

of the body in such a way that mosquitoes could not bite them, and by the use of mosquito-nets for the house, it was possible to protect artificially from malaria men who lived and worked in the most gravely-infested localities.

In the following year (1900), whilst this method of mechanical prophylaxis by protecting the face and hands was being confirmed indisputably by the employes and labourers on the railroads, I began the first application of this preventive system among the peasants of La Cervelletta and among the guards of the Campagna.

In 1901 the experimental field had extended from La Cervelletta to several farms along the road to Rome. La Cervelletta had become a model, not only of intensive agriculture, but also of anti-malarial hygiene, and over the whole of this territory, until then ravaged by fever, we undertook a vast anti-malarial campaign, which was extended through the whole low-lying ground of the Arno, and in which we tried all the best methods of fighting malaria, such as the assiduous treatment of recurrent fever, both during the epidemic period and before it, the preventive treatment with the most digestible salts of quinine, and the mechanical protection of houses.

In like manner, little by little, since 1900, the work of the society has been extended to other malarial parts of Italy, and at the same time it has continually turned the discoveries of the laboratory to a practical application. Thus, on the model of La Cervelletta eleven similar stations were established in 1900. In 1901 a number of others were opened, ten in all, and in 1902 six others.

Thus, then, over all parts of Italy, the contagion of malaria is understood as well as or perhaps better than any other contagion, and there has been put into motion on a large scale the successful application of new methods of prevention against this pestilence which desolates the most beautiful and the most fertile parts of our peninsula.

[After some scientific discussion which we are compelled to omit, the account continues:]

But the most extensive and fruitful inquiries are those which have been made in the most important field, from the point of view of practical results, that of prophylaxis. The first steps taken by Casagrandi and myself had for object the destruction of the mosquitoes. The results obtained in my laboratory were very encouraging. But in the unlimited field of practice the difficulties were such that one could hardly, in this way, accomplish the extirpation of malaria except in special cases. Our attempts to find a preventive serum remained equally fruitless.

On the other hand, the most practical results were given us by quinine and by mechanical protection against the sting of the mosquito. Quinine has long been employed as a specific in malaria

either to cure an infection already received—curative treatment, or to obtain an artificial immunity induced by the drug—preventive treatment.

As regards the first of these two types of treatment, we were able to add to the testimony that there are fevers so obstinate as to recur in spite of even prolonged treatment with quinine alone or associated with arsenic and iron. This is why treatment, even the best and most intensive, applied in the pre-epidemic period only, does not prevent, in the course of the summer immediately following, the development and extension of malaria, and, consequently, it is practically more difficult than one would believe to extirpate malaria from an extended locality by treatment with quinine during the fever alone. In any case this could only be the work of long years, and every case of fever, whether primary or recurrent, in each period of the year would have to be combated assiduously and energetically. Happily, the preventive treatment by means of the preparations of quinine gives more definite and more satisfactory results. Thus, in 1900 we experimented with euquinine, but its price being excessive, we had to give it up, in spite of its easy administration and excellent results.

In 1901 we employed the bisulphate and hydrochlorate. Of 208 persons under treatment, there were scarcely 2 per cent. of cases of malaria, whilst those who, as control experiments, received no treatment showed a proportion of cases varying from 25 to 66 per cent.

[Statistics of treatment with hydrochloric acid then follow, and the article continues:]

The above-mentioned salts of quinine, easily soluble, are tolerated longer and better than we would at first have supposed.

For prophylaxis the daily treatment is more efficacious than the discontinued treatment at intervals of almost a week. When administered daily, some buzzing of the ears is caused for the first three or four days. After that there is no disturbance, the appetite improves, and strength increases. When these salts are given every five, seven, or ten days the buzzing of ears returns with each fresh administration. Moreover, the alkaloid is eliminated rapidly; the blood may be thus protected insufficiently or not at all. On the other hand, with daily doses the drug exerts a cumulative action and produces a perfect antidotal force.

We may note in addition that the preventive use of quinine, even when it does not succeed in preventing fever (and failure of this kind is rare), in no wise prevents the therapeutic action of larger doses, as has been believed, but, on the contrary, facilitates it. Large doses, far from being less efficacious with those who have taken preventive treatment, are more effective in terminating malaria if it should have developed despite the preventive doses.

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