone is probably converted to progesterone in the body and that one step in its metabolic degradation may be by the removal of the primary hydroxyl group. Zarrow, Hisaw, and Bryans (*4*) have presented evidence concerning the conversion of DCA to progesterone *in vivo,* but no information has been advanced regarding the site of this conversion in the organism.

In an attempt to gain information concerning the organs that are involved in such conversion, we have determined the progestin concentrations in the serum of castrated, adrenalectomized, and nephrectomized rats after an intramuscular injection of DCA. All determinations for circulating progestational activity were made by the method of Hooker and Forbes (*5*). Since chemical evidence for the identity of the substance measured by this test is lacking, the term *progestin* will be used for the hormonal activity measured in these experiments. In keeping with previous studies, however, the activity of the progestin has been standardized against progesterone (*6*).

The serum progestin levels of intact male (*7*) or castrated female rats in our colony have been shown to vary between 0 and 1 μg/ml. It may be seen from the data in Table 1, that following the administration of 5 mg of DCA to castrated animals, a maximum level of serum progestin was observed within 4 hr and a return to preinjection levels within 24 hr. Bilateral adrenalectomy or nephrectomy followed by 5 mg of