the "new skin" or celloidin is poured into the bottles. This consists of covering the inside of the bottle with a ten per cent. solution of molasses and water. The molasses solution film is allowed to thoroughly dry on the inside of the bottle, before coating the inside of the bottle with the celloidin film. The celloidin film can very easily be removed by simply immersing the bottle in water as this will dissolve the film molasses coating on the bottle.

The only precaution necessary is to be sure that the ether of the celloidin solution has been thoroughly removed before the water is added. As pointed out, the ether will have sufficiently evaporated when the odor of ether is gone.

Our technician has found this a great time-saver; it also eliminates the danger of breaking the bag in removing it from the bottle.

M. W. WELCH

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## HEARING IN A NOISE

REFERRING to the letter of Dr. G. W. Boot, in SCIENCE of October 17, it seems that many cases of enhanced acuity of hearing of deaf people in the presence of a noise, including one of the cases cited by him, are really cases of greater ease of conversation with a normal hearing person. These may be explained by the fact that the noise bothers the deaf person less than the normal person, due partly to the difference in the levels of loudness to which they are sensitive and partly to the difference in frequency between the noise and the speech, the deaf person being more deficient for the noise frequencies than for the speech frequencies. As Dr. Boot points out, it is people with fixation of the stapes who report the phenomenon, and these people are deaf at the lower frequencies, which is the region of probably most disturbing noises.

I would like to call attention to the desirability of having the test made which was suggested in the March issue of the *Annals of Otology, Rhinology and Laryngology*. If the hearing itself is improved in the presence of a noise, as Dr. Boot maintains, then two such people with similar deficiencies in hearing should be better able to converse *with each other* in noisy surroundings, while if the change usually noted by them is due to the change in loudness with which normal hearing people talk in a noisy place, as is suggested above, then the two deaf people should not find the noise to be of any benefit. It is hoped that some one with clinical material available may try this experiment.

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# SPECIAL ARTICLES

## INFLUENCE OF ULTRA-VIOLET LIGHT ON YOUNG LAYING HENS

WE have found ultra-violet light to have as much effect on the egg production in young laying hens as it has on the bone development in young growing chicks. It is very common for young laying hens, when kept in the absence of ultra-violet light, and on a feed low in the anti-rachitic vitamin, the condition that tends to produce rickets (leg weakness) in growing chicks, to develop a pathological condition characterized by the following symptoms:

(1) The egg production is low.
(2) The eggs produced have very thin shells.
(3) The whites and yolks have less calcium and phosphorus than normal eggs.
(4) A much smaller percentage of these eggs hatch than normal eggs.
(5) Fully developed eggs are often retained in the oviduct, for three or four days.
(6) The hens often develop lameness or paralysis of the legs or wings.
(7) The bones become low in their mineral content and are easily broken.
(8) The calcium and phosphorus content of the blood is below normal.

That ultra-violet light will prevent the above condition is shown by the following experiment which we conducted last winter.

Two lots, of twelve Leghorn pullets each, were placed in the nutrition laboratory October 1, 1923. They were given the same ration, which consisted of yellow corn 82 per cent., tankage 5 per cent., casein 5 per cent., butter fat 5 per cent., bone ash 3 per cent., all ground together in a mash, and all the sprouted oats and oyster shells they would eat.

A cockerel was placed in each pen the first of January. Once a week these cockerels were shifted from one pen to the other in order to reduce, as much as possible, the influence of the male on the hatchability of the eggs from the different pens.

Beginning January 23 the hens in Pen I received a ten-minute ultra-violet light treatment each day during a period of sixteen weeks. During the period before the light treatment of Pen I was begun, there was no significant difference in the egg production of the two pens. The light treatment had a very marked effect on the egg production which showed up during the first week it was used.

During the sixteen-week period, in which Pen I received the ultra-violet light, the hens laid 497 eggs, while those in Pen II laid only 124 eggs. The eggs in Pen I had about 30 per cent. more calcium in the shell, and 5 per cent. more in the contents (whites and yolks) than the eggs in Pen II. Eggs from Pen I had an average hatchability of 78 per cent.,

while the hatch for those in Pen II was only 40 per cent. The leg weakness and retention of eggs in the oviduct began to be manifested in Pen II about the middle of the sixteen-week period. During the last half of this period six of these hens died. These hens all contained ruptured egg yolk.

On May 12 the light treatment was discontinued on Pen I, and June 1 light treatment was begun on Pen II. When this change was made, the previous record was just reversed. No more hens died in Pen II, and they increased in egg production, while Pen I decreased in egg production. The percentage produced in Lot I fell from 48 per cent. during the sixteen-week light treatment to 23 per cent. during the ten-week period when they received no light treatment. The percentage produced in Pen II increased from 11 per cent. during the sixteen-week period they received no light treatment to 34 per cent. during the ten weeks they received the light. During the period that Pen I received the light treatment, the shells on the eggs weighed 44 per cent. more than those in Pen II. When the light was changed to Pen II the weight of the shells from this pen was 12 per cent. greater than those from Pen I.

These data indicate that the ultra-violet light caused the difference noted between these two pens.

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## THE AMERICAN CHEMICAL SOCIETY

DIVISION OF CHEMISTRY OF MEDICINAL PRODUCTS

*Executive Committee*

E. H. Volweiler, *chairman*, H. A. Shonle, *secretary*, E. B. Carter, F. O. Taylor.

*The effect of some guanidine derivatives and other related substances upon the blood sugar of normal rabbits:* HARRY E. DUBIN and H. B. CORBITT. In line with Collip's suggestion that insulin might be a guanidine compound, a number of derivatives were tested out for their blood sugar-reducing effect. While a reduction in blood sugar was obtained, it was necessary to use a comparatively large dose. As a result, the animals died; besides, the decrease in blood sugar was not at all comparable to that produced by a unit of insulin. It seems unlikely that insulin is a guanidine compound.

*Relationship between chemical structure and physiological action. The effect of 1-suprarenin (synthetic epinephrin) and various derivatives upon the blood sugar of normal rabbits:* HARRY E. DUBIN, H. B. CORBITT and LOUIS FREEDMAN. Rabbits were prepared for use in a manner similar to that employed in testing insulin. Definite amounts of 1-suprarenin and various derivatives were injected and the blood sugar noted at stated intervals. The blood sugar-increasing effect varied with the chemical configuration of the substance injected. Frequently, the rise in blood sugar was followed by a decrease below the normal. This is undoubtedly only a compensation for the previous rise and has no further significance.

*The establishment of chemotherapeutics:* H. M. SPENCER. Chemotherapy has been defined and its limitations enunciated. It has been demonstrated that chemotherapy is a part of physical chemistry rather than of organic chemistry. A new medicament, Mercodel, has been described, the therapeutic vigor of which exemplifies this fact. Chemotherapy should concern itself at least equally with the energy in the body as with the material changes. The limitations of animal experimentation must be recognized, but the value of a comparative study of disease in organic life will lead to most fruitful results. Chemotherapy must contribute to a science of comparative medicine that should shed as much light upon human diseases as comparative morphology has thrown upon an understanding of human evolution.

*Mercury derivatives of some carbonyl compounds:* EDWARD LYONS. New mercury compounds of several imids and their preparation are described. In these, the mercury joins the molecule through the carbonyl group, and in the case of saccharin, the $SO_2$ group functions as if 2 CO groups were present. Succinimide and phthalimide yield mono- and di-mercury compounds, saccharin yields mono-, di- and tri-mercury compounds.

*The effect of glucose upon the toxicity and therapeutic efficiency of arsphenamine:* GEORGE W. RAIZISS, M. SEVERAC and A. KREMENS. In 1917, Kopaczewski suggested the adding of glucose to solutions of arsphenamine in order to prevent immediate reactions, such as nitritoid crises, which sometimes follow the intravenous administration of the drug. It was found by others that glucose generally decreases the toxicity of arsphenamine and its derivatives. It has also been found that solutions of these drugs can be made more or less permanently stable if glucose is added. The authors found that chemical combination takes place between arsphenamine and glucose and they isolated such compounds. These authors further found that the addition of glucose solution decreases the toxicity of arseno compounds, but it diminishes their therapeutic efficiency to still greater extent. The therapeutic efficiency was tested on the albino rat infected with trypanosoma equiperdum.

*Studies of the vitamin potency of cod liver oils—XIII —The vitamin A potency of dogfish liver oil:* ARTHUR D. HOLMES and MADELEINE G. PIGOTT. Commercial fishermen have raised the question as to the value of dogfish liver oil as a source of the fat-soluble vitamins. To secure information in this connection, dogfish liver oil was prepared from average, mature fish of both sexes. The vitamin A potency of this oil was tested under the same laboratory conditions as employed for testing the vitamin A potency of cod liver oil. It was found that one milligram daily of this dogfish liver oil contained sufficient vitamin A to restore growth and health in albino rats suffering from vitamin A malnutrition.