

stitutes for grain alcohol, which would be unpotable and free from internal revenue taxation and prohibition regulations, are greatly desirable. Ordinary denatured alcohol, while useful for some laboratory purposes, is not satisfactory for most uses because of the character of the denaturants; and the use of a special denaturing formula is so involved in regulations as to be almost impossible.

A considerable series of experiments has shown that *isopropyl* and chemically pure *methyl* alcohols will fulfill practically any use for which alcohol is needed in biological work. It is indicated that inhalation of fumes of *isopropyl* alcohol does not have dangerous consequences; certainly, in any properly ventilated place the fumes would not be a danger. The experience of those who work in factories where methyl alcohol is produced, and who at times inhale the fumes in large quantity, shows that there is also little to be feared from its use in the laboratory. Experiments along this line are in progress. Probably most persons would prefer to use *isopropyl* alcohol for those purposes which might cause considerable quantities of the fumes to be inhaled. But both alcohols can be used with perfect safety for histological or other ordinary purposes. Out of consideration for those who consider alcohol a beverage all containers of both these alcohols should display warning labels.

The commercial grade of *isopropyl* alcohol contains 91 to 92 per cent. of the alcohol, while the similar grade of *ethyl* alcohol is 95 to 96 per cent. A purer grade of *isopropyl* alcohol, 98 to 99 per cent., can be supplied by the manufacturers, which can be made anhydrous by ordinary procedures.

"Chemically pure" methyl alcohol is practically anhydrous, and being less hygroscopic than *ethyl* alcohol is more useful and reliable for such purposes as dehydrating tissues than the anhydrous ("absolute") *ethyl* alcohol. As it contains only a trace of acetone it is entirely without the disagreeable odor of ordinary wood alcohol.

Both *isopropyl* and methyl alcohols have been tested against *ethyl* alcohol in the preparation of reagents, and in histological work

done with such reagents and stains, as well as in the preservation of museum specimens. No differences could be detected in favor of either of them, except that the methyl alcohol proved much more satisfactory as a dehydrating agent.

In addition to the advantage that methyl and *isopropyl* alcohols have of being free from vexatious regulations and the danger of irregular use, they possess the additional merit of competing in price with the tax-free commercial *ethyl* alcohol.

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IRIDESCENT CLOUDS

ON the afternoon of January 21, beginning before four and lasting perhaps an hour, an unusual set of iridescent cloud phenomena was seen in the southwest. Low in the sky, partly hiding the sun, were thick clouds edged with brilliant gold, which remained practically stationary. Higher up the sky was for the most part clear, with occasional cirro-cumulus clouds, many finger-shaped and pointing downward to a point north of the sun. The edges of these clouds were quite definite, and surrounding the tips and sides were two or three alternate narrow parallel bands of bright pink and green, the outer band in most cases being pink and the color extending at times 45° from the sun. Some of the clouds showed flocculent edges, giving an appearance of a colored fringe and one cloud broke up entirely into horizontal flecks and disappeared as it passed the zenith. Besides these were detached clouds which showed brilliant iridescent colors throughout the whole. One thin flocculent cloud showed small uniformly distributed flecks of pink and green, a larger one showed four irregular vertical bands of pink and green which covered the whole cloud, several glowed with lurid irregular patches of colors such as are seen in a thin film of oil on water. In one case a small spot of dark rose appeared against a misty blue background, rapidly grew into a pillar of vivid mottled colors, and then stretched out toward the northeast to form a white streamer all the way across the sky, its western portion being bordered with the characteristic pink and green bands.

These colors appear to be characteristic interference effects. Stoney¹ describes almost identical phenomena and states the conditions under which there would be formed crystals of such orientation and thickness that light reflected to the observer from the front and back surfaces of the crystal would produce interference. The explanation based on diffraction which McConnell² offers in criticism of Stoney's article does not seem to fit the phenomena observed here. His theory does satisfactorily explain the effects which he observed during a winter spent where similar phenomena were frequent, but there the brightest colors were within a range of from 3° to 7° from the sun and the farthest distance at which he could ever detect any color was 23°. He says that according to Stoney's theory the most brilliant effects might reasonably be expected somewhere about 20°-30° from the sun "for which we should look in vain." There were in this case few if any iridescent colors within the area where he found them most brilliant, and certainly beyond 23° they were very brilliant. It would therefore appear that there are these two different types of phenomenon.

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QUOTATIONS

THE PROPOSED SUPPRESSION OF THE TEACHING OF EVOLUTION¹

THE mode of origin of species was practically discovered by a little-known German paleontologist by the name of Waagen in 1869, but, like the great discovery of Mendel in heredity, this truth has been long in making its way, even among biologists. Waagen's observations that species do not originate by chance or by accident, as Darwin at one time supposed, but through a continuous and well-ordered process, has since been confirmed by an overwhelming volume of testimony, so that

¹ *Phil. Mag.*, s. 5, Vol. 24, p. 87.

² *Phil. Mag.*, s. 5, Vol. 24, p. 423.

¹ Extracts from articles in the *New York Times* for March 5, in answer to the article by Mr. Bryan from which extracts were printed in the last issue of *SCIENCE*.

we are now able to assemble and place in order line after line of animals in their true evolutionary succession, extending, in the case of what I have called the *édition de luxe* of the horses, over millions of years. We speak to the earth from Eocene times onward to the closing age of man, and it always teaches us exactly the same story. These facts are so well known and make up such an army of evidence, that they form the chief foundation of the statement that evolution has long since passed out of the domain of hypothesis and theory, to which Mr. Bryan refers, into the domain of natural law.

Evolution takes its place with the gravitation law of Newton. It should be taught in our schools simply as Nature speaks to us about it, and entirely separated from the opinions, materialistic or theistic, which have clustered about it. This simple, direct teaching of Nature is full of moral and spiritual force, if we keep the element of human opinion out of it. The moral principle inherent in evolution is that nothing can be gained in this world without an effort; the ethical principle inherent in evolution is that the best only has the right to survive; the spiritual principle in evolution is the evidence of beauty, of order, and of design in the daily myriad of miracles to which we owe our existence. This is my answer to Mr. Bryan's very natural solicitude about the influence of evolution in our schools and colleges—a solicitude not inherent in the subject itself, but in the foolishness and conceit of certain of the teachers who are privileged to teach of the processes of life.

It would not be true to say that the evolution of man rests upon evidence as complete as that of the horse, for example, because we have only traced man's ancestors back for a period of 400,000 years, as geologic time was conservatively estimated in 1893 by Secretary Walcott of the Smithsonian Institution, Washington; whereas, we have traced the horse back for a period of 3,000,000 years, according to similar estimates of geologic time.

The very recent discovery of Tertiary man, which I have just described in *Natural History* (November-December, 1921), living long before the Ice Age, certainly capable of walking in an erect position, having a hand and a foot fashioned like our own, also a brain of suffi-