having a solubility in water greater than 1 in 20 were considered. They are shown in the accompanying table.

Compound	Solubility in H_2O at 25° C.	Per cent. of sulfanilamide in molecule	Toxicity for albino rats in milligrams per kilo of body weight
Sulfanilamide	1 in 200	100	7,040
Camphorsulfonate ..	1 in 2	42.5	6,240
Benzenesulfonate ...	1 in 14	49.4	5,400
Phenolsulfonate	1 in 14	49.7	7,040
Sulfosalicylate	1 in 16	44.1	6,000

The toxicity of these water-soluble compounds as determined by oral administration to albino rats is indicated in the table. The probable dose which would kill 50 per cent. of the animals fed is above the amount indicated.

It will be noted from the table that the toxicity of some of the soluble compounds is slightly greater than that of sulfanilamide. This may be due to the fact that the relatively insoluble sulfanilamide is not absorbed as readily as these compounds.

In the preliminary protective tests it was possible to demonstrate a protective action of the water-soluble derivatives equal to or greater than that of sulfanilamide, although the derivatives contain only 40 to 50 per cent. of the mother substance (sulfanilamide). The protective tests were performed on albino rats which had been infected intraperitoneally with lethal doses of beta-hemolytic streptococci of Lancefield's group A, and then treated by oral administration with the compounds studied. Three hundred and fifty animals were used in these tests.

The protective action of the most soluble of the compounds listed (camphorsulfonate) was not due to the camphorsulfonic acid radical alone, since this failed to protect rats when it was administered in equivalent doses. This material apparently had slight bactericidal effect on the strain of streptococcus used when tests were performed in vitro. This bactericidal effect was entirely lost, however, when the material was combined with the mother substance to form the camphorsulfonate compound.

Clinical studies and further animal experiments are now in progress and will be reported in the near future.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

SUSTAINING LONGITUDINAL VIBRATIONS IN RODS

THE well-known demonstration of the Bernoulli effect, in which a card can not be blown from the end of a spool, has suggested a means of maintaining longitudinal vibrations in a rod such as that employed in the Kundt tube experiment.

If the card is replaced by the smoothly squared end of the rod, the latter may be kept vibrating indefinitely by a stream of compressed air. It may be necessary to start the vibrations in the rod in the usual way by stroking by hand. Then, a little adjustment of the clearance between the end of the spool and the end of the rod and also of the air pressure will very easily secure vibrations of such large amplitude that the intensity of the sound produced is quite surprising. In so far as the writer knows, this method of sustaining longitudinal vibrations in rods has not been described previously.

This method has some distinct advantages over the standard mechanical, electromagnetic, electrostatic, magnetostriction and piezoelectric methods. It requires only the simplest of apparatus, little or no attention during operation, and it is applicable to rods (and other bodies) of many shapes.

Inasmuch as the pitch of the tone produced depends on the physical constants of the rod, a considerable variation in the air pressure is permissible. Ordinarily the writer has used a line pressure of about fifty pounds per square inch when working with a one-inch metal rod about six feet long. The hissing of the escaping air is quite unobjectionable, but if it is desirable to eliminate this sound entirely, the free end of the rod may be passed through a hole in the wall so as to serve as a source of sound in an adjacent room.

A rod vibrated by the method described here is ideal for the production of the Kundt dust figures or for setting up stationary waves in a large room. These may be detected by merely walking across the room.

If the end of the rod is replaced by the bottom of a "tin" can, such violent vibrations may be set up as to be deafening. In the same way a tuning fork may be operated continuously if the lateral face of one of the prongs is placed against the air jet. The sound thus produced may reach an intensity difficult to obtain otherwise.

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DISCOLORED PLATES

IN the Smithsonian Contributions to Knowledge, Volume VII, is an article by J. W. Bailey, "Notes

on New Species and Localities of Microscopical Organisms," published in February, 1854. It is illustrated by a plate printed on highly surfaced paper. This plate, in all the copies examined, had become so discolored that many of the figures could not be observed in any detail. Figures of diatoms are of great importance, especially in the case of new species. In an effort to clear up one of these plates, I tried the following treatment. Several sheets of newsprint were placed below the plate to absorb excess moisture. A small piece of absorbent cotton was dipped in hydrogen peroxide and with this the surface of the plate was gently swabbed, using no pressure. The swabbing was continued until no trace of the discoloration remained, after which the remaining moisture was removed with a clean white blotter. The plate was allowed to dry thoroughly and no alteration has taken place in three months since it was treated. The figures are restored to their original clarity.

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PRESENCE OF HOST KEEPS PARASITES ALIVE IN CAPTIVITY

FOR the past two years the Division of Entomology of the Agricultural Experiment Station at Rio Piedras, Puerto Rico, has been engaged in attempting to introduce and establish in Puerto Rico a parasitic wasp, *Larra americana* Saussure, which attacks the "changa" or Puerto Rican mole-cricket, *Scapteriscus vicinus* Scudder. The wasp occurs in considerable abundance at Belem, Pará, Brazil, at some seasons of the year, and because the adults could be collected so easily and by airplane transportation arrive in San Juan by the second morning, the attempt at introduction has up to the present been concentrated on the adults. Most unfortunately, however, the mortality of the wasps in captivity has been rather considerable, so that, under the best methods of shipment that could be devised, the bulk of them arrived at destination dead. To obviate this distressing mortality, the collector at Belem this year, Mr. Luis F. Martorell, has been inducing parasitism in the laboratory on collected mole-crickets and shipping parasitized changas in a screened container inside the larger box containing the wasps.

The difference in mortality is most striking. In the first two shipments made without changas, only one wasp arrived alive. In three succeeding shipments immediately following, accompanied by parasitized mole-crickets, nearly two thirds of the wasps were alive in the first, only one was dead in the second and two had been crushed under the box of soil and changas in the third. So far as one could judge, all conditions were the same for all shipments, except that two were without and three were with a screened cage containing parasitized mole-crickets. The presence of clean, moist soil, uncontaminated with changa feces, apparently is of no importance in this connection, as had been indicated in shipments containing much larger quantities of soil in preceding years. It should be especially noted that the wasps could not come into actual physical contact with the changas because of the screen covering the box or can containing the earth inhabited by the mole-crickets; thus they could derive no satisfaction in again attempting to parasitize them, and the wasps do not feed upon the changa, for it is the egg and the larva of the wasp which is parasitic, not the adult. The excrement of the mole-crickets is a black, foul-smelling liquid, and when many of them are crowded close together, its odor is powerful. The crickets also chirp and sing, this being another possible comfort to the wasps in captivity, besides being an obvious proof of their hosts still being alive. No attempt will be made to determine whether the smell of or hearing their host is the more powerful in inducing *Larra* wasps to endure the discomforts of captivity, because the value of each shipment is too great to permit of experimentation once a successful method of shipment has been found. But this appears to be the first instance of the mere presence of the host serving to keep introduced parasites alive while en route between the point of collection and that of release. A more detailed account of the entire project is to be published in the *Journal of Agriculture* of the University of Puerto Rico.

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