guardian." The amendment was specifically sought by the Christian Science Church.

Dr. Lewis A. Wilson, Commissioner of Education, has already approved the exemption of the children of parents or guardians of the Christian Science faith from instruction in the units of disease prevention and control and has indicated specifically which parts of the syllabus are to be omitted in their case. According to his ruling, these children will get no instruction in such areas as the building up of resistance to disease; the understanding of current health programs, both public and private; measures used to prevent the spread of communicable diseases; the importance of heart disease, cancer, diabetes, diphtheria, typhoid fever, tuberculosis, and infantile paralysis; the role of insects in the transmission of disease, a role which properly understood enabled the United States to build the Panama Canal after France had failed; the relation of the sanitary control of water and food to public health; war conditions and the problem of disease control and prevention; what bacteria are; the work of such eminent figures as Florence Nightingale, Louis Pasteur, Walter Reed, Robert Koch, and Alexander Fleming, the discoverer of penicillin; the home care of the sick; first-aid treatment; and so on. This is only a sampling of the units of instruction that fall under the ban of law.

It is obvious from the mere listing of these topics that the law will deprive exempted children of invaluable information; but even more, the Commissioner goes on to state that "required sections of the Regents examination as well as the State Scholarship examinations will be constructed so as not to penalize pupils who have been excused from instruction in the specified units of study." Thus, de-emphasis and virtual elimination of these topics loom up for all children, Christian Science or not. Even on a history examination, for example, no question may be asked about Louis Pasteur or Gen. William Gorgas, for these men were concerned with disease control.

This law and its method of implementation are so alarming from the point of view of the protection of the health of the individual and the community and from the point of view of the preservation of the state itself and its public educational system, that a widespread demand for its repeal is in order.

Lipoid-Lipoprotein Cholesterol

THE ultracentrifuge studies of J. W. Gofman and co-workers on lipoid-lipoprotein cholesterol complexes in sera have established the importance of the differences in the physical state, especially particle size, in atherosclerosis. We have observed an even more striking similar effect while producing experimental hypercholesteremia in rabbits. In these animals a definite and consistent layering of the hyperlipemic and cholesteremic sera occurs merely on standing. Two definite layers form without centrifuging, similar to cream in a bottle of milk. This process is accentuated and quickened by an ordinary centrifuge. The upper layer consists of large aggregates which may be seen easily with an ordinary microscope. The effect occurs only when high serum levels are attained, especially over 1,500 mg% of cholesterol; and the height of the layer increases roughly in proportion as the cholesterol level is raised by continued feeding. There is a marked difference in the cholesterol content of the two layers. In one serum the top layer contained 4,540 mg% of total cholesterol and 1,100 mg% of free cholesterol, whereas the bottom layer had 2,020 mg% total and 616 mg% of free cholesterol.

This very easily elicited difference in lipoid aggregates probably plays an important role in the experimental production of atheroma in the rabbit. The study of these layers should aid in determining the exact nature of the lipo-protein-cholesterol complexes.

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A Correction to North American Fauna No. 35

IT WAS recently suggested to the writer by Elliott S. Barker, State Game Warden of New Mexico, that the figures given by the late Vernon Bailey in "Life Zones and Crop Zones of New Mexico" (*North American Fauna No. 35* [1913]) for some of the life zones of New Mexico seemed to him to be seriously in error. Since Bailey's paper and its accompanying map are still in rather wide use, at least by students of faunistics, and since the areas of the life zones are of importance in certain phases of game management, we decided to check Bailey's map carefully to recompute the areas. We assumed the map to be reasonably accurate. It is, apparently, the only detailed map of the life zones of New Mexico in existence.

E. S. Barker, Richard Allgood, and Levon Lee together carefully checked a copy of this map, using a planimeter for all zones except the combined Hudsonian–Arctic–Alpine, which they estimated. The writer made an independent estimate from another copy of the map, by taking each township separately and estimating visually to the nearest 25% the proportion of the township in each of the several life zones. (There are approximately 3,400 townships in New Mexico, the area of the state being about 122,400

TABLE 1

Zone	Bailey (round figures, sq mi)	Barker (round figures, sq mi)	Campbell (actual figures, sq mi)
Lower Sonoran	18,000	19,400	19,516
Upper Sonoran	92,000	79,000	78,482
Transition	10,000	20,000	19,242
Canadian	2,000	3,850	4,167
Hudsonian	300	150	234
Arctic-Alpine	100		
Totals	122,400	122,400	121,641

sq mi.) The total number of townships in each life zone was thus found, and these figures were then multiplied by 36 to convert to square miles. It is not known how Bailey computed his estimate, but it is natural to suppose that he drew the map first and then used it as a basis.

Table 1 shows the three sets of available figures for the areas of life zones of New Mexico.

Evidently Bailey was wide of the mark in several cases, and the actual values of the zone areas in square miles may be taken to lie somewhere near the following figures: Lower Sonoran, 19,500; Upper Sonoran, 79,000; Transition, 19,700; Canadian, 4,000; Hudsonian–Arctic–Alpine combined, 200. The latter two zones are not separated on Bailey's map. Probably the Arctic–Alpine in New Mexico does not include more than 75 square miles. This would leave about 125 square miles for the Hudsonian.

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Glycols and Atomized *E. coli*

THE recent article by Nagy and Mouromseff concerning the effect of propylene and triethylene glycols on atomized *E. coli* (*Science,* **112**, 593 [1950]) deserves careful comment, since their conclusions are at great variance with those found by many other investigators. They interpret the results of their experiments as showing that glycol vapors are not germicidal but simply accelerate the settling out of airborne bacteria, thereby diminishing the bacterial population of the atmosphere. It is apparent from their data that they were dealing with bacterial aerosols containing many large particles, since only a bacterial cloud of predominantly large particle size would give such high initial settling plate and electrostatic precipitator recoveries. The use of unusually high atomizing pressures (50 psi) with a relatively coarse atomizer upon a culture containing an organism that is relatively fragile would tend further to eliminate the presence of viable bacilli in the finer particle size fractions of the dispersed aerosol. It has long been recognized that glycol vapors are relatively ineffective against large particles, especially if they are still in the liquid state in an atmosphere of high humidity. The use of more efficient sampling techniques than those dependent primarily upon the process of sedimentation would have greatly increased the significance of the experimental results they present.

Another very unfortunate feature is the lack of any quantitative information concerning the actual amount of either propylene or triethylene glycols present in the air of the treated environment at the time of atomization of the bacterial culture. In reporting the experiments performed in the 16-cu-ft chamber, no statement is made concerning the method of glycol vaporization. Since the concentration of glycol vapor is a critical factor in determining its efficacy as an aerial germicide, the omission of these data vitiates any conclusions that have been drawn. Furthermore, the operation of a commercial vaporizer (capacity unstated) for only 1 hr in the schoolroom (the dimensions of which are not given) prior to the atomization of the bacterial culture would make it unlikely that adequate germicidal concentrations were attained during the experiments cited. Equally deficient in essential information are the duct and room tests, in which no concentrations of glycol vapor are reported.

In summary, the data cited by Nagy and Mouromseff lack significance because of (1) the absence of definition and precision relative to the particle-size characteristics of the bacterial aerosol studied, (2) the use of sampling techniques appropriate only to the evaluation of large particles, which are relatively inefficient in determining the presence of viable organisms dispersed in the air as particles of less than 3 μ in diameter, and (3) the complete absence of any determinations of the glycol vapor content of the air.

In addition to lack of appreciation of the requirements for adequate experimental studies on aerial disinfection, numerous incorrect quotations from earlier work and apparent unawareness of the crucial experiments demonstrating the lethal action of propylene and triethylene glycols on various species of airborne bacteria make it evident that these authors did not acquaint themselves with the literature on this subject. That the effect of glycol vapors is not due, as Nagy and Mouromseff conclude it is, to a marked increase in the settling rate of bacteria-containing droplets, was clearly shown many years ago in this laboratory (Chicago) and has been corroborated since by others.

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WE appreciate the opportunity to answer the criticisms of Robertson, Lester, and Puck regarding our paper on the effect of glycols on atomized *E. coli*. The numerous papers on this subject, most of them by the investigators at the University of Chicago, deterred us for some time from publishing our results. Our tests, therefore, were devised to determine where the previous investigators may have erred. A more careful reading of our paper by them would have answered all their criticisms.

Our early tests on the use of glycols, which were not published, date back to 1941, and they all showed that vaporized or atomized glycols only increased the rate of settling of organisms and were not germicidal. The tests were interrupted by the war. Our interest was renewed when there was placed on the market a "vaporizer designed and manufactured by the research group who were instrumental in the original discovery" (quoted from instruction sheet supplied with vaporizer). This vaporizer was used for most of the tests in the 64-cu-ft box, schoolroom, and air ducts.