CONCLUSION

I believe the facts mentioned in this address show that those animal cells or organs which lend themselves to exact measurements of osmotic changes obey the law of Avogadro-van't Hoff, as long as they are normal or alive: *i. e.*, they neither absorb nor lose water if put into solutions of any kinds of sugar or neutral salts which are equi-molecular with the blood; that they absorb water in solutions of lower osmotic pressure, lose water in solutions of higher osmotic pressure. If the law of Avogadro and van't Hoff is correct (which nobody doubts), this behavior of the tissues is the expression of the applicability of this law to the exchange of water between tissues and liquids of the body.

It does not often happen in biology that we are able to reduce life phenomena to a fundamental physico-chemical law to such an extent that we can not only predict the results qualitatively, but also quantitatively, as is the case in the application of Avogadro's law to the exchange of water between tissues and the liquids of the body.

If anybody wishes to supplant the law of Avogadro he must be able to offer a theory which allows a still closer approximation between calculated and observed results than is the case in the experiments on the absorption of water by animal cells or tissues. No such theory has thus far been offered.

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THE SPREAD OF THE BROWN-TAIL AND GYPSY MOTH

FOR several years Massachusetts has been spending large sums of money in fighting the brown-tail and gipsy moths. These insects have spread westward in their devastating course and are now recorded from a point not far distant from the eastern boundary of New York. In February a conference was called in Boston by the state forester of Massachusetts for the purpose of bringing together not only those actually engaged in the fight with the gipsy and brown-tail moths, but those who are sure to be concerned in the near future. The New York State College of Forestry at Syracuse University is investigating the work of these insects and Dr. M. W. Blackman, forest entomologist of the college, was its representative in the conference in Boston and is ready to take up the fight against these insects when they appear in this state.

Interesting facts were brought out at this conference as to the spread of the gipsy moth. It is very certain that New York and other states about Massachusetts will soon be reached by these destructive insects and that unless more effective means are taken they will destroy not only forest trees but shade and ornamental trees over large sections of the state. As shade tree pests these insects can be controlled by spraying and destroying egg clusters, but these methods are used only at considerable expense and must be continued indefinitely. It seems probable that as soon as the parasites and diseases introduced from abroad which work upon and destroy these insects have become fairly established that they will aid man greatly against future serious outbreaks.

The gipsy moth problem of the future in the state of New York is a forestry problem, as the insect can not be fought in the forest by spraying but must be controlled and eventually eliminated by proper methods of forest management. Certain trees, such as the oak, willow and birch, are apparently more favorable and often seem necessary for the development of the caterpillars of the moths. Methods of forest management can be used which will remove these trees from the forest and thus destroy the most favored food of the pests. With these methods of proper forest management must go strict quarantine against lumber, cordwood and nursery products shipped in from infested areas. Some effort

has been made to establish a "dead line" to prevent further spread of the insect. A zone of timber consisting largely of white pine and other evergreens is selected and all hardwoods or broad-leaf growth removed. As the insects are unable to complete their life history on the pines, they are checked and it may be possible to prevent their spreading northward into the Adirondacks, or into the Catskills, through the maintenance of such zones of coniferous growth. In the caterpillar stage the two moths do the greatest damage and the greatest spread of the insect occurs at this time. They are often blown long distances by the wind or carried by automobiles and other vehicles and much can be done in preventing this kind of distribution by keeping the roadside districts free of the caterpillars through spraying and the removal of their favored food plants.

The outbreak of the gipsy moth in this state in the summer of 1912 was not extensive and by prompt measures, such as the removal of infested trees, spraying, etc., the colony was destroyed. It is entirely possible, however, that there may be other well established colonies in outlying districts near the Catskills or Adirondacks of which there is no official knowledge. The state in the prosecution of its forestry work should make thorough investigations, especially along the eastern border in sections where there is the greater danger of the incoming of the caterpillar and thus prevent its doing the tremendous damage which it has done in Massachusetts.

THE NEW GEOLOGICAL SURVEY BUILDING

After a campaign lasting 26 years the United States Geological Survey has received generous recognition at the hands of congress in the authorization of an expenditure of $2,596,000 for the construction of a fireproof building "of modern office-building type of architecture." With this sum it is proposed to erect a building on ground already owned by the government which shall accommodate, besides the Geological Survey, the Reclamation Service, the Indian Office and the Bureau of Mines, all bureaus of the Interior Department whose work is closely related to that of the Survey and among all of which there is more or less constant cooperation. The public buildings law, which carries the Survey item, authorizes an immediate appropriation of $596,000, the balance to be appropriated as needed in construction. Plans can thus go forward at once for the construction of the new building. For the needs of the Survey and the other bureaus mentioned an up-to-date, conveniently arranged, and well-lighted building is of especial importance. Too many of the civil employees at Washington work in part or exclusively by artificial light, in quarters that may be compared to dungeons, a condition which is suggestive of medieval times, when the first requirement of castles was walls thick enough to resist the attacks of battering rams and catapults, or of the still more ancient period when huge, ornate pillars and columns were the fashion, regardless of the arrangements with respect to light and convenience on the inside of the building. The innovation of providing a structure of the modern office type for government "workshops" in which a maximum of the best work is the first consideration, such as will occupy the new building, will be welcomed.

Mr. Alfred H. Brooks, of the Alaska Division, Mr. Sledge Tatum, of the Topographic Branch, and Mr. Herman Stabler, of the Water Resources Branch, of the Geological Survey, have been appointed an advisory committee to assist the director in regard to the plans for the new building.

SCIENTIFIC NOTES AND NEWS

For the meeting of the British Association, which will take place in Birmingham on September 10–17 next, under the presidency of Sir Oliver Lodge, F.R.S., the following sectional presidents have been appointed: A (mathematics and physics), Dr. H. F. Baker, F.R.S.; B (chemistry), Professor W. P. Wynne, F.R.S.; C (geology), Professor E. J. Garwood; D (zoology), Dr. H. F. Gadow, F.R.S.; E (geography), Professor H. N. Dickson; F (economics), Rev. P. H. Wicksteed; G (engineering), J. A. F. Aspinall, M.Eng.; H (an-